

g insight

About

Digitalization is leading to the transformation of the construction industry with the opportunities it offers to transform and optimize every stage and process of the asset life cycle. The magazine g insight provides influential knowledge and thinking on key digitalization trends inside the built environment, such as

digital building, BIM, digital twins, sustainability, asset lifecycle management, etc. With our expertise and contribution of professionals, the magazine will show you a clear and feasible digitalization route through a global lens in both theoretical and practical ways, to make every project a success.

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Glodon Company Limited

SPOTLIGHT

**Digital Transformation in
Construction: Why It Matters**

**Revolutionizing Quantity Surveying,
Cost Management with Data and
Technology**

OPINION

**Shaping a Sustainable Future with
Digital Building**

**Building Smarter with Digital Project
Management Solutions: Harnessing
the Power of Automation, Analytics,
and AI**

JULY 2023



From Blueprint to Bright Future: Embracing Digitalization for Sustainable Buildings

The construction industry continues to face unprecedented changes. As businesses navigate the complex market landscape, they must contend with the uneven growth in residential and non-residential segments. However, amidst these challenges, digitalization presents an opportunity to drive sustainable practices and ensure long-term success. The importance of digitalization extends throughout the building life cycle, enabling us to reimagine how we design, construct, and manage buildings.

At the core of digitalization lie powerful technologies such as Building Information Modeling (BIM), Artificial Intelligence (AI), and data analytics. By leveraging these digital technologies, construction professionals can make informed and data-driven decisions. In the design phase, digital technologies empower stakeholders to collaborate seam-

lessly, integrate systems effectively, and visualize building elements in real time. By leveraging digital tools, professionals can accurately quantify and estimate project costs, mitigating the risks of cost overruns and ensuring efficient resource allocation. During construction, digital tools enable efficient project management, precise cost estimation, and streamlined scheduling. Furthermore, digital technologies facilitate effective building management, maintenance, and energy monitoring in the operation phase, ensuring long-term sustainability and enhanced occupant comfort.

To embrace digitalization, professionals must embrace change, foster innovation, and promote collaboration. Together, we can create buildings that not only meet the needs of the present but also ensure a brighter future for generations to come.

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Driving Integrated Construction with Digital Design



By Langsheng Yun

Senior Vice President at Glodon

In the wave of digitalization, many AEC enterprises are actively exploring digitalization. However, compared with other industries, the overall digitalization of the AEC industry is still at an elementary stage. The digital achievements are mostly reflected in fragmented and isolated applications. To fully leverage the value of digitalization, it is necessary to consider it in a more comprehensive and systematic manner.

The traditional design process is characterized by low collaboration efficiency across disciplines, and insufficient consideration is given to construction, operation and maintenance plans and whole lifecycle costs at the design phase. This leads to repeated revisions, increased costs, extended project timelines, increased project risks, and ultimately, the delivered results often deviate significantly from the design objectives. With the growing demands for construction industrialization and green building practices, the AEC industry urgently requires effective digital tools to support the systematic optimization of building design, construction, operation and maintenance.

Glodon's digital design, defined as data-driven integrated design, aims to effectively address these problems. Through digitalization, we can achieve efficient, real-time and transparent cross-disciplinary collaboration. At the same time, we more accurately prioritize construction, operation and maintenance and cost considerations in the design phase to eliminate project risks, streamline data flow across stages. This enables the optimization of design plans, construction plans, operation and maintenance solutions and whole lifecycle costs.



Our integrated solution combined with digital design is reflected in the following three aspects.

The first aspect is the integration of conceptual design and detailed design across all disciplines. Through a common construction data platform, it effectively integrates all stakeholders during the conceptual design phase, enabling integrated design. It also establishes efficient interdisciplinary collaboration and project management during the detailed design phase to bridge data barriers between the conceptual and detailed design phases.

The second aspect is the integration of design and cost. Through the closed-loop of accumulation and application of enterprise cost data, a systematic cost index is established. This system measures cost indicators to select more optimal design plans, set more reasonable cost targets, control project bidding and procurement costs within targets, and provide timely warning and risk management for cost overruns, ensuring more reasonable project costs and optimal project value.

The third aspect is the integration of design and construction. Through the construction data platform, design outcomes can be transferred to the construction phase without loss. Based on detailed models down to the process level, effective data integration can be achieved with the process management platform for construction. This enables the management of quality, cost, schedule and

other aspects of the construction process based on the integrated model. Additionally, it effectively promotes full-process data exchange, thereby improving the efficiency and delivery quality of projects. Digital design and smart construction complement each other, empowering the digitalization of the AEC industry.

With the vigorous development of artificial intelligence (AI), especially foundation models, let's envision some future AI-driven digital building scenarios. At the job level, AI assistants will empower various professionals or management personnel, making work more efficient and of higher quality. For example, designers can quickly generate and compare design plans through conversations with AI assistants; and project managers can engage with AI assistants for systematic learning and project guidance. At the project level, AI project brains can quickly complete construction planning according to project requirements and design inputs. It can automatically collect and analyze relevant on-site data such as progress, cost, quality, and safety, providing timely alerts and optimization suggestions to ensure projects are delivered on schedule with high quality and maximized project benefits. At the enterprise level, AI models for AEC can support business operations and market analysis, enhancing decision-making efficiency and quality for construction companies.

The future is now.



British Property Federation and UK PropTech Association to Merge to Protect Proptech Ecosystem

The British Property Federation (BPF) and UK PropTech Association (UKPA) have announced a partnership to boost collaboration between property and proptech businesses. The companies hope to create a new integrated strategy for driving innovation and tech adoption across the property sector. The integration of the two organisations will be formalised in June 2023 after consultation with UKPA members.

New Group Launched to Boost Residential Retrofit Efforts in UK

A new group has been launched to boost residential retrofit efforts in the UK. The National Homes Decarbonisation Group (NHDG) has 17 founding members, including the country's leading contractors. Its core mission is to collectively deliver high-quality energy efficiency measures and low-carbon technologies at scale across the UK's housing stock. The move comes amid a government target for 26 million homes in the UK to be decarbonised to meet its 2050 net-zero target.



Survey Reveals Construction Project Management Salaries Rise by 10% in UK

The 2023 Association for Project Management (APM) Salary and Market Trends Survey reveals project professionals in construction currently receive an average salary of £57,500 – a rise of 10% from £52,500 in 2021. This makes construction project professionals the joint second highest paid alongside consultancy, hospitality and telecoms. This increase is due to the high demand for construction project managers in the UK.

British Government Launches High-rise Buildings Register

The Building Safety Act 2022 obliges owners of existing higher-risk buildings' principal accountable persons to register them with the Building Safety Regulator (BSR). The deadline for completing the registration through the register is September 30, 2023. Failure to register high-risk buildings will be a criminal offence, punishable by a fine or imprisonment.



Boston Adopts Sustainable Building Code to Enhance Decarbonisation Efforts

The City of Boston has adopted a new stretch code that requires new multifamily structures to meet Passive House building requirements starting from January 1, 2024. The updated Stretch Energy code requires energy conservation measures to reduce heating and cooling demand. It creates a solid standard to ensure buildings are more resilient to power outages while enabling efficiency, electrification, and affordability.

Dubai Municipality Launches New Online System for Building Permits and Control Services

Dubai Municipality has announced the launch of a new online system for building permits and control services aimed at streamlining procedures for customers in the emirate. The new system will provide smart and integrated services and solutions while implementing automated checks using BIM. By providing these solutions, Dubai Municipality seeks to enhance the quality of building permits and control services in Dubai, ultimately promoting the competitiveness of the city.



Oman Unveils Plans for New City for 100K Citizens

Oman has announced the construction of a new city on the outskirts of Muscat to accommodate Omani citizens. It is designed to house 100,000 people and will have 20,000 housing units, including schools, places of worship, hospitals, a university and shopping centres. The city has also been designed to raise the quality of life by optimising solar energy as a sustainable source.



Singapore Homebuyers to Benefit from New Banding System Tracking Performance of Developers, Builders

Homebuyers who want to gauge the level of quality of condominium projects can now check a new construction quality banding system that ranks developers and builders according to their track record for the past six years. The banding is based on the Construction Quality Assessment System (CONQUAS), a framework established in 1989 to assess construction workmanship. Developers, builders and private residential projects are rated on a scale from Band 1, which means they are found to have a very low incidence rate of major defects, to Band 6.

MagiCAD Acquires Majority Stake in EQUA Simulation

Glodon Company Limited, a digital building platform service provider, announced in February that its subsidiary MagiCAD Group Oy has completed the acquisition of a majority stake in EQUA Simulation AB, the developer of the world's leading building performance simulation software IDA Indoor Climate and Energy (IDA ICE). The companies will join forces to drive sustainability in building services design in the future.



Glodon's Commitment to ESG Principles Drives Sustainable Growth and Impact in Construction Industry

Glodon recognized the importance of sustainable development not only as a means to mitigate risks but also as an opportunity to create long-term value for society and the environment. In 2022, the company tried the best to practice ESG commitments and invest in R&D to assist customers so as to transform the construction industry toward positive outcomes with technology.

INTELLIGENCE

Thriving European AEC Software Market: Growth, Regional Variation, and the Rise of BIM

By Sebastian Tang
International Research and Intelligence Director at Glodon

European AEC Software Market Shows Robust Growth and Regional Variation

The European market for Architecture, Engineering, and Construction (AEC) software demonstrated strong growth in 2022, reaching a total value of around \$5.5 billion. This accounted for approximately 34% of the global AEC software market. While the growth rate in Europe was slightly slower than the

global average at 7.7% compared to 9.3%, it outperformed the European construction market, which experienced a decline of -2.8%. Currently, the value of the European software market represents only about 0.2% of the total construction project value in Europe, but it is expected to rise to 0.3% by 2026.

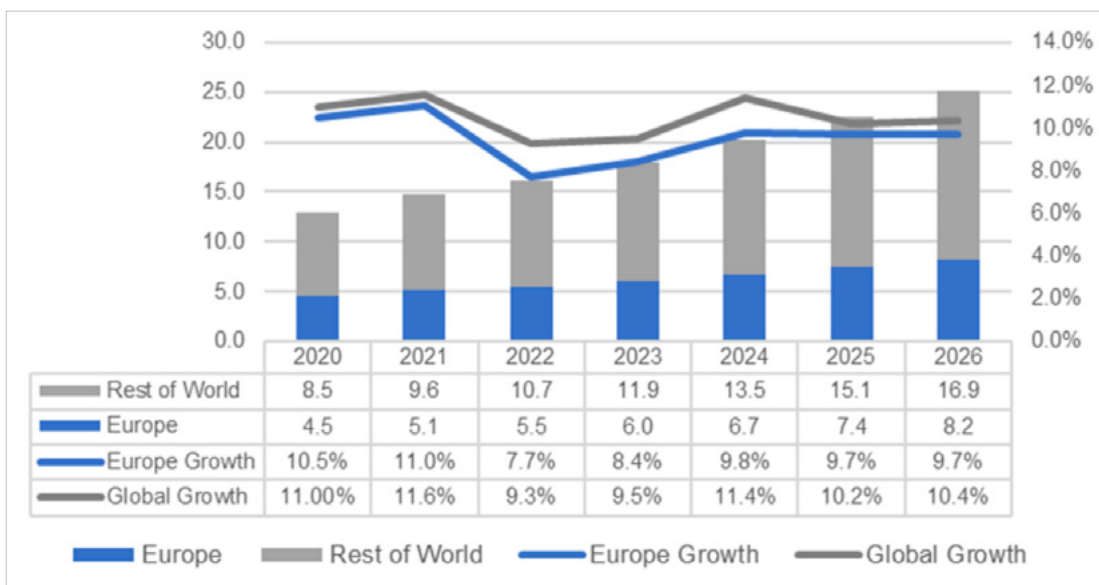


Chart 1. AEC Software Market Size and Growth (in Billion US Dollars)



Research conducted by Cambashi reveals that the architectural design industry exhibits higher software spend intensity than the engineering services and construction sectors. The software spend intensity ratio, which measures software expenditure relative to value-added services, is approximately 1.6 times higher in architectural design and a staggering 13 times higher in construction when compared to engineering services.

The United Kingdom, Germany, and France emerge as the dominant players in the

European AEC software market, collectively accounting for around 70% of the market size. This significant market share can be attributed to the substantial investments made by companies in these countries and the prevalence of architectural design, engineering, and construction firms from these regions in the European construction market. Interestingly, the combined share of the UK, Germany, and France in the total construction project value is approximately 40%, indicating their strong lead in AEC software adoption.

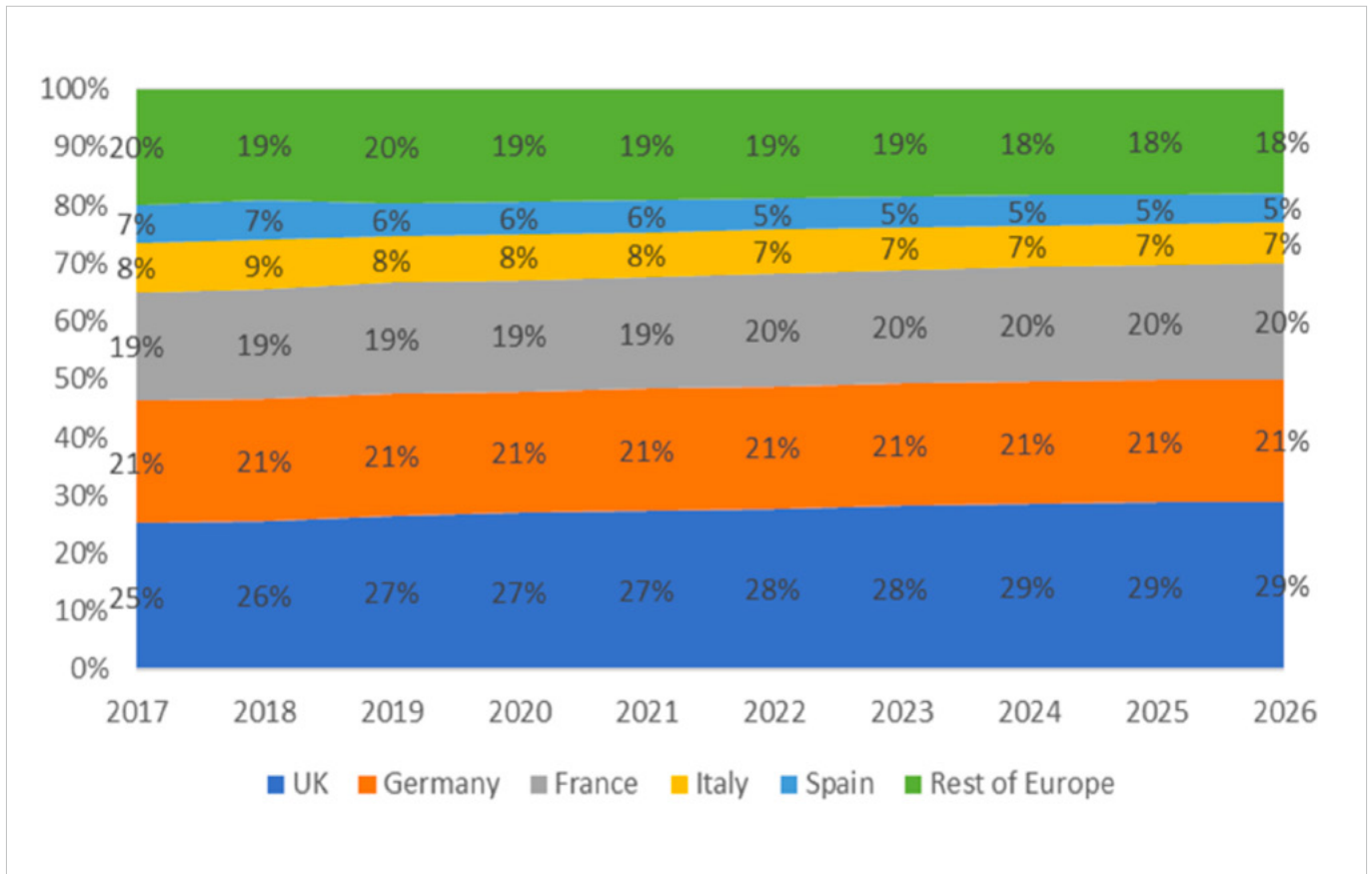


Chart 2. AEC Software Market Share by Countries

BIM Takes Center Stage in Europe with Growing Penetration Rates

Building Information Modeling (BIM) is gaining traction in Europe, with Northern Europe, the UK, France, and Germany leading the way in terms of BIM adoption. It is projected that by 2023, BIM will surpass CAD/2D as the more prevalent design approach in these regions, highlighting the growing importance of digitalization in the construction industry.

The AEC software market can be divided into three distinct subsegments: BIM Design, BIM Construction, and BIM Operations and Maintenance. Historical data highlights the performance of each subsegment within the AEC software market and provides valuable

insights into the European market landscape. BIM design software has consistently been the largest component, experiencing significant growth and widespread adoption. However, it may have reached a saturation point, suggesting that most potential customers interested in adopting BIM have already done so. On the other hand, BIM construction software has demonstrated the highest growth rate, indicating the urgent need for increased digitalization in the construction phase. BIM operations and maintenance software, benefiting from advancements in IoT technology, has maintained a relatively stable but lower growth rate.

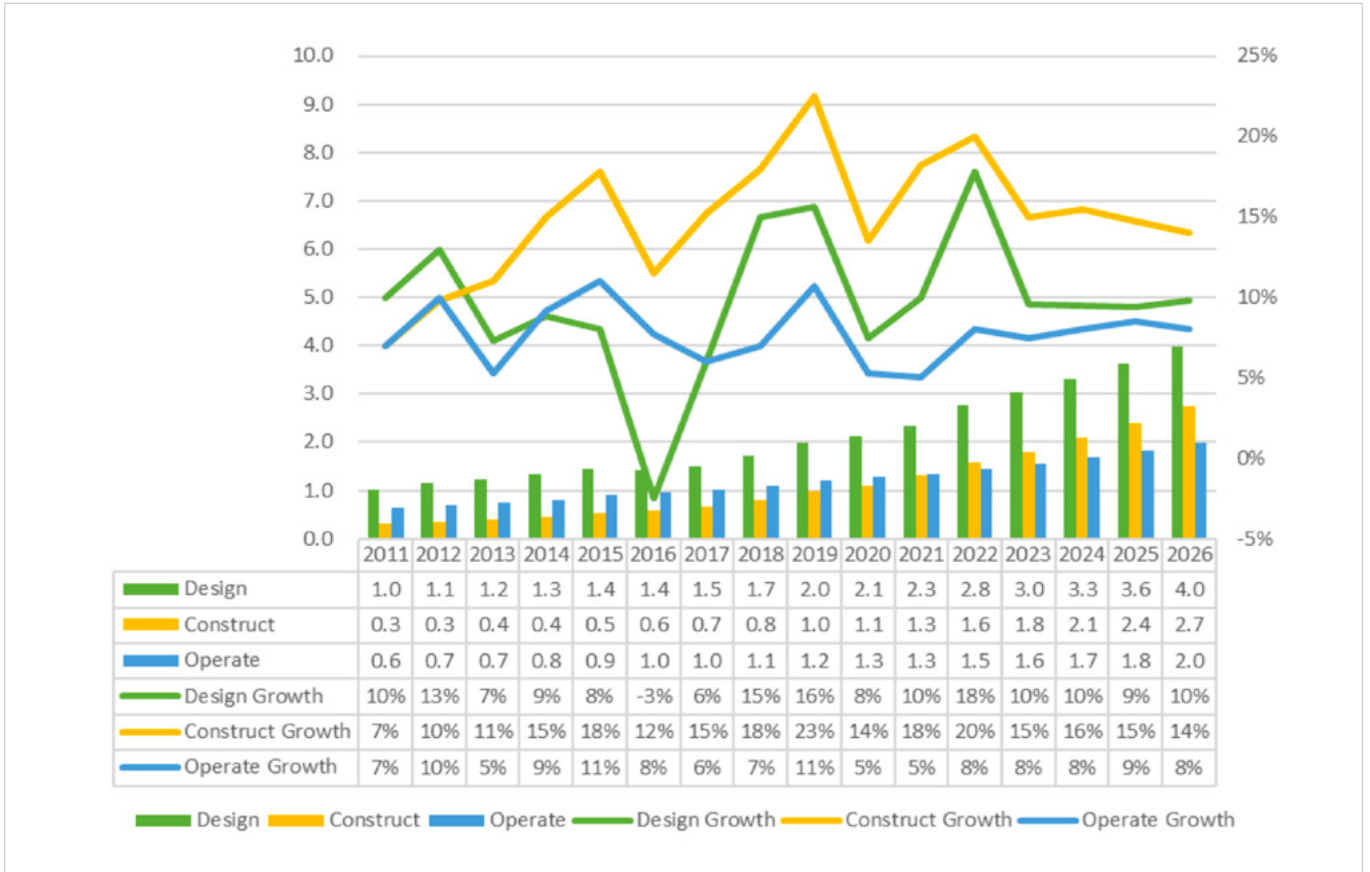


Chart 3. Market Size and Growth by Software Segmentation (in Billion US Dollars)

To Conclude

These findings above provide some key estimations into the European AEC software market, enabling industry stakeholders to understand the trends, opportunities, and challenges associated with software adop-

tion in the region. With the market projected to expand in the coming years, companies need to stay proactive in embracing AEC software solutions to stay competitive in the evolving construction landscape.

A background image showing a group of people in a meeting or collaborative work environment. One person is holding a pen, and another is pointing at a document. The scene is brightly lit, suggesting an indoor office or conference room setting.

SPOTLIGHT

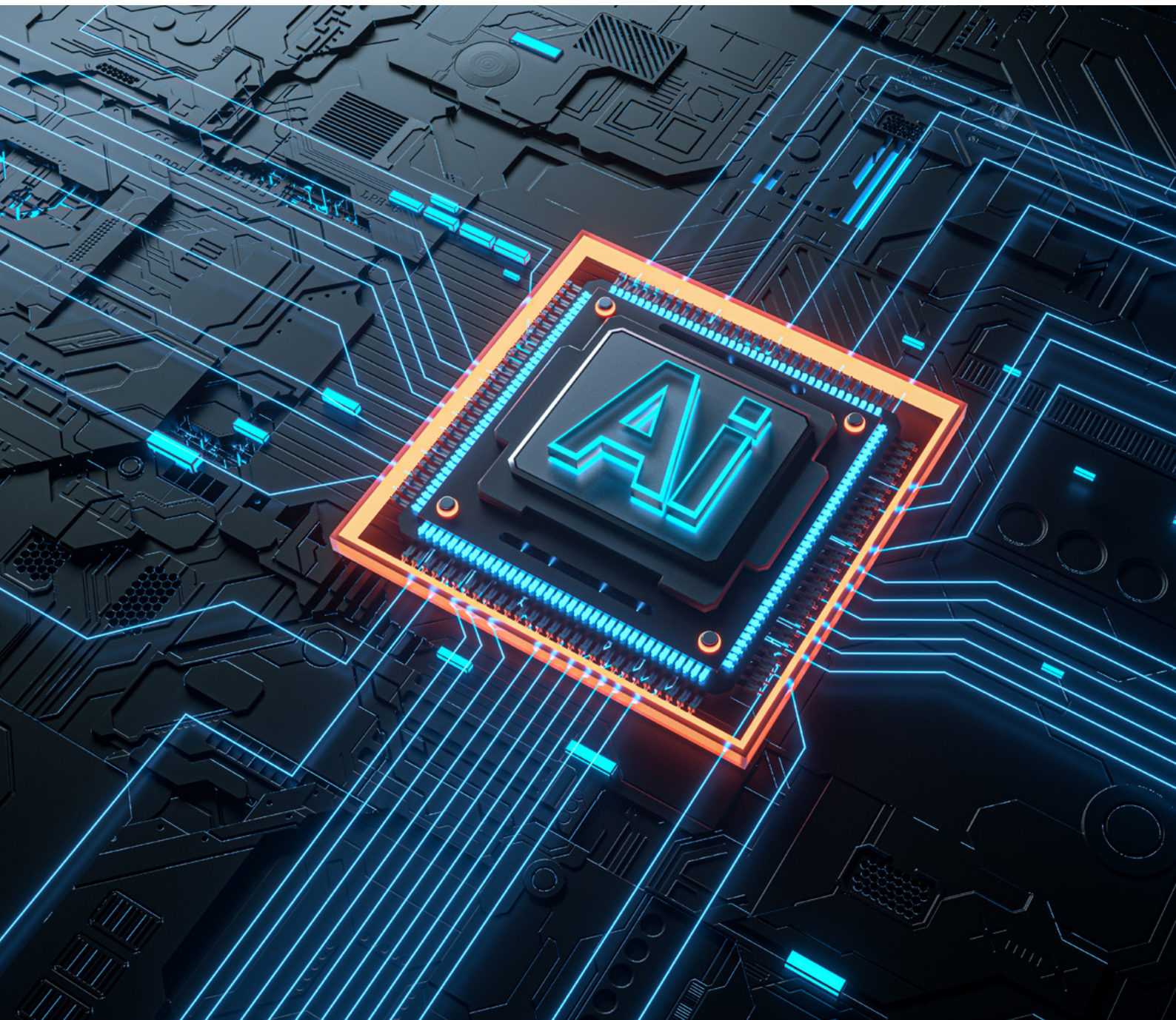
The global construction industry is on the brink of a transformational shift towards sustainable practices that minimize environmental impact and ensure long-term viability. By embracing digitalization, the construction industry can unlock new possibilities for long-term development and enhanced outcomes.

In this section, we delve into how technological advancements empower professionals to make informed decisions based on data, leading to the creation of buildings that are not only energy-efficient and cost-effective but also environmentally friendly. We explore the application of these advancements throughout the building life cycle, with a specific focus on the design, quantity surveying, and construction stages.



Digital Transformation in Construction: Why it Matters

A digital revolution has transformed many industries, including the construction industry. The tools and technologies we use to design, construct, and operate our buildings have become more streamlined thanks to digitalization. However, construction still remains one of the least digitalised industries in our society.



In the years to come, digitalization will continue to grow in influence in the construction industry, offering many benefits such as Building Information Modeling (BIM), Digital Twins, Virtual Reality (VR), cloud computing, and robots.

Glodon Vice President Pierpaolo Franco said, "Humans spend most of our time indoors; therefore, the building sector has no reason to lag behind in the sweeping trend. Digital transformation of the building industry cannot be achieved overnight but requires overall planning and gradual development."

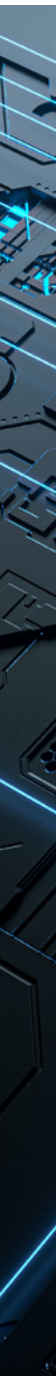
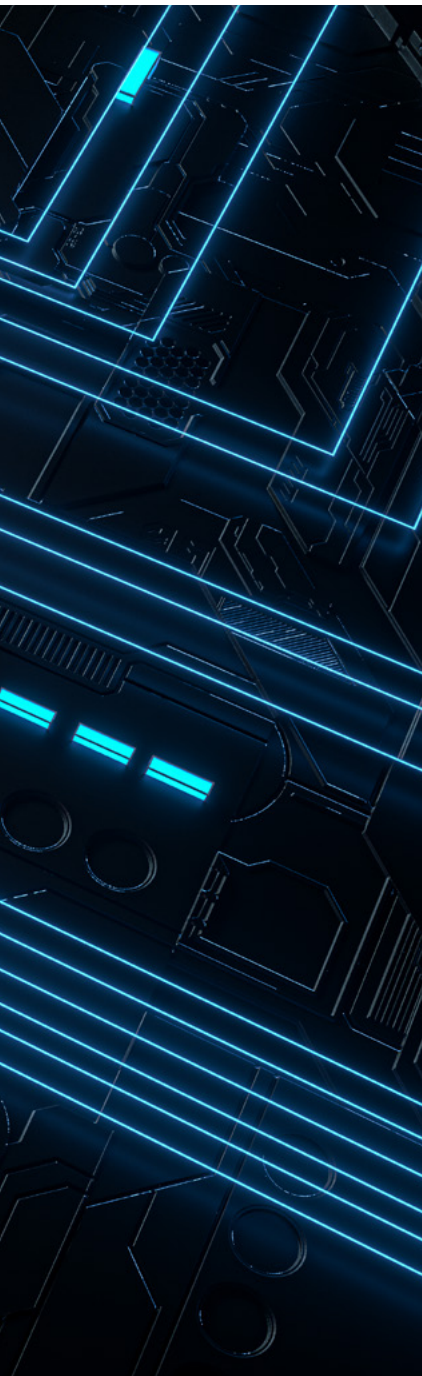
In the years to come, digitalization will continue to grow in influence in the construction industry, offering many benefits such as Building Information Modeling (BIM), Digital Twins, Virtual Reality (VR), cloud computing, and robots. The construction industry is motivated by a number of benefits of digital transformation.

Improved Efficiency and Productivity

A significant advantage is improved efficiency and productivity. Construction companies can use digital tools like BIM to create models of buildings, improving efficiency and planning. Through BIM, architects, engineers, and contractors can collaborate on a single digital platform, reducing errors and improving communication.

Improved Collaboration and Communication between Stakeholders

The construction industry also benefits from digitalization in terms of collaboration and communication. Architects, engineers, contractors, and owners can collaborate together on a project using digital tools, sharing information and data, and making decisions at the same time. With cloud-based collaboration and project management tools, everyone has access



to the same information and can communicate more effectively. Delays and errors are reduced as a result of better communication and coordination.

Enhanced Accuracy and Quality

In construction projects, digitalization enhances accuracy and quality. IoT devices allow construction teams to capture precise measurements and data, which can be used to create accurate models and maps. By tracking progress in real-time, sensors can help identify potential issues before they become major ones. This reduces errors and ensures that projects are completed to a high standard.

Cost Savings through Optimised Processes and Reduced Waste

One of the benefits of digitalization in the construction industry is cost savings. By reducing waste and optimising processes, digital tools can result in lower costs for materials, labour, and equipment. Furthermore, reducing rework can save a significant amount of time and money. Some estimates claim that rework costs up to 5%, and that's only counting the direct cost. Using BIM, potential clashes or conflicts can be identified before construction begins, reducing the need for expensive rework after construction begins.



Increased Safety on Construction Sites

Construction sites are also safer with digitalization. Virtual reality and augmented reality, for example, allow workers to simulate construction processes before implementing them on-site, allowing them to practice safety procedures in virtual environments. In addition, construction teams can monitor and track workers, equipment, and materials with wearables, sensors, and drones, reducing injuries and accidents.

Improved Sustainability

There is a growing need for a more sustainable built environment. Construction is one of the largest contributors to global carbon emissions and environmental degradation. Digitalization can contribute to the achievement of these sustainability goals in the construction industry. Construction professionals, for example, can track and manage the lifecycle of building materials, from procurement to disposal, with material tracking tools. Digital tools can also help the construction industry monitor and manage energy consumption in buildings, allowing for greater efficiency and reduced energy consumption. This can reduce waste, promote circularity, and help reduce the environmental impact of construction.



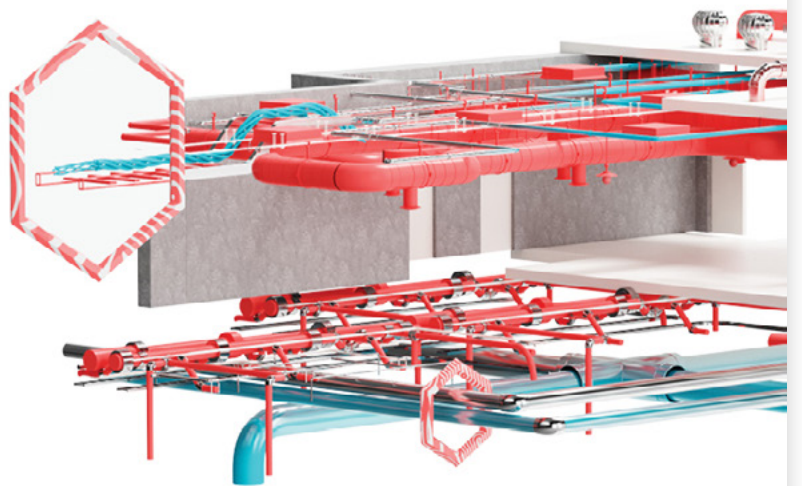
MagiCAD Empowers the Built Environment with Innovative MEP Design in 40 Years

Throughout its rich history, the world of MEP design has witnessed a remarkable evolution driven by groundbreaking technological advancements, visionary collaborations, and a relentless pursuit of excellence. This continuous transformation has not only reshaped the way we construct buildings but has also laid the foundation for a future where intelligent systems and sustainable practices seamlessly converge to create a harmonious built environment.



MagiCAD

2024



The future of MEP design holds promises of enhanced energy efficiency, optimized systems, and seamless connectivity, resulting in buildings that are not only functional but also sustainable, adaptable, and human-centric.

Keeping Innovating for 40 Years

Founded in 1983 as Progman in Rauma, Finland, MagiCAD Group has a rich history of technological advancements, partnerships, and collaborations shaping the future of MEP design and other digital solutions for the built environment. Its focus on MEP design and information modelling began early on, driven by a passion for understanding what makes buildings work. The name "MagiCAD" was inspired by the software's ability to perform

design automatically, just like magic.

Over the years, MagiCAD Group has continued to develop innovative solutions for MEP design, including MagiCAD Cloud, a comprehensive BIM content platform for MEP design including products from 300+ manufacturers. In 2014, it became part of Glodon Company Limited, one of the world's largest AEC software companies.

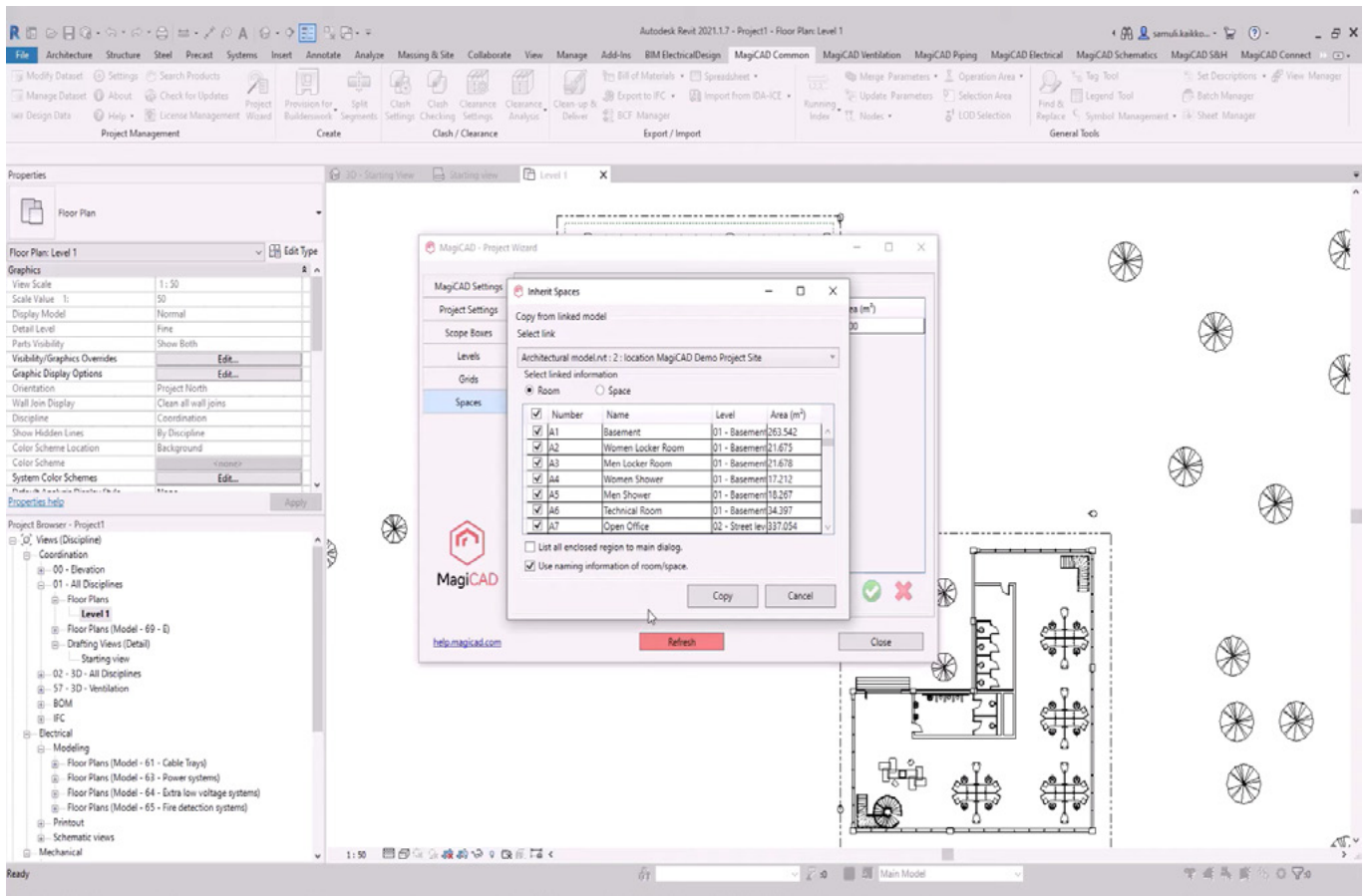
Driving Efficient MEP Design Forward

Today, MagiCAD Group's team of passionate software professionals continues to provide intelligent solutions to make engineering, design, and construction management easier, faster, and more profitable.

Its newly released MagiCAD 2024 offers designers powerful tools to design and calculate variable air volume (VAV) systems in both Revit and AutoCAD environments. With the new functionality, users are able to simulate different usage scenarios in order

to find the optimal balance of comfort and energy efficiency.

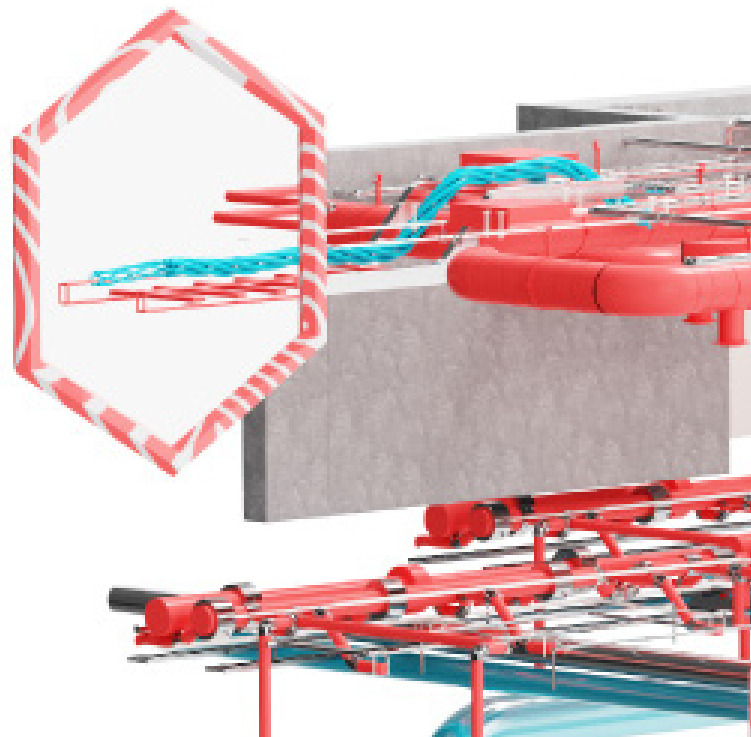
Other highlights in MagiCAD 2024 for Revit, include a Project Wizard tool that combines everything needed to start a new project in one easy-to-use window, and a View Manager tool, for creating and managing views. Modelling work is easier with the possibility to copy branches between levels and electrical designers will also benefit from multiple new additions, such as ELV data for products.

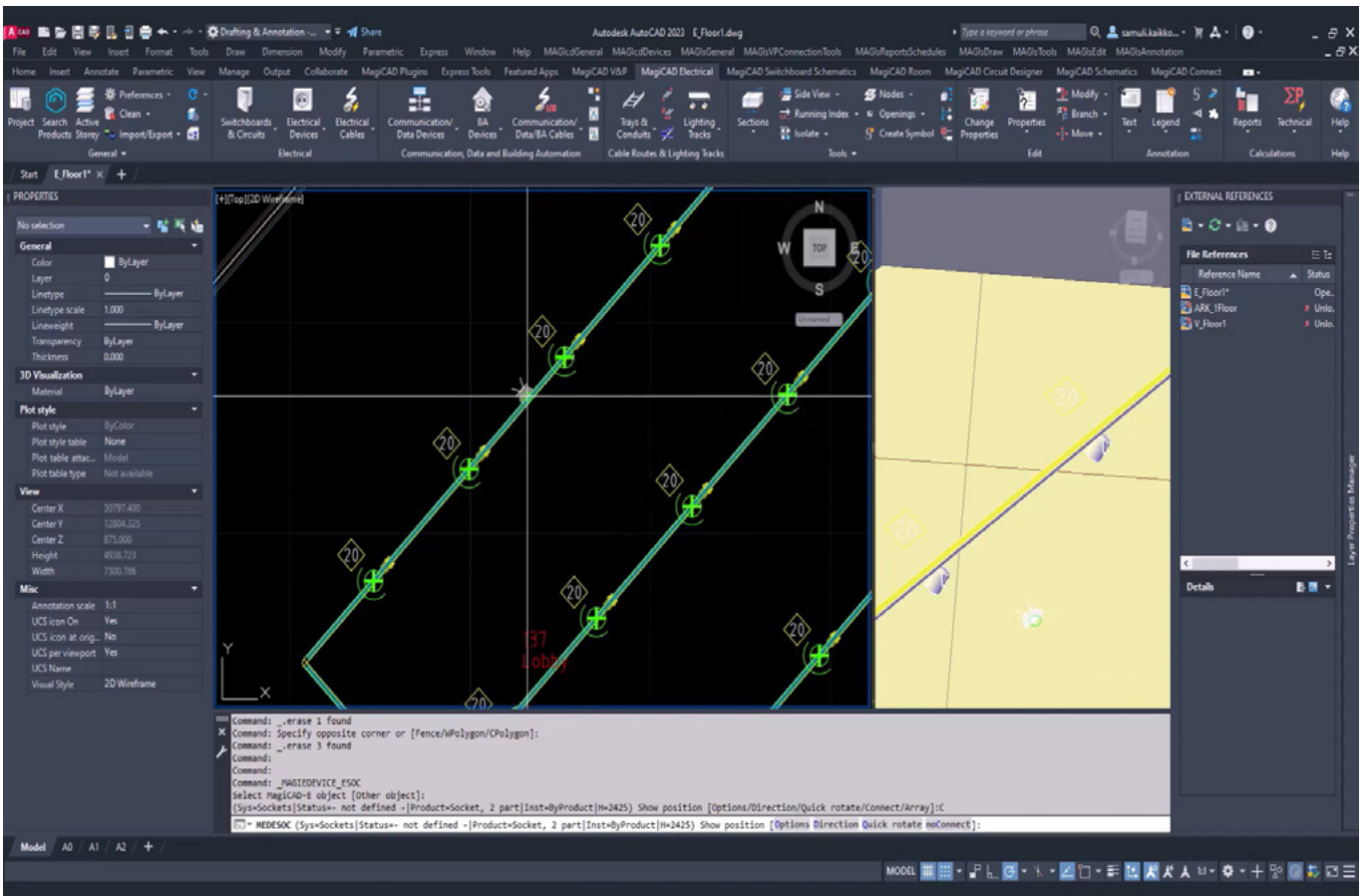


Set Up Projects Easily with the New Project Wizard Tool (Image: MagiCAD)

MagiCAD 2024 for AutoCAD provides the possibility to assign classification standards for systems, enabling automatic classification codes to be added for objects during the design. Other improvements that help

the daily work of MEP designers include labeling objects to enable custom filtering in reporting and file exports and the possibility to update saved products directly from MagiCAD Cloud.

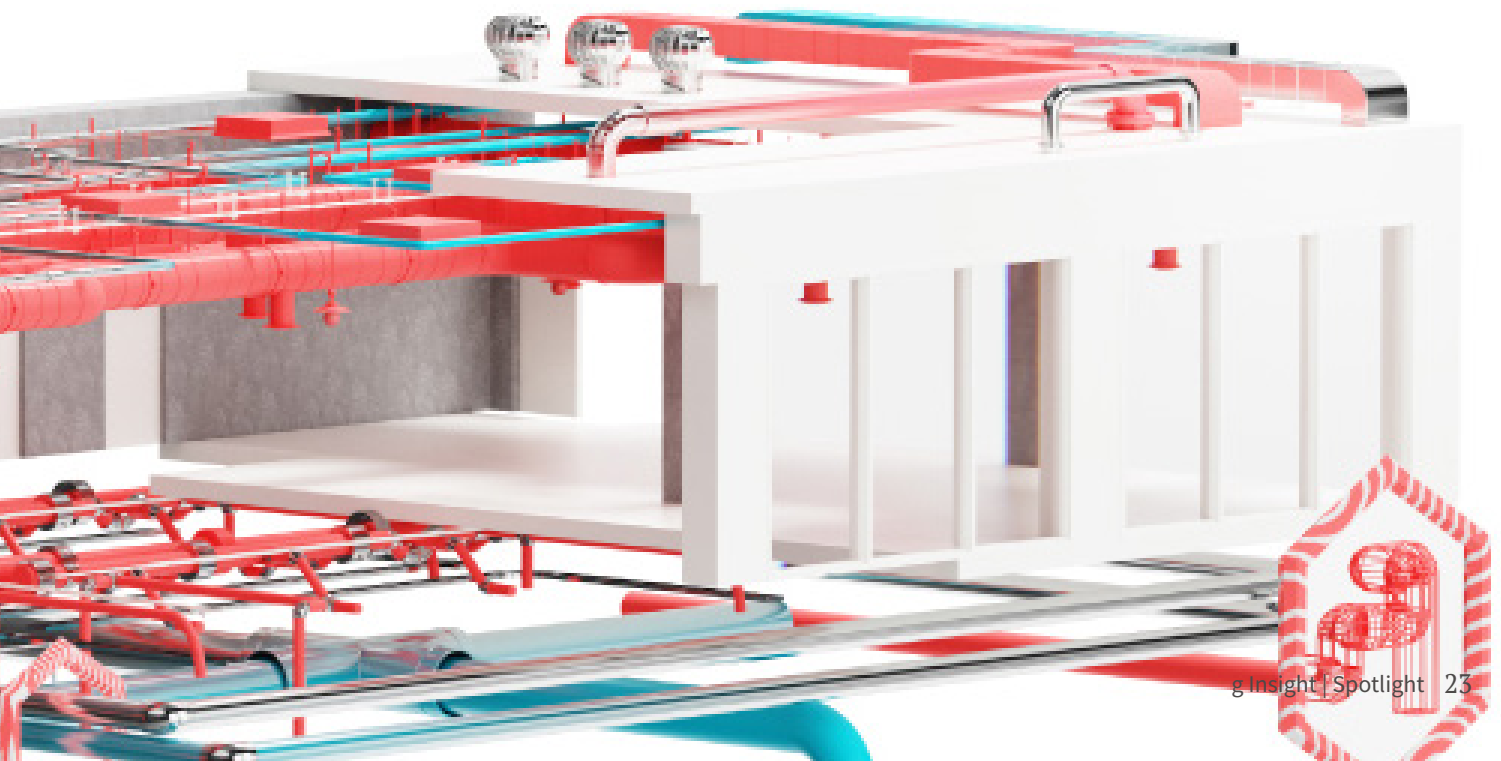




Connect Any Device Type to A Lighting Track (Image: MagiCAD)

As we celebrate the remarkable advancements in MEP design, we embrace the exciting possibilities that lie ahead. The industry is poised for further digitalization, automation, and integration, with technologies like BIM, IoT, and AI revolutionizing

the way we conceive, design, and operate buildings. The future of MEP design holds promises of enhanced energy efficiency, optimized systems, and seamless connectivity, resulting in buildings that are not only functional but also sustainable, adaptable, and human-centric.



Revolutionizing Quantity Surveying, Cost Management with Data and Technology

The construction industry has been grappling with substantial uncertainty in recent years, primarily due to the economic downturn and the mounting complexities stemming from demand-side pressures. Notably, there is a pressing call for urgent action to address decarbonization, adding further intricacy to the industry's landscape. In response, industry professionals are actively exploring innovative methods of working, and the role of quantity surveyors and cost managers has become even more crucial amidst these dynamics.

The Significance of Data and Technology

These professionals are responsible for ensuring the agreed financial outcomes of a project through tasks such as cost planning, commercial management, and project control. They are also expected to extend their role beyond traditional functions and engage in activities such as measuring social value, implementing environmental, social, and governance principles, adopting whole-life and whole-asset thinking, and calculating carbon footprints across various projects and assets.

"In today's construction sector, we cannot overstate the significance of data and technology in quantity surveying and cost management practices to remain in sync

with upstream digital workflows on projects and programmes." Said Pierpaolo Franco, Vice President at Glodon.

Thus, quantity surveyors and cost managers must incorporate data and technology into a model-centric and data-driven process to remain competitive and deliver value to their clients. These processes provide the opportunity to make informed decisions, reduce costs, enhance efficiency, promote sustainability, and ultimately deliver better value to clients and other stakeholders. However, the potential of data is not being fully realized, as many quantity surveyors and cost managers are still reluctant to integrate into upstream digital workflows.

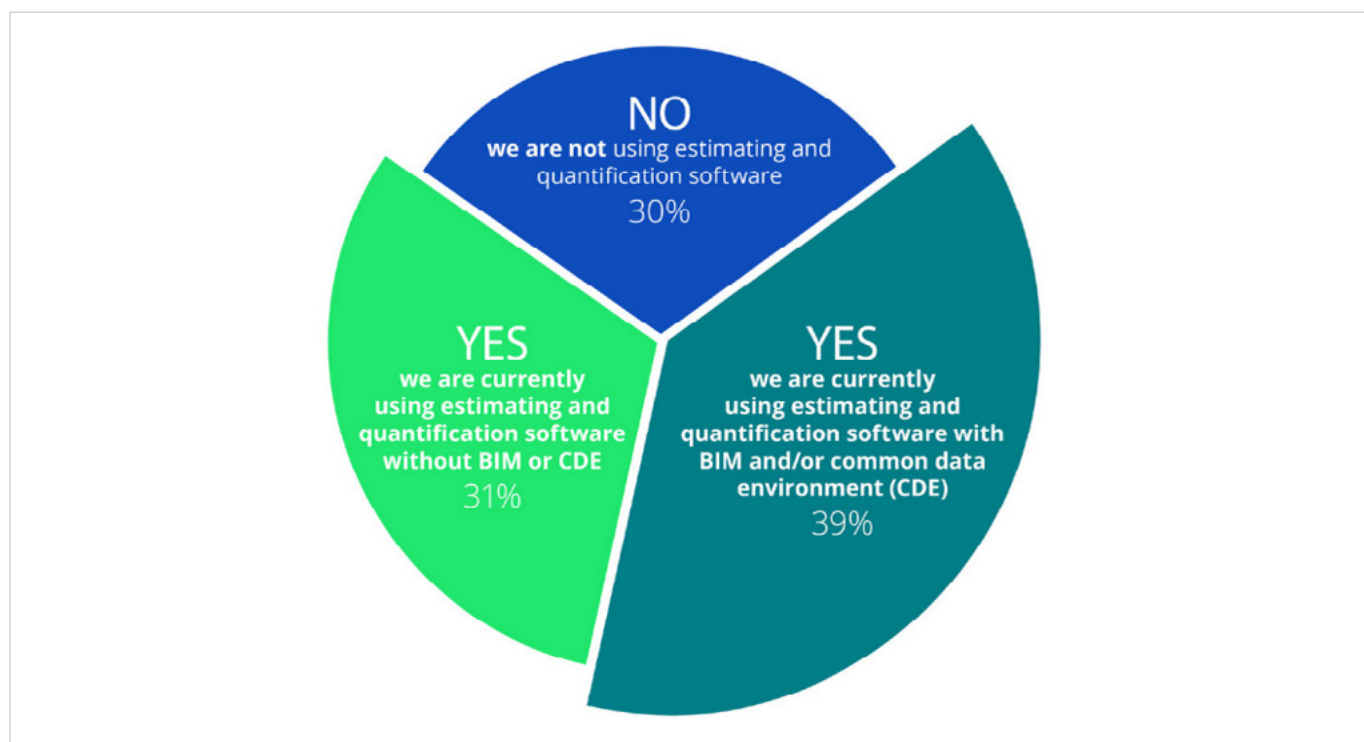
"In today's construction sector, we cannot overstate the significance of data and technology in quantity surveying and cost management practices to remain in sync with upstream digital workflows on projects and programmes."



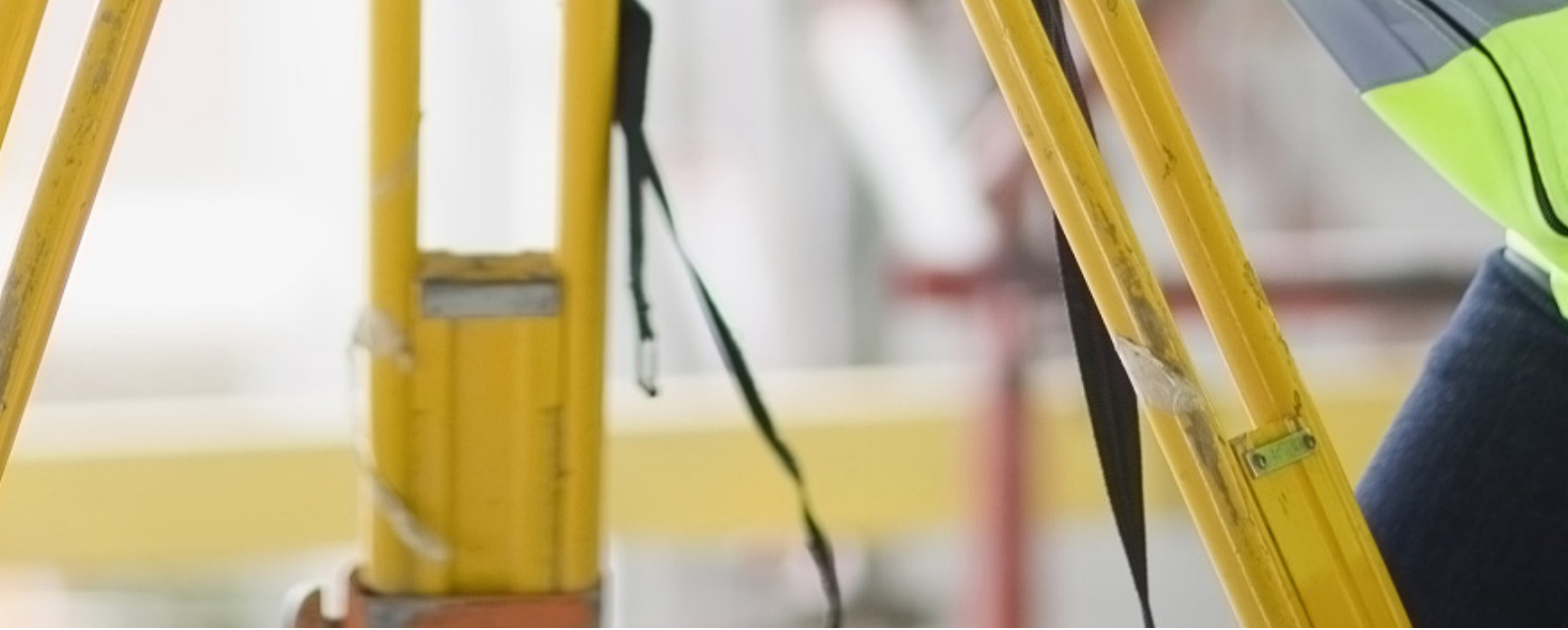
The Findings of A Global Research

To understand these issues, RICS and Glodon conducted a global online survey, a series of focus groups, and individual interviews in Australia, New Zealand, Singapore, Hong Kong, the UK, and Canada. The aim of the study was to understand the current thinking around data and technology usage in the quantity surveying and cost management profession. The research team conducted the study in Q4 of 2022.

The findings reveal a crucial need for greater adoption and integration of digital tools such as building information modelling (BIM), common data environments (CDE) and AI. Although progress has been made, the research indicates that many professionals are still relying heavily on spreadsheets and traditional methods, with emerging tools like AI, digital twins and blockchain still experiencing low usage levels.



Use of Estimation and Quantification Software (Figure: RICS)



The potential benefits of embracing data and technology are vast, with respondents expressing strong agreement that quantity surveyors and cost management professionals can enhance their project advisory functions using these tools. By incorporating data-driven processes into their core functions, project professionals can achieve enhanced progress monitoring and control, greater cost certainty and more realistic and reliable cost targets.

Moreover, at the organizational level, the adoption of data and technology yields further benefits. These advancements result in improved cost certainty, enhanced progress monitoring, and the ability to set more real-

istic and reliable cost targets.

This adoption is not without its challenges. The cost and effort required, cultural resistance to change and low return on investment are barriers that must be overcome to fully harness the power of AI, data and technology. As the report suggests, focusing on education, training and professional qualifications can drive adoption levels and help the industry forge a path towards a brighter, more innovative future. It is important to ensure that project professionals understand that data analytics skills are essential and just as important as being proficient in desktop programmes and spreadsheets.

	Major barrier
Shortage of skilled persons, including retention of trained staff	● 55%
Resistance to change	● 49%
Lack of availability of data	● 41%
No demand or financial support from clients	● 40%
Cost and effort needed	● 40%
Lack of data standards	● 40%
Disciplinary silos	● 36%
BIM and CDE only geared towards design	● 33%
Improper use of construction information classification systems	● 28%
Low return on investment	● 21%

Major Barriers to Adoption (Figure: RICS)



The Future of Quantity Surveying and Cost Management

Based on the research findings and focus group discussion, several key recommendations are made by industry experts. Firstly, it is advised to "develop a playbook documenting the 'level of information need' and information deliveries for enhancing digital work processes and practices of quantity surveyors and cost managers", according to Anil Sawhney, Head of Construction, Knowledge and Practice at RICS. This playbook should be crafted using efficient and effective information management practices.

Secondly, there is a pressing need to enhance the skills and competencies framework for quantity surveyors and cost

management professionals, placing significant emphasis on the value of digital tools, analytics, and initiatives for decarbonization. By updating the framework, it will ensure that professionals in these fields are equipped with the necessary expertise to adapt to the evolving industry landscape.

Furthermore, efforts should be focused on establishing connections and mapping cost classification standards with other existing systems that are used to categorize construction information. This strategic alignment aims to overcome the current challenges of fragmentation within processes and practices, fostering a more streamlined



and cohesive approach.

Lastly, it is crucial to develop and implement strategies that promote the adoption of model-driven and data-centric work practices. By prioritizing these approaches, collaboration across the entire value chain within the construction industry can be significantly enhanced, leading to more efficient and productive outcomes.

Just as James Garner, Senior Director at Gleeds, said, "As we continue to navigate the rapidly changing world around us, it is paramount that quantity surveyors and cost management professionals keep pace with

the digital and AI revolution. By embracing data and technology, these professionals can unlock their true potential and play a significant role in shaping the future of their industry."

This article is based on the study "Role and Importance of Data and Technology in Quantity Surveying and Cost Management Practice". [Download the report](#) to know better the benefits and improvements of data and technology, drivers and barriers behind the adoption, and more inputs from worldwide experts.

Introducing Gsite 2.0: The Next Generation Digital Construction Management Solution

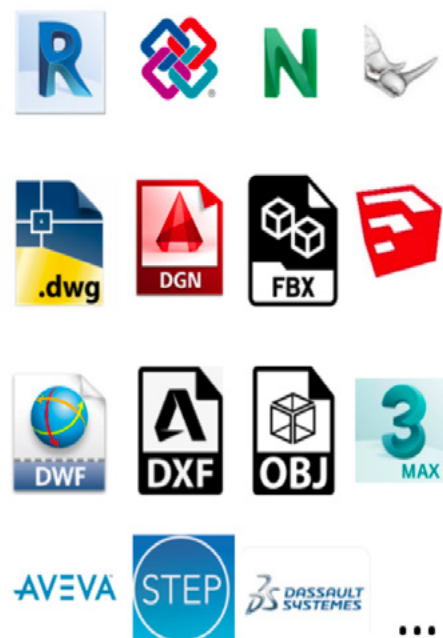
Glodon delivers an exceptional leap forward in construction management technology with Gsite 2.0, providing an advanced visual foundation that simplifies coordination and communication, minimising costs and saving valuable time.

This next-generation platform encompasses a host of enhancements and new workflows, seamlessly connecting BIM models, drawings, and locations with those in the field. Enhanced design document management and streamlined collaboration processes improve productivity and accountability and provide real-time insights into the project's health.

Fully BIM-Enabled Open-API Platform

Gsite 2.0 boasts full BIM-enabled capabilities and supports integration with major industry standard file formats within its neutral, open-BIM cloud. Users can seamlessly integrate file formats such as Revit, IFC, or NWC into a unified viewer, providing unparalleled

flexibility to adapt to project conditions. Using Glodon's self-developed, highly customisable BIM engine, Gsite 2.0 is designed to meet projects' specific BIM workflow requirements, ensuring high performance even in large-scale endeavours.





Fully BIM-Enabled Open-API Platform (Image: Glodon)

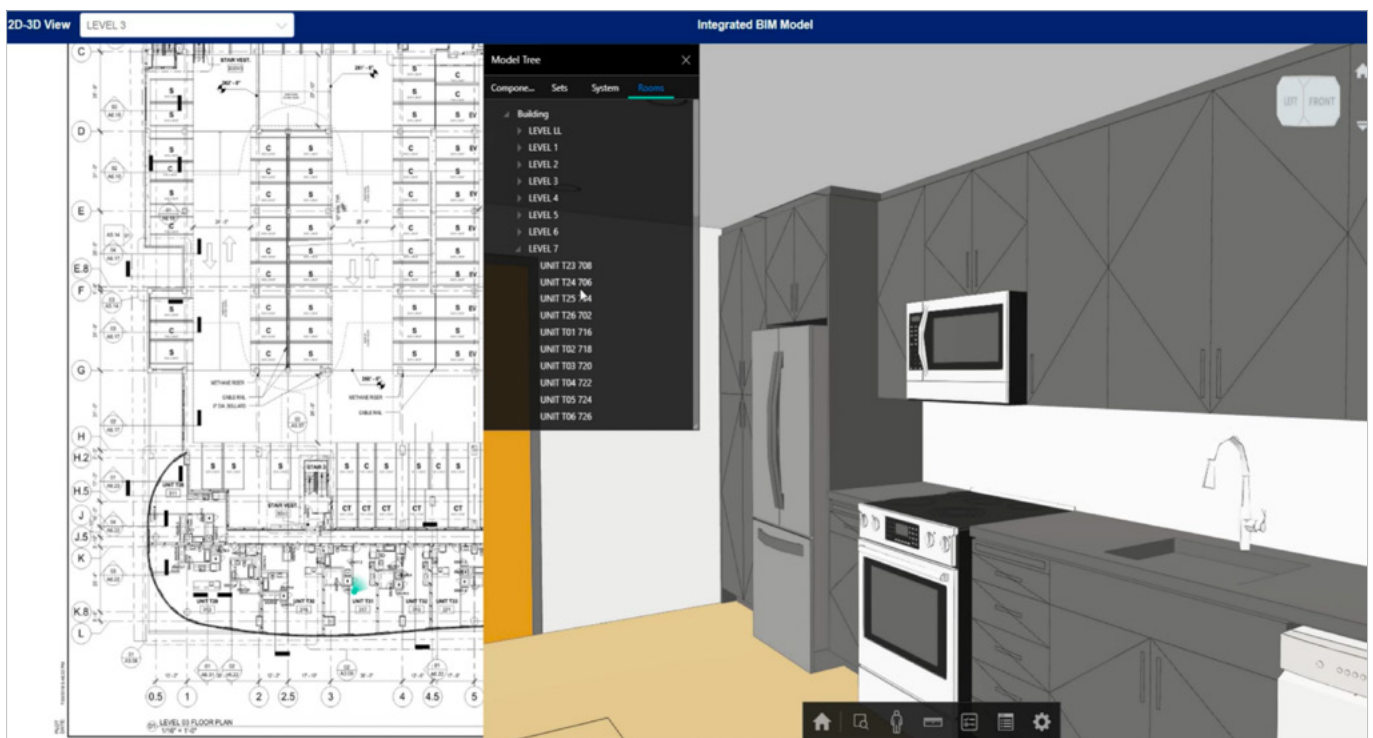
Connecting Locations, Drawings, and BIM Models

A notable feature of Gsite 2.0 is its ability to connect project locations, drawings, and BIM models, forming a comprehensive visual foundation for seamless collaborations. Upon uploading, the platform automatically recognises and links the levels and spaces within BIM models in a selection tree, enabling users to switch between rooms, floors, and zones effortlessly.

Additionally, users can import the project location structure directly from the BIM model with a single click, saving valuable time in

the project setup. This simplified setup allows for the seamless linking of locations, drawings, and models, creating an optimal visual foundation for workflow efficiency.

Users can easily navigate their projects, effortlessly transitioning between mouse and keyboard controls in the model view, tapping on floorplan drawings, and seamlessly accessing any space or room on any level through the synchronised 2D-3D overlay with just one click in the selection tree.



Connecting Locations, Drawings, and BIM Models (Image: Glodon)

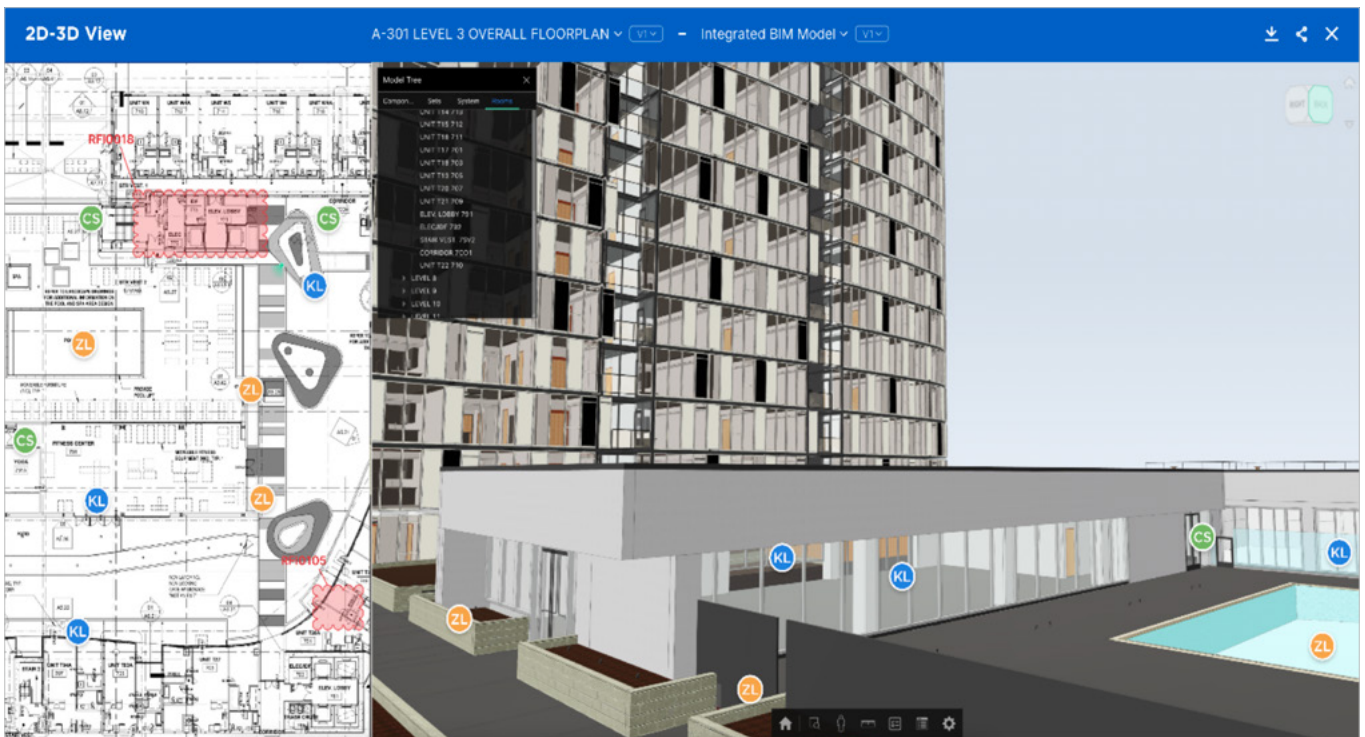
Effortless Spatial Coordination

With the advanced visual foundation offered by Gsite 2.0, coordination becomes effortless. Users can create, track, and manage issues swiftly and accurately, with location and

2D-3D viewpoint information seamlessly saved in the issue details. This reduces miscommunications and provides crucial context for better understanding.

Furthermore, Gsite 2.0 supports easy-to-use RFI workflows across modules. It offers a range of visual assistance options, such as markup on drawings or viewpoints of 2D-3D locations. Users can enrich the collaboration process by associating additional items like documents, specifications, and drawings.

The Gsite 2.0 mobile app further enhances the flexibility of coordination. It breaks time and location constraints, enabling users to collaborate whenever and wherever necessary.

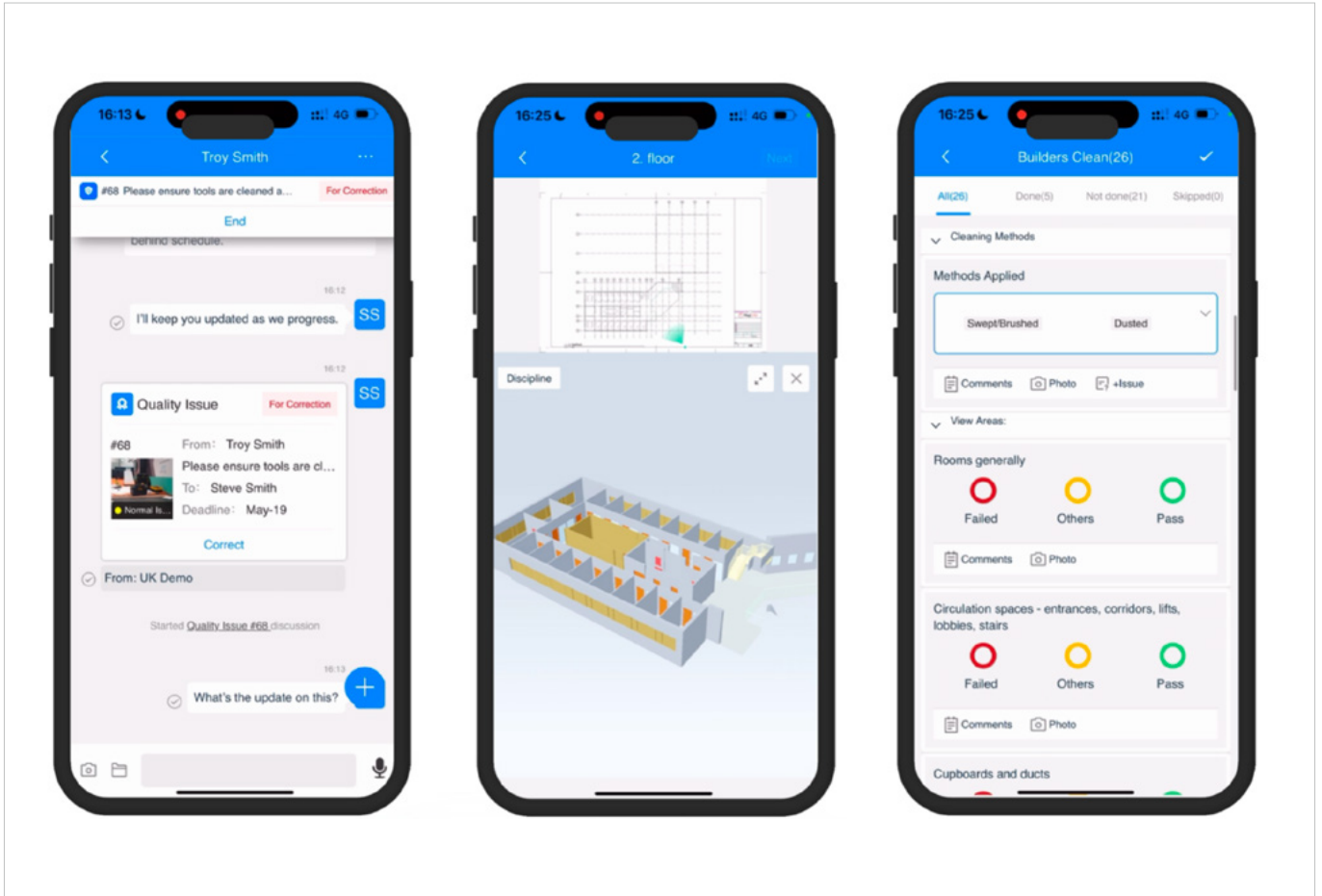


Effortless Spatial Coordination (Image: Glodon)

Anytime, Anywhere Collaboration

Gsite 2.0 also streamlines field inspections and managing quality and safety issues. It offers customisable forms on mobile devices, facilitating efficient, on-the-go site management. Users can conveniently create auto-filled issues from checklists with markups, photos, and 2D-3D locations. This feature aids in managing issues during field walks.

Additionally, users can send collaboration items directly or take advantage of voice, and video calls with instant messaging. This expedites auditable communication between stakeholders, fostering more efficient collaboration.

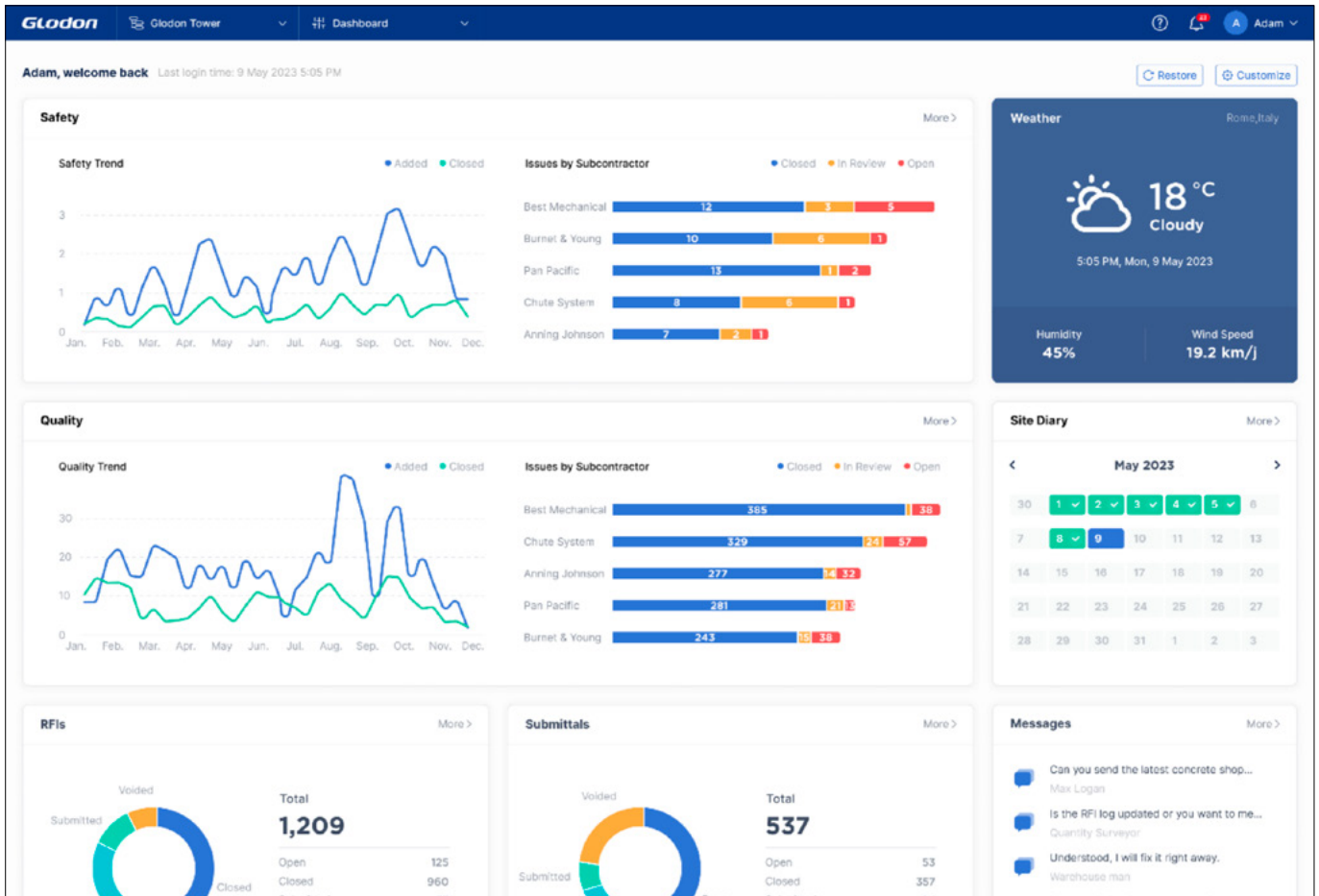


Anytime, Anywhere Collaboration (Image: Glodon)

Actionable Insights for Cost and Risk Reduction

Gsite 2.0 not only streamlines collaborations and coordination, but also collects and integrates data from various modules to deliver actionable insights for cost and risk reduction. Users can enhance their profitability by accessing real-time financial performance

insights. They can also effectively mitigate risks through comprehensive reporting and notifications. Additionally, Gsite 2.0 enables benchmarking and optimisation of projects by tracking time, resources, and trade performance.



Actionable Insights for Cost and Risk Reduction (Image: Glodon)

A Commitment to Industry-Leading Construction Management Technology

Glodon is dedicated to delivering industry-leading, best-in-class construction management technology. We value the feedback received from our esteemed

customers. In response, we've developed a roadmap of critical features and workflows required to achieve our objective to help you achieve excellence in your projects.

Shaping a Sustainable Future With Digital Buildings



By Cristina Savian

nima international ambassador and Digital Twin expert at BE-WISE

The Environmental, Social, and Governance (ESG) criteria have become increasingly important in today's rapidly evolving world. With companies becoming increasingly aware of their need to create a more sustainable future, digital building is becoming increasingly clear that it has the potential to help towards these goals as well. How do we leverage digital buildings to promote environmental, social and governance issues and transform them into an effective tools to create a sustainable future?

Digital Building: An Overview

A digital building refers to the application of digital technologies and processes throughout the entire lifecycle of a building project, starting from the initial design and planning stages to the construction, operation, and maintenance stages. People often believe the term only refers to operations and maintenance phases during a lifecycle; however, its purpose, in fact, starts much earlier. To achieve our sustainability objectives and make decision-making more effective, we must have access to structured digital information about our building assets throughout their lifecycle.

Having access to a digital replica of our building can offer numerous benefits, including enhancing efficiency, reducing costs, improving collaboration, enabling data-driven decision-making, promoting sustainability, streamlining asset management, simplifying regulatory compliance, optimising resource usage, streamlining facility management, and enhancing the overall

My best advice is to invest time and effort in developing a well-thought-out business case that clearly identifies the desired outcomes for the digital solution. Focus on data interoperability to ensure that whichever solution you choose, its most valuable asset – the data – can be easily reused and repurposed across different applications and platforms.

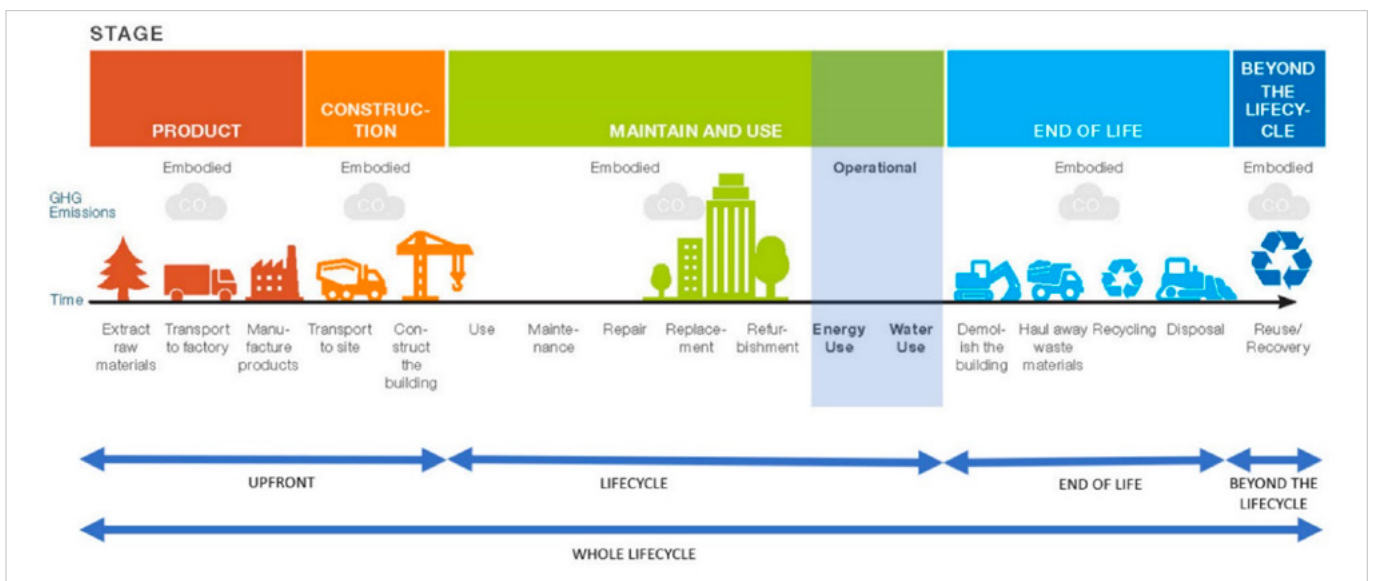
performance of the building and ultimately increasing resilience throughout the entire project lifecycle, ultimately contributing to the achievement of ESG goals.

ESG goals and climate change are closely linked. The built environment is responsible for 79% of total carbon emissions¹, of which the sector directly controls 43%². To understand what these statistics mean, it is crucial to contextualise them to determine what

interventions are required and how a digital building may be able to assist.

Let us first look at whole-life carbon emissions as explained by the equation provided below and illustrated in Figure 1.

Whole-life carbon emissions = Embodied Carbon + Operational Carbon + Beyond the Lifecycle Carbon



Edited version of BS EN 15978-2011(4)



A building's embodied carbon emissions include the net greenhouse gas (GHG) emissions from construction materials, construction processes, and demolition throughout its life cycle. A building's upfront embodied carbon is associated with construction, its lifecycle embodied carbon is associated with use, maintenance, repair, replacement, and refurbishment, and its end-of-life embodied carbon is associated with demolition, transport, and waste removal.

An asset's operational carbon is the GHG emissions it produces over its lifetime from energy and water use. Beyond the lifecycle, carbon emissions are emissions beyond the system boundary from reuse, recycling, energy recovery and other recovery, covering aspects of circularity.

Over the last several decades, the focus has been on reducing operational carbon, primarily through reducing energy and water consumption. And now, as operational carbon reduces, the importance of embodied carbon increases.

The embodied and operational carbon emissions of an asset or portfolio are interconnected. For instance, when designing a building envelope, the designer should opt for one with a low embodied and operational carbon footprint. A whole lifecycle comprehensive approach is required in the selection process, as well as efficient data and information sharing between project members³. This is where digital buildings can provide assistance.

Digital Building: Impact on Reducing Embedded Carbon

Digital buildings can significantly support reducing the environmental impact of construction projects by minimising embedded carbon throughout the construction lifecycle. Here are some of the aspects that can be influenced:

Optimised Design: Digital buildings can enable architects and engineers to create more efficient and sustainable designs by allowing them to evaluate the most sustainable option. By optimising design, the types of material used and reducing waste, and incorporating energy-efficient systems, digital buildings can significantly lower the embedded carbon footprint of a project.

Material Selection: Digital information allows in-depth analysis and comparison of different materials based on their environmental impact. This enables the selection of materials with lower embedded carbon, contributing to a more sustainable construction process.

Construction Efficiency: Digital building can streamline construction, reducing material waste and improving resource management. This can result in lower emissions from transportation, manufacturing, and disposal of excess materials.

Prefab and Modular Construction: Digital building processes facilitate the use of prefabricated and modular components, which can be produced more efficiently in controlled environments. This reduces waste, transportation emissions, and the overall embedded carbon of a project.

Supply Chain Management: Digital tools can help track and manage the supply chain, ensuring that materials are sourced responsibly and sustainably. This contributes to reducing the overall carbon footprint of the construction process.

Adaptive Reuse: Digital tools can facilitate the adaptive reuse of existing buildings, reducing the need for new construction and the associated embedded carbon emissions. By repurposing

existing structures, digital buildings promote a more sustainable and circular approach to the built environment.

Ultimately digital buildings enable a comprehensive lifecycle assessment of building projects, considering the environmental impact from design to demolition. This helps identify opportunities to reduce embedded carbon during construction and throughout the building's operational life.

How to Put Digital Buildings in Practice

Now that we know the theory, the question remains, how do we put it into practice? I am frequently asked about the best technology solution for creating a digital building. While I wish there were a single, definitive answer, the reality is that our industry is highly fragmented, and it's unlikely that a one-size-fits-all solution will ever emerge. Instead, we have numerous excellent point solutions addressing specific use cases or the challenges described above.

My best advice is to invest time and effort in developing a well-thought-out business case that clearly identifies the desired outcomes for the digital solution. Focus on data interoperability to ensure that whichever solution you choose, its most valuable asset — the data

— can be easily reused and repurposed across different applications and platforms.

A platform solution approach, such as Glodon, could indeed be beneficial. The Glodon digital building platform is undoubtedly one of the most comprehensive and fully integrated solutions I have encountered. However, it's essential to recognise that the construction market in China has evolved distinctly from the rest of the world, primarily due to significant sociopolitical differences. The Chinese construction industry has achieved a higher level of standardisation, supported by an exceptionally advanced degree of digitisation. This unique development has allowed China to establish its own construction approach, setting it apart from other global markets and enabling companies like Glodon to develop such advanced digital building platform solutions.

Whether we can replicate China's achievements and apply them to the rest of the world remains to be seen. However, we currently have the opportunity to learn from an excellent practical example of how digital buildings can support sustainability, as demonstrated by the Glodon (Xi'an) R&D Centre project.

Glodon (Xi'an) R&D Centre: A Benchmark in Digital Building Practices

The Glodon (Xi'an) R&D Centre project stands as a remarkable example of a digital building. Spanning a total construction area of 66,000 m², the building features 3 underground floors and 12 above-ground floors. As a property owned by Glodon, the Digital Building paradigm is employed throughout the entire lifecycle of the project, establishing it as an exceptional benchmark for Digital Building practices.

Construction on the project began in September 2019, and the structure was completed in May 2021. By leveraging Building Information Modelling and Integrated Project Delivery, the project successfully breaks through industry silos, fostering effective communication and collaboration among all stakeholders throughout the entire lifecycle.

This innovative approach has led to outstanding sustainability results and a significant reduction in resource usage. Key achievements include:



Achieving a 7 per cent faster project completion compared to traditional construction methods.

Requiring 5 per cent fewer management personnel.

Eliminating the need for reconstruction, resulting in

the elimination of waste and inefficiencies.

Improving 70 per cent in collaboration compared to analogue processes.

Saving about 400,000 U.S. dollars through optimised construction from the initial



Realistic Achievements in Digital Building

The achievements of the Glodon (Xi'an) R&D Centre project may not appear as remarkable as they truly are. The results seem humbled and realistic to me, more so than the unattainable promises made by some solution providers that no one seems to ever be able to replicate.

This raises an important question: How many technology solution providers construct their own buildings using their own solutions? The answer is none, leading to another simple yet crucial question: Why aren't they?

By constructing its own R&D Centre, Glodon has effectively demonstrated the practical application of its digital building platform,

thereby validating its efficacy and offering a valuable model for the industry. This approach underscores the significance of setting realistic expectations and attainable objectives when it comes to digital building technology and its potential influence on the construction sector. As a renowned quote states:

"A leader knows the way, goes the way, and shows the way."

In my opinion, Glodon's initiative serves as a prime example of true leadership in the field, motivating others to adopt similar practices and work towards a more sustainable and efficient future in the construction industry.

design.

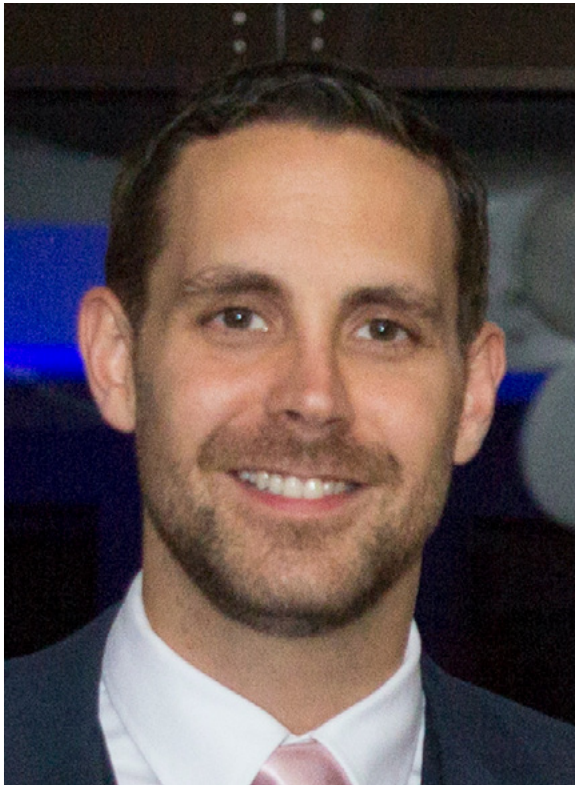
These accomplishments showcase the enhanced sustainability and resource efficiency made possible by adopting the digital building approach.

¹ Thacker S, Adshead D, Fantini C, Palmer R, Ghosal R, Adeoti T, Morgan G, Stratton-Short S. 2021. Infrastructure for climate action. UNOPS, Copenhagen, Denmark.

² United Nations Environment Programme (2022). 2022 Global Status Report for Buildings and Construction: Towards a Zeroemission, Efficient and Resilient Buildings and Construction Sector. Nairobi.

³ <https://www.pbctoday.co.uk/news/featured/digital-twins-decarbonise-the-built-environment/124030/>

Building Smarter with Digital Project Management Solutions: Harnessing the Power of Automation, Analytics, and AI



By Jason Thomas

Industry Consultant

A fast-paced, ever-changing business landscape requires organisations to manage construction projects smarter. Over the past two decades, construction has experienced only 1% productivity growth, but by automating, analysing, and leveraging artificial intelligence, organisations can build smarter and more efficient projects.

Businesses can lose significant money due to inefficient construction practices. McKinsey found that the construction industry loses \$1.6 trillion annually because of inefficiencies such as delays, rework, and waste¹.

The construction industry is complex and faces many unique challenges, such as multi-tiered supply chains, fragmentation, limited adoption of technology, and high levels of risk and uncertainty due to the need for more insights and predictability. Every project is unique and poses its own barriers, but using technology to streamline processes is proven to boost efficiency and productivity and provide real-time data insights. Dodge Data & Analytics² found that companies using digital technologies in construction are four times more likely to meet schedule and budget goals.

CIOB reported that project delays in the UK cost

£21 billion a year, of which 66% were caused by poor management practices³. Digital construction solutions can provide real-time data insights for construction companies, helping them to make data-driven decisions to avoid costly mistakes. AI-powered analytics can provide foresight and help project managers navigate potential problems before they occur, saving time, money, and reputational damage. Furthermore, digital solutions can streamline supply chain management, reducing the risk of material shortages or delays.

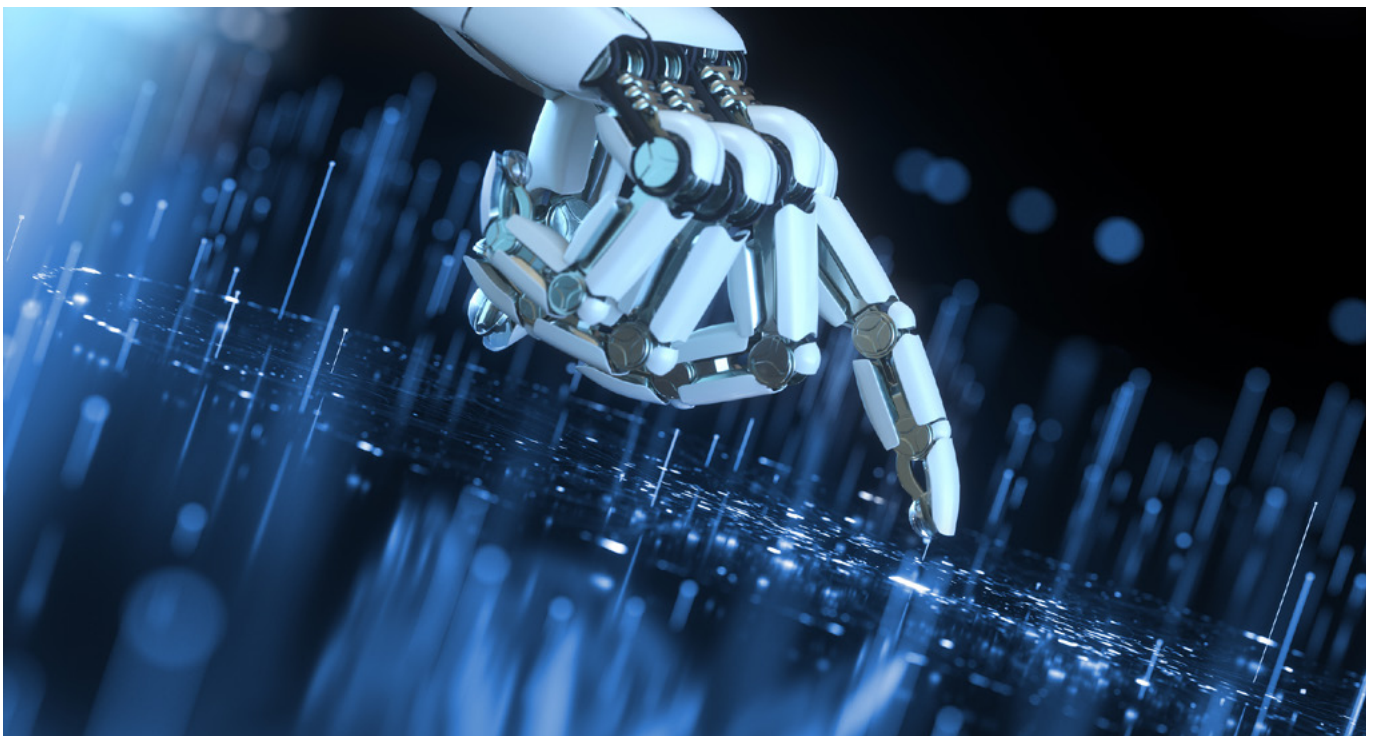
Innovation and adoption of digital solutions are needed for streamlining and automating processes and providing real-time insights into every aspect of your projects and business: from resource allocation and workload distribution to budgeting and forecasting.

The Benefits of Real-time Data for Business

As a business leader, you know project management is critical for your organisation. You want to ensure your teams work efficiently and effectively to achieve their goals. But

how do you make sure that happens?

Innovation and adoption of digital solutions are needed for streamlining and automating processes and providing real-time insights into every aspect of your projects and busi-



ness: from resource allocation and workload distribution to budgeting and forecasting. Executives rely on this information when making decisions about future investments and always

require up-to-date data. FMI reports that the construction industry's cost of bad data strategies was over £1.3 trillion globally in 2020⁴.

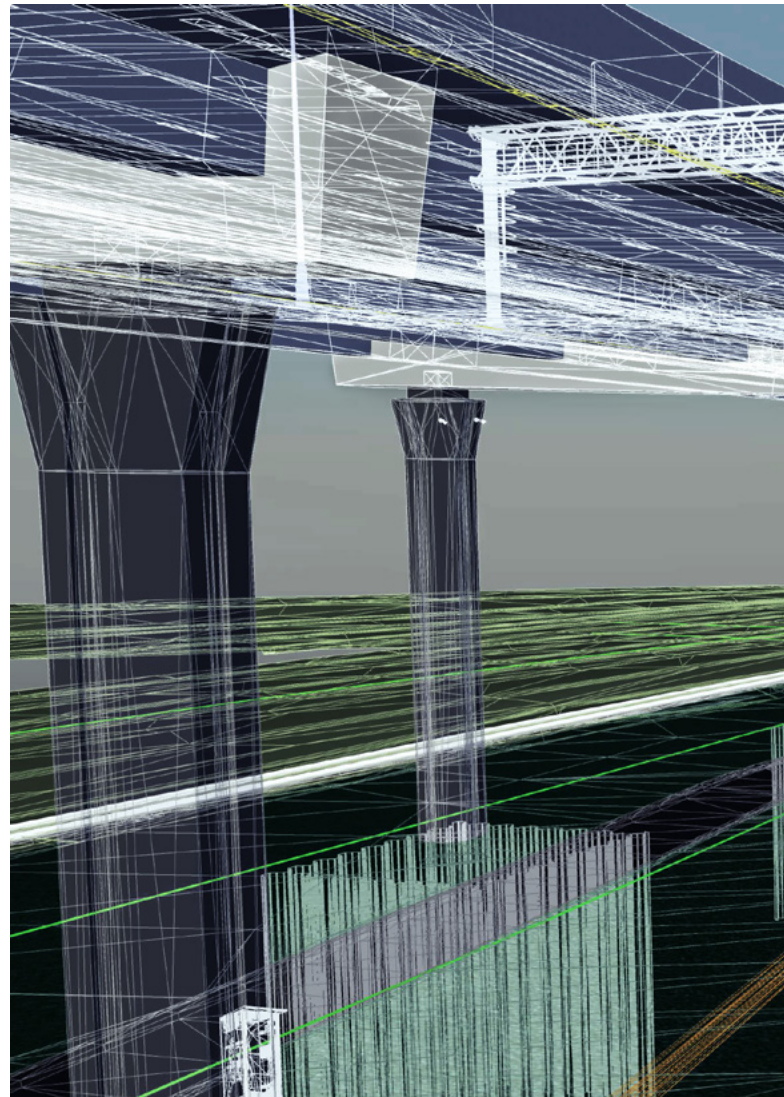
As a project manager, you can use automation, analytics, and AI to make better decisions and improve your team's efficiency. The first step is understanding how data can be better used in planning. The second step is determining how best to collaborate with stakeholders so everyone can access the correct information when needed.

As a construction site worker, you strive to find ways to improve safety and productivity. You also want to ensure you get the most out of your tools and equipment. The use of digital project management solutions can help accomplish these goals by providing insights into what's happening on the job site, so you can make adjustments as needed.

The Power of Automation, Analytics, and AI

When implemented correctly, systems integrations and AI can automate routine tasks like data entry or reporting, giving workers valuable time to focus on value-add activities and strategic decision-making. Companies implementing such technologies and processes early in the project see significant cost savings over time due to the reduction in double handling of data and human error, coupled with the speed of access and the standardisation and accuracy of the data.

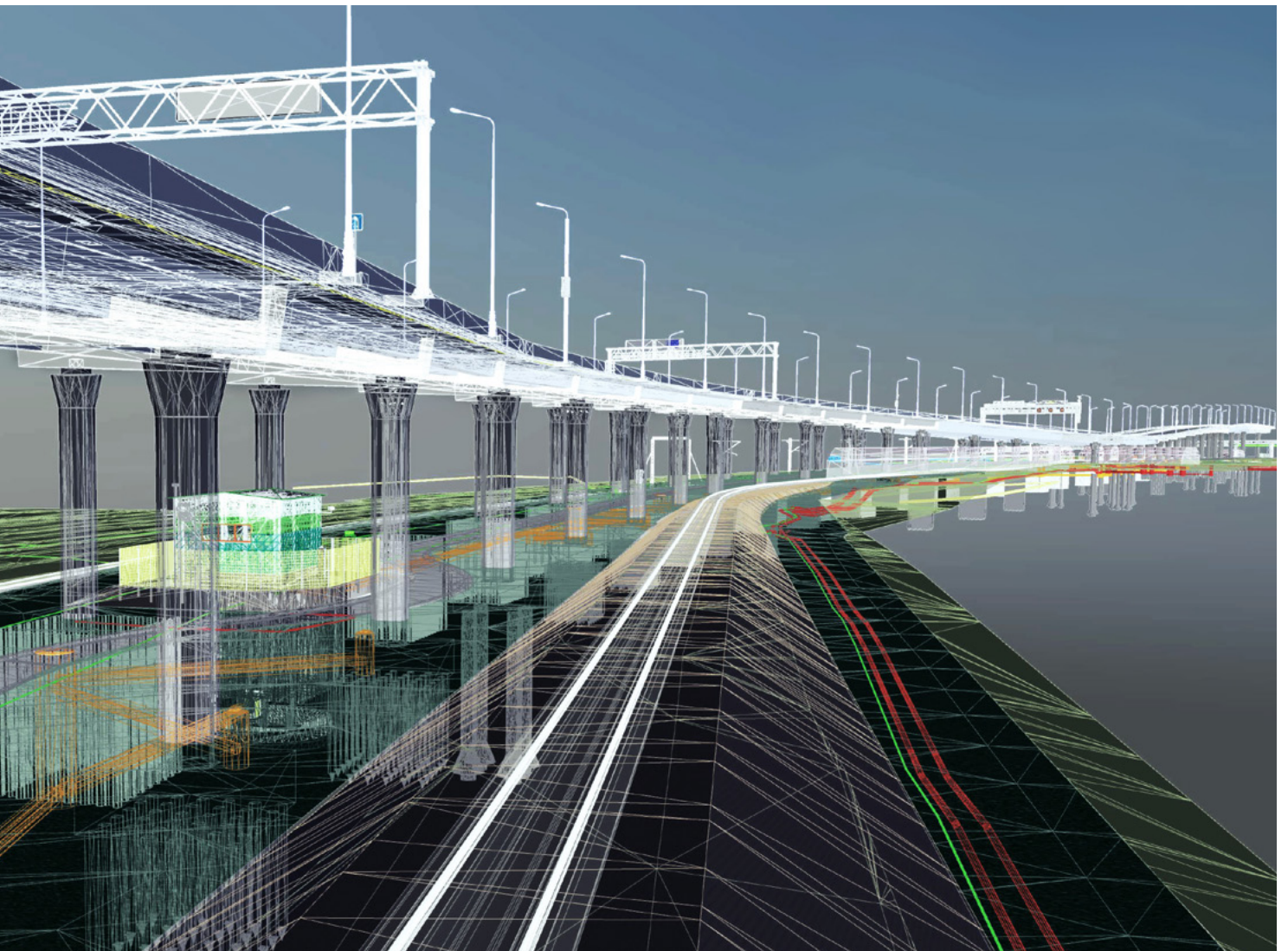
Digital project management solutions like



Cloud-based project management solutions help organisations save time and resources and automate various project management processes, providing powerful analytics capabilities that focus the team's attention on mission-critical tasks. Organisations can use these capabilities to identify and rectify issues before they become significant problems, providing valuable insight into project performance and unlocking value from the data.

By leveraging the power of AI, organisations can streamline project workflows, optimise resource allocations, and even predict project outcomes. Work with such technologies to innovate and implement new techniques to deliver projects on time and within budget.

Today's fast-paced business environment



calls for organisations to work and build smarter, safer, and more environmentally friendly. Due to technological advancements and the adoption of BIM, AIM, and CIM, project data is now produced in greater volume (200% YoY) and complexity (400% increase in size). Manual, paper-based management processes are no longer sustainable; a digital-first strategy is required if projects are to be delivered on time, within budget, and to specification.

Leveraging automation, analytics, and AI can optimise resource allocation, streamline workflows, improve health and safety, reduce rework, and improve profitability. Take your project to the next level with digital project management solutions.

¹ <https://www.mckinsey.com/capabilities/operations/our-insights/reinventing-construction-through-a-productivity-revolution>

² <https://www.construction.com/news/new-era-data-use-emerging-construction-july-2019>

³ CIOB – 2017- Understanding the Causes of Construction Delay in the UK

⁴ <https://constructiondigital.com/technology-and-ai/bad-data-strategies-cost-industry-over-ps13-trillion-2020>

Successfully Transforming the Built Environment: An Interview with Glodon's Pierpaolo Franco



By Tim Clark at Build in Digital

The construction industry is changing, reflecting the world's growing focus on innovation and sustainability. Here, Tim Clark talks with Glodon's vice-president for the European market, Pierpaolo Franco, about how a shift in mindset and a willingness to embrace new technologies can help the industry successfully transition.

“A successful technology needs to affect more than just one team; it needs to impact the whole organisation. Therefore, we need to bring people on board and educate [an organisation] on how to use the digital solution. Instead of just changing one aspect of technology or software, it changes many aspects of how people think or work.”



The full potential of comprehensive digital solutions requires a shift in mindset.

Construction may be one of the largest employers worldwide, but it can also be one of the slowest to adopt innovations. This reluctance hinders its progress in an ever-changing industry.

Globally, governments are pushing for net-zero initiatives, and more clients and consumers are prioritising sustainability, resulting in an increased demand for sus-

tainable construction solutions.

As a key player in the digital transformation of the construction industry, Glodon has recognised the need for change within the industry. With 25 years of experience in the sector, Glodon aims to meet the industry's challenges throughout the lifecycle of construction projects with over 100 products and services.

“We do not develop point solutions or software applications you sign into from a

website. At Glodon, we designed digital solutions for the industry to improve efficiency and innovation,” says Pierpaolo Franco, Glodon’s vice-president for the European market, who learned about technology and sustainability at the vast Taranto steel plants in Southern Italy during his early career.

“A successful technology needs to affect more than just one team; it needs to impact the whole organisation. Therefore, we need to bring people on board and educate [an organisation] on how to use the digital solution. Instead of just changing one aspect of technology or software, it changes many aspects of how people think or work.”

Changing the mentality of the construction sector can be a slow process at the best of times and look reminiscent of the problems faced by Taranto’s steel works, which can build a case for starting afresh.

Current construction processes are, arguably, too complex and digital construction has many terms, processes, and learning aspects. Each presents a barrier to new entrants, and Glodon strives to remove as many barriers as possible by offering user-friendly and practical solutions.

“Cloud-based platforms, BIM engines, IoT centres, data centres, 5G, artificial intelligence, and edge computing are all technical nightmares,” he says.

“At the end of the day, we need a solution that is easy to use and can be put into practice almost immediately.”

Glodon’s vision extends globally, as it seeks to leverage the experience of mature markets such as the UK while harnessing the global reach of its Chinese parent company. This approach encourages collaboration between established and emerging markets,



facilitating innovation, and driving change within the construction industry.

Major initiatives undertaken by the firm include acquiring MagiCAD Group, which specialises in MEP design software, opening a big data research centre in Silicon Valley, accelerating digital building projects in the EU and SEA, and collaborating with international industry associations and universities to stay at the forefront of innovation.

Entering the UK market is important for Glodon.



“We believe that entering the UK market allows us to adapt what we have into another language used in many parts of the world,” Franco says. “But not only that, the UK is also where the built environment construction traditionally developed and inspired many other places.”

This plan took a step forward in May this year with the UK launch of Gsite 2.0, a centralised, integrated digital platform that takes digital construction management to the next level. The system offers BIM-enabled collaboration, streamlined workflows, and actionable data insights and can boost efficiency, reduce

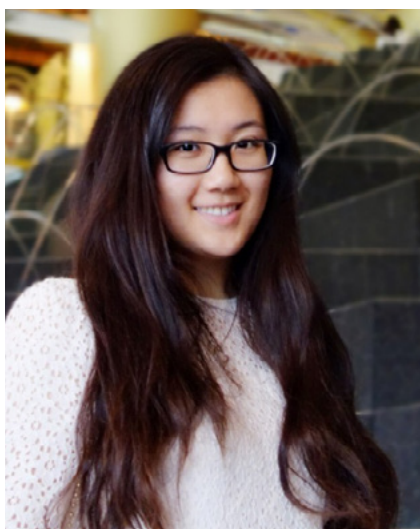
costs and risks, and foster organisational growth.

If implemented correctly, it could benefit clients in multiple jurisdictions as part of Glodon’s aim to lift innovation within construction. Glodon is facing the new challenges of streamlining digital construction head on.

This article is first published on the Build in Digital website.



Interview: Digitalization in Construction Industry Facilitates Data-driven Decisions to Reduce Environmental Impact



Dr Shu Tang

Assistant professor at Xi'an Jiaotong-Liverpool University (XJTLU)'s Department of Civil Engineering

"The rise of the digital economy offers an opportunity to bring business transformation in the construction sector and promote a new way of doing things, effectively enabling transformative change in the construction system as a whole," said Dr Shu Tang, assistant professor at Xi'an Jiaotong-Liverpool University (XJTLU)'s Department of Civil Engineering, during a recent interview with Glodon.

Dr Tang is in charge of research on low-carbon operation strategies in the green building industry based on big data under an MoU signed between Glodon and XJTLU. She added that the construction industry's unavoidable progression trend includes green concepts and intelligent means.

What follows are highlights of Dr Tang's answer to the interview, edited and condensed for clarity.



It is also necessary for digital enablers to bridge the industry and maintain adequate communication within the sector. The lack of interest and communication among members may also affect the adoption of digitalization technologies and practices.

Green Building and the Impact of Digitalization on Environment

The construction industry is known as a major contributor to carbon dioxide emissions because it consumes a sizable amount of global energy. The construction industry consumes more than 40% of the world's energy and emits one-third of all greenhouse gases, other environmental impacts of the building industry are wide. Green building has gained substantial support as a panacea for minimising the environmental impacts of buildings to achieve sustainable development.

The primary benefits of green building are known to include enhanced human health and well-being, environmental protection, increased profitability, and energy efficiency. Green building demands the integration of

green technologies and interactions among other building components to achieve sustainability goals. It is evident that the application of green technologies can contribute to sustainable development.

For instance, in southern California, the application of efficient water heating, energy-efficient HVAC systems, the introduction of daylight, optimisation of building orientation and configuration, insulation, and application of passive solar have helped designers to achieve a 59% reduction in building energy consumption.

Digital technology adoption promotes the quality and efficiency of information acquisition in the project network. Existing research

indicate that a digital construction framework incorporating BIM, three-dimensional (3D) laser scanning, and other technologies helps to optimise the efficiency of the renovation project process by 15% and helps to shorten the duration by two months, with cost savings of 7.41%.

It also facilitates data computation and analysis, which assists stakeholders in making rational decisions.

At the same time, digital technology adoption reduces potential uncertainty-related environmental management and positively affects environmental performance. By supporting sustainable design and construction with digital technologies, firms can accurately create detailed production planning and control workflows to maximise the effi-

ciency of resource utilisation and minimise resource waste.

For example, radio frequency identification (RFID) is used to record waste tracking information and to direct waste to the appropriate facility for reuse. In recent years, green BIM was developed, which includes three R functions, i.e., reduce, reuse, and recycle.

In particular, digital twins, big data and IoT are a perfect combination that can be applied to green building scenarios for energy efficiency. A big data original approach becomes necessary to process large volumes and varieties of both real-time and historical data to extract meaningful information in order to make data-driven decisions.

Four Main Barriers to Digitalization

Introduction of digital technologies generally contributes to disruptive innovation, but four main barriers should be highlighted in the construction industry.

First, the cost can be a major barrier, which could be a significant amount of time, effort, and money. But applications might still come about if the benefits are apparent and properly understood.

Second, adopting digitalization in AEC industry requires embracement of change and re-engineering of processes. However, the mechanism that explains how adopting digital technologies leads to performance outcomes in construction projects is still under investigation.

Third, the lack of information needs to be

considered. It would be difficult to persuade stakeholders, who are not knowledgeable and feel they do not have adequate and right information, to adopt digitalization practices and technologies.

Finally, the success of implementing digital construction greatly depends on the type of contract adopted to deliver the project. Not being able to determine the potential performance of digitalization technologies, the need to change site behaviors and practices, and the usage of different procurement and contract forms of project delivery suggest that stakeholders would have to adopt new technologies and practices in the face of uncertainties and risks. This often reduces the efficiency of digital technology and may push stakeholders back to conventional construction methods.

Glodon and Other Digital Enablers' Role in Digital Transformation

Companies need to collect more empirical data to validate the effects of digital tech-

nology adoption on economic outcomes as well as social performance and environmen-



tal performance.

Such companies can also provide more expertise training for managers and staff. It is well known that the adoption of digitalization technologies is directly affected by support from top management. As the application of digitalization technologies and practices can sometimes bring trouble to the entire construction process, it is necessary to ensure that all project participants are competent

and technically trained to effectively handle the complexities and relevant digitalization considerations involved in the project.

It is also necessary for digital enablers to bridge the industry and maintain adequate communication within the sector. The lack of interest and communication among members may also affect the adoption of digitalization technologies and practices.

Prepare the Future Workforce with Industry-University Cooperation

There is an increasing demand for highly qualified professionals in digitalization, automation, and globalisation in the construction industry.

AEC companies ought to establish digitalization roadmaps and methodologies that place employee education and training first. They should develop a digitalization-skilled workforce who could smartly embrace interdisciplinary teamworking, agile development, new thinking ways, and 'big dataset' exploration. One best way to achieve this is to use in-house capacity-building programs rather than external programs to train employees, as the latter may not afford the holistic company-specific education/training

necessary to drive rapid scaling, agile and cross-functional collaboration, and deep/lasting cultural changes.

Universities play an essential role in preparing human resources for the industry of the future. By providing the proper knowledge, they can ensure that graduates can adapt to the ever-changing industrial sector. But to achieve this, the courses provided by academia must cover the current and future industrial needs. Companies could offer practical opportunities for universities as external partners and provide feedback on actual knowledge demands of technologies, and then universities can upgrade their curricula.

PROJECT OVERVIEW

LOCATION

Beijing, China

CONSTRUCTION PHASE

Tender & Bid, Construction

DESCRIPTION

The airport terminal is a large-scale building complex with a cast-in-place reinforced concrete frame structure as its centre and composed of several supporting structures.

MAIN CONTRACTOR

Beijing Urban Construction Group Co. Ltd

GROSS CONSTRUCTION AREA

1,430,000 m²

GLODON PRODUCTS INVOLVED

Glodon BIM5D Platform, Cost Estimation

A Complex-structured Single-building Airport Terminal Enabled by Digital Construction

Beijing Daxing International Airport is a prestigious national project. The airport's design highlights a level of complexity seldom seen in construction, pushing the boundaries of what is possible. With its largest single-building construction complexity, it is the first to have double-deck departure and arrival platforms, making travel seamless. Furthermore, it is the nation's largest integrated transportation hub, offering travellers from near and far seamless high-speed rail connectivity.



“Daxing International Airport is the largest single building featuring vibration isolation in the world, which is innovatively & digitally built with Glodon BIM5D Platform.”

— Glodon Recommend

KEYWORDS

BIM #Cost Estimation
BIM5D Platform
International Airport
Simulation



Key Insights

Given its remarkable complexity and extensive stakeholder involvement, the project necessitated the employment of sophisticated construction technologies and managerial systems. Here are a few significant insights into how advanced technology was put to use:

i. BIM Technology:

Efficiently executed modeling, layout simulations, and scheme comparisons for temporary transport steel trestles of super-large and ultra-long structures, swiftly addressing technical difficulties and guiding the utilization of steel trestles.

ii. Isolation Bearing Modeling:

Digital modeling for isolation bearings and simulation for nearly 20 construction procedures, evaluating procedure settings, shortening technical

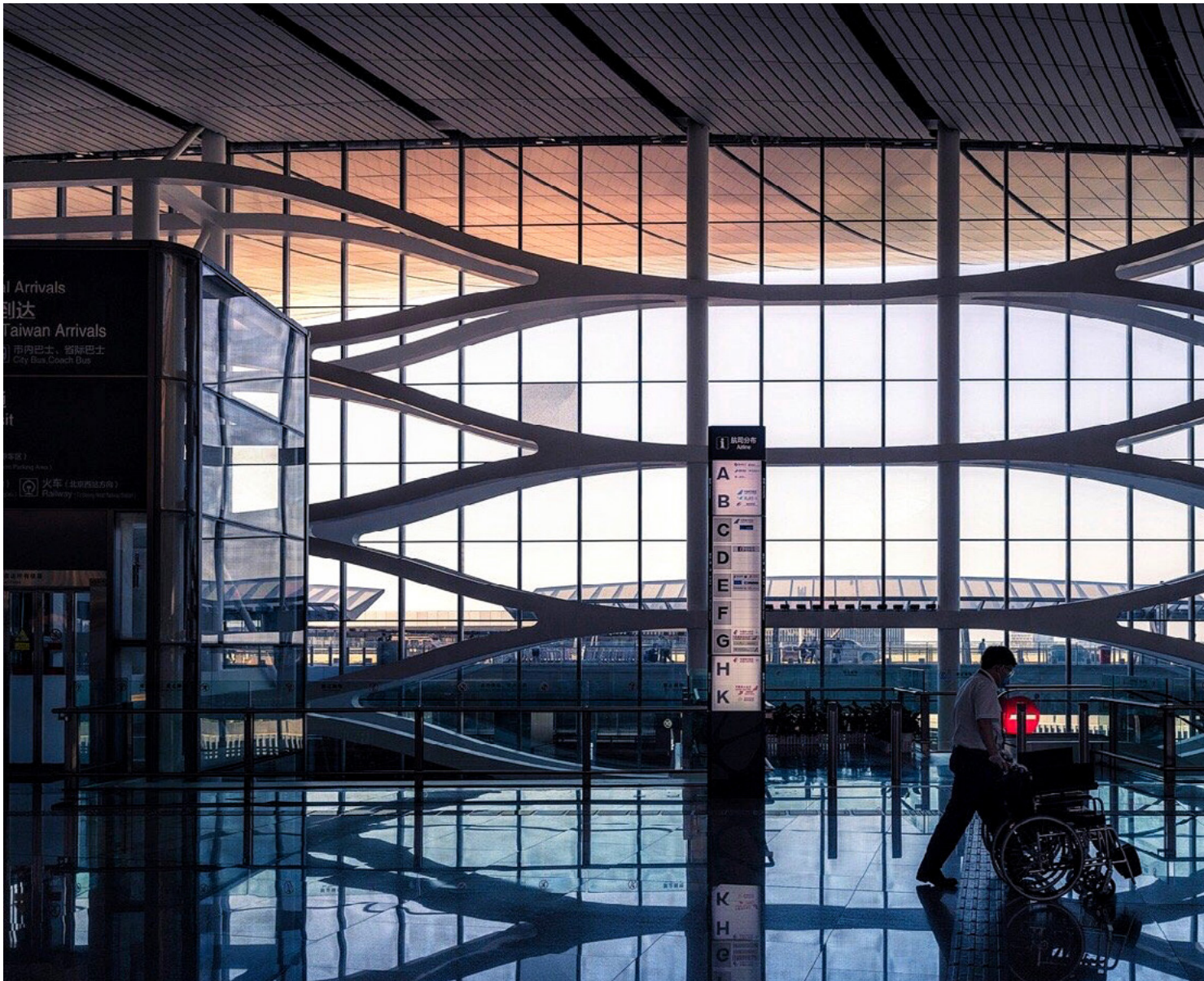
disclosure time, and ensuring uniformity and quality of construction with a more visual approach.

iii. MEP System Digital Design:

Implementing a detailed design reduced work quantities for annotating secondary structural openings by over 80%. Furthermore, optimizing the layout of cables and wires has resulted in a 10-15% improvement in the efficiency of MEP work's construction.

iv. 5D Management Platform:

Utilizing the BIM 5D management platform amplified the efficiency of management data transfer by 15-20%, decision-making by over 10%, and cutting down on material extraction time by 15-20%. This sophisticated approach allowed for streamlined and effective management of technology, schedule, quality and safety across the entire project.



Solution

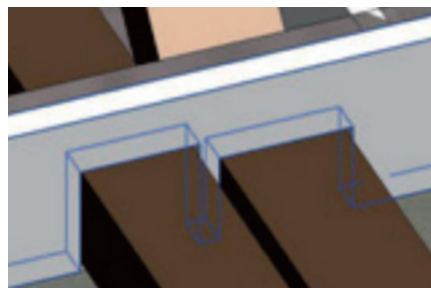
The successful delivery of the complex project was significantly aided by Glodon's BIM5D Platform and Cost Estimation software. Some key details include:

i.5D Model

Using various models, the platform simulated and analyzed geological conditions, calculated earthwork excavation differences, generated animations, and efficiently managed 8,275 foundation piles.

ii. Automatic Openings/Markings

The platform enabled the automatic creation of secondary structural openings and markings, reducing marking workload, avoiding errors, and improving accuracy and uniformity.



iii. Reinforced Concrete Structure Simulation

The Glodon platforms also leveraged BIM technology for comprehensive detailed design schemes by simulating all reinforced concrete structures and steels before beginning construction.





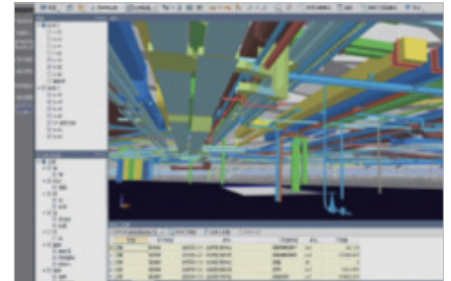
v. Steel Trestle Scheme Simulation

Applied BIM technology during the planning and design of the steel trestle to compare different options. Detailed BIM simulations and calculations have been performed to assess the rooting form, support system, component selection, and load conditions.



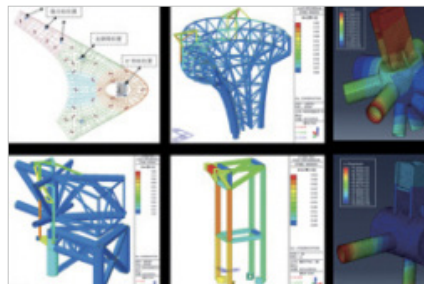
viii. Material Extraction Based on BIM

Facilitated procurement by automatically generating material demand plans after importing models directly into the BIM5D platform.



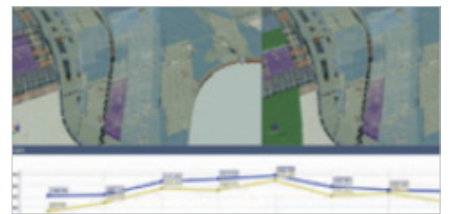
vi. Steel Structure Scheme Simulation

BIM modeling enabled the calculated deformations, and simulated construction processes using node modeling and finite element calculations.



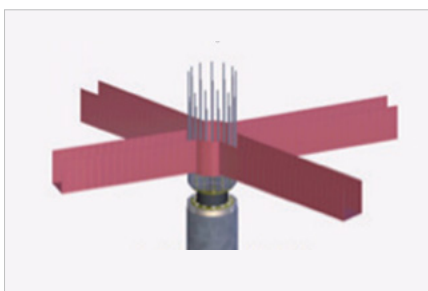
ix. Schedule & Resource Curve Analysis

By linking the BIM model with the project schedule, project progress was effectively visualized while evaluating project finances and resources contributed to efficient, lean management.



iv. Isolation Bearing Process Simulation

Thanks to Glodon BIM5D, 20 isolation bearing procedures' technical disclosure accuracy and uniformity improved while shortening disclosure time and helping construction staff on-site.



vii. Streamlined Section Management

The platform promoted lean management for construction accomplishment and component completion using BIM-based streamlined section management. This made it possible to accurately manage on-site construction progress and track the completion status of various components.



x. Enhanced Pile Foundation Application

The BIM5D platform's additional Pile Foundation module improved progress monitoring, facilitated multi-dimensional analysis, streamlined updates sharing, and boosted management efficiency and record accuracy for pile foundation construction through mobile platforms.

