

Completing the digital puzzle: putting the pieces together to unleash the power of data and technology for construction



The government's Construction Playbook is a timely reminder about the value of embedding digital technology and data to improve productivity and cost-efficiency. It is also recognising how that value can be harnessed beyond the construction phase of a project. Gleeds' Ben Huskisson, James Garner, Jana Honkova and Nahid Jafar discuss the digital puzzle and the power of putting the pieces together.

Digital technology and data are changing how we work and how we do business in the construction sector.

The value of digital information and information management has been thrown into sharp relief during the COVID-19 pandemic. The challenges of keeping construction going during social distancing and lockdown have shown the importance of digital technology and having well-structured digital information.

In recent years, the adoption of digital technology in the sector has steadily progressed. Initially, the focus was on digital technology which could improve existing processes, but it is now being used to transform the way that we operate.

More and more businesses have invested in digital technology and digital skills because its value is plain to see. For example, drone surveys offer a fast, safe and cost-efficient way to survey at height, offering versatility with minimal impact on a property's day-to-day operation and occupants. Gleeds use them as a standalone solution or a complementary offer alongside our traditional building surveying methods.

Digital technology is enabling what has traditionally been a fragmented and low-margin industry to modernise and standardise processes for greater efficiency – and profit. With projects often involving many different contractors and suppliers, technology can help bring different stakeholders together. It enables data gathering, so each new project isn't starting from scratch. More than that, the information and data gathered can inform strategic asset management and the whole life cycle of a project.

In highlighting the need to further embed digital technology, the Construction Playbook is a reminder to the industry that it is moving from 'nice to have' to 'should have' to very soon 'must have'. It is also suggesting that investing in digital technology alone is not enough. It requires a clear digital and data strategy to move from simply augmenting the process we currently have in place to using data and technology to transform the way we operate.

Gleeds Digital has helped clients set up digital strategies which capture and manage information and data on strategic construction projects.

For the Welsh Government, we are working on a framework for the procurement, construction and operation of schools and colleges in Wales. We are helping them and the local authorities in Wales to achieve their key objectives in the delivery of exemplar educational institutions in compliance with the UK BIM Framework, the ISO 19650 suite of standards and the Construction Playbook. The legacy of this work is the establishment of best practice and the creation of a collaborative culture. The client can create true value for the communities it serves.

However, while there has been huge progress, the construction industry is only at the beginning of its digital transformation journey. It is on the cusp of some exciting advances from robotics and Artificial Intelligence (AI) to properly harnessing the power of data analytics.

One area ripe for advancement is storing and managing the data gathered during a project for ongoing use.

A typical project completion takes two years, over which time a huge amount of data is accumulated. That data tends to get lost at the end of a project, and the industry is only just starting to understand the power of that lost data. How that data can be structured and stored for future use is a big area of focus. BIM partially addresses the use of this data for the operational phase of the asset with streamlined activities such as maintenance, future upgrades and retrofits. There is, however, additional pool of data available which is not getting the spotlight it deserves. We are talking about activities associated with tendering, evaluation processes, cost and contract administration, change management, risk management and similar.

And this is where information management and project data analytics will become increasingly important. If you can digitally gather and integrate data from different sources and then curate and contextualise that data, the value is exponential. Those sources could be anything from quantity surveying and building surveying to project management and more.

The application and benefits of digital augmentation and data analytics are huge. For example, combining project cost data with machine learning makes it possible to get more accurate cost estimates on future projects considering the specific risks associated with that project. The clever bit is when you integrate it with existing digital technology such as BIM – Building Information Modelling - and 3D modelling; it can reduce a process that used to take weeks.

Similarly, digital augmentation could also be used to streamline and add value to the tendering process and contracting, both of which are either done on paper or using basic electronic processing.

It will make the development and construction process much more efficient and free up construction professionals to do more value-adding consultancy work. For example, rather than the cost manager spending time measuring quantities, they can analyse trends and add more value by focussing on using the foresight from data analytics to de-risk a project before starting on-site.

And, where consultants would rely on their experience to advise clients with digital augmentation, they can back up that experience with data – provide the proof of what they know.

It is frequently misconceived that these digital technologies and data gathering channels have to be developed concurrently, but that isn't the case – taking that approach is counterproductive. The reality is there are some easy and quick wins and others that will take more time to develop and implement.

The Construction Playbook is a clear indicator of the direction the construction industry needs to travel. As a sector, as the pieces of the digital puzzle come together, the value and potential of digital technology and data will be exponential.

What next for the construction digital tech revolution?

Imagine standing in a room wearing a virtual reality headset and watching your building being designed in front of you in minutes.

If you combine BIM with AI, augmented and virtual reality, that scenario is feasible and here right now. Although, what we are seeing is an unbalanced uptake from across the industry.

Software company Autodesk is already using AI to provide different design options based on certain criteria, and it is being used in construction. Months could be spent designing the mechanical and electrical (M&E) system for a building, but it could be soon possible to do it with a few mouse clicks with AI and graph databases.

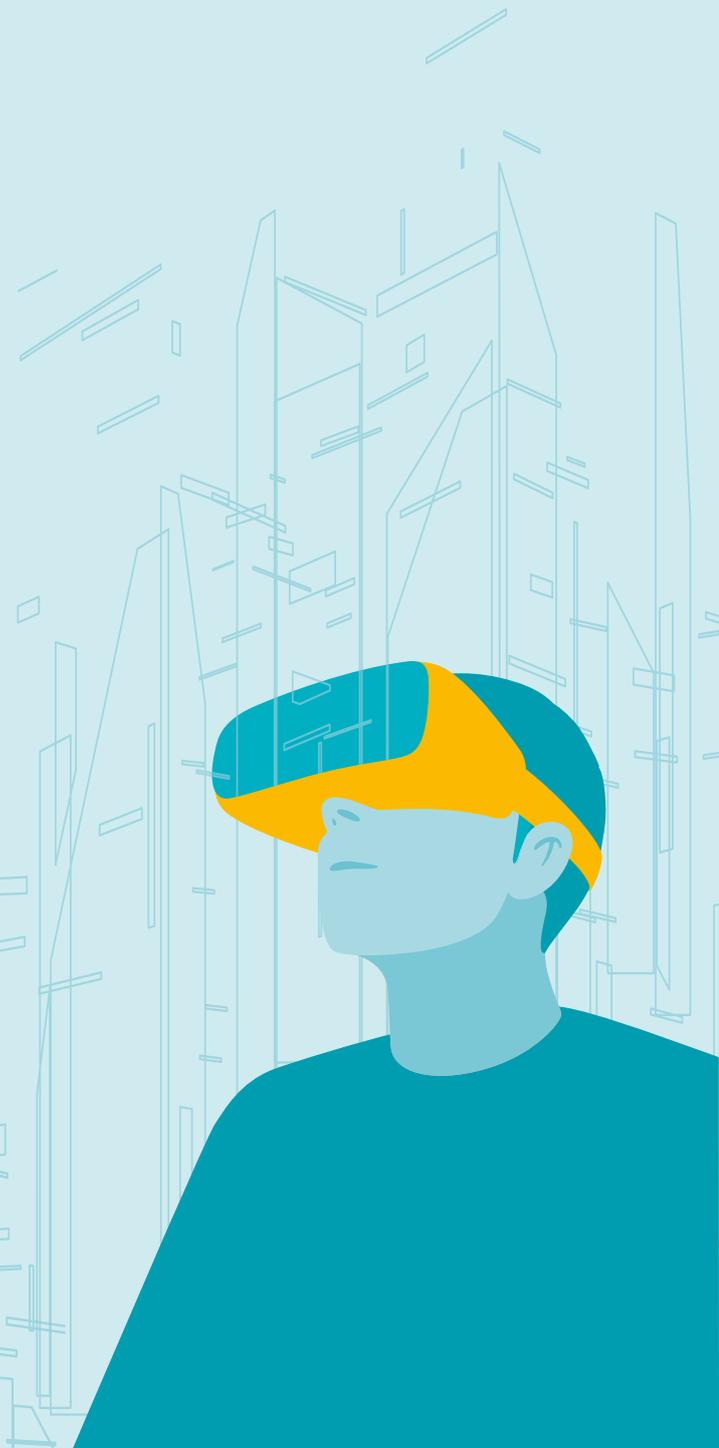
Add in the architecture and structure, and a whole building could be designed and tweaked in a virtual environment. Link it up to the Internet of Things, and you can gather all the relevant site information, such as Land Registry, ecological searches, flood plains, planning legislation - the list is endless.

The way the industry interacts with data will become more important because of AI and machine learning. Machine learning is based on a series of predetermined rules, whereas AI can create something from scratch.

AI tools will augment roles such as quantity surveying and project management.

Another digital technology that has huge potential is using sensors installed on construction sites to monitor activity and conditions. Information and data can be gathered on a number of things, from people movement and distribution to weather conditions.

The immediate application of this is for project management and claims. You can see where labour is concentrated on-site or the weather conditions at a particular point during construction. In the future, the vast amount of data collected will help inform a variety of decisions such as how many people are needed, or which is the best month for building the sub-structure.





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