

# BIM – a repository of invaluable energy information

**Author: Paul McCormack, Belfast Metropolitan College Innovation Manager**

It is widely accepted that digitalisation is a game-changing strategy that will empower the construction sector to thrive and deliver the expertise for sustainable energy skills (see *Building Services Engineering* May/June 2021). In this, the second article in our Digitalisation Series, Paul McCormack, Innovation Manager, Belfast Metropolitan College, focusses on the significant role BIM has to play.

**T**ransforming the EU construction sector to be greener, consume less energy and to reduce its carbon footprint will be driven by the growing market for digitalisation and data, and by legislated carbon reduction targets. However, it will all be achieved through upskilling the built environment workforce. Building information modeling (BIM) is the backbone of the new “informed” way of working that’s been triggered and targeted by the digitalisation opportunities presented to the sector.

The challenge for industry is how to engage in the digitalisation journey, where is the next starting point, and how do you navigate a journey when you are unsure of the destination?

### Fundamentals

As with any journey it is vital that you get the fundamentals right. Digitilisation journey is no different ... get the right training materials together, suitably prepare and correctly

package them for the audience, ensure the learning process fits and that everything is well mapped out. While technology affords us the chance to do many things, it is essential to get the pedagogy (the theory and practice) right first. Establishing the correct pedagogical structure for the process is the foundation of the learning process, regardless of the delivery mechanism.

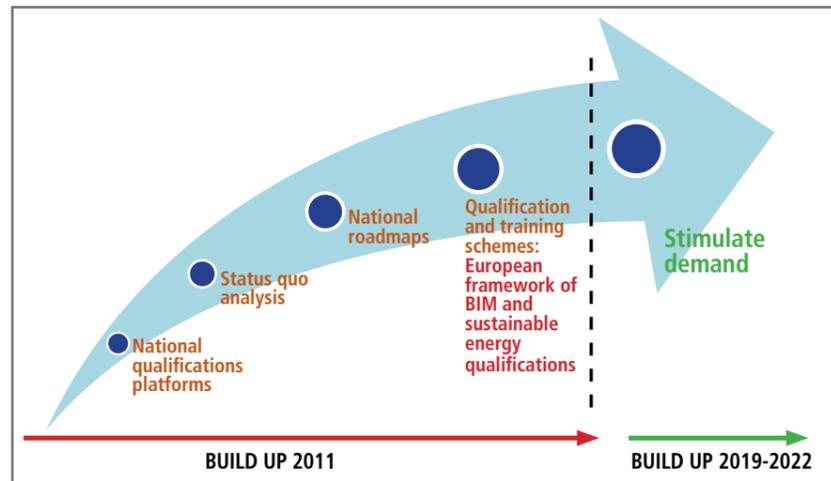


Figure 1. BUILD UP Process Curve.

Our work in this field continues on the EU BUILD UP work (<https://www.buildup.eu/en>) in developing the skills and processes to reduce the carbon footprint in the construction sector. See Figure 1.

In the post-Covid-19 environment there will not be a return to pre-pandemic normality. Many of the previous systems, structures and jobs have disappeared and will not return. It is therefore imperative that, in order to help kick-start the economy and to take full benefit from the emerging low-carbon economy and other opportunities, all training tools, mechanisms and channels developed must be future-fit in design, content, delivery and accreditation.

In the current crisis individuals, industries and governments are being affected on an unprecedented scale. Our challenge is to develop training materials and modules for the new economy and marry these with new forms of learning. This approach enables industry and workers to start their digitalisation journey learning new skills while also accelerating the process.

### The journey

BIMcert is a project based on three steps, aimed at providing a largescale training and qualification scheme providing the requisite skills for the entire construction supply chain to:

- (1) Enable collaborative working to improve access to, and the transition from, design to development and delivery of both new-build and renovation to achieve energy efficient near zero buildings (embedded energy);
- (2) Achieve efficient and effective ongoing management of the building in terms of energy and fabric (operational energy);
- (3) Utilise Building Information Modelling (virtual construction) as the enabling methodology and tool (sustainable energy).

The construction sector is increasingly struggling with how to gather and utilise data in a coordinated fashion across the entire sector supply chain. By upskilling the workforce initially to master the digital fundamentals, and then to utilise BIM to gather the data, the sector can organise, store and extract value from the data. This will lead to greener construction and enable net zero carbon footprints in construction. BIM is simply a repository of energy the information of buildings, accessible and usable by all stakeholders in a systemic and coordinated environment.

### Materials

Extensive industry links in the BIMcert project, harnessed through the BIMcert Startegy Compass (Figure 2), informed strategy, content, direction and delivery. We had the Technical Advisory Panel (TAP), which included technical organisations, accreditation bodies, digitalisation transformation experts and BIM experts.

This was supported by the Industry Advisory Panel (IAP), included industry bodies, companies, SMEs and industry representatives, and ensured that our material was responsive to both organisational and staff needs.

Our research and feedback from the advisory panels showed that high-quality learning in the workplace is more than just technology. The

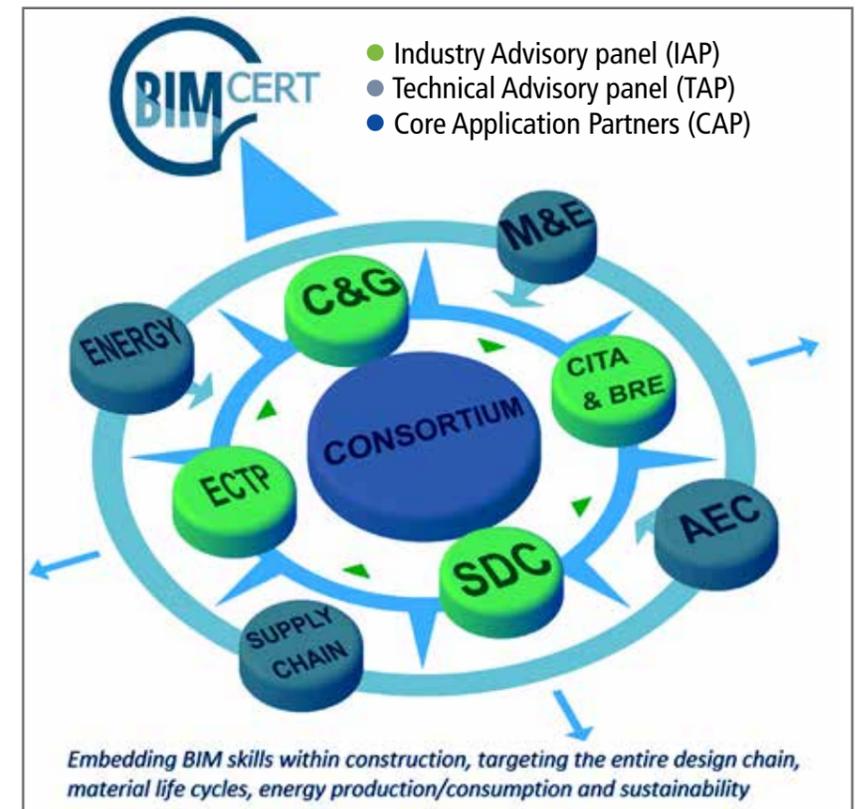


Figure 2. BIM-EPA Digitilisation Strategy Compass (DSC).

challenge is to design effective learning and development tools that fully utilise the capabilities of technology, combined with work-based activities and experiences, to deliver a real and lasting impact on performance in the workplace. Our key goal as a learning and training provider for digital transformation to ensure participation and deliver success is to shift the traditional focus of learning inputs to learning and performance outcomes.

## BIM adoption

### Barriers

- 29% of companies believe that disappointing BIM adoption is due to a lack of knowledge;
- 38% attribute it to budgetary issues;
- 38% also attribute it to a lack of support from employees.

### Solution

BIMcert tackles all three problems at once, with a comprehensive, easily-accessible training and qualification platform.

### BIM journey

Through the extensive external stakeholder and industry links, we developed and continually refined the material to ensure it met industry and learner needs. This is critical with plenty of industries having to rapidly adapt post-crisis. The material must be fit for purpose and we must continually refine the curriculum to match imminent industry demands.

BIMcert addresses all these issues at once, with a comprehensive, easily-accessible training and qualification platform designed to level the playing field. BIMcert has developed training packages that, instead of a lengthy and rigid multi-module accreditation process, follow a digital micro-accreditation process. Such bite-sized micro-accreditation facilitates learners in following their own learning path as opposed to a prescribed standardised journey.

The journey itself is quite different from usual training schemes. A first innovation lies in personalisation –

the system systematically taps into the experience of learning professionals to get them familiar with new digital technology. Comparisons are then provided, emphasising the benefits of digitalisation at individual and industry level.

### **Multiple BIM development routes**

While BIM is an enabler and a priority for companies to understand and embrace, in reality the level of knowledge and use of BIM will differ from one company to another, depending on their position in the construction value chain. Large multi-national companies will have resources for a dedicated BIM department, whereas SMEs will require this to be an "add on" to someone's job description.

Therefore, the BIM adoption levels and development routes are different for each player and the resources available need to reflect this. Every company will adopt a different BIM approach depending on need and capacity. However, every company will require a basic grounding in BIM fundamentals and then, if necessary, develop individual specialisms.

Now is the time for companies to develop and implement their specific needs and opportunity-driven digital strategy with BIM at the heart. The starting point for this journey is getting the fundamentals in place.

### **Successful example**

An example of how this can be achieved is Northern Ireland based O'Hare and McGovern (OHMG). Realising the need to lay down firm BIM foundations upon which to base their digitalisation journey, last year they embarked on a company-wide BIM course. Twenty seven OHMG staff have since completed the OCN Level 3 Award in Digital Construction with BIM, delivered by Belfast Metropolitan College.

This 20-week online course was delivered in a "beyond blended" online

education process with the learners engaging with the process remotely and at a time that suited them. This digital process enabled and empowered the OHMG workforce to study "on site" at their own pace, time and location, thus ensuring the learning process balanced with work and home life.

Speaking of the experience Martin Lennon, Managing Director said: "As with all others in the construction sector, we face the challenge of ensuring our staff are fully skilled in digital tools for construction, while still delivering the goods on site. The Belfast Met BIM course was a perfect fit for our team and is another step on our digital transformation journey."

### **BIM modules**

BIMcert has developed a comprehensive multi-discipline curriculum for the AEC sector for the double challenge of energy efficiency and digitalisation. The curriculum is formed by a set of on-demand units, divided into several strides, to allow a build-up of skills. Those units are delivered via bite-sized modules that combine form-flexible training plans.

### **Mechanisms**

Through the Belfast Met experience in H2020 projects, we have ensured that traditional barriers to learning are not reinforced. Our experience in the BIMcert project shows that there are still many barriers that prevent adults from engaging in the learning process, including lack of time and cost, lack of access to high-quality training, limited guidance and a lack of belief and motivation to get involved in training in the first place. The learning mechanisms we put in place are designed to address these very issues.

### **Delivery**

In our delivery we were faced with significant challenges, not least being the fact that construction is only

second to agriculture as the slowest industry engaging in innovation and digitalisation. However, we built in mechanisms to ensure our delivery process empowered learners to reflect on a number of things:

- (1) How technological developments affect their roles and their lives;
- (2) What skills they can build on, or may need, to develop as a result;
- (3) How to identify personal opportunities in a digitally-transformed world.

### **Engagement vital**

Digitalisation is currently changing the face of the construction industry. It is vital for companies to engage in this transformation in order to avail of the ensuing opportunities. Those who fail to engage will fail, it is that simple. Data is being generated across the construction process and presents tremendous value that needs to be captured. Those with the capability and capacity to do so will thrive.

All companies must develop a mechanism of dealing with the levels of data that they are faced with. In order to engage, companies must get the basics right and then map out their own individual journey. This is essential if they are to take advantage of the opportunities and to succeed.

### **Conclusion**

BIM is more than just an acronym ... it is a system for handling data that allows the user to manage construction. The first step in the BIMcert project was to demystify BIM and let the learner engage. Hence we broke the process down into basic steps, introduced the fundamentals as the first step in this process, and allowed users to design their own learning pathway. To facilitate this there are now 32 modules for trainees and trainers on the BIMcert programme. Get your tailored digitalisation journey underway now by logging on to <https://energybimcert.eu/> ■