The Future of Construction & Data; Digital Disruption 25th June 2020

This was the second of the summer programme of three online workshops and roundtables. This event focussed on the role of data in 'deep tech' (blockchain, AI, IoT BIM and machine learning) for the Real Estate Sector.

Twelve speakers first gave short presentations that were followed by three breakout groups, in which delegates considered various market sectors where the tech can be applied. The theme of the event was to identify where the value can be identified if the techniques under consideration were to be introduced.

The opening introduction was by **Gary McCluskey** who is **the global design managing director of Greystar** and a qualified architect with 25 years experience in master planning, architecture and interior design. He explained how the key to designing software for architecture involves observing people to understand how spaces work, something we all do consciously or subconsciously. The theme of his presentation was that data is now being used now to influence the design process, and that the growing ability to gather and process larger volumes of data using algorithms, now allows companies like WeWork and AirBnB to make informed decisions and design not only web pages but actual buildings and spaces.

Gary's view was that as the data is becoming so important to the design process, it has a clear value, but a main issue is that often the volume of data that is collected is overpowering, and often it is not clear why the data has been collected. He felt, therefore, that a priority is the collection of clean and reliable data. The nature of the business activities that Greystar undertakes means that it is in an ideal position to understand where the value of the data that is already being collected can be found.

Gary was followed by **Yael Tamar, the CMO and Partner at Solidblock** which offers a compliant global platform for the issuance and trading of digital securities backed by Real Estate and other assets.

Yael explained that tokenisation is used to raised funds from investors, where the token represents the not only the underlying asset but also is capable of containing the associated data, which she described as 'dynamic asset data'. The increased use of tokenisation should bring additional liquidity to the market as it allows retail investment and also investment in income streams as well as the traditional equity models. In her view, investment decisions will be assisted by the provision of data attached to tokens, thus giving the data a value in risk assessment and valuation of the underlying asset.

Chris Stephenson from Concrete VC followed Yael and explained the reason why data has such potential value to the owners of Real Estate. He started by reminding delegates that McKinsey noted '*we are highly inefficient: we spend a great deal and we design every product from scratch'* and felt that the answer is to find ways to solve that approach from within the data. Chris believed that the exercise of collecting critical data needs to be conducted in phases of the development, starting with the questions around whether or not to do the project and moving through all the later phases including the design, construction, operations, disposal and repurposing/ decommissioning of the asset.

Chris explained that the current method of property development is not conducive to this approach to achieve collaboration, as the owner or investor hires an architect who then appoints a contractor who then starts to 'value engineer', hoping to save money and improve their margin. This creates an adversarial relationship where there is no incentive to share the data or the problem. Rather than growing and developing the data, it is too often the case that when the building is handed over upon completion the contractor gives the owner the data set and wishes him/her good luck.

The solution to the problem is that the collection of the data should start at the outset of the project and that the owner should become a partner with the contractor in the collection process, incentivising the contract to collect and verify the information for the benefit of all. This will allow the owners of the buildings to make better decisions.

Kevin O'Grady, Associate Director from **Arup** then followed and spoke about modern methods of construction and designing out waste to keep assets at their highest value for as long as possible. Again, he emphasised that the object of data collection is to allow the owners of buildings to make better decisions and explained current techniques in obtaining *'less information - but the right information'*.

Kevin mentioned a 1-year pilot programme that he had been involved in which created a digital smart contract passport that tracked construction materials through the supply chain to optimise value. He referenced the post Grenfell Tower call for a 'golden thread' including material passports that could relate key information to architects, fire engineers and the ultimate end users.

Kevin concluded by pointing out that as the demand grows for ESG (environmental, social, governance) principles and a recognition of the need to change our ways of considering economic growth in areas such as investment and construction, that, as is often said, '*Data is the best friend of the circular economy'* as it plays a key role in unlocking the enablers that are necessary to rethink, redesign and build a positive future economy.

Alan Muse, Global Director of the Built Environment at RICS and **Niall Roche, Head of Distributed Systems Engineering at Mischon De Rey** then spoke about the importance of standards developing a 'win-win', where the data can improve and inform comparable practice and also help codify learning. There has already been considerable international collaboration on standards for valuation, property land and cost measurement, where standardised reporting and data collection encourages vendors to develop systems and allowing professionals to talk to each other.

Alan explained that the development of standards allows collective decision making, in particular making predictions in the problem areas of capital cost, lifecycle costs, sustainability/design and cost classifications. This then assists facilities and asset management. He felt that BIM had held out a promise '*a deluge of data'*, but issues have arisen around security, privacy and the use data in the public good.

Niall explained that from his perspective, the key issue was the identification of data sources for the provision of 'clean data'. He explained the work that he been involved in, which

includes a research project with Arup and also a project to map data from the Land Registry in the Accord machine language to build smart legal contracts. A discussion about a possible use case based on Real Estate then took place, as this project has developed a significant following from the UK legal community.

The workshop then considered two use cases: the first being the RPL pilot for UCL Estates (UCLE) where they are collecting and verifying critical statutory Fire Safety data for later use in dispute avoidance, collaboration in project management and facilities management. **Associate Professor Simon Addyman** from UCL and RPL set out the background to the pilot where RPL are collating material from the gateway process that UCLE have adopted throughout their undertaking. Simon emphasised the role of the duty-holder as set out in the Hackitt Independent Revie of Building Regulations and Fire Safety and the increasing obligation of individuals to accept personal responsibility for all actions. Simon emphasised the importance of transparency of the audit process to permit enforceability and explained the importance of the stage gateway process in data collection.

Neil Turvey, Associate Director of Capital Projects at UCL Estates presented a case study explained why the PEARL [Person in the Environment and Activity in Laboratory] project was suitable for this pilot project. The Professor who commissioned the building said '*I want to create the world in a building' which, for example, allows the accommodation of full size, such as tube train carriages, to conduct experiments to study the behaviour of those involved – e.g. passengers on the train and on the platform'.* He explained that major construction projects such as PEARL create a huge volume of data when driven by the stage gateway management process. Despite managing an efficient system of data collection, the RPL pilot had already identified significant gaps in the collection and retention of critical data and recommendations are currently being made to improve that capability without disturbing the current project management systems that are in place across the entire estate.

Simon Cooke, the Fire Safety Manager for UCL (the client) explained the post occupancy fire safety management drivers that were imposed from the client's perspective in the project. He set out in detail the system of fire safety that is in place to drive compliance with the Fire Safety Order and industry best practice. His interest is in post handover management and how, on this project, there had been issues around the stated requirement for sprinklers that was changed as the design developed due to various factors including a fire alarm design issue. He explained that although he had been confident that all critical data had been retained, the audit process conducted with RPL regarding the removal of the sprinklers was useful in pointing out gaps in what, where and who made the decisions and the exercise had assisted in establishing a process to better understand how critical decisions had been made.

Simon touched on Building Regulation 38 which imposes an obligation for the contractor to supply critical data on handover, which had hitherto been poorly enforced by building inspectors. In his view collection and collating the huge volume of data that is produced on such a project is often beyond the scope of the client, an example was that in a recent visit by the Fire Brigade to a newly constructed building, they said that everything was too complicated and difficult to follow in an emergency.

Fabian Süss from Daimler then spoke about lessons that could be learned by the Real Estate sector from Automotive industry where intrapeneurship played a key role. He felt that the hardest part in implementation of innovation was convincing ourselves and our clients that the data project will help us move things forward from a business point of view.

Fabian described a proof of concept project where they brought a bank in early to cooperate with an automatic truck refuelling payment system, a plan that played dividends in due course. When asked if he would bring in the lawyers from external stakeholders at the start of such a data collection exercise, or after it was shown to have value, he clearly indicated that in his view it is essential to build a collaborative team to iron out potential problems from the outset rather than wait for objections to be made down the line.

The session was concluded by a talk from **Jo Bronkers Vice President of FIBREE (the Foundation for International Blockchain and Real Estate Expertise)** which is an international network in over 60 countries, with over 6,000 participants and industry members. Jo explained the importance of collaboration with investors, academics and industrial partners, and the need to develop a consensus around both the underlying technology and standards that should be introduced.

Jo explained the detail of the Unique Object Identifier project, a system that serves as the key to accessing interoperable databases with dynamic information about new and existing buildings or their built environment. The UOI allows users to view specific information about a building, floor, room or window frame based on your role and access rights and is the type of enabler that needs to be developed on behalf of the industry, rather than for any of the participating members.

Following the conclusion of the talks, delegates went into breakout groups to discuss the specific issues and benefits around collection of data for dispute resolution/dispute avoidance with Howard Price and Jeremy Barnett from RPL, the Circular Economy methods of Construction with Kevin O'Grady and Olivia Finch from the Ellen MacArthur Foundation, the UCL PEARL project with Neil Turvey and Simon Cooke and The use of data in facilities management and asset management with Mike Millar and Simon Pursey from RPL.