The digital journey

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Mark Bew explains how the availability of digital data will speed project delivery and cut costs

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The need for common measurement approaches is well understood, and has challenged the construction industry for many years. The work to standardise measurement through the New Rules of Measurement (NRM) project is the culmination of many years' work and experience, and marks the current state of the art with traditional methods.

But we are entering a new age, and the UK government has, as part of its 2011 Construction Strategy , set out on the digital journey. The government's adoption of building information modelling (BIM) Level 2 for all public procurement from 2016 onwards, and the comprehensive programme of delivery contained in the National Infrastructure Plan 2010) signals a new commitment from the public sector. This now ensures that it both supports and secures the best possible performance from one of the largest sectors in the UK economy.

An essential by-product of the BIM programme is the procurement and delivery of clean, verified data that can be put to a multitude of uses. These include regulation checking, procurement, planning, take off, room data sheets, answering key client questions and, of course, cost management.

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The UK BIM Task Group website hosts a 'labs' area that has published the first system to help bridge the gap between the old 'plans of work' ? which defined levels of geometric detail and a list of key documented deliverables ? with the new 'digital plan of work'. Together with the geometric details, the digital plan also displays the required 'attached' data for each element in the design. This clear definition of need is then used to verify that the required data is delivered at the appropriate time. Obviously this will not guarantee a good design, but it will at least ensure that clients and other suppliers are provided with all the required information. In turn, this will then allow users more time to ?design? productively rather than sort through large numbers of drawings and schedules, only to find a week later that the information required is missing key elements.

The dataset the government has identified at Level 2 is known as Construction, Operations, Buildings Information Exchange (COBie) . The purpose of COBie is to provide a common data format designed to exchange information between organisations, typically, in the case of government strategy, between the client and the supply chain. This common approach is designed to present a consistent demand on the supply chain, so that users can optimise their systems and approaches across their organisations. The intention, of course, is to

reduce costs so that the client is in a position to verify data deliveries quickly, and reformat this into information useful to their businesses operations.

Clearly, the amount of data and geometry delivered on a project increases as it progresses. Currently, the level of detail delivered is a function of the various plans of work, and duties documents provided by the client that make up the contract. These documents are the result of many years' experience and practice, but new methods of procurement have challenged the approach and we have all seen the rise of language such as 'C+ or D-' which articulates an unmeasurable delivery to suit specific needs. This 'analogue' method of definition is poorly suited to the challenges of a digital world. If we are to move to a position of being able to verify deliveries and reliably transact project data we need to find a better answer. Step forward the 'digital Plan of Works' (DPoW).

Bridging the gap

The DPoW is the next incarnation of the plan of works and manages the process of procuring design and data delivery services. It sets out to bridge the gap between the client and statutory requirements, the brief and the design process and the data required in satisfying these requirements.

The amount of data produced at each stage is a function of client and statutory needs. If information is provided too early it may be abortive or wasted. If it is provided too late, key questions cannot be answered and waste is introduced, which will invariably result in poor decisions that may introduce delays due to retrofit key information.

It therefore follows that a reasonable place to start would be with the key client questions, or 'plain language questions' (PLQs) that every client needs to address. In the DPoW it is these PLQs that drive the level of geometry nd data required at each key stage.

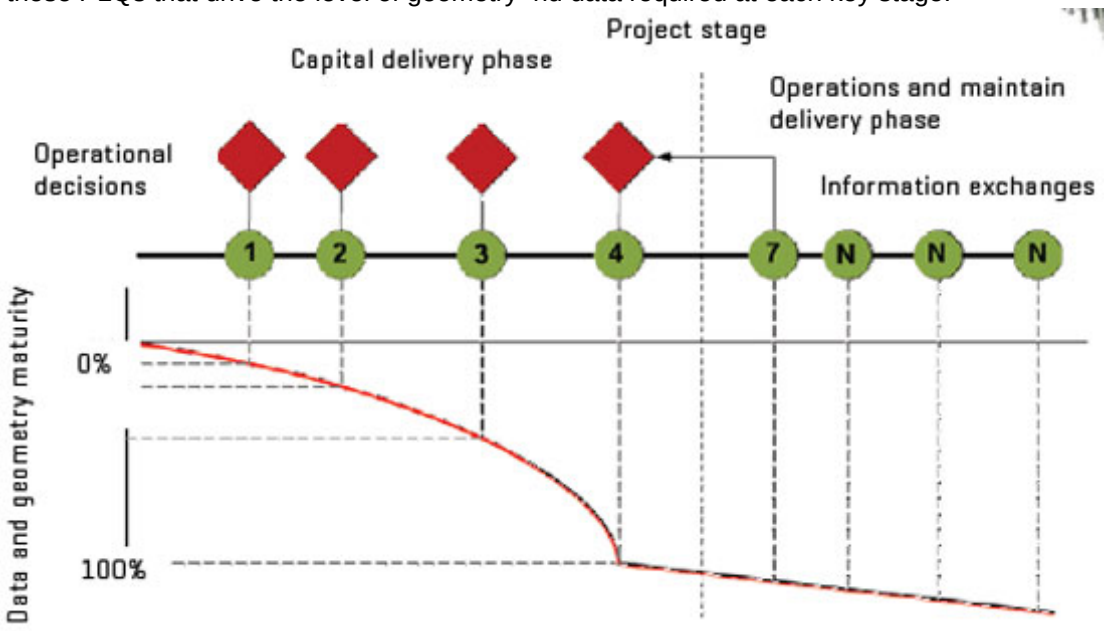

Figure 1: Progressive data delivery

Figure 1 demonstrates this point. The red diamonds represent the client decision, the green

spheres the data transaction and the red line the progressive growth in geometry and data. Once these data points are defined, a matrix of attributes to be delivered at each stage can be produced. The key questions at this stage are how many elements should I check, and at what level should I be checking my BIM data? These are difficult questions but the current view is that asset elements, defined by table G and L in the Unified Classification for the Construction Industry (Uniclass) or table EE in Uniclass 2 , means by current definition around 2,500 individual elements.

With this approach it is now possible to procure specific data requirements, test delivered data and move from a position of extremely variable data quality to one of quality certainty. This leaves the client or data recipient in a position of being able to focus on adding value to the design from the moment of verification, and with a much enhanced level of confidence. This benefits the client in operating their business, as well as onward suppliers and designers who are subsequently able to focus on delivering design rather than administration.

COBie as a data format is only a common method of transporting data from one organisation to another, a type of 'common briefcase'. This enables software vendors to develop and deploy common verification and interfaces. However, to make use of the data we have to reorder it and pass it on to other systems. These may be very simple, such as report writers or spreadsheet applications, or highly complex enterprise resource planning or computer aided facilities management systems as shown in Figure 2. To reorder the data to apply to these new requirements, classification systems such as Uniclass are employed, analogous to the index numbers on library books (except that the index code is buried in the COBie data). The subject of interest is looked up in the index, and the number leads the reader directly to the correct shelf and book.

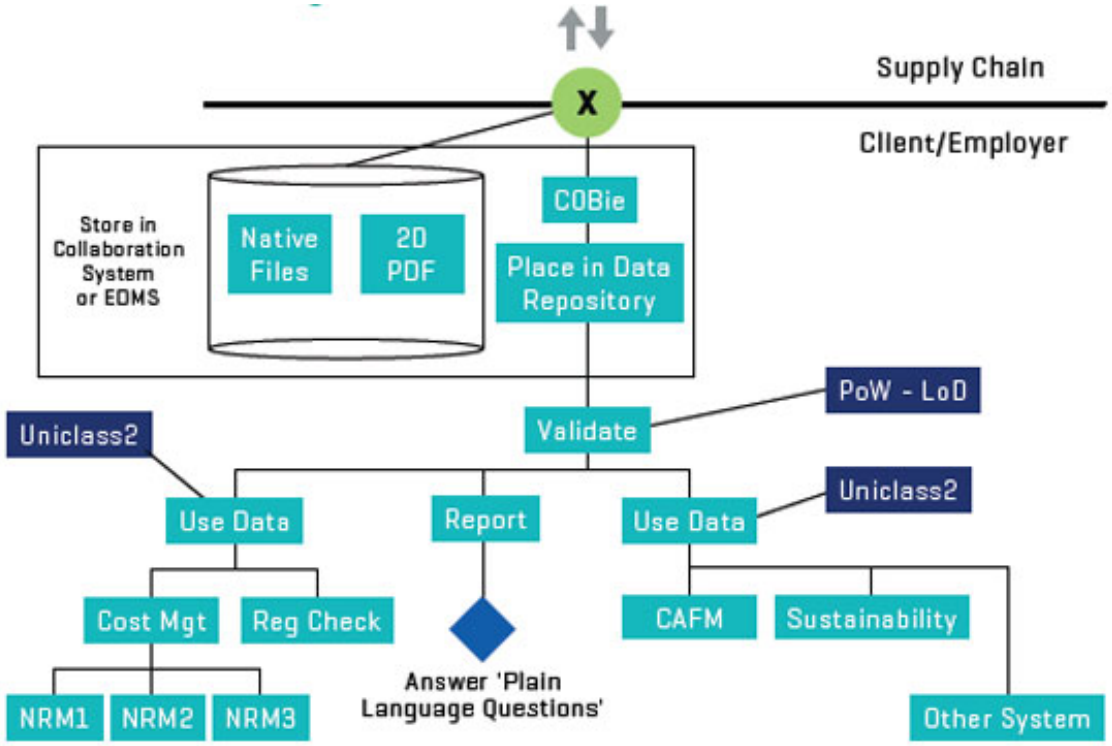

Figure 2: Data Validation and Usage Process

NRM3 is focused on the estimating and cost management of building maintenance works. Clearly, this dataset is a subset of the entire COBie set, and Uniclass is used to identify the

data needed to undertake these operational activities. The BIM Task Group is engaged in delivering further data, and process guidance in this area is due for release toward the end of 2013 in the form of PAS1192:3:2013.

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More information

- The Digital Plan of Works (DPoW) can be found in the 'Labs' area. The Construction Industry Council is coordinating the public consultation process. Documentation for the DPoW and demonstration class room models can be downloaded and used to validate individual models.
- HM/Industry BIM Strategy (2011)