

HOW CAN DIGITAL TOOLS IMPROVE THE POST-COMPLETION HANDOVER?



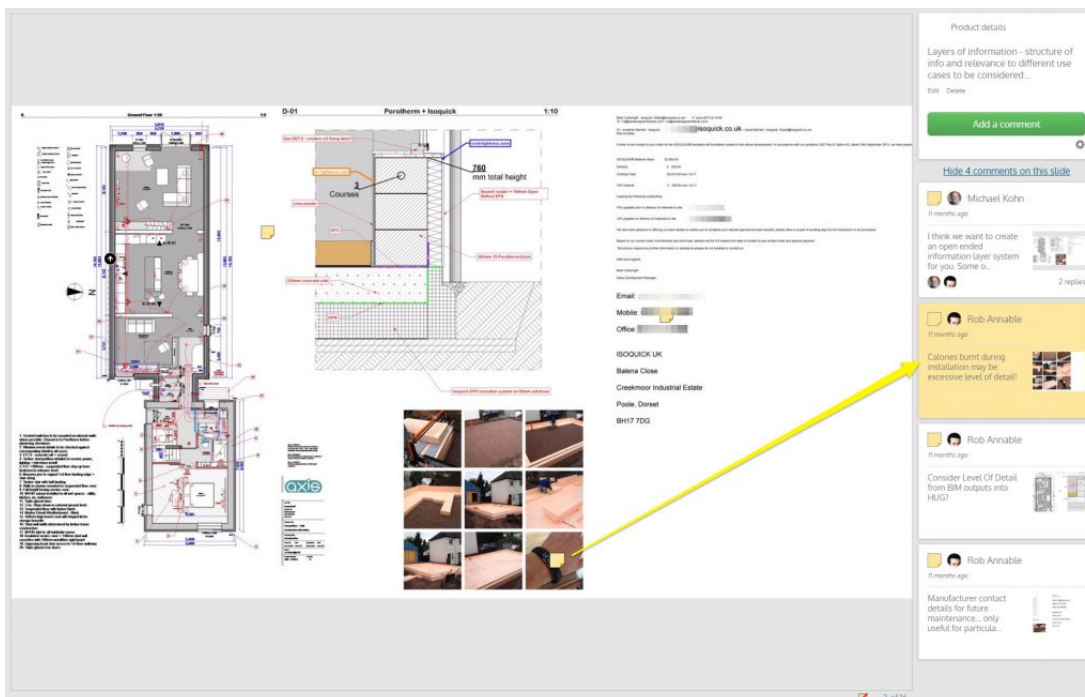
20 May 2016

Rob Annable, director of Axis Design Architects, talks us through the development of the Home User Guide at the Wolverhampton pilot...

Axis Design's role in the Digitising Custom Build research project is to explore how digital tools can improve a [home user guide](#) and 'as-built' hand over information. Using an innovative, energy efficient house in Wolverhampton as a [live case study](#), the exploration has covered numerous aspects of design and construction data compiled during the completion of the building.

The images below show some of the early mock ups. It uses a variety of resources made available due to the extensive BIM data developed, and procurement information made accessible by the fact the project was my own self build scheme. The [Stickyworld](#) portal was used to share ideas and discuss during team meetings each quarter.

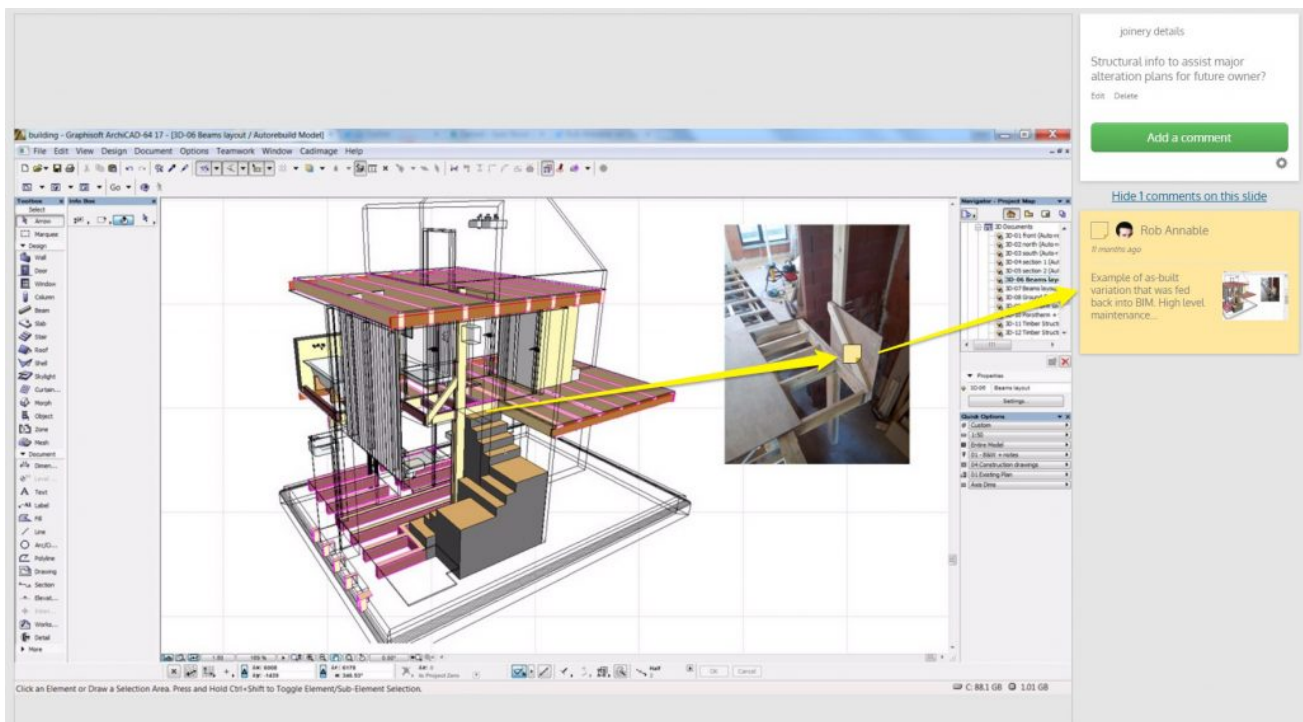
The first mock ups sought to further the debate by exploring opportunities that arise from combining information from several stages and sources into one interface. Traditional technical drawings taken from the production information stage could be combined with in-progress photography and further supplemented by procurement details such as supplier's contacts and costs.



The screenshot displays a digital interface for a home user guide. On the left, there is a technical drawing of a wall section labeled 'D-01 Paratherm + Isoquick' with a scale of 1:10. The drawing shows 'Courses' and a '760 mm total height'. Below the drawing is a grid of photographs showing construction progress. To the right of the drawing is a list of contact information for ISOQUICK UK, including the name 'Sarena Close', address 'Creekmoor Industrial Estate, Poole, Dorset, BH17 7DG', and phone number '01202 333333'. On the far right, there is a 'Product details' section with a comment thread. The comment thread includes a comment from Rob Annable: 'Calories burnt during installation may be excessive level of detail!'. A yellow arrow points from the comment to the photographs in the drawing.

FUTURE MAINTENANCE

Site photography quickly became an important consideration. It highlighted the value of recording aspects of the construction that would later become covered up with finishes but might be useful for future maintenance. This could be combined with the BIM data to offer both qualitative and quantitative information.

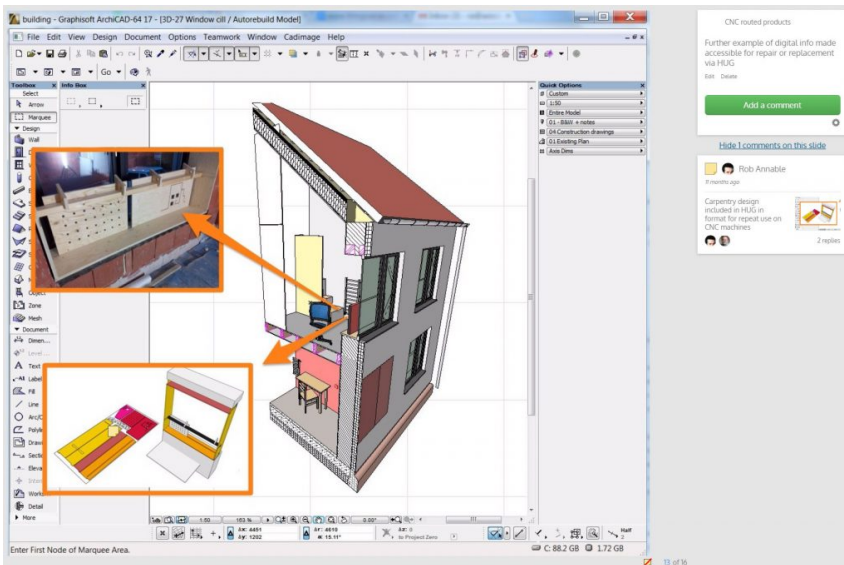


SEEING THE FINANCIAL IMPLICATIONS OF CUSTOM BUILD DESIGN

Considering how digital tools could impact the final user guide information also encourages you to imagine how this might exert an influence on the design and construction process from the outset of the project.

Several elements of the home have been fabricated using rapid manufacturing techniques, such as CNC routing and 3D printing, creating a perfect opportunity to embed more data into the guide that would improve maintenance or refurbishment decisions in future.

For example, cutting patterns for fit-out items created using CNC routing could be included in the guide to allow easy replacement or alteration, supplemented by assembly or location info in the same interface as the rest of the guide.

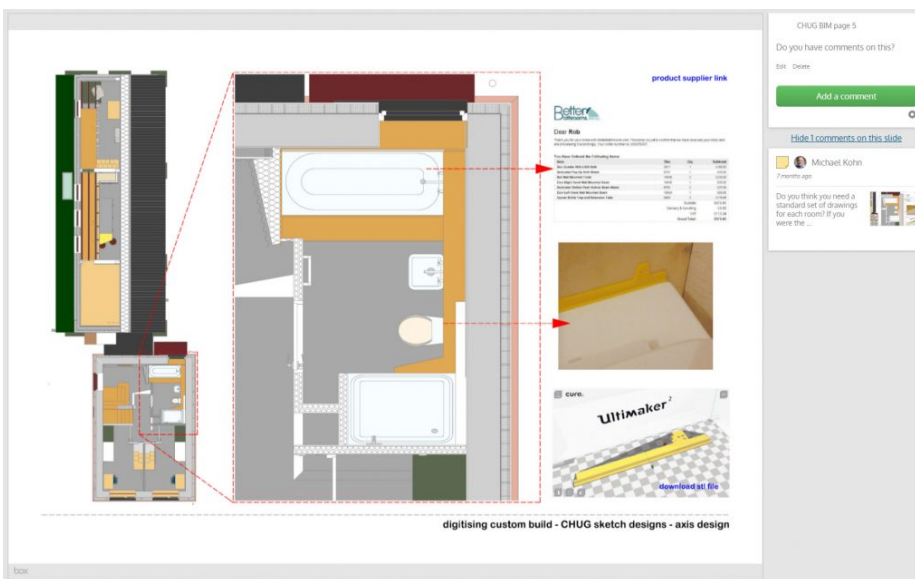


BESPOKE ITEMS

Pushing this further with the latest manufacturing techniques, 3D printing has been used in selected places in the home. Bespoke items to improve fit-out detailing or appearance of the home have been created and the data from each stored for inclusion in the guide.

This culminates in system that can combine design drawings,

construction details, material costs and replacement sources into a single interface. Offering access to the raw 3D printer data (STL files) reduces the dangers of being unable to implement maintenance over the long term thanks to changes or commercial failure of a proprietary product and prepares for a future in which ordering 3D printed products becomes commonplace.



CUSTOM BUILD STAKEHOLDERS

The most important outcome of these early tests was how it focused our thoughts on the question of intended audience. These examples started from the basis of traditional architectural drawing outputs and exposed levels of information that might be valuable for future

maintenance involving trade skills, but potentially complicated a user guide for the home owner unnecessarily.

As the project progressed we began to consider how this could be considered more carefully, resulting in different media and different visuals offered to numerous different stakeholders that might need to learn about the building in future.