

## 3D printing has boosted modelmaking

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Mike Fairbrass, former head of modelmaking at Rogers Stirk Harbour + Partners, explains why 3D printing does not represent a threat but an opportunity for specialist architecture studio staff



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The physical model is a powerful magnet in any presentation or pitch. A competition jury, potential client, planning official or the public in consultation are drawn to, persuaded and inspired by models, which can instantly communicate the idea as whole. But does it matter who, or what, has made them?

The buzzing technology of the moment is 3D printing as smaller, affordable machines become available. Does this herald the demise of traditional modelmaking? Predictions are everywhere about how 3D printing will revolutionise everything: jewellery, toys, chocolate, shoes, prosthetics, human organs, guns and, of course, buildings. Everyone knows it is significant in the future of architecture, both for prototyping and construction. But to what extent?

Forming an accurate picture of what is to come is flawed by imagining the future in terms of the present. When the future arrives, it will follow its own rules. The innovation and convenience of processed food technology led mass markets and still does, but the spaceman capsule food *Tomorrow's World* told us we would all be eating did not appear. Chefs have not only survived, but have flourished and even become celebrities.

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As with buildings, scale models have evolved a language of material combinations and techniques: acrylics - clear, frosted, laser-cut or etched, live edge, opaque painted or back-sprayed. Timber and veneers, metal etchings and now 3D-printed plaster or bonded resin components can all be combined in myriad ways. 3D printing machines are often presented as magical but, if used in isolation to produce the whole model, they are limiting and examples appear soulless.

Combine new tech with professional modelmakers to fully enhance and exploit it, however, and you get hand-built models with the dynamic energy of a sketch or the sophistication of a render and more.

Modelmaking's demise was previously predicted in the early 90s with the widespread availability of affordable laser cutters. But modelmakers quickly embraced the new machines and maximised their technological and creative potential to produce faster work and a host of new experimental species were born, such as stacked acrylic models. The same investigation is happening now with 3D printers.

3D technology companies are unlikely to develop a single machine sophisticated enough to get close to producing objects with the wide-ranging material qualities of hand-made models in the foreseeable future because the architectural modelmaking industry is too niche to fuel that investment.

It is also improbable for a different mass market to demand it, as there are no economies of scale in 3D printing, and production speeds are held back by the physical melting and fusing points of materials.

Hardware is only half of the equation, as you only get out what you put in. Preparing a 3D file to print takes knowledge and skill to learn and understand the nuances of program tools, build orientation, support parts and tolerancing, as well as converting the virtual model into a 'watertight' printable object. Once printed, support structures or powder must be removed by hand and the part cleaned up or cured before further hand-finishing as needed.

The making process informs design. Architects who make models explore relationships between elements and to context while making, and the haptic feedback from materials or spatial interactions from life-size mock-ups are invaluable.

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Symbiotic relationships develop between architects and modelmakers, who develop the ability to work collaboratively with evolving information. Issues are considered by both to focus the viewer on the broader architectural vision. Ideas and concepts are given emphasis and literal interpretation can be filtered rather than showing the nuts and bolts of buildings not yet designed. The materiality of a timber model with its beauty, warmth and charm, instantly engages both public and professional with the abstraction of wood, something understood by all.

Once you have your finished model it remains part of the design process as schemes evolve and consequently skills for deconstruction, remodelling and reassembly are always in demand. Entirely 3D-printed models are less useful here, as alterations require either a complete reprint of an updated model file, or modelmakers chopping and changing existing 3D printed elements by hand.



Eric Parry Architects' proposals for 1 Undershaft

*Source: Anthony Coleman*

The model of Eric Parry Architects' proposals for 1 Undershaft

Through shared facilities such as Fab Lab or Makerversity, millions of people are producing crafted, machined, lasered or 3D-printed products, and this maker economy is fuelled by online marketplaces such as Etsy and eBay. The rise of 'craftmania' continues to be driven by emerging high-tech methods and materials and the same is true in modelmaking. Modelmakers are in demand. Companies are taking people on and in-house modelshops are recruiting. Practices of a certain size want an in-house facility and even small firms are enhancing the modelmaking capability of their staff with some professional modelmaking input and some new kit.

The most valuable modelmaking assets are not the machines or equipment but the people. Not only the specific skills of each team member to collate and translate information, design, abstract, and make, but the social skills to form collaborative relationships in the crafting of exquisite objects that win work and contribute to the construction process whilst broadcasting a practice's individual design style and its passion for well-designed and well-crafted buildings.

Modelmaking workshops also act as cultural hubs, softening professional boundaries, supporting and nurturing collaboration and team spirit while engendering a sense of fun at work. For any architectural practice, these should be the most useful and important things to build. It is the process itself of making a model that is the creative part, if you replace that with a technician and a machine, you only get 3D replication.

*Mike Fairbrass created and headed the modelmaking studio at Richard Rogers Partnership (and then Rogers Stirk Harbour + Partners) for more than 20 years. He is now a freelance creative consultant for the modelmaking industry.*

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