Modular construction: Priorities for real-estate developers

Real-estate developers are in prime position to lead the shift to modular construction. Crafting their product strategies and supplier partnerships are good places to start.

Nick Bertram

Associate partner, London
McKinsey & Company

Jan Mischke

Partner, Zurich
McKinsey Global Institute

Erik Sjödin

Partner, Stockholm
McKinsey & Company

Modular construction represents the future of building development. The benefits over traditional construction should be huge: lower costs, accelerated schedules, greater predictability of both time and cost, and improved building quality. However, the modular supply chain is nascent, and benefits of the approach are largest where there is a degree of repetition well beyond individual, large projects.

Real-estate developers can be the catalysts for the transition to modular—and early movers stand to gain significantly, as they can pocket the cost savings over the traditional approach throughout the industry's transition, until they're forced to pass through the savings to the end customer to remain competitive. Developers must start by rethinking their product strategy with an eye toward enabling modular design—for example, by reducing the use of bespoke floor plans. From there, they can begin to build the supply chain by signing long-term partnerships with material and product suppliers.

The case for leading the charge

Real-estate developers are a natural catalyst for scaling modular construction, as they can determine how their projects are realized and by whom. The shorter timelines indicative of modular construction help to mitigate risk, as developers' capital isn't tied up in empty or developing land for as long. Furthermore, developers have what modular suppliers need: a forward-looking pipeline and control of the product to put through it. This position provides them with enough visibility to optimize factory operations and reduces the need to refit equipment for different projects.

Those with sizeable pipelines per product can take the biggest leap toward modularization. According to McKinsey research, a volume of about 1,000 units a year can be enough for a modular factory to break even, and a volume of 5,000 units annually allows for efficient automation.[1] Developers capable of such scale can and should be the first ones to embark on the journey to reshape the industry—and some of

them are. Berkeley Homes in the United Kingdom is building its own factory to produce 1,000 modules a year.[2]

Getting started

For many developers today, prefabricated elements such as bathroom pods are a matter of course. Others are new to the concept. Regardless of where they fall on the spectrum, developers that want to aggressively pursue modularization should start by creating a product strategy. Today, developers often think in terms of unique projects and opportunities. Pivoting to a "productized" mode of thinking should start with articulating the right design parameters that balance modularization at scale with the freedom to tailor each project. The approach should be based on an analysis of market segments with clear needs and growth, as well as customer research to understand the exact requirements of the targeted segments, including willingness to pay and desired customization options. Many such design customization options are readily available today through modern modular methods and building information modelling (BIM).

Developers should collaborate with designers to establish their own unique sets of product offerings—for example, specific layouts or components that best suit their target customers' demands and can be reused over time (see sidebar, "How HB Reavis has developed a flexible office solution for midsize organizations"). The benefits of this approach are twofold: First, reusing an established design avoids rework in the design phase, facilitating scale while also meeting the needs of target customers with a known, popular product as opposed to designing from scratch. Second, investors and property owners are likely to have more confidence in a product that already resonates with the market.

Developers can work with engineers to tweak a design to make it more amenable to factory production and logistics. For example, they can

How HB Reavis developed a flexible office solution for midsize organizations

The developer HB Reavis wanted to create a specific office-building product for small and medium-sized companies that seek the flexibility of coworking spaces but the privacy and branding of owned real estate. The developer conducted extensive customer interviews to identify needs and applied design thinking and virtual reality to develop and test product options, which included floorspace layout; engineering approaches to maintain flexibility in the structure; and productization of the commercial offering with simple, two-page contracts, per-workspace pricing, and guaranteed scale-up options. This product can now be rolled out across cities globally. With this scale, modularization of the entire construction process could be a next step.

explore making room types, such as kitchens and bathrooms, more repeatable to reduce factory switchovers—that is, the need to refit equipment to create different types of modules (2-D panels, 3-D rooms). They can reduce the width of building elements to facilitate road transport from the factory to the build site. They can engage local authorities to approve changes to zoning or building codes with a promise of higher efficiency and lower cost provision of housing. And they can explore what mix of 2-D and 3-D elements is most cost efficient.

Building relationships with modular suppliers will be crucial. Developers should aim to transition from operating on a project-by-project basis to forming strategic partnerships to commit a pipeline of repeatable projects over several years. They can also work with their suppliers to switch from buying materials suitable for a construction site to those suitable for a factory. An example of this is plasterboard, which in most markets is prepared to a size that can be easily transported around a site; ordering far larger panels would reduce the amount of work required in a factory.

The next step would be to test fully modular construction on individual projects to gain experience—and trust in the chosen supplier. After that, developers can roll the product out in large numbers.

The benefits of committing at scale to a modular approach can be large. One developer identified a part of its future pipeline that was particularly suitable to a modular approach and developed a strategy to reduce construction costs. It worked closely with suppliers and committed to co-invest in and provide minimum orders for their factories. The arrangement led to cost reductions of up to 20 percent.

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Developers face many challenges before modular construction can be adopted at scale. But for those willing to take the risk and disrupt the industry, the potential reward is undeniable. ■

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[1] Nick Bertram, Steffen Fuchs, Jan Mischke, Robert Palter, Gernot Strube, and Jonathan Woetzel, *Modular construction: From projects to products*, June 2019, McKinsey.com.

[2] Nick Myall, "Berkeley gets the go-ahead for modular homes factory," World Architecture News, February 2, 2018, worldarchitecturenews.com.