BITS AND BRICKS

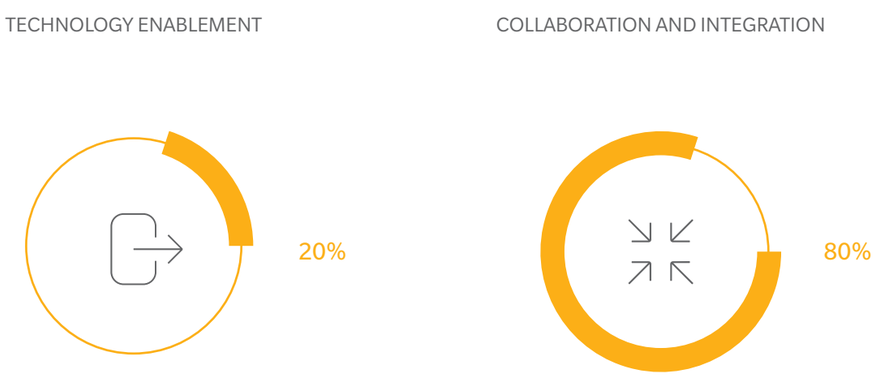
BUILDING INFORMATION MANAGEMENT IS TRANSFORMING CONSTRUCTION

In the buildings of the future, lights will turn themselves on as people enter rooms, and off as they exit. Doors will open only for a face they recognize electronically. And walls will shift to create different-size rooms. The building of the future will also be faster and easier to construct. A sophisticated design process will come up with the optimum design, including selection of the right materials and components. Construction management will be easier, and costs transparent – and lower.

The key enabler of these buildings is a digital tool that promises to revolutionize the building process and the final product. Building Information Modeling (BIM) centers on a digital version of a scale model, which allows architects, contractors, and customers to design and build more efficiently. It also makes it easier to construct buildings that go beyond mere edifices, and that use connected sensors to optimize services for the people who live or work in them. That means a world in which buildings save money, minimize their environmental impact, and maximize comfort.

Unlike the classic 2D drawings used by architects, the new digital mock-up is not constrained by physical space, so it contains far more information. Components and functions are planned from conception to demolition, enabling digital management of the building throughout its lifespan. All participants – and their suppliers – can provide input. Operating in real time, the mock-up is alive and collaborative.

Exhibit 1: House-building in the future
BIM is 20% driven by technology and 80% by collaboration and integration



Source: Oliver Wyman

That means it can run digital simulations, allowing rapid test and redesign before – and during – physical construction.

REAL-TIME TEST-AND-LEARN

As a result, everything in the construction process becomes easier to optimize – materials selection and procurement, the supply chain, and management of the site. Notably, BIM can be used to order more precise quantities of materials and components for just-in-time delivery – extending the idea of lean production to building sites, and lowering costs. Each phase of the operation is easier to control, even with a greater range of participants.

In addition to faster, lower-cost construction, the result is more sophisticated buildings. BIM helps to design a building and choose its materials to reduce energy consumption – and maximize the production of energy via solar panels. The finished building features smart lighting and heating systems, as well as security systems based on face and fingerprint recognition technology. Walls are flexible, so that tenants can create the spaces they need. The buildings can also help maintain those parameters that are quality-of-life considerations, such as air quality and noise.

The way buildings are valued is already coming to depend on their services more than the bricks and mortar. As BIM is implemented over a building's entire lifetime, the builder will remain involved in the management of the building for far longer than he is today. Sales offers can include guaranteed completion times and building performance, such as its conforming to a growing number of parameters subject to certification – energy use, effects on health, and environmental impact. To regulate these better, governments are likely to progressively make BIM compulsory.

For companies that fully implement BIM, the cost reductions should rise to between 15 and 25 percent on a work's life cycle, depending on its type. To make the most of the opportunity, constructors should develop a strong understanding of the disruptions that BIM will trigger. They should first figure out the immediate digital opportunities in their specific business models, so that they can reduce costs, construction time, and quality problems. They should also identify likely changes in customer needs, and figure out digital responses. This could involve bringing in skills from outside through acquisitions or partnerships. Above all, they need to recognize that the changes signal an unavoidable, major shift in the industry. This will see constructors focusing on clients' needs, seeing beyond traditional market formulae, and taking new risks. And every step of the way has to be digitized.

15–25% COST REDUCTION ON A WORK'S LIFE CYCLE FOR COMPANIES THAT FULLY IMPLEMENT BIM

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