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FEATURE

Digitalizing the construction industry

A case study in complex disruption

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A CASE STUDY BY THE DELOITTE CENTER FOR THE EDGE AUSTRALIA

- The dynamics of disruption are changing from simple disruption due to a specific technological innovation, to complex disruption stemming from a confluence of technological and nontechnological trends.
- To identify complex disruption, companies can ask: Is the disruption due to the invention of new technology, or is it due to a combination of factors, of which technology is only one?
- To position a firm to capitalize on such disruption, business leaders should identify and invest in the disruption's key enabling trends in order to give themselves the real option of capitalizing on the opportunity (or not) in the future.

THE GLOBAL CONSTRUCTION industry is a massive enterprise, with aggregate sales of more than €1,098,569 million and a market capitalization of almost €501,948 million in 2017.[1] Like firms in many other industries, builders are wary of "disruptive technologies": technologies whose adoption significantly changes the way businesses, or entire industries, operate. 3D printing, to pick one example, has been promoted as a potential disruptor in construction.

As we discussed in the article *Your next future: Capitalising on disruptive change*,[2] it is unlikely that any one particular technology will disrupt construction on its own. Rather, it's more likely that a confluence of trends will enable established technologies to be used in new, disruptive ways. This shift—from simple disruption due to a specific technological innovation, to complex disruption stemming from a convergence of technological and nontechnological trends—can be seen across many industries.

The story that follows is one of complex disruption. Its main protagonist, Unitised Building, didn't invent the technologies it is using to build high-rises in places previously thought to be undevelopable. But it, and companies like it, recognized that an otherwise unsolvable problem could be solved if the problem was framed differently, using established technologies and techniques in new ways. Because the new approach—unitized building—was seen to have benefits beyond the first project, it attracted investments that helped it grow and mature, and become more generally applicable. Today, we might be at the point where this potential disruption is crystalizing into actual disruption, especially because the approach has changed at least one community's expectations—expectations that a regulator is considering making concrete by baking them into regulations, excluding conventional builders from the market in the process.

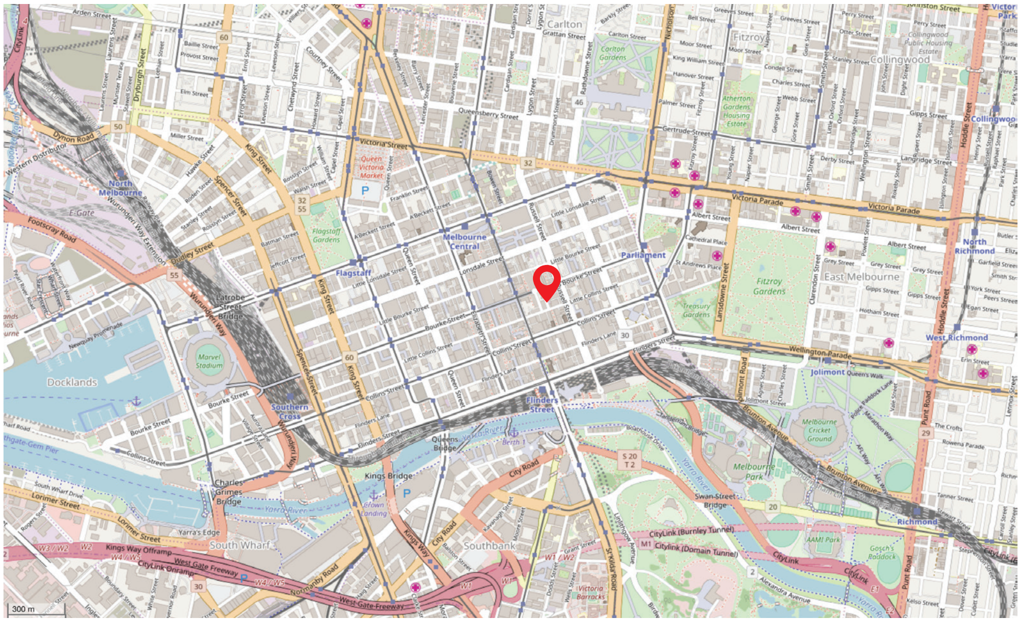
For the purposes of this case study, we use a narrow definition of construction, one that refers only to the construction of medium- to high-rise buildings of three floors or more for residential, commercial, or mixed use. This excludes the construction of low-rise buildings, individual homes, and suburban apartments. It also excludes infrastructure projects, roads, and unique buildings such as stadiums.

A challenging site, a new approach

A major challenge facing the construction industry is how to bring unproductive sites—sites that are currently too challenging to build on—into productive use. The need is urgent: As societies urbanize, they need to make fuller use of the limited amount of land at their disposal. As more and more land is developed, sites that had previously been

FIGURE 1

The restrictions on this Melbourne site, directly above a power substation, stymied multiple developers



Source: OpenStreetMap contributors.

too awkward, or even impossible, to build on soon become desirable locations.

One such site was in Melbourne, Australia. Located on Russell Place, close to the middle of the city's central business district (CBD), a piece of prime real estate. Numerous developers had acquired it with the intention to build, but none had been able to do so, and all ended up passing the site on.

The problem was that an electrical substation serving a large portion of the CBD was located directly under the site. Any disturbance could cause the substation to trip, leaving many businesses without power. This led to a number of building restrictions. First, only the air rights to the site were available, precluding the construction of basements for parking or facilities. Second, weight restrictions constrained the mass of any building constructed on the site, along with any construction equipment that might be needed. Finally, the extent of allowable ground vibration during construction was minimal, as undue vibration could trip the substation.

Around 2008, Nonda Katsalidis, an architect whose prior designs include the Museum of Old and New Art in Hobart and the Eureka and Republic Towers in Melbourne, acquired the site's air rights. Katsalidis had been thinking about the site for some time, envisioning an approach that might enable him to construct a building within its tight restrictions. The approach: to treat the construction of medium- to high-rise buildings as a design-for-manufacture-and-assembly (DFMA) problem, rather than as a building problem.

Design-for-manufacture (DMF) is an established technique whereby products are designed in such a way that they are easy to manufacture. Katsalidis's particular twist on the technique was to architect the building so that it could be divided into a set of regular units—*unitizing* the building, as it were—that would be manufactured and transported to the site, then quickly assembled. This procedure is more akin to LEGO® Duplo than the IKEA-like approach used by many building systems that involve offsite manufacture. Rather than assembling building elements—walls, for example—to speed construction, the building itself is assembled by stacking completed units.

Executing such an approach would require a digital model to be made of the entire building, accurate down to light fittings, power points, washers, hinges, doors, and doorstops—a building information model (BIM) on steroids. The modeling process would ensure that the connections between building units would be aligned within a few millimeters, making it easy to plug together completed units. The digital model, cut into units, would be used to generate the instructions needed to guide both mechanical and human activity on the unit production line. The finished units would be complete with wiring, plumbing, and furnishings before being transported to the site, and they would be designed to fit inside the envelope of a standard intermodal shipping container—and to attach to standard container connectors—to simplify transport.

This approach seemed tailor-made for the Russell Place site's requirements. The fully assembled building would be lighter than most similarly sized buildings due to the DFMA manufacturing process's preference for steel over concrete. The only heavy machinery required to assemble it would be a crane to lift the building units, and the crane would be located in the lane facing the site rather than on the site itself. Vibration would be effectively eliminated, as the vast majority of the work would be completed on a production line elsewhere. The result would be a building *and* a construction process that worked within the site's restrictions.

Unitised Building for unitized building

Katsalidis formed Unitised Building[3] in 2008 to capitalize on this idea. The company partnered with building firm Hickory Group[4] to create both the tooling required to develop and manipulate the digital models, and the production line to build the units themselves. The partners were able to find off-the-shelf products to create both the tooling and the production line, while the decline in the local car

FIGURE 2

Little Hero's unitized construction complied with all site requirements—and took only four weeks to complete

Source: Hickory Group.

manufacturing industry provided convenient access to the manufacturing expertise needed.

The Russell Place site was the first to host a building constructed with Unitised Building's modular method. Completed in 2010, the building, Little Hero, contains 63 one- and two-bedroom apartments and duplex penthouse residences, all of which sit atop seven retail shops, cafés, and restaurants. The unitized process not only complied with all of the site's restrictions, but also reduced construction time by more than six months compared to a conventional approach: The eight-story building took only four weeks to erect, at a cost comparable to that of a conventional process.

What sets unitized building apart

The ideas behind prefabricated buildings, of course, are not new. However, there are three important differences between the unitized building approach pioneered by Katsalidis and Unitised Building, and earlier approaches to prefabricated, modular offsite construction.

First is the focus on medium- to high-rise buildings. Almost all previous prefabricated building efforts have been of low-rise (one- to four-floor) buildings for single dwellings or businesses. Katsalidis's unitized approach supports the construction of buildings of three or more stories (in fact, the need for a crane to lift building units can make a unitized approach uneconomic for buildings under three stories).

Next is the unitized approach's ability to construct custom buildings rather than limiting clients to selecting from a catalogue. Previous prefabricated building approaches treated the building as the product: Customers would browse a catalogue and select the building that best matched their preferences, or a company (such as a fast food chain) might work with a manufacturer to add its own needs to the catalogue. In contrast, the unitized building process takes an architect's design as its starting point—or an architect can even apply their design to the unitized process.

Finally, the unitized approach involves assembling a set of modular units that are "snapped" together onsite. This contrasts with the "kit of parts" approach of other prefabricated building systems, which require more onsite labor to assemble frames, fill out the structure, and integrate services.

The birth of an industry

Little Hero was an impressive proof of concept, but unitized building had to become more useful more often before it would be more broadly adopted. As with many other disruptions, it wasn't that the new technique didn't have potential; the question was whether its potential was great enough for firms and clients to prefer it to a more conventional approach. And as with other disruptions, the affirmative answer depended on its ability to address widespread needs more effectively than conventional processes.

For unitized building to become more widely applicable, what had begun as a particular solution to a specific problem had to evolve into a general solution for many problems. The volumetric process used on Little Hero, though successful in its niche, had its limitations. Rooms, for instance, were constrained to fit entirely inside a single modular unit. This was acceptable for a residential building, as a building unit could be designed with a living space at one end, a kitchen in the middle, and all the services gathered at the other end where the common hall was located. This requirement would, however, discourage more general adoption. The Little Hero process also finished the interior of each building unit during its manufacture in the factory. This required some of the same tradespeople, such as plasterers and painters, to attend both the offsite manufacturing process and the onsite installation. It would be more efficient for the tradespeople to ply their craft at either the factory or the building site, but not both.

FIGURE 3

Unitized building produces high-rises indistinguishable from conventional construction

Source: Hickory Group.

The short story is that both of these problems, as well as other barriers to adoption, were solved. Modular DFMA building processes have been developed that are capable of building any medium- or high-rise building that a conventional building process can. Rooms can be split across multiple building units, and buildings can contain large voids such as atriums. The workflow has also improved, removing the need for tradespeople to attend both the manufacturing process and the installation. The resulting buildings are indistinguishable from those built with a more conventional process. For instance, the building on the left in figure 3—La Trobe Tower—was constructed with the Hickory Building System,[5] a DFMA construction process; at 44 levels, it is Australia's tallest prefabricated building. The building on the right is under construction with a conventional approach. La Trobe Tower was delivered 30 percent faster than the conventional building.

With barriers to adoption reduced, what started with Little Hero in 2010 has since developed into a burgeoning industry, with other firms developing similar processes. An industry body, prefabAUS,[6] was established in 2013 to provide a forum for industry participants to meet and address common challenges. A research and training body, the ARC Centre for Advanced Manufacturing of Prefabricated Housing,[7] was also established in 2015 at the University of Melbourne, with the goal of creating a $15 billion AUD prefabricated housing sector by 2020.[8] The industry can be said to have come of age in that year as well, when Business Victoria named Hickory Group its 2015 Manufacturer of the Year (Large Business) for the Hickory Building System.[9]

Nor is this all. Good ideas rarely emerge in one location or at one time, and so it is with unitized building. Many builders, and many manufacturers, are experimenting with integrating manufacturing techniques into construction. For instance, Broad Sustainable Building,[10] based in China, is making a name for itself by using a modular building system to construct ever taller buildings in increasingly shorter time frames. It has built a 30-story building in 15 days and a 220-floor building in just 90 days,[11] with time-lapse videos of the process posted on YouTube.[12] Firms in both the United States and Europe are also developing unitized systems, though with mixed success.[13]

The benefits of unitized building

A state-of-the-art unitized building process is cheaper, faster, and safer than a conventional building process, while the resulting buildings are indistinguishable from those built via a conventional process. The approach is cheaper and faster because there is less waste during construction. The majority of the work is done in a controlled environment that is not prone to the weather delays or waste management problems that plague construction sites. Onsite work is also more efficient, with all workflows modeled and tested in virtual reality before going onsite, while once onsite a typical unitized building process capable of lifting a new unit into place every eight minutes—and once a new layer of building units is complete, the floor below is weatherproof. And with the majority of manual work done in a controlled environment, and the ability to eliminate live edges while the building is being assembled, a unitized building is safer than a conventional building. (To date, there have been no deaths on a unitized build.) Another benefit of a unitized building is its greater sustainability. The unitized process favors recyclable materials, such as steel, over concrete, enabling a higher proportion of building materials to be reused from decommissioned buildings, while it also enables new, more environmentally friendly materials to be used, such as geopolymers,[14] whose need for oven curing makes them challenging to integrate into a more conventional building process.

Besides the benefits it can deliver to particular construction projects, unitized building also makes possible a new approach to export. This is because the intellectual property (IP) that underlies the process—the general parametric models that encode the foundational engineering knowledge needed to construct a building, and the digital models for particular building designs—can be accessed remotely. Rather than exporting completed building units, or exporting the parametric and building models themselves, it is possible for a firm to retain possession of the models and export only the instructions they generate, to guide the machines and workers in a remote contract manufacturing facility and the remote building site. The models are held domestically, where the engineering talent required to develop and maintain the IP in them is located. The design team, the regulators, the manufacturing facility, the facility's machines and workers, and the installation team access the model remotely—whether as printed drawings and instructions, an interactive digital representation on a tablet, or an immersive virtual reality (VR) or augmented reality (AR) experience. In effect, this moves the people and machines to the process (virtually) rather than moving the process to the people and machines.[15] Governments and tax authorities facing such a scenario will need to ask: What is "exported" when a construction firm constructs a building in a remote geography, but where few staff, no materials, components, or building products, and no IP, are sent overseas, and all the significant value-creating work is done domestically?

A step beyond digitization

At this point, it's worth considering why the development of unitized building is different in kind from simply applying new technology to improve standard construction techniques.

Construction firms are continually refining practices and integrating new techniques and materials, using technologies such as drones, robots, and GPS tracking to streamline and automate building processes. Unfortunately, these investments in technology are likely to result in only incremental improvement. Integrating new technologies into existing building processes has not transformed the building process itself—a process which we might date back to the construction of the pyramids, when a confluence of surveying, design, planning, management, and building practices came together to produce some of the world's first permanent large-scale structures. A construction firm's product is the building process, not the buildings; consequently, a builder's operating model has always been built around this age-old construction process, with their value as a builder depending on the precision of the process rather than different techniques used in the process itself.[16]

The greater opportunity is not to merely improve existing building processes, but to explore new and radically different approaches to building as an activity. Rather than simply *digitizing* existing building practices—swapping analog measures and tasks for digital ones to make them more precise and effective—we need to *digitalize* building by shifting the foundation of our operating model to a wholly different premise.[17] Instead of the organization and prosecution of tasks in the construction process, the operating model in unitized building is based on the management of *information* about the building, replacing old methods of sharing and managing information with new ones. Not only does this enable the building process to be arranged in new ways, it also makes the process malleable—enabling, in turn, the creation of new operating models.

Digitalization enables existing business processes (and technologies) to be rearranged. One might, for example, choose to inspect and certify a digital model of a building, rather than the building itself.[18] Or the building process might be made quiet and fast enough (by moving noisy activities from the building site to the factory) that construction need only occur at night, minimizing disruption to the lives of surrounding residents. (Both of these things are possible, as we'll see later.)

The right technologies at the right time

A new combination of technologies is rarely sufficient for disruption, however. Instead, the trigger which trips a potential complex disruption into an actual disruption may be a change in the social or economic environment. For example, one of the early barriers to unitized building was the lack of a suitable risk model to support financing. Established risk models were built around conventional construction processes, with each funding payment dependent on a quantity surveyor verifying that the last payment had been productively spent on the building site. The unitized approach, though, requires a significant portion of the funds upfront to start the manufacturing process, while the building's actual assembly occurs so quickly that little quantity surveying can take place on the construction site. (Early unitized building projects were at least partly self-funded to overcome this hurdle, while, over time, quantity surveying practices and risk models were evolved, such as quantity surveying the work in the factory, to integrate the new building process.)

One possible trigger to shift a complex disruption like unitized building from a potential to actual disruption, can be a change in community expectations. This can happen in the form of more and more clients demanding the new process. Or it could occur indirectly: a regulator changing the rules to favor the new operating model, for instance. The latter is what appears to be happening with unitized building.

In 2017, Hickory was working on a site in Melbourne's CBD where access was awkward. The crane that needed to lift building units into place blocked a narrow laneway, making it difficult for local residents to access their properties. To navigate the problem, the firm offered to build only at night: It would lift and position an entire floor of building units outside normal business hours, leaving the laneway free during the day. Both the city council and residents were skeptical that construction work could be quiet enough to happen at night without disturbing the neighborhood. To prove the approach, Hickory ran a trial build one night, which went unnoticed despite the firm warning nearby residents about it beforehand. With the council and residents convinced that installing building units at night would work, construction went ahead.

The greatest impact of this project may be on Hickory's conventional competitors. The build's disruption to the local neighborhood was so minimal that the council is considering mandating similar nighttime builds for all future medium- to high-rise constructions in Melbourne's CBD. This regulation would implicitly require all new constructions to be done via a unitized building process, as it would not be possible to meet the nighttime noise requirements with a more conventional approach. Nor would a conventional approach be fast enough to construct only at night, and nighttime labor rates would make it uneconomic. With the stroke of a pen, conventional builders could be excluded from the market.

Dealing with complex disruption

It's common to assume that every disruption is due to a particular disruptor, and that the way to get ahead of a disruption is to identify (and invest in) that disruptor early. But in today's complex technological environment, this is not always the case. We're seeing a shift from simple disruption due to a single disruptor to a more complex form of disruption, where various technological and non-technological factors come together and enable the creation and spread of new operating models. The unitized building process is a case in point.

This shift from simple, disruptor-driven disruption to complex disruption has significant implications for companies in all industries. Complex disruption is harder to foresee, and even if recognized early, it is more challenging to monitor and understand. It is difficult, if not impossible, to predict the precise shape of the future unitized building operating model, for instance. There are many established technologies to choose from and many equally productive ways to combine them to create a future operating model that has similar benefits. Nor does the timing of the disruption depend on the development of a particular technology. This means that there's no technology-development S-curve that we can track to determine when to dip our toe into the pond. The social factors that influence the final shape of the model—such as how a digital building model might be certified rather than the building itself—are also something negotiated with the community, and there is no "right" answer on which we can expect the industry to converge. Consequently, it's not possible to identify and track the particular future state technologies or regulatory requirements. We also need to be mindful that when the disruption does strike, the transition from the old operating model to new could be quite abrupt, as it won't be moderated by the need to incrementally improve a new technology.

So how can companies stay ahead of complex disruptions of this sort? If we're to identify (a potential) complex disruption, we first need to distinguish between it and (a potential) simple disruption. We can do this by critically evaluating the trends shaping our industry or sector. Is the trend due to the invention of new technology, "new math"? Or is it due to a confluence of factors?

Consider artificial intelligence (AI). Many of the "disruptive" technologies emerging from AI, such as deep learning, have long pedigrees: While there are recent developments in the field, the foundational ideas, the "new math," were set out some time ago. If we turn to the successes ascribed to these technologies, we see that the trigger for many of them was a confluence of environmental trends, rather than improvements in the underlying technique. The mathematical foundations of statistical machine language translation, for example, were laid in the late '40s,[19] though the approach didn't become practical until bilingual texts such as the Canadian Hansard corpus[20] and EUROPARL[21] were made electronically available in the mid-2000s. Similarly, the recent development of autonomous cars depends more on price-performance improvements in computer processors, along with the development of new sensors (such as LIDAR) and centimeter-accurate digital maps, than novel AI algorithms. We might also consider how well formed the idea behind the disruption is. Does it refer to a particular technique, or does it refer to a broad family of techniques that are not otherwise strongly related? AI, for example, is a suitcase term packed with all sorts of otherwise unrelated ideas.

This provides us with a three-part test. First, does the potential disruption involve a truly novel idea (rather than one with a long pedigree)? Second, are the successes ascribed to it due to recent developments in the technique (instead of being due to a confluence of environmental trends)? Finally, is the idea behind the disruption a single, well-formed idea (rather than a suitcase containing many otherwise unrelated ideas)? If the answer to all three questions is "yes," then the potential disruption is most likely a simple disruption driven by a particular technological development. Obvious examples include the telegraph and the fax machine. On the other hand, if the answer to one or more of the questions is "no," then the potential disruption is likely a complex disruption driven by a confluence of environmental trends. AI, blockchain, and cyber, all of which became commercially significant only fairly recently, are examples.

To anticipate a complex disruption, we need to predict where the confluence of environmental trends behind the disruption might take us. This can be challenging, as it can require us to question deeply held assumptions about the source of our competitive advantage and competence. For instance, unitized building uses parametric models and design for manufacture and assembly to create a new, and more productive, foundation for building as an activity—capabilities that traditional builders formerly found no need for.

It's not important for our prediction to be precise. What is more important is to identify the underlying environmental trends and understand how they will interact with each other to create value, as well as how they will interact with existing industry practices to create barriers to adoption (such as the way the lack of an appropriate risk model held back unitized building). If we consider AI as a complex disruption, for instance, then rather than focusing on particular AI techniques such as machine learning, we'll broaden our view to consider other AI techniques that are beholden to the same underlying environmental trends. Consider planning engines, which have a pedigree reaching back to the early '70s with STRIPS (Stanford Research Institute Problem Solver);[22] they enable us to compute the optimal way to sequence a collection of related tasks. The environmental trends that enabled techniques such as machine translation and machine learning to emerge from the lab might also enable a firm to replace their carefully designed but rigid business processes with dynamically generated, optimal ones crafted by a planning engine. This would have broad and deep implications for many aspects of a firm's strategy and operating model, as it would change the trade-off between simplifying processes to enable straight-through processing versus increasing process complexity to support mass customization.

Finally, to prepare for a complex disruption, firms need to identify and invest in building their expertise in the key enablers for the disruption. With unitized building, the key enabler was the development of a parametric building model and design for manufacture and assembly. With the AI planning example, it might be the development and documentation of a complete set of business APIs, so that all process tasks can be accessed programmatically. The investment in this capability must be treated as a real option, an investment made in an opportunity to have a real choice to capitalize on the opportunity (or not) in the future, rather than as a productivity improvement exercise.

Creating the real option provides a firm with the room to develop the skill sets and expertise required to operate once the disruption crystallizes. Without these skill sets and expertise, the firm will find itself confused and unable to respond. With these skill sets and expertise, the firm has the option to either drive the disruption or to be a fast follower. The real option lets us ask the question: What is the value to the firm in the future to have the option of rapidly capitalizing on the complex disruption when it crystallizes, or even the option of causing the disruption to crystallize earlier?

Construction firms, to return to our case study, have been experimenting with building information models for some time—but for many of them, the investment in a BIM was considered a tool to drive onsite productivity. The leap required to develop unitized building was to realize that this digital model could be put at the heart of the construction business. Consequently, digitalization of construction moves the BIM from something that has to be mandated to happen to being something that is required for a builder to succeed, while the flow-on benefits in maintenance, usage, and emergency management that were the focus of adopting a BIM are now merely its byproducts.

Endnotes

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3. Unitised Building, founded in 2008, is a leader in the development of modular and prefabricated—unitized—medium- and high-rise buildings. Unitised Building website, accessed January 23, 2019.
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14. A geopolymer is an inorganic, typically ceramic, noncrystalline material, and is used for fire- and heat-resistant coatings, high-temperature ceramics, toxic and radioactive waste encapsulation, and cements for concrete.
15. The use for virtual reality to support a new approach to export could represent a step into the next, fifth phase of globalization, as outlined by Richard Baldwin, which he expects will be triggered by a dramatic reduction in the cost of moving people. The prior two significant transitions were due to the dramatic reduction in cost of transport, and information management (communication). See Richard Baldwin, *The Great Convergence: Information Technology and the New Globalization* (Cambridge: Harvard University Press, 2016).
16. Aki Pekuri, Laura Pekuri, and Harri Haapasalo, "Business models in construction—Construction managers' viewpoint," Diversity, Technology, and Innovation for Operational Competitiveness: Proceedings of the 2013 International Conference on Technology Innovation and Industrial Management, ToKnowPress, 2013.
17. It's becoming more common to distinguish between "digitization" and "digitalization." Rodney Brooks provides a good working definition of the difference between the two terms: "Digitization of documents originally allowed them to be stored in smaller lighter form (e.g., files kept on a computer disk rather than in a filing cabinet), and to be sent long distances at speed (e.g., the fax machine). Digitalization of office work meant that the contents of those digital representations of those documents were read and turned into digital representations of words that the original creators of the documents had written, and then the 'meaning' of those words, or at least a meaning of those words, was used by programs to cross index the documents, process work orders from them,

update computational models of ongoing human work, etc., etc. That is the digitalization of a process." See Rodney Brooks, "The productivity gain: Where is it coming from and where is it going to?," Robots, AI & other stuff, February 25, 2018.

18. One of the authors was involved in a recent modular project that utilized a BIM via VR headsets to identify up any design and noncompliance issues prior to commencing any works onsite or in the factory. The building certifier was able to walk through the building in its as-built form and highlight where issues needed addressing that would cause delays during construction and at completion for handover.

19. Statistical machine translation was first proposed in 1947 by Warren Weaver, in a letter to Norbert Wiener. Following urging by his colleagues, Weaver published a simple memorandum on the approach in 1949. See Warren Weaver "Translation," Rockefeller Foundation, 1949.

20. The Canadian Hansard is the English-French permanent record of proceedings of the Canadian parliament.

21. EUROPARL is the permanent record of the proceedings of the European Parliament. It is provided in the 11 official languages of the European Union: Danish, Dutch, English, Finnish, French, German, Greek, Italian, Portuguese, Spanish, and Swedish.

22. Stanford Research Institute Problems Solver (STRIPS) is an automated planner developed in 1971 by Richard Fikes and Nils Nilsson while at SRI International. See Richard E. Fikes and Nils J. Nilsson, "STRIPS: A new approach to the application of theorem proving to problem solving," *Artificial Intelligence* 2, no. 3 (1971): pp. 189–208.

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Acknowledgments

The authors would like to thank **Damien Crough** of prefabAUS Pty Ltd for his support and significant contribution to the development of this case study; without his help, the case study would not have been possible.

About the Deloitte Center for the Edge

The Deloitte Center for the Edge conducts original research and develops substantive points of view for new corporate growth. The center, anchored in Silicon Valley with teams in Europe and Australia, helps senior executives make sense of and profit from emerging opportunities on the edge of business and technology. The center's leaders believe that what is created on the edge of the competitive landscape—in terms of technology, geography, demographics, markets—inevitably strikes at the very heart of a business. The Center for the Edge's mission is to identify and explore emerging opportunities related to big shifts that are not yet on the senior management agenda but ought to be. While center leaders are focused on long-term trends and opportunities, they are equally focused on implications for near-term action, the day-to-day environment of executives.

Below the surface of current events, buried amid the latest headlines and competitive moves, executives are beginning to see the outlines of a new business landscape. Performance pressures are mounting. The old ways of doing things are generating diminishing returns. Companies are having a harder time making money—and increasingly, their very survival is challenged. Executives must learn ways to not only do their jobs differently but also to do them better. That, in part, requires understanding the broader changes to the operating environment:

- What is really driving intensifying competitive pressures?
- What long-term opportunities are available?
- What needs to be done today to change course?

Decoding the deep structure of this economic shift will allow executives to thrive in the face of intensifying competition and growing economic pressure. The good news is that the actions needed to address short-term economic conditions are also the best long-term measures to take advantage of the opportunities these challenges create. For more information about the center's unique perspective on these challenges, visit www.deloitte.com/centerforedge.

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