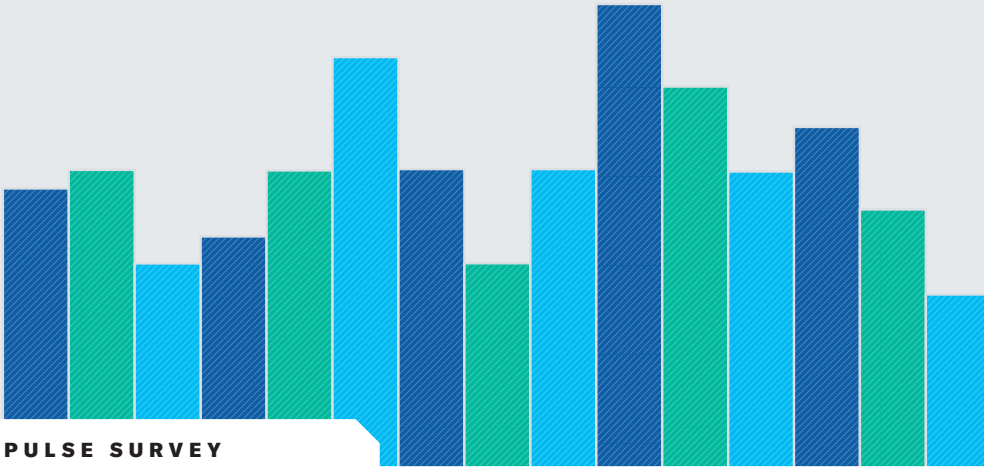




**Harvard
Business
Review**

ANALYTIC SERVICES



PULSE SURVEY

The Future of Building Design

Fostering Partnerships Between AEC Firms
and Building Product Manufacturers



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The architecture, engineering and construction (AEC) industry is undergoing a transformation on multiple fronts. Built environments themselves are changing, with spaces becoming more organic, connected and sustainable. Historically disparate teams are now working in a more integrated way. Design processes are increasingly digital and data driven.

And you, the building product manufacturer, are at the centre of it all. You make the products that shape the ever-changing spaces around us. You have the knowledge and expertise essential for AEC to make better design decisions. You own the data your collaborators and clients need.

In short, building product manufacturers belong in AEC – and in a bigger way now than ever.

But as you straddle the two fundamentally different worlds of manufacturing and AEC, you have distinct needs. In particular, you need to work more closely than ever with those responsible for specifying your products. Distance between you and them puts you at a real disadvantage.

The good news is that as AEC undergoes a significant digital transformation, there's more room than ever for wider integration and collaboration with building product manufacturers. But the path forward is not always clear.

We have sponsored research by Harvard Business Review Analytic Services to examine the role of manufacturers in AEC and explore their path toward greater participation in the industry. You will read what AEC firms envision for their relationships with manufacturers. And through interviews with manufacturers in the midst of digitalising their design processes, this report will share thought-provoking insights about how they have formed strategic partnerships with their AEC collaborators.

There is never been a bigger opportunity for building product manufacturers to take a seat at the AEC table. This research demonstrates that digital platforms that allow for effortless communication between manufacturing and AEC are available, attainable and critical for the industry's future. I encourage readers to use this report as a blueprint to begin their digitalisation journey. We invite you to meet us here at the rapidly transforming intersection of manufacturing and AEC.



Srinath Jonnalagadda

**Vice President,
Business Strategy & Marketing,
Design & Manufacturing**

Autodesk

The Future of Building Design

Fostering Partnerships Between AEC Firms and Building Product Manufacturers

The architecture, engineering and construction (AEC) sector has been rapidly evolving in recent years and is increasingly focused on delivering differentiated experiences with the buildings it produces.

To accomplish that, AEC requires building products that are more complex and customised than ever before, and building product manufacturing (BPM) partners that are highly agile, collaborative and responsive.

These are among the findings of a recent Harvard Business Review Analytic Services survey of 172 respondents in the AEC sector (65% of whom work in an architectural design or engineering firm and 22% for an engineering service provider) who were familiar with their organisation's relationships with their BPMs. Indeed, more than three-quarters of those respondents agree at some level that the market's increased attention to the building occupant experience has increased their organisation's need for more customised solutions and closer collaboration with BPMs (30% strongly agree and 48% somewhat agree).

"[In the past], an architect designed a beautiful building for aesthetics. Then an engineering company made sure it wouldn't fall apart. Then construction companies confirmed the specs. Finally, the building product manufacturer would come in and would, say, fill the holes with windows", explains Erik Rasker, vice president and chief technology officer (CTO) at Reynaers Aluminium, a Belgian developer of aluminium products for buildings. "This has changed dramatically. Now, we are involved from the beginning with the architects and the engineers. How we design, make and install our systems has so much influence on the final product. AECs look to us for collaboration because the more integrated the process is, the faster and more efficient it is, the better the quality is and the more satisfied the customer is."

HIGHLIGHTS



77% of architecture, engineering and construction respondents say the **increased attention** to the building occupant experience has increased their **need for customised solutions and closer collaboration** with building product manufacturers.



73% say having a highly collaborative **relationship with building product manufacturers** is extremely or very important to the success of their projects today.



56% say their **building product manufacturers are increasingly collaborative** suppliers, providing some custom solutions, and are increasingly familiar with their digital tools.

In fact, a number of significant business advantages emerge when AEC organisations work with BPMs that have evolved in their approaches and are highly agile, collaborative and very responsive to project requirements, according to survey respondents. However, BPMs and AECs have some work to do to build stronger partnerships. Fewer than one-quarter (22%) of AEC respondents indicate that their relationships with building product manufacturers are extremely collaborative. “The approach has gotten much more holistic”, says Rasker. “But the whole market is not there yet.”

The fragmentation of the market, lack of digital tool standardisation and historically change-averse nature of the industry pose some difficulties for BPMs looking to forge stronger ties with AEC partners. Although the path forward is challenging, AEC respondents make clear what they would like to see more of from their BPMs, including greater innovation, customisation, agility, digitisation and scheduling accuracy.

The Future of Building Design and Experience

At State Window Corp., which designs and produces windows and doors for high-rise buildings, “almost all new projects require a custom product”, says Rafik Mohareb, research and development manager with State Window. “Most architects are trying to do something new, so most of our projects involve a new custom feature that has to be designed. It is a big challenge.”

Also, every client is looking for speed, and in a hyper-competitive building products market, BPMs must provide it. “Usually everything is a rush. If we are slow to give them a new design, they will walk out the door to another competitor”, Mohareb says. “We do whatever is required to do the job and always provide quick feedback to the architect.”

Indeed, the survey paints a picture of a rapidly changing business environment in which AEC companies face a confluence of new demands from customers that, in turn, drives a greater need for speed, agility and customisation from their BPMs. Chief among the disruptors driving change for AEC organisations are increased demand for 3D digital experiences, more customised solutions, greater speed and velocity, more sustainable buildings and increased adoption of building information modelling (BIM) systems and processes. **FIGURE 1**

In order to successfully meet this convergence of increased customer demands and fully exploit these new technological capabilities, AEC firms are looking for higher-value partnerships from BPMs. Nearly three-quarters (73%) of respondents say that having a highly collaborative relationship with their BPMs is very or extremely important to the success of their projects today. Looking forward, the importance of collaborative relationships with BPMs remains high; 74% say that a highly collaborative BPM relationship will be very or extremely important to project success over the next three years.

Zach Kuecker, engineering manager with Schumacher Elevator, says his company’s clients are looking to the company for highly customisable solutions along with speed and agility. “We are usually contacted as the building is in process, and they need us to react quickly and also customise our products for them”, Kuecker says. “Collaboration is how we achieve their goals. Having a closer relationship with the customer helps us better understand their needs and timelines as much as our own so we can optimise our production planning and processes.”

At Reynaers Aluminium, the process begins with bringing all parties into a virtual reality (VR) room to walk through the building designs. Its VR tool turns an architectural model into an immersive experience that architects, engineers and product designers can step into to review all kinds of design and technical aspects from inside or around the building. “In many cases the discussion is not even about the windows or the façade”, says Rasker. “But it is a collaborative moment in which we can all start to make design decisions together. Our role is to facilitate that discussion and make sure our products meet the needs of everyone.”

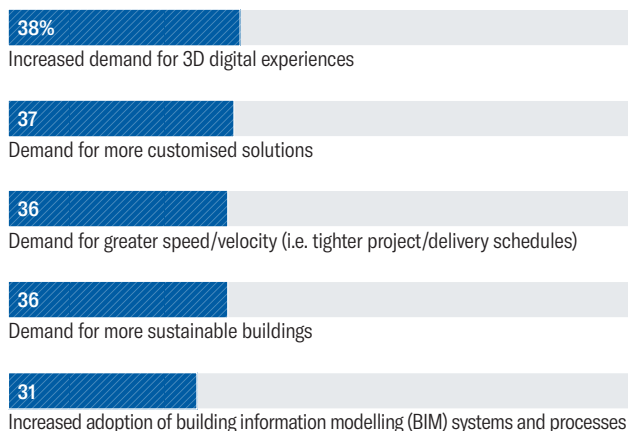
The State of the Collaborative Arts

It is clear that both AECs and leading BPMs recognise the need for strategic partnerships from the design phase to completion. In many cases, however, there is significant room for improvement. Such growth is happening at Schumacher Elevator. Customisation has always been a competitive differentiator for the 84-year-old company, but the focus

FIGURE 1

Disruption Comes to the Building Industry

The following factors are among the top three driving change within AEC organisations.



Source: Harvard Business Review Analytic Services Survey, June 2020



74%

**of AEC respondents
say that a highly
collaborative BPM
relationship will be
very or extremely
important to
project success
over the next
three years.**



61%

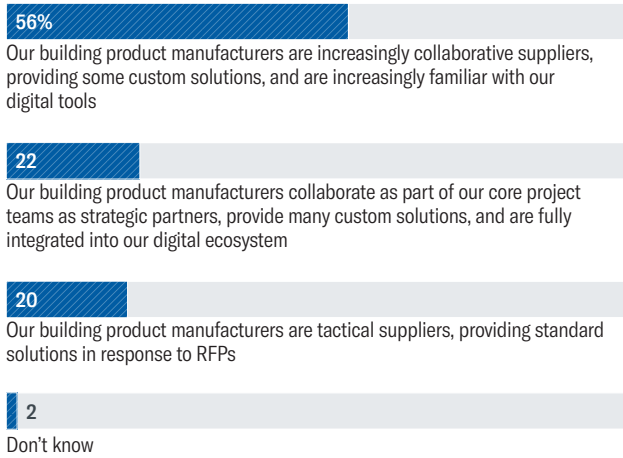
**of AEC respondents
would terminate
a relationship or not
engage with a BPM
whose solutions or
features were a poor
match to project
requirements.**

FIGURE 2

Building a Strategic Partnership

A minority of AEC respondents say their BPMs act as integrated and strategic partners today.

Which of the following best describes the majority of building product manufacturers with which your organisation works?



Source: Harvard Business Review Analytic Services Survey, June 2020

now is on moving faster, reacting faster and determining what new technologies might enable a more effective relationship between the company and its clients. To that end, it is evaluating tools like BIM, making sure its customer-facing sales staff are technically adept, and looking for greater transparency from its AEC clients. “If everything played out perfectly”, Kuecker says, “we would be involved earlier in the process so we could see everything upfront”.

Less than a quarter (22%) of AEC respondents indicate that their relationships with building product manufacturers are extremely collaborative, with 38% saying their BPM relationships are very collaborative. Three in 10 respondents say their BPM relationships are somewhat collaborative, and 11% say they are slightly collaborative.

The bulk of AEC-BPM relationships today, it seems, are in a state of evolution, meaning the BPM is no longer simply an order taker but is not yet an integral member of the AEC team. More than half of respondents say the majority of their BPMs are increasingly collaborative suppliers, are increasingly familiar with their digital tools, and provide some custom solutions. But just under a quarter say their BPMs act as partners to their core AEC project teams, are fully integrated into the AEC team’s digital ecosystem, and provide many custom solutions. One in five respondents say their building product manufacturers are merely tactical suppliers, providing standard solutions in response to RFPs. **FIGURE 2**

What AECs Want

When determining which building product manufacturers to work with, AEC firms are clearly looking for more responsive, agile, reliable and responsive partners, while also paying attention to costs. In fact, they will walk away from, or choose not to work with, BPMs that lack these capabilities.

AECs say the most important factors in a BPM are reputation, trust, and credibility (40% selected as a top-five factor); price (30%); ability to customise products or solutions for their projects (28%); ability to meet project delivery schedules (25%); and BIM proficiency (23%).

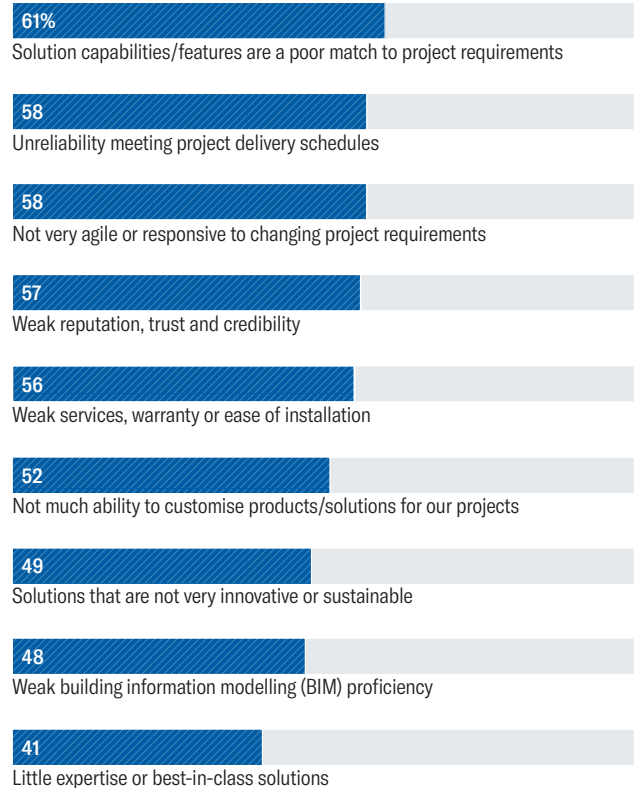
Moreover, 61% of AEC respondents would terminate a relationship or not engage with a BPM whose solutions or features were a poor match to project requirements. And more than half would do so if a BPM were unreliable in meeting project delivery schedules; were not very agile or responsive

FIGURE 3

The AEC-BPM Deal-Breakers

AECs would choose not to engage with, or would terminate a relationship with, BPMs for a number of reasons.

Percentage of respondents saying they would terminate a relationship or not engage with a building product manufacturer for the following reasons.



Source: Harvard Business Review Analytic Services Survey, June 2020

to changing project requirements; had a weak reputation for trust and credibility; had weak services, warranty, or ease of installation; or had little ability to customise. **FIGURE 3**

Meeting project requirements and schedules and ensuring that both reputation and services are solid are table stakes for the best BPMs. But these firms are also devoting increased attention to creating an efficient foundation for customisation and ensuring responsiveness and agility.

Customisation used to require significant time, effort and rework a decade ago, but Reynaers Aluminium has now systemised customisation in a way that enables the company to offer personalisation on a large scale efficiently. “There’s a big demand for that”, says Rasker. “We no longer have to reinvent the wheel all the time. We can do it in a way that is efficient, reliable and fast.” The company has created a store of building blocks and software for clients to configure their systems in the way they want to. Today, “90% of what we sell is [that kind of] mass customisation”, says Michel Van Put, the company’s chief product officer. The other 10% is more bespoke personalisation. “Even that customisation helps us be successful”, he adds.

Leading BPMs are also beginning to adopt the BIM technology that their AEC clients are using. “The more you are able to digitise the building process, from concept to realisation, the more you are able to really speed things up”, says Rasker.

“Before BIM, there were drawings and documents that someone had to put in the system. By providing design tools in the beginning, from the moment someone puts something on paper, we can inset our digital change. Nothing has to be reproduced. It is reliable, and we can make changes without discussion. It is an absolute must-do if you want to survive in the building world.”

Some organisations may struggle with investing in BIM proficiency because they have trouble connecting the dots between the money and time outlay required and the increased revenues that may result. “That is the biggest challenge. You have to sit down and figure out throughput and velocity between any customer and BPM”, says Kuecker. “We have to understand how we can use BIM to drive where we focus our product development activities.” It takes time to create a business case for it. “But that is the difficulty with anything that is innovative”, he says. “You have to understand how it is adding value upfront and how it can be used across multiple projects as you develop more strategic partnerships. You have to step back and look at it at the system level.”

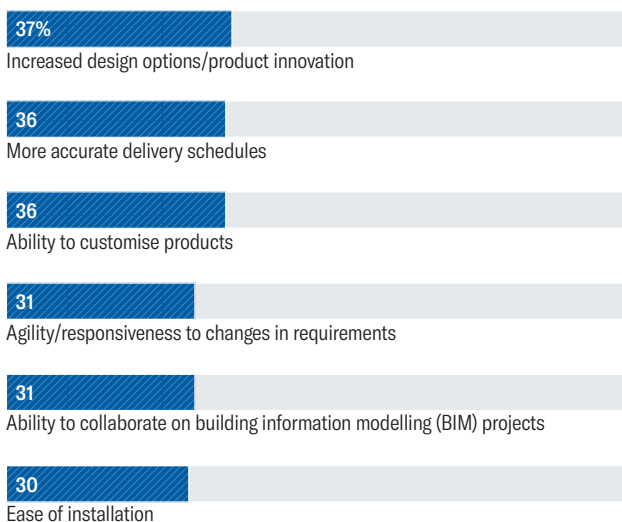
At Reynaers Aluminium, BIM is a piece of a larger digitisation effort. “We call it closing the digital loop”, says Van Put. “From the first sketch to production to installation, we do it all in a digital fashion to make it more efficient.” The company also provides digital tools to its fabrication partners to drive more efficient and agile production of its building systems. “We have developed an efficient production facility for our customers”, says Rasker, noting that the company is also using VR to provide 3D immersion to help fabricators design their factories. “They are not all there yet, but, little by little, you can convince them of the value. If you involve us in your production as a fabricator or in your design as an architect, we can form a digital team and partnership, and everyone wins.”

FIGURE 4

An AEC Wish List for BPMs

AEC firms want their BPMs to deliver more innovative products and design options, to start with.

In what areas do your building product manufacturers need to improve the most? (SELECT UP TO FIVE)



Source: Harvard Business Review Analytic Services Survey, June 2020

The Return on Strategic Partnerships

AEC customers demonstrate a clear preference for BPMs like Reynaers Aluminium, Schumacher Elevator, and State Window, which are devoted to increasing agility, responsiveness, customisation and digitisation, all qualities not yet the norm within the sector.

The survey shows, however, that there is a clear path forward for BPMs that want to become strategic partners to their AEC clients. AEC respondents revealed areas where they are eager to see some specific improvement from BPMs. Topping the list are increased design options and product innovation, ability to customise products, more accurate delivery schedules, agility or responsiveness to changes in requirements, and ability to collaborate on BIM projects. **FIGURE 4**

Even for the most forward-thinking BPMs, there are significant hurdles to overcome to meet the increasing expectation of their AEC partners. One of the biggest issues is the lack of standardisation on certain tools. “No customer

“There is a big demand for [systemised customisation]. We no longer have to reinvent the wheel all the time. We can do it in a way that is efficient, reliable and fast.”

**Erik Rasker, VP & CTO,
Reynaers Aluminium**



As the products that go into and around buildings become more sophisticated, the role of building product manufacturers must evolve from AEC supplier to AEC strategic partner. Leading BPMs are beginning to adapt to, and helping to craft, this new reality.

is the same in terms of what they like. You do one thing one way for one customer and then have to do it another way for a different customer to make them happy”, says Kuecker. “If they worked with the same platforms and software, it would be much easier.”

The building industry is also incredibly fragmented compared to, say, the automotive industry, which is much more mature in terms of forming strategic partnerships and collaboration between the various players. There are thousands of AEC firms versus a few carmakers, says Kuecker. Moreover, the building industry has been slower to adopt new ways of working. “It’s very traditional with companies that have been working in a certain way for years”, says Rasker. “It can be difficult to change. But it is changing rapidly.”

Finally, creating a cultural shift and building more collaborative relationships take time and effort. “It is difficult because thousands of people have to change what they have done for years. It requires continual re-education and training”, says Rasker.

But the returns are clear, for AECs *and* BPMs. AEC respondents report that the greatest benefits of working with these types of BPMs are, or would be, higher-quality products (45% say this is a top-three benefit), happier clients (33%), more sustainable solutions (32%), lower costs (31%), and faster execution of projects (31%).

The ability to customise quickly and in an agile and high-quality fashion has yielded State Window so much additional business that it has opened another production facility to increase its capabilities 40%. “We are growing so fast because we have good experience with so many custom design jobs”, says Mohareb. “We have built a reputation for custom design, and [clients] know how fast and accurate we are.”

Conclusion

The survey confirms a shift that is beginning to, and must continue to, take place between AEC firms and their BPMs as the industry turns its focus to more customised, sustainable and differentiated experiences for end users. As the products that go into and around buildings become more sophisticated, the role of building product manufacturers must evolve from AEC supplier to AEC strategic partner. Leading BPMs are beginning to adapt to, and helping to craft, this new reality.

Evolving from a focus on the measurement and management solely of productivity to the customer experience requires a shift in mindset. But, ultimately, the two are inextricably linked today. “Agility, automation and collaboration are what make us more productive”, says Van Put. “It will make us much more productive than ever before.”

When BPMs are highly agile, collaborative and responsive to project requirements, those qualities not only help the AEC; they boost their own top line. “It will help our business growth. Having a strategic supplier that you know will come through can take a lot of pressure off the customer and free them up to work on other aspects of the project”, says Kuecker. “They can get more business, and you can get more business.”

Moreover, a more collaborative partnership between AECs and BPMs drives greater building product innovation. “As a strategic partner, you can get a sneak peek into their vision of the industry and the customer roadmap, where they want to be in five to 10 years”, Kuecker adds. “It opens up opportunities and gives you time to be better prepared and have the right technology for the future.”

METHODOLOGY AND PARTICIPANT PROFILE

A total of 172 respondents drawn from the HBR audience of readers (magazine/e-newsletter readers, customers, HBR.org users) completed the survey.

Size of Organisation

4%
10,000 or more
employees

21%
1000-9999
employees

24%
500-999
employees

51%
499 and fewer
employees

Seniority

47%
Executive management/
board members

23%
Senior management

26%
Middle management

4%
Other grades

Regions

46%
North America

26%
Europe

19%
Asia Pacific

5%
Middle East/Africa

3%
Latin America

1%
Other

Figures may not add up to 100% due to rounding.



Harvard Business Review

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