



RISE ABOVE THE CHAOS:

LAY A SOLID TECHNOLOGY FOUNDATION
IN YOUR AEC FIRM

The influence of advanced technologies in the construction and engineering verticals is quickly reaching an inflection point. More and more intriguing technologies are coming online nearly every day. The breadth and capabilities of these technologies is overwhelming. Their deployments create a mandate to connect and share accurate, real-time data across a broader project ecosystem. So, how do you manage all this technology and all of the data for your organization?

Navigating this new technology landscape is challenging and rising in importance to every CEO in AEC. While many firms have dabbled in a variety of technologies, deployments are often executed in an isolated and fragmented approach. It is no surprise that this approach often creates more chaos and inefficiency in overall project execution, leaving executives disappointed in the net impact on the bottom line and wondering how to move forward as the pressure to deploy more and more technology rises.

The importance of operating within a well-crafted digital strategy cannot be underestimated. Within this strategy, the importance of laying a solid technology foundation for execution is the most important first step.

IN THIS EXECUTIVE BRIEF, YOU WILL LEARN ABOUT:

- The rise of ecosystems and their impact on the future of construction
- The importance of focusing first on your technology foundation and connecting to everyone and everything
- The need to re-engineer your business processes to in the digital age
- What the technology foundation looks like for an engineering firm
- Blending internal technology resources with outside partners





THE BIG PICTURE

Back in 2015, Deloitte University Press published a series titled “Business Ecosystems Come of Age”¹ that highlighted an important shift in economics brought on by technology advancements stating, “...the economy has been moving beyond narrowly defined industries built around large, vertically integrated, and mainly ‘self-contained’ corporations. New means of creating value have been developing everywhere in the form of ever-denser and richer networks of connection, collaboration, and interdependence. Businesses around the world are responding. Some view the rise of ecosystems as an opportunity for creating powerful new competitive advantage.”

This trend is now taking hold and has significant implications for all AEC firms.

Fueled by the new technologies that expose and connect the broader ecosystem, clients are demanding firms employ new ways of working that result in:

- Detailed information sharing across projects and across organizations
- Access to information in real time across the ecosystem
- Transparency in operations
- “Right-first-time” quality
- On-time, on-budget delivery
- Increases in resource productivity
- Accurate assignment of risk and responsibility

Firms no longer have an option to continue business as usual. Those firms that successfully blend change management with process re-engineering and new technology deployments will strengthen their position in the marketplace and gain a competitive position for the indefinite future.

The 2016 Engineering and Construction Trends report² from PWC emphasized the importance of this technology trend. The report identified technology advances as one of the top five global trends that will impact AEC firms. In fact, technology advances was the trend at the top of the list—ahead of demographic shifts, shifts in global economic power, resource scarcity and climate change, and urbanization. If you think about these top five, you will quickly recognize that technology advances is the only one of these trends within your control.

So, the journey ahead is new--and complex--and dynamic. How will you move forward?

In a recent construction exec.com post titled “*Is Your Jobsite Smart Enough?*”³ Joanna Masterson started to break this down further, stating “*There’s a lot for contractors to be excited about on the technology front: drones, BIM, mobile apps, sensors, wearables, telematics, smart tools, video documentation, robotics, 3-D printing, laser scanning, generative design and **much, much more** [i.e., mobile field and lab technologies]. But the prospect of all the analytics, alerts and automation can quickly turn overwhelming without a firm strategy and capable IT staff in place. The trick is finding the sweet spot between doing what’s right for the company and not falling too far behind.*”

This puts an exclamation point on how important it is to put a strategy in place to assess, acquire, and implement the **right** technologies for the **right** reasons at the **right** time—“*doing what’s right for the company and not falling too far behind.*”

LAY THE FOUNDATION AND PLAN TO CONNECT

The first step in doing what is right for the company is to establish a technology foundation that supports both efficient and repetitive processes internally as well as the ability to quickly connect to that broader technology ecosystem that connects firms to project owners. Keep in mind that if your firm is not capable of providing data digitally to project owners in the format and timeframe they request, you will be required to adopt their systems in order to meet this demand. The weight of accommodating the duplication of effort necessary to meet this demand could be devastating to your people, your performance multipliers, and your profits.

THE SUCCESS FORMULA

Success with technology deployments is the sum of process + technology + people + data. If anyone of these is a weak link, results will be compromised. Let’s focus on the first two elements in the formula, process + technology.

It is far too common that firms acquire technology and attempt to implement it on top of their existing processes, shying away from making significant changes in operations. Yet, research supports that fact that those who gain the most from their technology deployments are those firms who reverse this approach and re-engineer their processes to be digital first and **then** apply the right technology to the new process.

In the AEC industry, the processes between project management, field operations, lab testing, report delivery, and billing are often fragmented; characterized by manual efforts, duplicate data entry and dependence on spreadsheets. This all adds up to higher overhead than necessary. Connecting these processes in a manner similar to repetitive manufacturing processes and applying the right technology to this repetitive process can eliminate these conditions. Repetitive processes hold other advantages as well; the learning curve for new employees is reduced, the ability to rapidly scale across resources and projects is improved, integrity of data accuracy and data normalization across processes and projects is optimized, all resulting in improved profitability.



WHAT'S IN YOUR TECHNOLOGY LANDSCAPE AND WHY?

Creating a diagram of the current and future state of your technology landscape is an effective tool to manage this fusion of technology and process.

At the heart of the landscape for construction and engineering firms is the core foundational applications that are required to run the business. The core will most likely include ERP, CRM/Quoting, Field and Lab Operations, and Data/Document Management solutions. The specific functions served by each of these applications should be mapped out and integrated to support your lean process. For all data master files, such as customers and projects, identifying which application is the system of record and designing processes and integrations to share those master files across other systems of reference is key to providing data integrity across the landscape.

These applications should allow for data capture at the point of origination and provide audit trails of data improvement throughout the journey to the point of delivery. It is essential that duplicate processes, manual processes, and dependence on spreadsheets be identified and eliminated.

Applications like Metafield™ from Agile Frameworks are built for this model and provide a standardized, data-driven, integrated process flow that eliminates duplicate data entry and dependence on spreadsheets or paper forms. This data-driven model supports dynamic generation of all reporting needs and is built with an API model at the foundation to easily integrate to other supporting systems internally or externally.

Outside of the core applications, firms will most likely need to employ “add-on” applications to round out requirements that are not native to the core applications. Again, identifying the role these “add on” applications play and how to integrate these applications efficiently through modern APIs to your core is essential to keeping the landscape optimized for performance and integrity.

Last but not least, construction and engineering firms will deploy a variety of operational technologies ranging from design to equipment management to field applications with real-time data capture and communication. Identifying how to integrate these technologies into the core business technologies is the last piece to completing the landscape.

With the technology landscape in place and operating efficiently, you will be poised to create connection strategies to easily provide data to outside partners. Likewise, as future waves of technologies that support IoT, 3-D printing, augmented/virtual reality and more emerge, you will be poised to strategically integrate them into your operation as well.

DEPLOYING TECHNOLOGY RESOURCES

As technology ecosystems continue to increase in complexity, density, and sophistication, let's discuss the impact of this trend on your internal IT resources and your technology partners.

Most AEC firms have internal IT teams that are relatively small and often their primary focus is maintaining IT infrastructure. As the ecosystem grows, your team also must develop a core competency in integration in order to efficiently integrate the applications in your technology landscape, create normalized data across those applications, and be ready to syndicate this data to your partners. While outside application developers or their partners can assist in this effort, your team must own the integration, data normalization, and disbursement **across your entire ecosystem** to ensure data accuracy, availability, and speed.

In the past, internal teams often advocated for internal custom application development. In considering this option today, leadership must recognize that in order to be successful, your development team must include analysts, designers, software engineers, integrators, testers, deployment resources, and be prepared to handle daily troubleshooting, ongoing enhancements and maintenance of these custom efforts 24/7. In today's world, finding and retaining talented software engineers is an expensive and time consuming endeavor and for most firms, these issues now push the "build" option out of reach.

This puts an important emphasis on finding the right solution partners. These partners will be visionary, providing a product roadmap that strives to keep pace with marketplace needs and technology advancements. These partners also will provide the consulting necessary to optimize your processes across your landscape, continuously helping you go farther, faster.

Agile Frameworks is a partner with visionary leadership in both product development and program management and recognizes the important role solution partners play in this technology revolution, expecting to play a strategic role in the success of their customers. With business ecosystems coming of age, strategically aligning your firm with visionary technology partners that bring competitive differentiators to life will be worth their weight in gold.

In conclusion, it's imperative for executives of AEC firms to recognize the disruption underway and intentionally lead technology driven change. Your ability to compete in the future depends on it.

ABOUT AGILE FRAMEWORKS



Agile Frameworks offers MetaFieldR as a subscription-based software-as-a-service (SaaS) platform that is accessible on any computer or mobile device. To learn more about how MetaField's capabilities can help your firm streamline complex workflows for greater productivity and profitability, visit www.agileframeworks.com. Call 1.800.779.1196 or email sales@agileframeworks.com to request a demo.



¹ Kelly, Eamonn. *Introduction: Business Ecosystems Come of Age*. Deloitte University Press, 2015, *Business Ecosystems Come of Age*. <https://www2.deloitte.com/insights/us/en/focus/business-trends/2015/business-ecosystems-come-of-age-business-trends.html>

² 2016 *Engineering and Construction Trends* report. PWC, 2016, *2016 Engineering and Construction Trends* report, www.strategyand.pwc.com/media/file/2016-Engineering-and-Construction-Trends.pdf

³ Masterson, Joanna. "Is Your Jobsite Smart Enough?" *Construction Executive*, 27 July 2017, www.constructionexec.com/Articles/tabid/3837/entryid/8862/is-your-jobsite-smart-enough.aspx.