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Technology Trends

Excerpt from the 42nd Annual Architecture & Engineering Contracting Industry Study

In collaboration with:

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Technology Trends

54%

More than half of firms struggle with prioritizing which new technologies are most applicable to their business and which will yield the greatest returns.

Technology adoption and deployment carried momentum through 2020. Migration to the cloud continued seemingly unfettered, as these initiatives likely were under way and supported. Firms signal that these efforts will continue into 2021.

For IT Operations leaders, cybersecurity continues to be a key challenge for firms, and they will continue to invest in infrastructure, preparedness and compliance.

Emerging technology trends expected to have the biggest impact to the business include the IoT, geolocation and augmented/virtual reality. Fewer small and medium-sized firms identified emerging technology trends as key as they tightened focus on maintaining their core business functions. Large firms continue to indicate high impact to the business, specifically for big data and data science in which they are often already invested.

Firms envision a high degree of digital maturity on the short-term horizon, but cost and expertise are significant hurdles.

ADDRESSING TOP THREE TECHNOLOGY CHALLENGES

1 **Cost of Technology.** Balance objective short-term investment criteria with the opportunity cost of delaying next-gen technology trend adoption.

2 **Prioritizing Technology Applicability.** Prioritize key gaps/opportunities and then evaluate how technology can best serve the firm and its clients.

3 **Lack of Time to Learn About Technology Trends.** Dedicate an objective individual or consulting firm to evaluate which technologies can help the firm achieve its goals.

There is a perception that achieving technology advancement is costly and requires a comprehensive strategic plan. This can slow progress in a rapidly developing environment. Technology tools are foundational to future business practices. A&E firms can benefit by starting now with lower-risk technology investments rather than waiting for a comprehensive strategy that will delay implementation. As they wait, competitiveness wanes.

Still, firms need to prioritize which technologies are most beneficial to their business and how to apply them. Firms should start by developing a list of their own criteria for success. Ask questions like:

- What will serve our clients best?

- Where are internal bottlenecks that may be barriers to success?

- What are our firm's strengths, weaknesses, opportunities and threats?

The answers will point in the direction of a solution. At the very least, as an industry, A&E firms need to better leverage technology to improve on-time and on-budget performance.

Businesses expect to increase investments in emerging technologies in project management and project execution to enable new ways of working while increasing profitability.

KEY DATA POINTS FROM THE SURVEY

1 Small firms concentrated on the internet of things (IoT), geolocation and augmented/virtual reality as most important to their businesses. Small firms largely already have basic technologies in place and are taking a closer look at how these technologies can better serve their clients' needs.

2 Medium-sized firms leaned toward big data, data science and artificial intelligence (AI) as most important. Yet only 18% of medium-sized firms have a strategic plan for technology in place, indicating the need to dedicate resources to identify and prioritize which technologies will yield short-term return on investment (ROI).

3 Large firms focused on geolocation, big data and data science as most important to their businesses. With bigger and more complex projects, large firms stand to gain on multiple fronts from investment in new technology applications.

Top Emerging Technology Trends

Firms continue to see emerging technology trends as important to the business including IoT, geolocation and augmented/virtual reality, where the industry has yet to realize their full impact. Yet in 2020, the overall importance of technology trends retracted across the board – a reflection of firms focusing their resources on client-specific, revenue-generating activities.

While smaller firms reduced their technology interest in general, large firms continued near full bore. Meanwhile, medium-sized firms leaned into big data, data science and artificial intelligence. The importance of the emerging technology trends intensified for large firms, with more than half identifying big data, geolocation and data science as most important to their business.
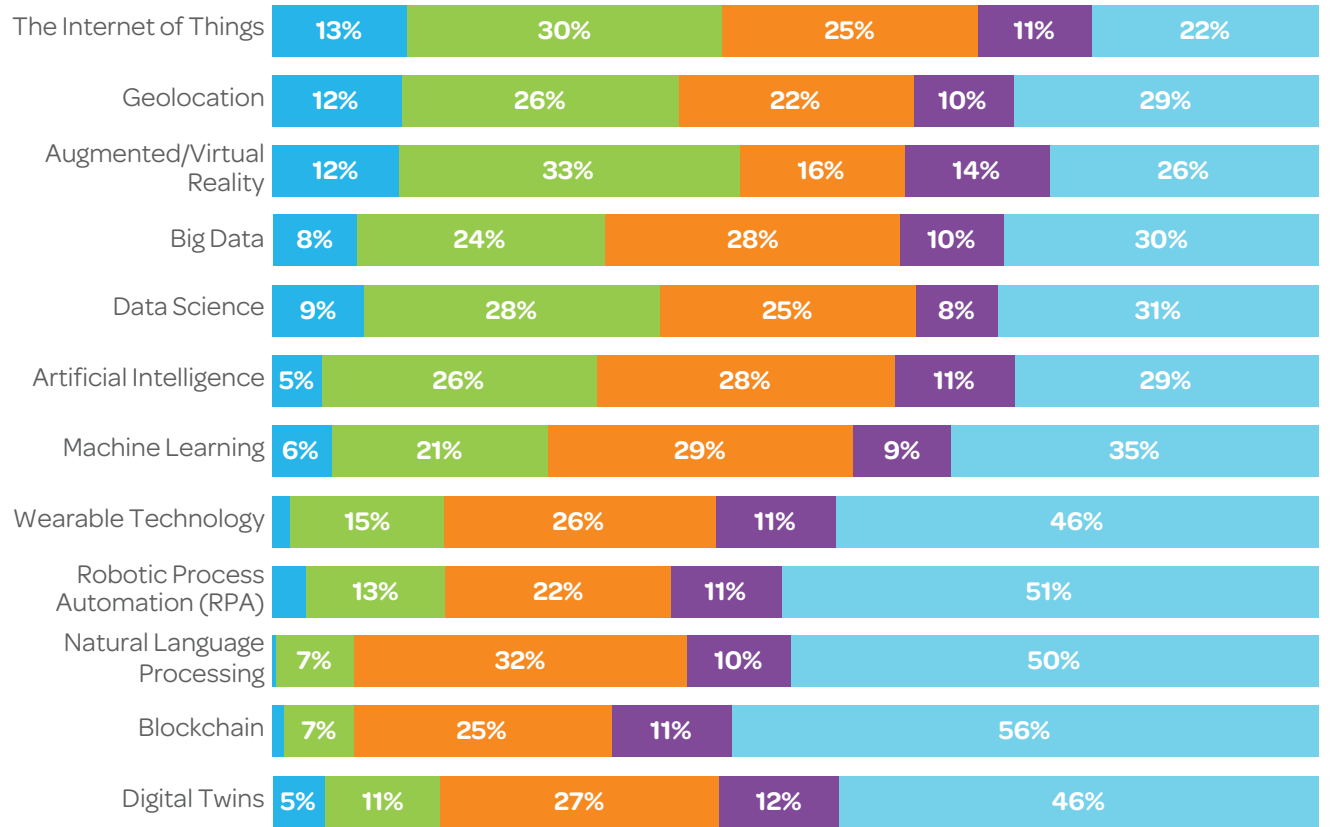
	Very important	Somewhat important	Neither important nor unimportant	Somewhat unimportant	Not at all important
The Internet of Things	13%	30%	25%	11%	22%
Geolocation	12%	26%	22%	10%	29%
Augmented/Virtual Reality	12%	33%	16%	14%	26%
Big Data	8%	24%	28%	10%	30%
Data Science	9%	28%	25%	8%	31%
Artificial Intelligence	5%	26%	28%	11%	29%
Machine Learning	6%	21%	29%	9%	35%
Wearable Technology		15%	26%	11%	46%
Robotic Process Automation (RPA)		13%	22%	11%	51%
Natural Language Processing		7%	32%	10%	50%
Blockchain		7%	25%	11%	56%
Digital Twins	5%	11%	27%	12%	46%

Top Technology Trend Challenges

As firms wade deeper into technologies that can manifest fundamentally positive change in their industry, they struggle with navigating the environment and finding the people and time needed to interpret it.
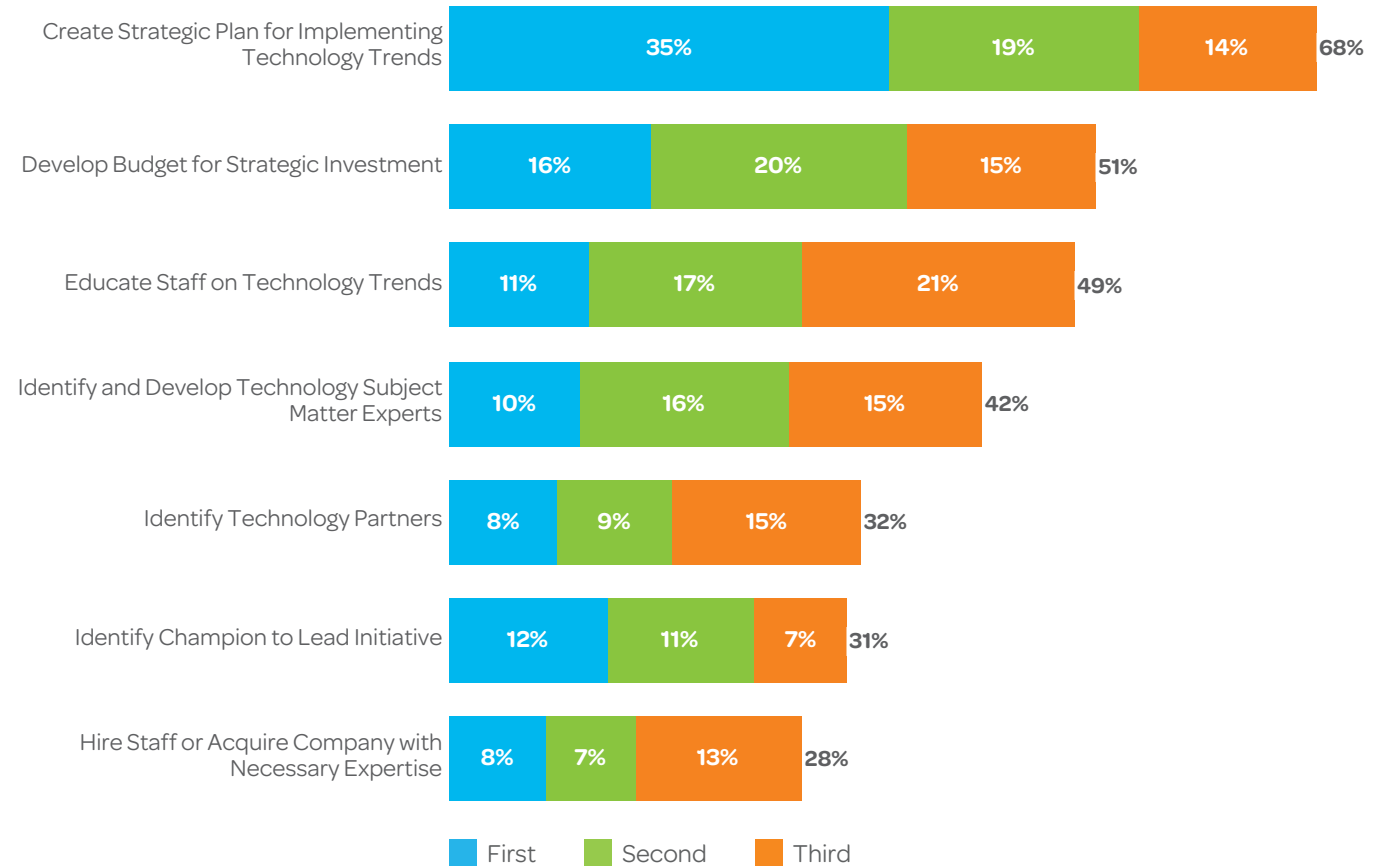
Small firms are most sensitive to the cost of adopting new technology, while large firms are more concerned about educating employees. The lack of internal expertise, cited by more than a third of small and medium-sized firms, is a bottleneck. And, without a champion to lead initiatives – called out by 26% of medium-sized firms and 14% of small firms – initiating technology adoption and meeting digitization goals seems daunting.

On top of educating employees, roughly a quarter of firms identified the need to educate clients about technology trends and their application to projects as a top challenge. In the short-term it may be difficult to prioritize which technologies will have the biggest impact to the business without client advocacy and tangible short-term benefits to the business.

	0–50 employees			51–249 employees			250+ employees		
Prioritizing Which Trends are Most Applicable to Your Business	20%	16%	18% (54%)	25%	18%	11% (53%)	28%	19%	9% (56%)
Cost of Technology (e.g. Equipment, Education)	32%	22%	16% (69%)	19%	18%	12% (48%)	28%	16%	19% (63%)
Lack of Time to Invest in Learning about Technology Trends	15%	17%	14% (46%)	13%	12%	17% (42%)		16%	16% (41%)
Lack of Internal Expertise	18%		13% (36%)	13%		13% (36%)		13%	9% (28%)
Educating Employees about Trends and their Application to A/E/C	11%		(28%)	14%		15% (35%)	13%	13%	22% (47%)
Educating Clients about Technology Trends and their Application		9%	(23%)	11%		9% (26%)			(25%)
Lack of Champion to Lead Initiative			(14%)	12%	9%	(26%)			(13%)
Corporate Culture/Openness to Emerging Technologies		9%	(17%)			(18%)		13%	(19%)
Buy-In From Firm Leadership			(13%)			(17%)			(9%)

■ First   ■ Second   ■ Third
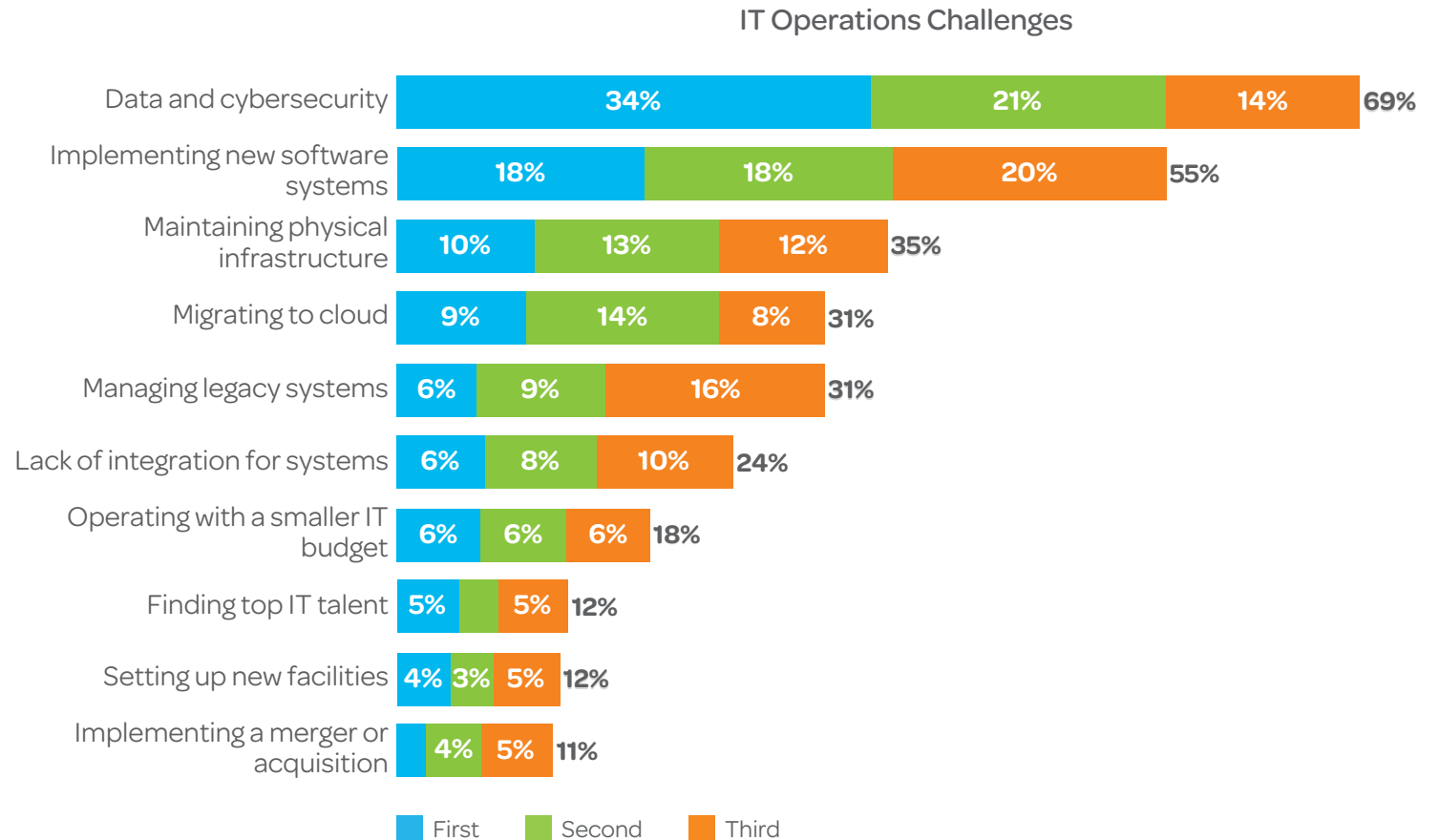
Top Technology Trend Initiatives

Across the industry, technology adoption and digital maturity remains largely in the planning phase as firms continue to focus on creating strategic plans for implementing emerging technology. This was the most prevalent initiative among respondents, followed by developing budgets for strategic investment. While continuing to plan for implementation of new technology, firms are slow to take action. While many firms may focus on developing a strategic plan, short-term actions can be taken to keep initiatives moving forward before the comprehensive plan is complete.

Initiative	First	Second	Third	Total
Create Strategic Plan for Implementing Technology Trends	35%	19%	14%	68%
Develop Budget for Strategic Investment	16%	20%	15%	51%
Educate Staff on Technology Trends	11%	17%	21%	49%
Identify and Develop Technology Subject Matter Experts	10%	16%	15%	42%
Identify Technology Partners	8%	9%	15%	32%
Identify Champion to Lead Initiative	12%	11%	7%	31%
Hire Staff or Acquire Company with Necessary Expertise	8%	7%	13%	28%

Legend: First (blue), Second (green), Third (orange)

Top IT Operations Challenges and Initiatives

As firms adopt more technologies, IT Operations face new challenges primarily with data and cybersecurity (69%) and implementing new software systems (55%).

Out of necessity, firms are concentrating largely on creating new security policies and procedures (46%). Thirty-four percent are planning to outsource IT administration and infrastructure while 32% are focused on re-engineering business processes. Only 14% of respondents prioritize hiring more IT staff.

IT Operations Challenges

Challenge	First	Second	Third	Total
Data and cybersecurity	34%	21%	14%	69%
Implementing new software systems	18%	18%	20%	55%
Maintaining physical infrastructure	10%	13%	12%	35%
Migrating to cloud	9%	14%	8%	31%
Managing legacy systems	6%	9%	16%	31%
Lack of integration for systems	6%	8%	10%	24%
Operating with a smaller IT budget	6%	6%	6%	18%
Finding top IT talent	5%		5%	12%
Setting up new facilities	4%	3%	5%	12%
Implementing a merger or acquisition		4%	5%	11%

Legend: ■ First ■ Second ■ Third

76%

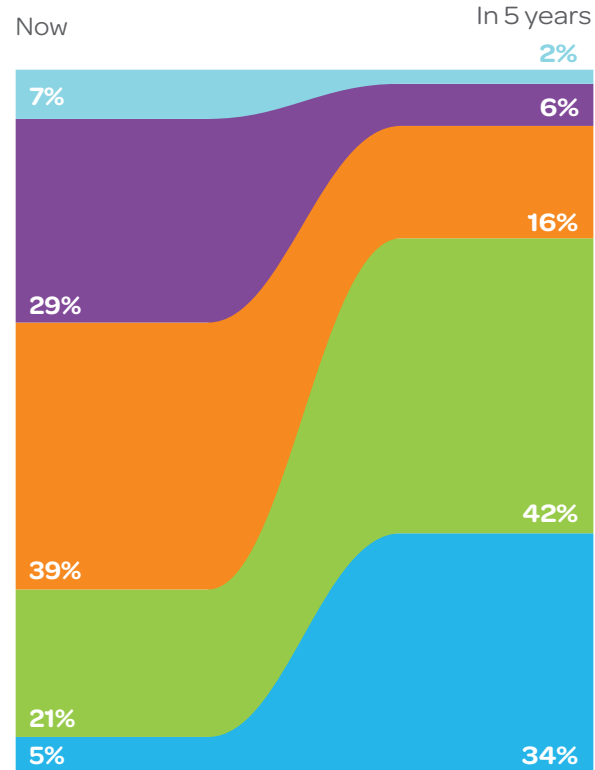Most firms envision their business as digitally mature or advanced in 5 years.

This transformation will require commitment, planning and investment as only 25% of firms consider their business digitally advanced today.

Technology Trends: Digital Maturity

While one in four firms have transitioned to a digitally mature business, most are in various stages of digital maturity. They are looking to better align business and IT initiatives and are looking for better ways to integrate business processes. Much has to change if three in four firms expect to achieve digital maturity in five years.

While firms are optimistic about their digital maturity in the coming years, far too many firms still rely on manual data entry, particularly in accounting and finance. With so many tools available to mitigate the risks of manual data entry, such as errors, delays and wasted time, there is no excuse for relying on manpower for this task. Reducing manual data entry and reliance on spreadsheets is a must in moving toward digital maturity and is another example of low-risk, high-return technology investment. For some companies, this requires adoption of software and for others, it may be leveraging solutions you already have to streamline business processes.

Now   In 5 years

	Now	In 5 years
Nascent	7%	2%
Exploratory	29%	6%
Applied	39%	16%
Mature	21%	42%
Advanced	5%	34%

Nascent. There's a disconnect between business and digital IT initiatives or a misalignment with company strategy

Exploratory. There's a recognition of the need for digital transformation strategy but execution is at the lighthouse stage, on an ad-hoc project, which is neither predictable or scalable

Applied. There's alignment between business and IT goals and momentum to adapt, but not dedicated focus on the full disruptive potential of digital initiatives

Mature. Business and IT management are integrated and delivering digitally enabled product / service experiences on a continuous basis

Advanced. Digital transformation is a primary strategic focus at the executive level and a culture of innovation is prevalent along with increasing revenue, improving customer experience, and growing operating margins

Technology Trends

In 2020, firms experienced a new way of operating and with it the opportunity to re-evaluate new technologies that can bring significant returns.

Adoption and implementation of new technology tools will continue into the foreseeable future.

Firms envision better adoption of emerging technologies, but cost and expertise are significant hurdles. Businesses should make it a top priority to identify or hire employees who can assist in this effort, and then take short-term actions to implement technologies most applicable to their business.

Finding ways to leverage technologies in project management will be particularly important. As clients increase their interest in new technologies for projects, teams will need to become well versed in not only leveraging the technology but utilizing it efficiently and effectively.

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Association of Consulting Engineering Companies | Canada

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Society for Marketing Professional Services

The Society for Marketing Professional Services (SMPS) is the only organization dedicated to creating business opportunities in the A/E/C industries. With more than 7,100 members, SMPS provides leadership and professional development programs, industry research, business-building events, and vital marketing resources. Through SMPS, A/E/C professionals in North America tap into powerful networks to form project teams, secure business referrals and intelligence, and benchmark performance. The Society is committed to validating the practice of marketing and business development as essential to the success of all professional services firms.

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- Nurture client relationships and improve win rates

- Deliver projects on time and under budget

- Manage your projects and firm-wide information

- Find, recruit and retain the best and brightest talent

- Streamline the financial management of their firms

- Gain complete visibility into all aspects of their business

Deltek for Architecture & Engineering Firms

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