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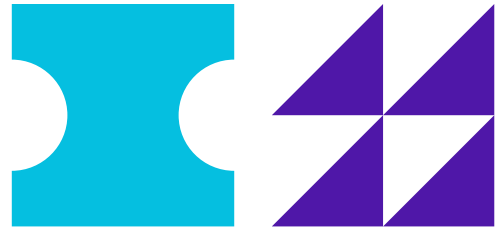# Signposts Report
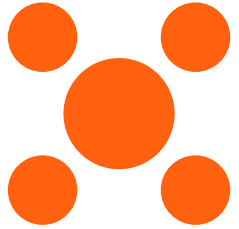
6 global business trends driving The Project Economy
and what they mean for project leaders

Project Management Institute

INTRODUCTION

Sunil Prashara
President & CEO, PMI

There is no doubt that project leaders specialize in turning strategic visions into reality. As transformation and an ever-evolving list of complex issues become our new "normal," project leaders can't truly deliver value to their organizations and society if they're operating in a vacuum. Today's project leaders not only need a strong understanding of technology, the ability to determine the best project management methodology for projects, AND the new "power skills" like empathy, creativity and inspirational leadership. They must also have an understanding of the major business, technological, economic and geopolitical trends shaping the world.

To help with that, PMI conducted an assessment of the most pressing, long-term trends around the globe—from climate change to shifting demographics to technological breakthroughs—and explored how these trends are influencing the work of project leaders.

We evaluated research, news reports and industry data; conducted interviews with project professionals; and analyzed information extracted from political, economic, scientific and demographic databases—all to gain a greater understanding of where these critical areas are heading and how industry project leaders can prepare. Then we compiled it all in one easily digestible document to benefit our stakeholders around the world.

We can't slow down the speed of transformation or make the world less complex. But by understanding these changes, project leaders will thrive in The Project Economy and make an impact on the world. I hope you enjoy this summary of these key trends that we've compiled for you!

> We can't slow down the speed of transformation or make the world less complex. But by understanding these changes, project leaders will thrive in The Project Economy and make an impact on the world.

SIGNPOSTS

Capital Flows	Political Climate
Economy Development and Project Management	Macroeconomic Trends
Economic Influence of Companies	Natural Resource Flows
Demographic Trends	Connectivity and Cybersecurity
Business Environment	Environment and Climate
Automation, AI and Robotics	

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Insight 1

Africa and most of the developing world will be home to a new generation of talent ready to tackle a new generation of projects.

Demographic Trends

Get ready. There's a youthquake ready to hit the workplace—and it's coming from some unexpected quarters. While long-term demographic trends point to aging populations across the globe, the developing world is fast emerging as a hotbed of young talent, with the highest proportion of 25-to-34-year-olds found in Africa, the Middle East, Southeast Asia, and South and Central America. And between now and 2050, the United Nations projects that more than half of global population growth will occur in Africa.

Alongside this new demographic cohort, there's a new urban landscape on the rise. The world's fastest-growing cities are now in sub-Saharan Africa, home to emerging hot spots like Kinshasa, Democratic Republic of Congo; Dar es Salaam, Tanzania; and Nairobi, Kenya. And that makes the region ripe with career opportunities for young project professionals looking to play a role in upgrading the continent's transportation, water management and energy infrastructure.

But while young talent might be eager, it's also inexperienced—and will need guidance in navigating a complex project landscape.

"As the youth population increases, so will the number of young people who are entering the job market and becoming project stakeholders. So project managers will need to change their leadership styles to become more like project coaches," said Richard Magu, PMP, regional project management office manager, Software Group, Nairobi, Kenya.

Zambia's government, for example, has launched an aggressive push to improve infrastructure in the country, where the population has doubled to 17 million since 1993.
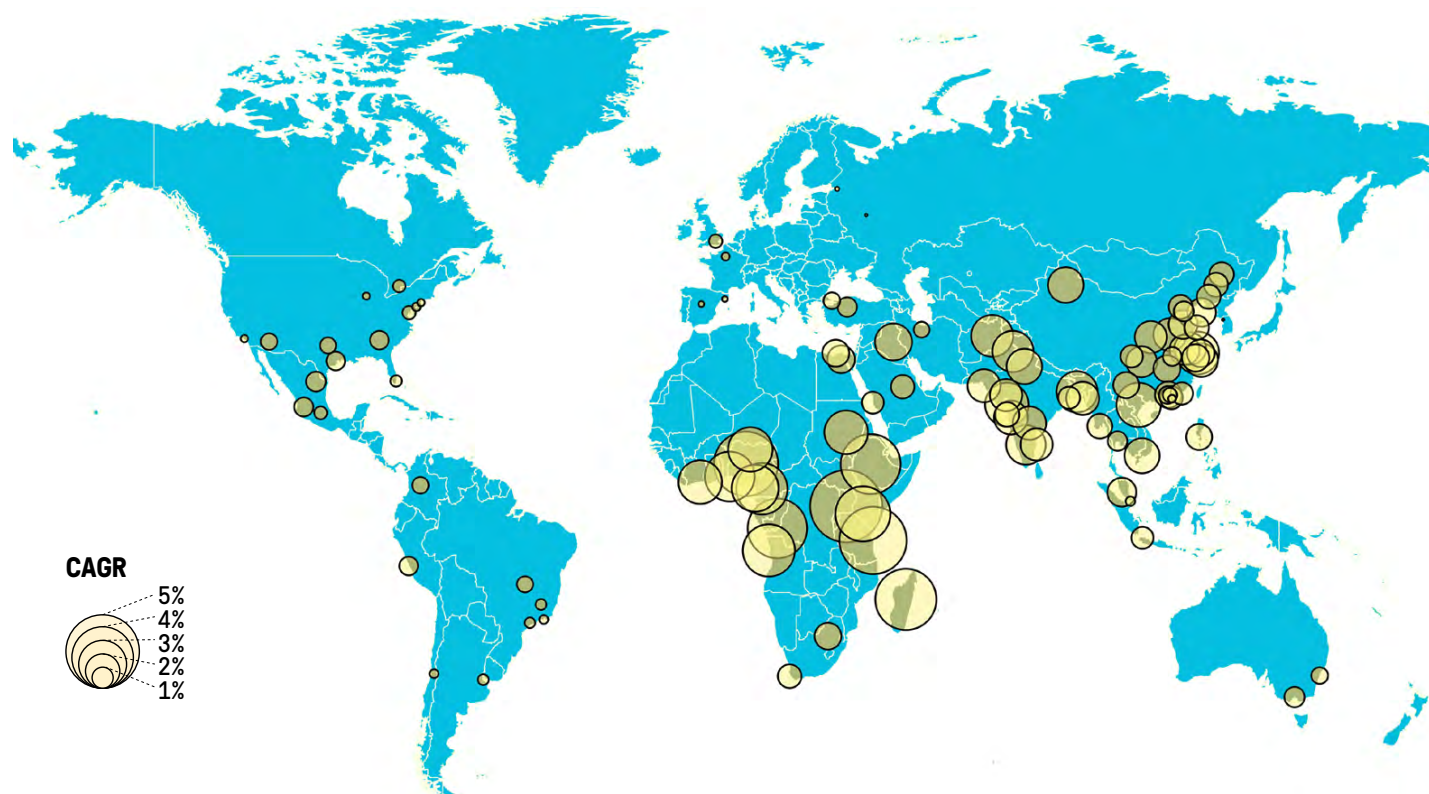
"Zambia is experiencing unprecedented infrastructure project rollouts," said Brian Mushimba, the Cabinet portfolio minister in charge of transportation and information communications and technology projects. "It's like a giant construction site."

The government has been working with local universities to promote engineering and construction programs in order to help fill higher-level talent needs, particularly in remote areas. Contractors are required to hire local workers and provide them with training as a condition of their agreements, which creates additional benefits to the community. The training requirement is intended to close the talent gap for future projects, though the results have been mixed, Mr. Mushimba told *PM Network*. "In some instances, we have seen uptake of complex skills by locals, but it is often not as fast as we would like."

It's not only a matter of gaining knowledge, however. Much of Africa's fate will depend on how successfully its leaders deal with persistent governance issues in their respective countries. It also remains an open question whether Chinese companies can be persuaded to allow African engineers and project managers to participate in Chinese-financed infrastructure projects that have proliferated in sub-Saharan Africa over the last decade through megaprograms like the Belt and Road Initiative.

The repercussions of the new demographic reality extend far beyond Africa. Aging populations and declining birth rates in the developing world will reshape

More than half of global population growth will occur in Africa.

CAGR
- 5%
- 4%
- 3%
- 2%
- 1%

The world's fastest-growing cities today are in Africa, and that will remain the case for the foreseeable future.

Source: *World Urbanization Prospects: The 2018 Revision,* U.N. Population Division

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> "Zambia is experiencing unprecedented infrastructure project rollouts. It's like a giant construction site."
>
> —Brian Mushimba, Government of the Republic of Zambia

generational cohorts throughout the world and compel organizations to seek out project talent in emerging markets.

And project leaders must be committed to fostering an environment that truly nurtures up-and-coming talent.

"We find that more than 80 percent of fresh graduates, they say just 30 or 40 percent of their ideas, because they're afraid of being discouraged," said Ahmed Bahaa, managing director at Hive Studio, a creative agency in Cairo, Egypt.

"So the most important thing is to let people be confident about themselves and their ideas," Mr. Bahaa told *Projectified™*.

That confidence is often hard-earned.

"Sometimes, being young and rather inexperienced, you can get overwhelmed by everything that you need to do, by the scope of the project," said Ilinca Rolea, a junior information and communications technologies project manager at Cameo Global, an IT firm in Brussels, Belgium. "And also sometimes you might not really understand what is expected, the scope or the next steps that you need to take."

Project leaders must build an environment where newbies are okay with asking questions.

"That was a challenge for me at the beginning, and of course I realized that it doesn't make me look incompetent if I ask questions, and it's actually better to do it," Ms. Rolea told *Projectified™*. "It can save me a lot of time, and overall for the company time as well as money, asking for help at the earliest time possible."

As younger project managers look to make their mark, Fernando Antonio Oliveira encouraged them to consider one big question: How do you want to change the world?

"We are responsible for shaping the future of the world from now on," said Mr. Oliveira, the E2 program director at Embraer, São José dos Campos, Brazil. "Understanding your part of that role and having the willingness to participate in creating a better world on any project that you work on and understanding the strategic value of where you are is key.

"And then based on that, you don't need anybody to tell you what to pursue," he told *Projectified™*. "You have an inner fire that will guide you to learn more, to learn the hard skills, to learn the softer skills, to think strategically and to contribute a lot to that vision."
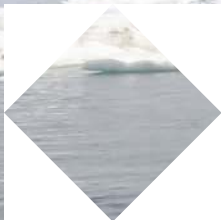
Insight 2

Climate change ranks as one of the biggest existential threats to civilization, but project professionals can play a pivotal role in avoiding the point of no return.

> "The readiness to change and to evolve as much as the sector is evolving is really a mindset that's important."
>
> —Jean-Baptiste Casedevant, PMP, EDF Renewables North America, San Diego, California, USA

Climate change is rapidly reshaping the face of the planet.

A Climate Central report found 300 million people—concentrated in coastal Asia—will be at risk from rising sea levels by 2050. Even now, communities around the world are forced to deal with extended droughts and raging wildfires—as well as the food scarcity that often follows extreme climate events.

Climate change is the top global threat, according to a 2019 Pew survey of respondents from 26 countries. And people—particularly young people—are demanding action. "Right here, right now is where we draw the line," teenage activist Greta Thunberg told an audience at the United Nations Climate Change Summit in New York, New York, USA on 23 September 2019. "The world is waking up. And change is coming, whether you like it or not."

Project leaders are positioned to play a pivotal role in making that change happen.

Facing an enormous flooding problem, for example, 30 of China's largest cities are joining forces on a massive government-sponsored push to build infrastructure and green space to soak up the excess water. Dubbed the sponge city projects, they include everything from installing rain gardens to creating more areas with permeable pavement—bespoke solutions designed to meet each city's architectural environment. The goal: By this year, the Chinese government intends to make 20 percent of urban land able to absorb at least 70 percent of rainwater.

There's an urgent thirst for such water management projects. World Resources Institute's Aqueduct Water Risk Atlas last year found that 17 countries—which are home to a quarter of the world's population—face "extremely high" water stress.

"Many cities have this linear system of use and dispose, which means using high drinking water for all-around use," said Hassan Aboelnga, researcher, urban water security, Koln University of Applied Sciences, Cologne, Germany. "They use water once and throw it away, and by doing so they are consuming water beyond sustainable limits," he told *Projectified™*.

To balance economic development with environmental sustainability, he said project leaders need to start thinking differently.

"Complex problems are systems issues that require from us systems thinking," Mr. Aboelnga said. "So it's important to have strong managers with holistic mindsets to see the big picture and deal with such a complex environment."

Reimagining how communities exist will help preserve quality of life in many regions. But some project leaders are taking it a step beyond. At the foot of Norway's Svartisen glacier, the Svart hotel is expected to be the first energy net-positive hotel above the Arctic Circle once construction is completed in 2021. Designed by architecture studio Snøhetta and building firm Miris, it will use 85 percent less energy than a traditional outlet—while producing more energy than it uses.

"Svart is intending to pioneer the way in which we look at hotel and building design, while placing nature, climate protection and sustainability at the forefront of
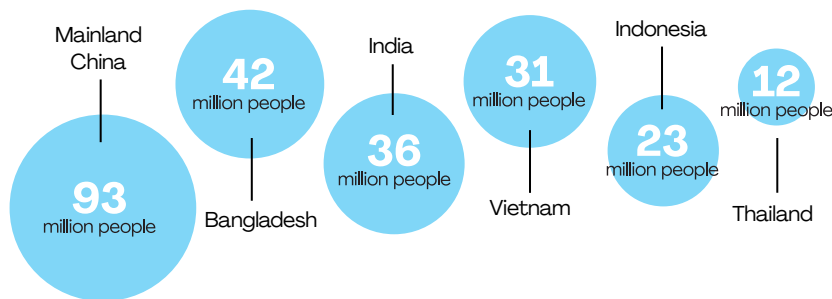
300 million
Number of people—concentrated in coastal Asia—at risk from rising sea levels by 2050

Source: Climate Central

Flood Watch

6 countries are home to the most people on land projected to be below average annual coastal flood levels by 2050:

Mainland China
93 million people

42 million people
Bangladesh

India
36 million people

31 million people
Vietnam

Indonesia
23 million people

12 million people
Thailand

Source: Climate Central

17 countries—which are home to a quarter of the world's population—face **"extremely high" water stress.**

Source: Aqueduct Water Risk Atlas

By 2050, McKinsey predicts **73% of the global power supply will be provided by renewables,** with wind and solar projects leading the way.

every aspect of project development," said Svart project director Ivaylo Lefterov.

It's just one example of how project leaders are rethinking how they use energy.

Oil, coal and natural gas currently provide roughly 80 percent of the global energy supply, but renewable energy is on the rise. By 2050, McKinsey predicted 73 percent of the global power supply will be provided by renewables, with wind and solar projects leading the way. China's government leaders pledged to have renewables supply 35 percent of its total energy needs by 2030. Behold the slew of megaprojects like the Tengger Desert Solar Park—ranked by PMI as one of the most influential projects of the last 50 years. Dubbed the Great Wall of Solar, it supplies power to more than 600,000 homes.

As renewables gain a larger share of the market, project leaders must stay informed—and be flexible, said Elton Soares, PMP, a project coordinator for GE Renewable Energy, Salvador, Brazil.

"We are required to be more agile each year because

the projects are changing very fast—and so is the technology," he said.

That means staying on top of shifting business models and strategies—and adjusting accordingly, said Jean-Baptiste Casedevant, PMP, project and portfolio manager, EDF Renewables North America, San Diego, California, USA.

"The readiness to change and to evolve as much as the sector is evolving is really a mindset that's important," he told *Projectified™*.

Along with developing their technical skills and business acumen, project managers must understand the factors that influence the value of the energy the project will produce.

"The energy California could use between 4 p.m. and 9 p.m. we now value a lot more than the energy produced in the middle of the day," Mr. Casedevant said. "What can make a difference is really to understand the business case of a project and what parameters matter the most when it comes to the project value."
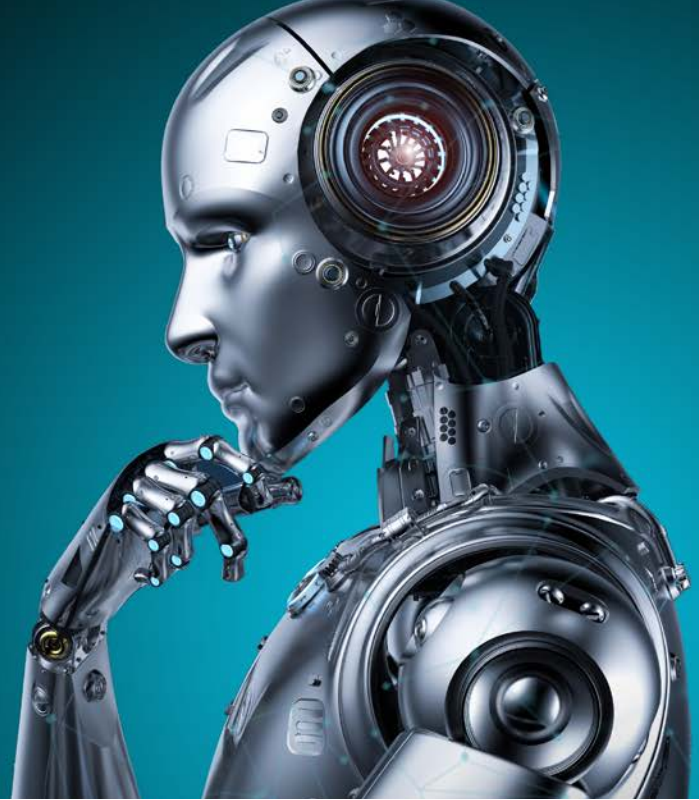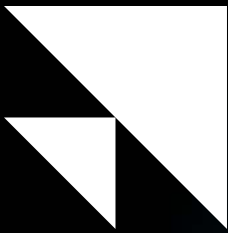
Insight 3

As artificial intelligence truly moves into the mainstream, it brings harsh realities—and immense opportunities for project leaders with the right blend of people and tech skills.

> Automation, AI and Robotics

> Business Environment

> "In the future, artificial intelligence will be doing a lot of the reporting and administrative work. So it will be important for project managers to invest in their leadership skills and other people skills because those will never go away."
>
> —Priscila Duarte, PMP, Microsoft, São Paulo, Brazil

Artificial intelligence (AI) has the potential to usher in an era of innovation that will improve humanity in ways we can't even begin to fathom. It could also bring on a dystopia where sentient robots rule and most of our jobs have been automated. The responsibility rests with project leaders to help make the most of the technology while mitigating the risks to society.

At this point, we're only starting to see the beginnings of AI in action. Healthcare organizations using the technology to improve diagnoses. A fashion designer futureproofing her company's brick-and-mortar venues with mirrors tricked out with AI, letting customers adjust lighting, select garments in additional sizes and colors, and even save items to their online account for later consideration.

Such projects have the potential to transform not just companies, but entire industries. And more organizations are getting on board: In 2019, McKinsey reported a nearly 25 percent year-over-year increase in the use of AI in standard business processes.

"I believe we're barely scratching the surface for the use of AI," Hari Doraisamy, senior director, mission-critical support at SAP, Newtown Square, Pennsylvania, USA, said in PMI's *AI@Work: New Projects, New Thinking.*

While nearly 60 percent of organizations have deployed AI, according to a 2019 survey by Gartner, those organizations had an average of only four AI projects in the works. Respondents expected that number will jump to 35 by 2022.

It's not just the type of projects that's shifting, but how they're being done. Project professionals already manage 23 percent of initiatives using AI and expect that will jump to 37 percent over the following three years, according to PMI's *AI Innovators: Cracking the Code on Project Performance*.

Yet uncertainty still looms large around what's real—and how AI will actually be used.

"Hearing and reading about artificial intelligence and its benefits … it's interesting, it's exciting, it's innovative," said Sindhu Joseph, founder and CEO of CogniCor Technologies, San Francisco, California, USA. "But exploiting that technology and incorporating that into your business is a completely different story."

AI is misunderstood, said Audrius Zujus, founder and CEO, Aresi Labs, Vilnius, Lithuania. "It's been so hyped that most people think it's now in a really advanced state and can do anything," he told *PM Network*. Reality check: It can't.

That lack of understanding has only amplified fears. And there is growing evidence that AI will be capable of performing many jobs in the workplace of the future—even roles that, until recently, many believed could be executed only by humans. A report by the Brookings Institution put it bluntly: "AI could affect work in virtually

Project professionals currently manage 23% of initiatives using AI and expect that will jump to 37% over the following three years.

Source: *AI Innovators: Cracking the Code on Project Performance*, PMI, 2019

By 2021, augmented AI will create **US$2.9 trillion of business value** and **6.2 billion hours of worker productivity** globally.

Source: Gartner

every occupational group." While much has been made of the robots stealing industrial jobs, the Brookings report said better-paid, better-educated professionals are also highly susceptible to AI's spread into the economy.

Deutsche Bank announced it would be cutting 18,000 jobs, with the bulk of reductions "achieved by using technology to streamline costs," said Ram Nayak, head of Deutsche's markets business and co-head of the investment bank, in a statement to investors. A new automated valuation process, for example, enabled a 25 percent reduction in headcount in the valuations team, according to eFinancialCareers.

Influential voices in the technology world have long warned of unintended consequences if AI is left unfettered. More than 8,000 people—including Tesla CEO Elon Musk, Apple co-founder Steve Wozniak and the late Stephen Hawking—signed an open letter urging that ongoing research efforts focus "not only on making AI more capable, but also on maximizing societal benefit" and ensuring AI systems "do what we want them to do."

While the risks are not to be glossed over, AI also creates tremendous opportunities, often leading to improved productivity and quality. Gartner predicted by 2021 augmented AI will create US$2.9 trillion of business value and 6.2 billion hours of worker productivity globally.

Capgemini's Priya Patra, PMP, uses a compliance audit bot that helps identify open items, sends follow-up emails and documents status updates. It also tracks progress against the project plan or audit checklist and automates reporting, including report templates and audit committee decks. Using bots gives her "more time to focus on analysis, forecasting and building relation-

ships—the things done best by humans," Ms. Patra wrote in *PM Network*.

Stephen Xu agreed: "It means more time to do strategic thinking and high-level planning," said Mr. Xu, head of the project management office, infrastructure service business unit, Alibaba Group, Hangzhou, China.

AI can help teams assess and manage risk. "An organization can put its project reports into a statistical or AI model to identify the most common risks and causes of failure," Mr. Zujus said. "The same goes for lessons learned and project successes. AI can help teams look for patterns as an indication of what might happen next."

For project professionals with the right blend of people and tech skills, the shift to AI could actually open up career opportunities. One example of the potential talent demand: McDonald's snapped up two AI and machine learning startups to help the fast-food giant automate and personalize its drive-through service.

AI@Work reported that over the next three years, 27 percent of respondents said AI will cause the number of new project management jobs to increase, versus 14 percent who said it will drop.

"We will always have a need for highly skilled project managers," said Alison Bakken, senior vice president and global head of the technology program office at Thomson Reuters, St. Paul, Minnesota, USA. "I don't see the technology taking that over."

But there will be a new focus. "In the future, artificial intelligence will be doing a lot of the reporting and administrative work. So it will be important for project managers to invest in their leadership skills and other people skills because those will never go away," said Priscila Duarte, PMP, technical delivery manager, Microsoft, São Paulo, Brazil.
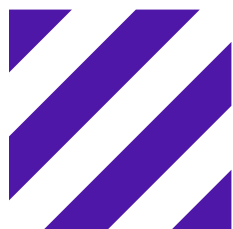
Insight 4

Rampant protectionism is forcing a rethink of the once unstoppable force of globalization. But for many project teams, it's cross-border business as usual (with a few tweaks).

> **Demographic Trends**

> **Political Climate**

> "International exchange empowers people and businesses around the world to collaborate and seize new opportunities. Ultimately, what we're seeing today is the evolution of globalization, not its decline."
>
> —John Pearson, DHL Express

The business world has long been defined by its massive global scale. People, goods, services, information—all on the move, from Chile to China (and all points between). Yet the sheer scope of globalization took an economic toll on many communities, leading to a wave of increasingly protectionist—and even discriminatory—trade, immigration and work policies.

According to a report by Allianz and Euler Hermes Economic Research, the United States has adopted 790 protectionist trade measures since 2008, while India has adopted 566, Brazil 302 and China 256. "Protectionism is the new normal," the report declared, predicting the volume of global trade of goods and services would grow by a meager 1.7 percent this year.

The biggest sign of the retreat from globalization: Brexit, the United Kingdom's drawn-out decision to leave the European Union—even as harbingers of economic decline loom. A Q3 2019 Deloitte survey found 76 percent of CFOs in the U.K. believe the nation's withdrawal from the EU will hamper the long-term business environment.

The economic anxiety extends far beyond Europe. The Brookings-Financial Times TIGER index predicted a "synchronized stagnation characterized by weak growth in some major economies and essentially no growth or even mild contraction in others."

"Persistent trade tensions, political instability, geopolitical risks and concerns about the limited efficacy of monetary stimulus continue to erode business and consumer sentiment, holding back investment and productivity growth," the report said.

All of this is happening in what can only be called a toxic political environment, with many of human nature's less attractive qualities—nativism, racism, xenophobia—on full display in many countries. Case in point: the backlash to the huge influx of Middle East refugees in a number of European countries.

Such blatant isolationism places further stress on the efficient planning and execution of projects by multinational, multiethnic and geographically distributed teams. The uncertainty on immigration and visa issues, for example, complicates efforts for organizations to tap talent from other parts of the world.

For project professionals, this means adapting to greater volatility in the business landscape—and job market.

"With trade wars and Brexit affecting the status quo, project managers will need to be agile toward changing operating models and cultural setups in the workplace," said Anurag Garg, director, aerospace and defense leader, PwC India, New Delhi, India.

And yet, this is where project leaders excel, collaborating across time zones, no matter the geopolitical tensions—a true case study in the power of globalization.
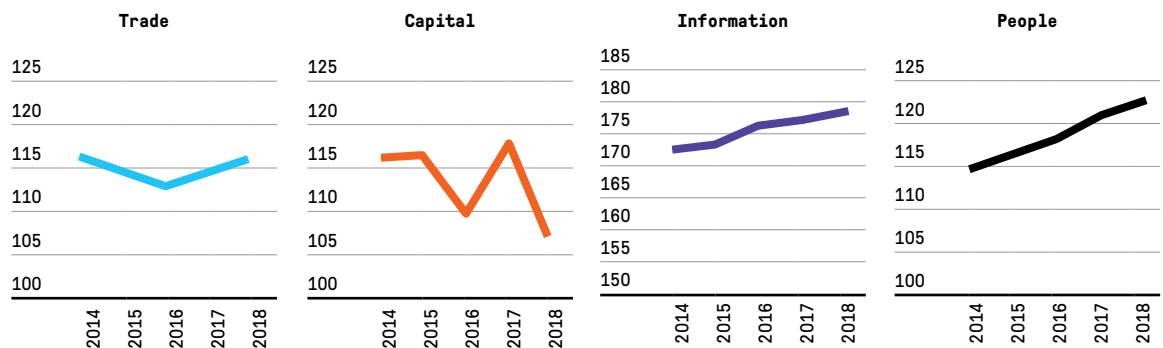
There are also signs that many organizations are keeping calm and carrying on, isolationism be damned.

46% of global workers interacted with team members in another country every day.

Source: Globalization Partners

FOUR PILLARS OF GLOBAL CONNECTEDNESS: TRADE, CAPITAL, INFORMATION AND PEOPLE, 2014–2018

Trade	Capital	Information	People

The decline in global connectedness in 2018 was driven by the capital pillar. The trade, information and people pillars all saw moderate growth in 2018.

Source: *DHL Global Connectedness Index*, 2019

"With trade wars and Brexit affecting the status quo, project managers will need to be agile toward changing operating models and cultural setups in the workplace."

–Anurag Garg, PwC India, New Delhi, India

Even the Allianz and Euler Hermes Economic Research report declared "the worst is behind us." The trade war between the United States and China, for example, seems to be cooling. At the same time, China is forging ahead with its Belt and Road Initiative, a US$8 trillion affair spanning more than 60 countries that account for two-thirds of the global population.

For many organizations, there's simply no turning back. According to a 2019 survey by Globalization Partners, 46 percent of global workers interacted with team members in another country every day.

The *DHL Global Connectedness Index 2019* showed a drop in international trade capital flows but indicated "no sign of a collapse," noting that global information and people flows were still advancing. The net result: Despite "strong headwinds in global geopolitics and trade," the index stayed close to its record high of 2017.

"International exchange empowers people and businesses around the world to collaborate and seize new opportunities," said John Pearson, CEO of DHL Express. "Ultimately, what we're seeing today is the evolution of globalization, not its decline. Decision makers need to be careful to not overreact to strong rhetoric or headlines."

Indeed, some organizations are launching projects to meet uncertainty head-on. In anticipation of Brexit, for example, global biotech organization CSL Behring pushed to secure its supply chain, ensuring anything the company obtained from Britain could be sourced elsewhere within the EU.

"We started to address the problem early. We didn't wait for Brexit," said Dirk Nadler, PMP, senior manager, project delivery support, CSL Behring, Marburg, Germany.

Ultimately, learning to navigate a changing geopolitical landscape can only help project professionals.

"Any form of large-scale complex change is good for career development in project management, as it provides new learning experiences and enhances skill sets," said Peter Glynne, co-chair, Joint All Ireland Brexit Working Group, Dublin, Ireland.

Brexit, for example, has "increased the demand for portfolio management through an intense focus on 'whole organization' impact and change."

Insight 5

The global infrastructure gap between needs and investment is wide. To close it, project leaders are relying on data-driven innovation—and good old-fashioned people skills.

Economy Development and Project Management

Economic Influence of Companies

Macroeconomic Trends

"You have to be smarter and more agile in your execution to cut costs and get to operation faster."

—Neil Riddle, Black & Veatch Construction Inc., Atlanta, Georgia, USA

The world is in dire need of an infrastructure overhaul. As urban population centers swell, climate change intensifies and emerging economies come in to their own, demand for water, roads, airports, ports, electrical grids and communication networks also increases.

The sheer scope of the problem is enough to daunt any political leader. But for China, it's a way to solidify its power on the global economic stage. And so began the Belt and Road Initiative, the largest infrastructure blitz the world has ever seen—with 1,814 projects and counting. China even launched the Asian Infrastructure Investment Bank as its own answer to the World Bank, promising faster loan originations for infrastructure projects across the developing world.

Yet even as China's megaprogram spreads to Europe, there's much work still to be done—and a huge funding gap: The G20's Global Infrastructure Outlook estimated that infrastructure investments totaling US$94 trillion are required by 2040 across 56 countries and seven sectors—with current budgeting trends falling US$15 trillion short.

That means a push to do more with less. "You have

to be smarter and more agile in your execution to cut costs and get to operation faster," said Neil Riddle, president, Black & Veatch Construction Inc., Atlanta, Georgia, USA.

Governments—and by extension the private-sector organizations they hire—face enormous pressure to speed project delivery and prove value. There's a bit of history to overcome here, with infrastructure megaprojects infamously prone to cost overruns and delays. Case in point: Per the Evening Standard, the Crossrail project in London, England is now £3.4 billion over budget and years behind schedule.

To buck the trend, many teams are turning to technology. Mr. Riddle's teams, for example, often use drones to track progress, "which gives us a lot more visibility, and it goes a lot quicker than taking pictures manually," he said.

McKinsey estimated that construction and engineering firms' investment in technology has doubled in the past decade to hit US$18 billion. 3D printing, modularization, robotics, twin models and artificial intelligence all stand to transform the industry.

To help determine demand on a transport project in the U.K., for example, a team at Jacobs used internet of things (IoT) sensors to capture data on 400 million journeys taken by car, bus, train, bicycle and subway. Armed with that information, the team could determine which roads to expand and where to add new routes. And they could make those decisions quickly.

Infrastructure investment at current trends and need
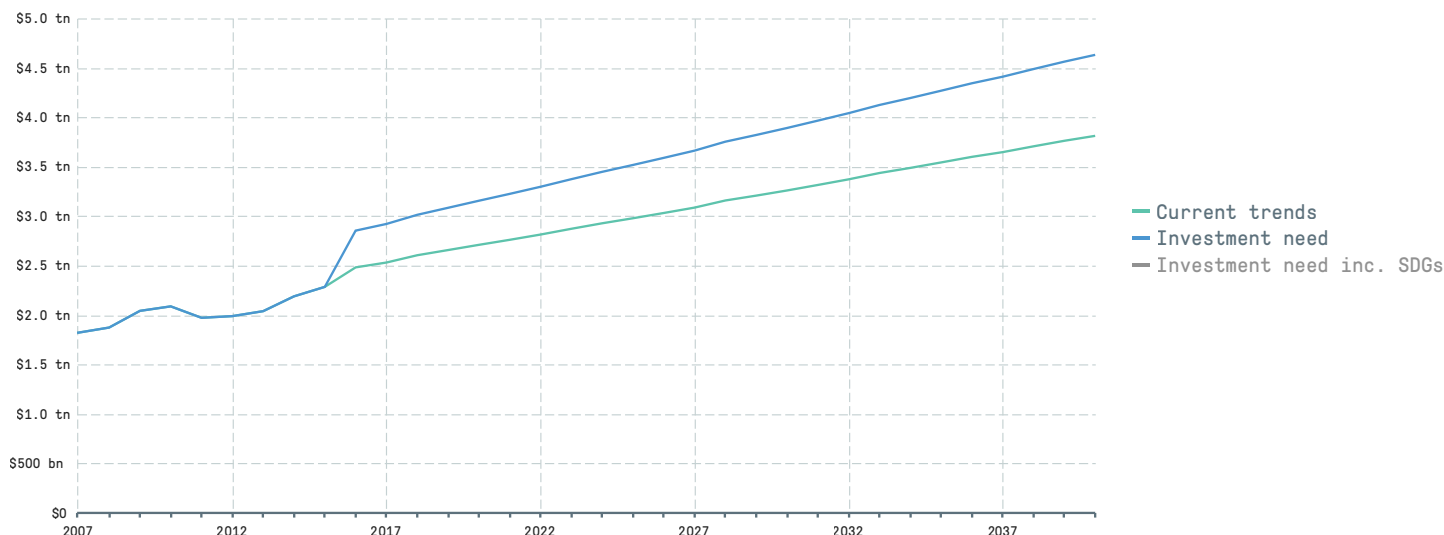
SDG disclaimer: Includes the additional investment needed for countries that have not yet met the SDGs. Source: *Global Infrastructure Outlook*, G20, 2018

Construction and engineering firms' investment in technology has doubled in the past decade to hit **US$18 billion.**

Source: McKinsey

"We were able to collect that data in three months," said Pierluigi Montanini, vice president, global director, architecture solutions, Jacobs, Hallandale Beach, Florida, USA. "That would have been unthinkable 10 years ago."

And then there's the treasure trove of schedule, cost, quality and safety data that many contractors have been sitting on, said Colin Cagney, director in major projects advisory practice, KPMG, Phoenix, Arizona, USA.

It's time to put all that information to use.

"With increased data analytics … teams will be able to benefit from the experiences of the company as a whole and historically, and they'll be able to know when in the past most projects have gone over schedule, what tasks have been delayed, where are the cost increases and be able to better mitigate those going forward," he told *Projectified™.*

Data also fuels one of the latest and most promising tech tools: the digital twin. A virtual replica of a city, it pulls information from government agencies, 3D models, IoT, real-time movement patterns and other sources—allowing project leaders to better anticipate ROI, inter-dependencies and any challenges that might arise. They can analyze the repercussions of construction work on traffic or the noise pollution from new rail lines. They can look at sun patterns to optimize a new solar project. And public stakeholders can visualize and better comprehend the proposals.

Such data-driven decision-making will enable "unprec-edented efficiency across the infrastructure life cycle," according to KPMG's 2019 *Emerging Trends in Infrastruc-ture* report.

Along with the benefits, though, new technologies also add risks. As the IoT and digitalization deepen connectivity, for example, electrical grids become more vulnerable to cyberattacks, the World Economic Forum noted in its *Global Risks Report 2020*. To tackle that kind of complexity, project leaders will need to draw on waterfall approaches typically used on construction, as well as agile.

And even with all the whiz-bang technology, project leaders will still need good, old-fashioned people skills to create stronger societal consensus. Because despite the overwhelming need, infrastructure projects can be a tough sell, especially when it means negotiating with multiple groups of stakeholders with conflicting objectives. Government sponsors, for example, may want projects completed quickly to show ROI, while community members might push back when projects threaten their land.

"The project manager has to be able to bring all of these groups together to agree on a single roadmap and desired outcome, or it won't work," said Yoftahe Yohannes, PMP, project manager, Ericsson, Addis Ababa, Ethiopia.

Assigning a point person to manage government stake-holders—and navigate the maze of bureaucracy—can help expedite the process, he told *PM Network*. To secure buy-in from the community, Mr. Yohannes makes an ef-fort to add and train local talent rather than using expats.

"As a project manager," he said, "it's your job to con-vince everyone that the value of the project is bigger than the risks."

Insight 6

Keeping information safe requires a united front, backed by a cross-disciplinary, enterprise-wide cybersecurity culture.

Connectivity and Cybersecurity

Capital Flows

> "We need to make sure that these systems that we're trying to field, and these capabilities, have security built in from the start. Security should be part of that initiating phase. And that goes for the things like dev ops. It should be sec dev ops."
>
> –Retired Brigadier General Greg Touhill, former U.S. chief information security officer, Washington, D.C., USA

Analog is not an option. A new generation of digital natives is pushing businesses, governments and nonprofits to transform how they operate—and forcing them to contend with cybercrime, information warfare and a whole host of new threats.

The attacks are varied, from the theft of an individual's banking password to the full-on infiltration of increasingly tech-driven pieces of critical physical infrastructure, like a power grid or a public transit system.

With such complex technologies, project leaders must forge ties across the organization, including with the corporate cybersecurity teams, said Albert Torres, PMP, cybersecurity program manager, Lockheed Martin, San Antonio, Texas, USA.

"In the past cybersecurity was seen as antagonistic, and they would block many projects from moving forward, but they can really help develop strategies that will not only meet the cybersecurity requirements but help you build working solutions," he told *Projectified™*.

Seeking out innovation is a must: While the overall number of security breaches is starting to drop, on average, a report by the Identity Theft Resource Center found cyber criminals are walking off with more valuable information. In the first six months of 2019, 3.2 billion records—including emails and passwords—were exposed in just eight breaches, according to Risk Based Security.

And organizations pay a high price. A report by IBM and Ponemon Institute revealed the average cost of a data breach globally in 2019 was US$3.92 million. To avoid taking this type of massive hit, organizations are making cybersecurity a top priority—and it starts with their own teams.

Whether it's their personal devices or their email accounts, an organization's employees present a wealth of vulnerabilities for hackers to try to exploit. The best line of defense is for project leaders to build a culture of security across the enterprise, said retired Air Force Brigadier General Greg Touhill, who served as the United States' first chief information security officer (CISO).

"Careless, negligent and indifferent personnel are every leader's challenge and represent the greatest threat environment that we're seeing right now," Brig. Gen. Touhill told *Projectified™*.

As harbors of sensitive client information, law firms are especially ripe targets for hackers. According to a 2019 PwC survey, 100 percent of the top 10 law firms had experienced a cybersecurity incident in the past year. And they're taking action.

"Ten years ago, few law firms were making significant information and cybersecurity investments," said Mark Walmsley, CISO, Freshfields Bruckhaus Deringer, London, England. "Now, it's considered pure hygiene. It's a business basic principle," he told *PM Network*.

The U.K. firm no longer relies solely on traditional cybersecurity measures such as anti-virus and firewall software to safeguard its clients' confidential data. It's now investing heavily in cybersecurity

US$3.92 million
Average cost of a data breach globally in 2019

Source: IBM and Ponemon Institute

projects that incorporate artificial intelligence—and teams use waterfall to execute those projects. Agile has "many benefits," Mr. Walmsley said, "but waterfall is preferred for the delivery of security technology or capability."

In healthcare—another frequent hacking victim—a 2019 survey by Infoblox found 92 percent of IT leaders were confident in their organization's ability to respond to a cyberattack. Part of the reason? They've been proactive about training their teams, with investment in employee education about IT security up 10 percent over the previous two years.

Getting team members up to speed on security issues can do a lot to bolster defenses. And integrating cybersecurity reviews into the project initiation phase helps ensure risks are addressed upfront.

"We need to make sure that these systems that we're trying to field, and these capabilities, have security built in from the start," said Brig. Gen. Touhill, now president of Cyxtera Federal Group in Washington, D.C., USA. "Security should be part of that initiating phase. And that goes for the things like dev ops. It should be sec dev ops."

For their cybersecurity efforts to be effective,

organizations require well-integrated multidisciplinary teams—drawing on everyone from software developers to engineers and security providers.

It often represents a new approach to projects, especially in sectors outside of IT. Kimberly Valentine, PMP, had spent 20 years at IBM before she took on her role as the program manager for the office of the CISO at Brunswick Corp., in Denver, Colorado, USA. And she discovered a very different culture.

"A technology company like IBM, we're building secure technology from the ground up and thinking about that the whole time," she told *Projectified™*. "But when you move into other sectors, they maybe have not had the time or maybe the awareness to start thinking of cybersecurity across the entire enterprise or across all of their processes."

And that means project professionals will need not only technical prowess but stellar leadership and stakeholder engagement skills, too.

"It [takes] marketing and education and awareness across the whole enterprise culture—and you get the buy-in because they just realize it is important," Ms. Valentine said. "But it takes time."
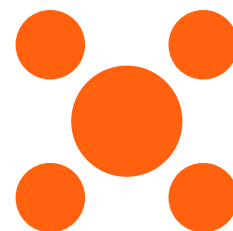
CONCLUSION

Climate change. AI. Globalization. The infrastructure gap. Cybersecurity. Shifting demographics.

The beginning of a new decade ushers in a world full of complex issues that require a new kind of thinking. We need to reimagine not just the nature of work, but the way it gets done. This isn't about defining work by its features or attributes or who holds what role. This is about figuring out what needs to get done and the best way to do it. This is about people—no matter their title—solving a variety of problems in industries big and small, and across all regions around the globe.

This is The Project Economy—and this is how we will prepare ourselves and our organizations to deliver value and create a better world.

PMI advocates that to truly make a difference, organizations need project leaders who bring holistic perspectives, a deep curiosity and broad skill sets to the work at hand. That means an increased demand for versatile and bold project leaders—capable of embracing new ways of working, leading diverse teams and exploring innovative solutions.

Are you ready?
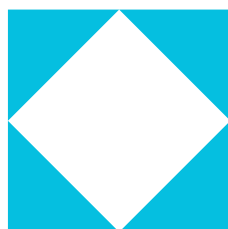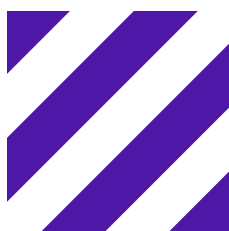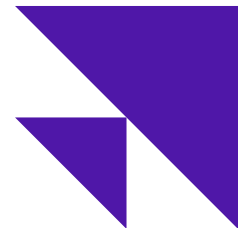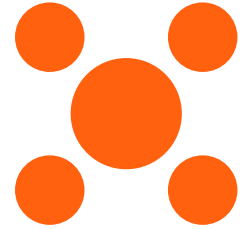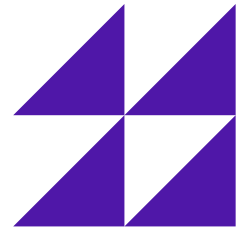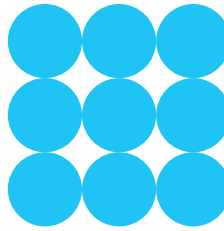
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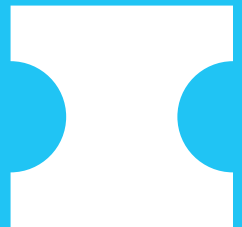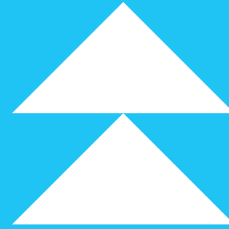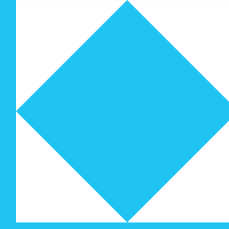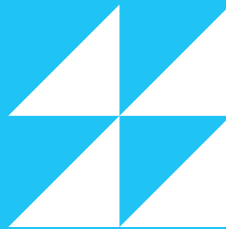*Cybersecurity in Healthcare: What Has Changed Two Years on From WannaCry*, Infoblox, 2018
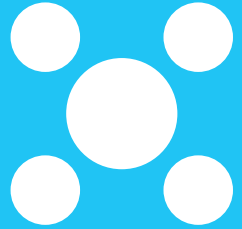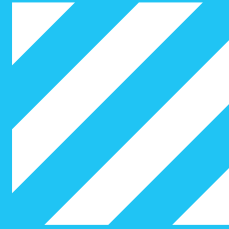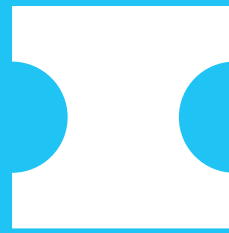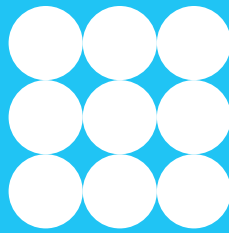
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PMI is the world's leading association for those who consider project, program or portfolio management their profession.

Through global advocacy, collaboration, education and research, we work to prepare more than 3 million professionals around the world for The Project Economy: the coming economy in which work, and individuals, are organized around projects.

Celebrating our 50th anniversary in 2019, we work in nearly every country around the world to advance careers, improve organizational success and further mature the project management profession through globally recognized standards, certifications, communities, resources, tools, academic research, publications, professional development courses and networking opportunities.

As part of the PMI family, ProjectManagement.com creates online global communities that deliver more resources, better tools, larger networks and broader perspectives.

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