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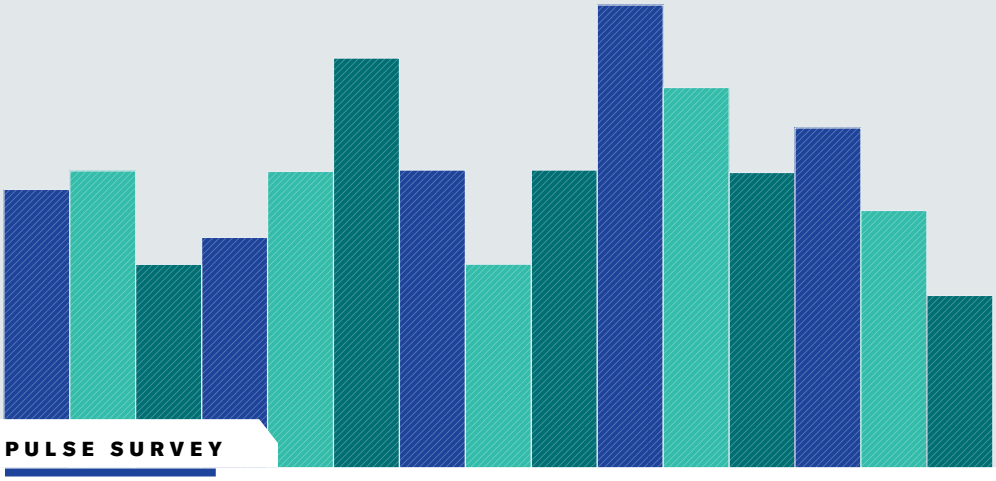

PULSE SURVEY

Capitalizing on the Evolution of Emerging Technologies in Latin America

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SPONSOR PERSPECTIVE

Latin American businesses face two critical challenges in the emerging technologies landscape: delivering digital outcomes and harnessing the power of artificial intelligence (AI). NTT DATA has sponsored this Harvard Business Review Analytic Services research to provide crucial insights and analysis, informing and guiding enterprise leaders across the region as they aim to meet these goals.

Latin America's tech landscape is undergoing a significant shift compared to last year. Generative AI (gen AI) is rapidly emerging as a major force, mirroring a global trend but potentially with even greater impact in our region.

Businesses across the most important sectors, from banking to mining and manufacturing to logistics, are now actively exploring uses for AI in its widest forms, with gen AI at the heart of promising value propositions. We are excited by this development because we think Latin America has much to gain in productivity, profitability, and growth from innovative technologies. Yet there are obstacles.

The talent gap is still large. Businesses need to develop and retain skilled individuals, while also offering more flexible and creative work models. Leading companies are finding success by empowering their talented people. They have discovered that fostering self-expression and professional development reduces turnover and attracts top performers. We urge senior leaders across industries to reimagine their structures, cultures, collaboration models, and talent development methods to unlock the full potential of advanced technologies and accelerate innovation.

Breaking new ground isn't easy, but the rewards are great. Senior executives must champion new technologies but also demonstrate clear ROI. The answer lies in learning from successful Latin American businesses leveraging gen AI, digital twins, intelligent networks powered by 5G, or augmented reality, to deliver measurable competitive advantages. By integrating AI and other emerging technologies into the core of their workflows, at the very foundation of their processes, companies will streamline operations, achieve significant efficiency gains, and deliver accelerated growth.

Latin America has outstanding growth potential and superb human capital. By showing visionary leadership in adopting new concepts, top executives across the region will deliver exceptional results for their shareholders, employees, customers and, perhaps the greatest prize, the societies in which they operate. This report gives deeper understanding, direction, and support in turning new technologies into long-term advantages for the region.

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Head of Digital Technology

NTT DATA Iberia, Latin America and International Organizations

Capitalizing on the Evolution of Emerging Technologies in Latin America

Latin America is home to a wide array of cultural, political, and socioeconomic conditions. Rich in diversity, the region encompasses a variety of spoken languages, government policies, and even communication styles. Yet the organizations that make up Latin America's economic engine share a common goal: to be at the forefront of a technological revolution that will redefine industries and drive economic growth.

For many Latin American organizations, deploying highly disruptive emerging technologies, such as artificial intelligence (AI), digital twins, blockchain, and edge computing, is a critical step toward achieving significant competitive advantages. In fact, a December 2023 survey by *Harvard Business Review* Analytic Services of 372 members of the Harvard Business Review audience in seven Latin American countries (Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, and Peru) shows that 92% of survey respondents say their organization has been successful in using emerging technologies during the past 12 months.

Despite such progress, emerging technologies have yet to have a real financial impact on Latin American organizations. Only 28% of respondents cite increased growth and profitability as a business benefit their organization has realized from using emerging technology, and an even smaller percentage (18%) cite increased market share. Furthermore, less than half (45%) of respondents say their organization has achieved a positive return on its investment from its use of emerging technologies.

"Enterprises are willing to invest in the purchasing of technologies, particularly mature ones, but they still lag in terms of incorporating them into business processes," says Raul Katz, a professor at the Universidad de San Andrés in Buenos Aires, Argentina.

HIGHLIGHTS

92% of survey respondents say their organization has been **successful in using emerging technologies during the past 12 months**.

61% say their organization **plans to implement generative AI and/or other types of artificial intelligence** in the next year.

45% agree their organization has **achieved a positive return on their investment** from its use of emerging technologies.

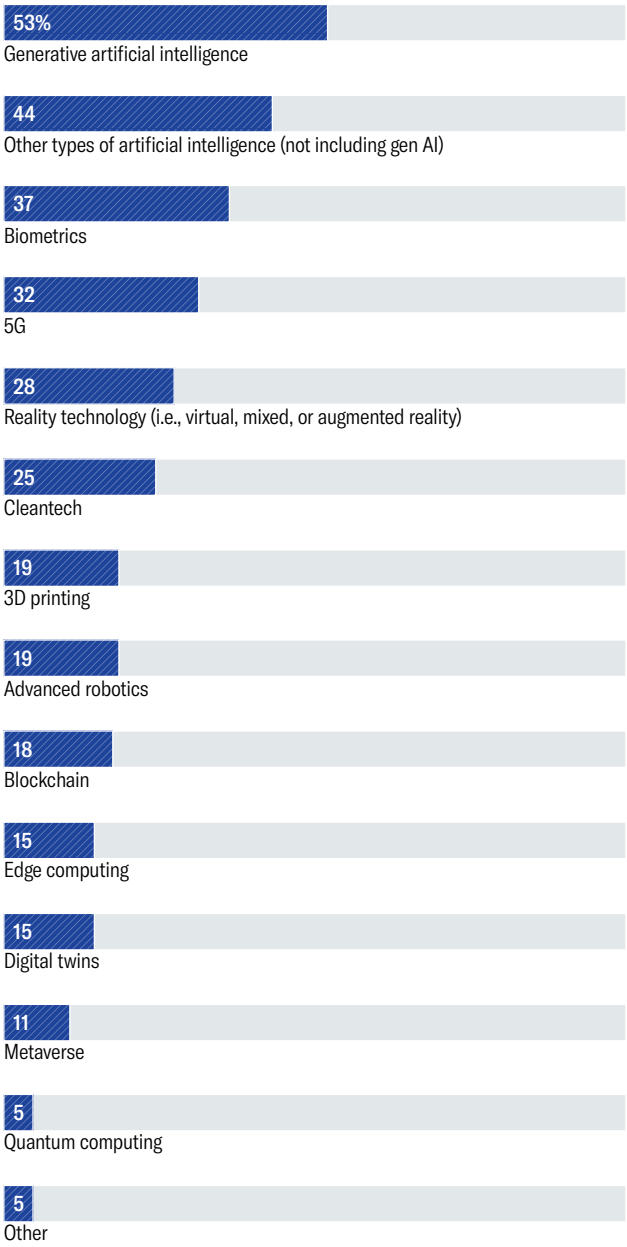
Due to rounding, some figures in this report may not add up to 100%.

FIGURE 1

A Vested Interest in Generative AI (Gen AI)

Generative AI (gen AI) and/or other types of artificial intelligence are being used by the majority of organizations

Which of the following emerging technologies does your organization currently use? *Select all that apply.*



Base: 372 respondents. Not shown: 0% don't know, 0% none.

Source: Harvard Business Review Analytic Services survey, December 2023

Indeed, advancing along the maturity curve to incorporating emerging technologies to automate mundane tasks, streamline workflows, and glean valuable insights from data means addressing issues such as talent shortages, which can directly influence the effective implementation of these technologies. Strong leadership and cross-enterprise collaboration are essential to driving adoption of innovative tools such as generative AI (gen AI) and blockchain. Similarly, embracing new workplace strategies and partnerships can deliver a greater return on investment in emerging technologies at a time when many Latin American companies are attempting to secure a place on the global economic stage.

This paper explores the evolution of emerging technologies in Latin American organizations. It examines the technological, cultural, and organizational challenges they encounter as they continue to use these technologies. The paper also delves into the strategies deployed by organizations in the region that achieve positive business outcomes.

A Rise in Generative AI

Although comparatively new, technologies such as digital twins, blockchain, and edge computing have earned the trust and recognition of IT teams, many of which have already integrated these tools into everyday workflows. Gen AI, on the other hand, is freshly capturing the imagination of Latin American organizations, and for good reason. Capable of creating new content, including text, audio, images, or other media using generative models, gen AI has the potential to deliver significant benefits to the region, including improvements in manufacturing, health care, and agriculture. In fact, 74% of survey respondents say their organization is currently using gen AI and/or some other type of AI. **FIGURE 1**

Gen AI's rise in popularity signals a shift in technological preferences among Latin American organizations. While 61% of respondents say their organization plans to implement gen AI and/or other types of artificial intelligence in the next year, interest in other tools appears to be waning, as only 13% of respondents plan to deploy digital twins, 10% metaverse technology, and 6% quantum computing during the same period.

At RappiCard México, for example, developers are starting to use gen AI to create code for the Mexico City-based financial services company's mobile e-commerce app. By using large language models and natural language processing, says Gerardo Avilez, RappiCard's chief digital strategy officer, developers can create code 30% faster than with traditional development tools. Built-in security capabilities, such as encryption, also help reduce time spent using software to test code for security vulnerabilities.

Banco de Crédito (BCP) is another Latin American organization achieving productivity gains by using emerging

technology. The Lima, Peru-based financial services company relies on gen AI to write new code, document code as it's created, and refactor code into various programming languages. "We've seen increases in productivity ranging between 20% [and] 60%, depending on the task," says David Saenz, BCP's chief operations officer.

Such measurable returns on gen AI investments are helping drive long-term commitment to the technology. Indeed, 76% of respondents expect gen AI to be very or extremely valuable to their organization in the next year, and 84% believe gen AI is likely to be a competitive game changer within their organization's industry. More importantly, organizations aren't limiting gen AI's capabilities to a single task or use case. Currently, respondents say their organization is using gen AI for business intelligence and data analysis (30%), for innovation and product development (25%), and for customer service and user experience (21%). Many more respondents indicated that their organization is considering using gen AI in the next 12 months for uses such as business intelligence and data analysis (47%), for innovation and product development (40%), and for customer service and user experience (50%). **FIGURE 2**

Yet these are experimental days for gen AI compared to more-established technologies, such as data analytics, which are already having a transformational impact on how businesses operate. Consider Vista Energy SAU. The Neuquén, Argentina-based shale oil and shale gas operator relies on 20 trucks to transport proppant from a drilling site to a proppant manufacturing plant every day. Because the 62-mile journey involves the use of costly equipment, any nonproductive time at the drilling site due to transportation delays can cost the company as much as $2,000 per hour, according to José Biondi, Vista Energy's innovation and technology manager.

"We've seen increases in productivity ranging between 20% [and] 60%, depending on the task," says David Saenz, BCP's chief operations officer.

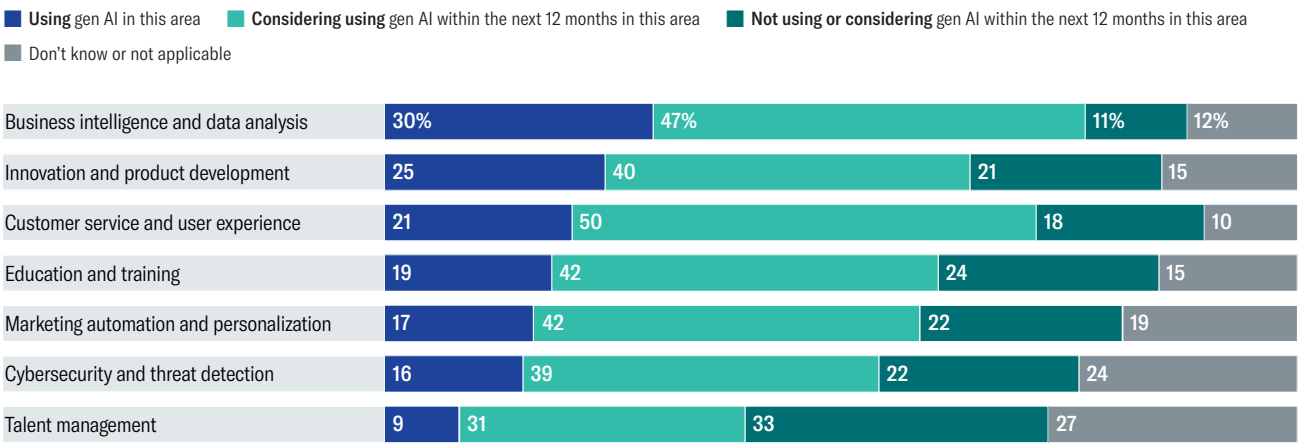
To maximize productivity, Vista Energy developed an AI-powered analytics platform that works in tandem with satellite technology to track the location of each truck. Using this data, the analytics platform provides proppant logistics coordinators with optimized route recommendations based on factors such as weather and road blockages. Since deploying

FIGURE 2

A Multi-Use Approach to Gen AI

Organizations are considering using the technology for a variety of use cases

To what extent is your organization exploring the use of generative AI in the following areas of the business?



Base: 372 respondents.

Source: Harvard Business Review Analytic Services survey, December 2023

the advanced analytics system, Biondi says Vista Energy has not only eliminated downtime caused by proppant delivery delays but has also realized a "more than 10-times" return on its investment in the technology because of productivity gains and operational cost savings.

Emerging technology is also helping Latin American organizations accelerate decision making and enhance customer support. For instance, BCP uses sophisticated AI and machine learning models to predict consumer interest in new products, evaluate borrower risk, and determine the amount of money that must be stored in automated teller machines to meet customer demand.

"The value we've added with data and analytics projects in the last few years is probably a quarter of a billion dollars," says BCP's Saenz. "It's a huge number."

In fact, survey respondents report that their organizations are achieving a wide array of benefits from using emerging technologies, including increased employee efficiency/productivity (58%), faster decision making (48%), increased cost savings (47%), and differentiation from competitors (45%). **FIGURE 3** Moreover, 83% agree that the use of emerging technology provides their organization with a competitive advantage in their region.

Blockades to Business Value

Countries across Latin America are beginning to realize the full potential of emerging technologies. Brazil's e-commerce sector, for example, continues to experience rapid growth and is expected to exceed $200 billion by 2026.[1] As part of its National Development Plan, Colombia plans to increase internet access and connect 85% of the country through digital connectivity and device access.[2] Meanwhile, Chile's Santiago Declaration, signed in October 2023, represents a growing commitment to participating in today's global dialogue on AI.[3]

Together, these initiatives, combined with the efforts of Latin American organizations, are a step toward deepening the region's digital footprint. But certain obstacles must be met head-on to maintain progress, starting with the region's scarcity of qualified labor.

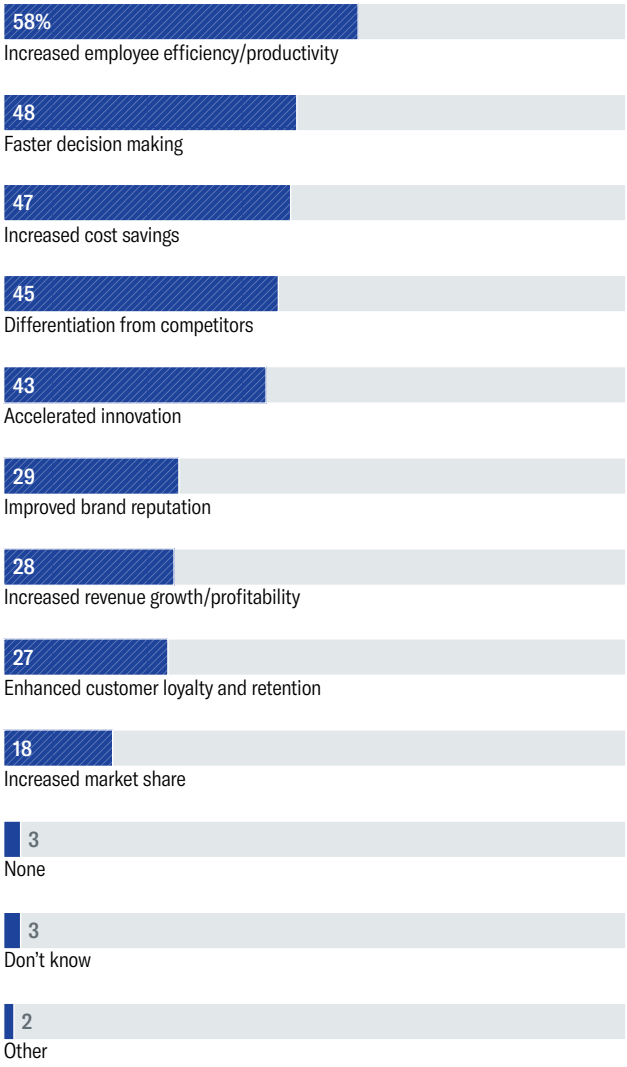
Nearly half (48%) of respondents cite a lack of skilled talent as the greatest challenge to deriving business value from using emerging technologies. There are multiple explanations for Latin American organizations' struggle to build the workforce needed to deploy and maintain innovative technology. For starters, finding talent with the necessary skills is challenging, especially when it comes to working with newer and more experimental technologies. "We need more specialized talent that know and understand how to use gen AI tools," says RappiCard's Avilez. "That's one of the challenges we'll be facing in the couple of years ahead."

FIGURE 3

Efficiency and Speed Gains

Embracing emerging technologies can help boost employee efficiency and accelerate decision making

What business benefits has your organization realized from using emerging technologies? *Select all that apply.*



Base: 372 respondents.

Source: Harvard Business Review Analytic Services survey, December 2023

A lack of commitment to upskilling existing employees is also standing in the way of progress, notes Katz of Universidad San Andres. "Our research indicates there's very low willingness on the part of companies to actually invest in retraining their employees," he says. One possible

explanation for this reluctance, he adds, is the high cost associated with upskilling workers.

Another impediment to deriving business value from emerging technologies is the absence of a clearly defined strategy, cited by 46% of respondents. As it stands, only 6% say their organization has a fully developed enterprisewide strategy with defined objectives for using gen AI. Thirty-eight percent say their organization is making progress by currently developing such a strategy. But as a relatively new technology, gen AI requires careful assessment of internal capabilities, technological limitations, and business objectives to ensure a return on investment. “First, you have to determine your priorities as a business,” says Luis Kubota, a researcher with the Institute for Applied Economic Research in Brasilia, Brazil. “If you try to tackle everything at the same time, it’s a recipe for failure,” he asserts.

Organizations must also take steps to introduce emerging technologies into an existing technology stack. “While emerging technologies have rapidly developed, it’s still complex to integrate them into an installed technology base in a simplified way,” says César Valdes, chief technology officer at COPEC SA, an energy and forestry company in Santiago, Chile.

In some instances, emerging technologies can even be considered a double-edged sword. For example, 37% of respondents cite cybersecurity risks as one of the greatest challenges their organization faces when trying to derive value from using emerging technologies. Meanwhile, 39% say they are considering using gen AI within the next year for cybersecurity and threat detection.

But eliminating skills gaps, setting strategy, and integrating tools are only effective if employees are willing to embrace change. Just ask Álvaro Carmona Ruiz, vice president of technology services at Bancolombia SA, a financial services company based in Bogotá, Colombia. Today, Bancolombia has more than 10 million digital users. But that hasn’t always been the case for the nearly 150-year-old company. “We have people who have worked here basically all their life,” says Ruiz. “They’re used to processes being physical, where the customer goes to the branch and talks to a person. But many of our new processes are digital, so we’re challenging our employees all the time to think about processes in a different way and to learn how to use data, analytics, and all these new technologies.”

Forging New Pathways

Fortunately, Latin American organizations are employing a wide variety of strategies, from upskilling workers to partnering with private institutions, to achieve quantifiable business outcomes at a time when the region’s economic and political landscape is changing.

At Bancolombia, for example, employees are given the opportunity to work with emerging technologies on innovative projects as part of the company’s talent retention plan. By helping employees hone their skills, Ruiz says Bancolombia’s

Thirty-eight percent of survey respondents say that their organization is fostering a workplace culture that encourages the use of emerging technologies by offering training on needed skills and expertise.

workforce attrition rate reached only 10% last year in a region where 42% of the workforce is actively seeking new jobs.[4] In fact, increasing investment in employee training and skills development ranks as a top step for securing the necessary talent to support the use of emerging technologies, according to 47% of survey respondents. **FIGURE 4**

FIGURE 4

The Fight for Talent

Upskilling employees and tapping into local talent are critical to talent management

What steps is your organization taking to secure the necessary talent to support the use of emerging technologies? *Select all that apply.*

Base: 372 respondents. Not shown: 0% other.

Source: Harvard Business Review Analytic Services survey, December 2023

A smaller proportion of respondents (39%) cite hiring new talent locally as a means to secure necessary expertise while 31% say their organization is increasing support for remote work and other flexible work arrangements to maintain their workforce. In fact, remote work, popularized by the pandemic, continues to empower Latin American organizations to cast a wider net for qualified candidates. For instance, Saenz says the financial services company goes outside its native Peru and hires talent from other countries, including Brazil, Argentina, Colombia, Spain, and those of North America.

Corporate culture also plays a key role in endorsing the innovative use of emerging technologies. Sixty percent of survey respondents say their workplace culture actively encourages the use of emerging technologies. But approaches to creating an environment with such support vary significantly. For example, 41% of survey respondents point to cross-functional or interdepartmental collaboration as a means for fostering a workplace culture that supports the use of emerging technologies.

Consider Bancolombia, which in 2022 restructured some of its workforce into 50 distinct "tribes," each one designed to function as a startup with the agility to quickly adopt new technology solutions. Business and IT leaders also work together to conduct proofs of concept on a wide range of new technologies, the results of which are then shared with the C-suite to inform technology buying decisions.

Also cognizant of the benefits of cross-functional collaboration, RappiCard created a small task force made up of five employees from various departments whose job it is to determine how best to use new technologies as well as establish best practices, policies, and metrics around the performance of emerging technologies.

However, the most productive collaborative teams possess a powerful blend of domain knowledge and technical expertise. It's not surprising then that 38% of survey respondents say that their organization is fostering a workplace culture that encourages the use of emerging technologies by offering training on needed skills and expertise.

"We've been researching and experimenting with gen AI tools over the last two months with really good results, but right now we need to determine what we can do and what we can't do with them," says Avilez. "So, we're setting up a small, quick course to teach all of our developers how to use them because there are some risks."

In addition to fostering a collaborative culture and providing training, the C-suite can significantly influence a workforce's willingness to test new tools. But while leadership dedicated to technology is widely considered key to ensuring employees make good use of emerging technologies, few organizations are working toward this goal. Eighty-nine percent of respondents agree that leadership commitment to emerging technologies is critical to driving adoption of these tools at their organization, yet only 31% say their organization is establishing strong leadership to encourage the use of emerging technologies.

The reality is senior executives must practice what they preach if they want to reap long-term value from emerging technologies. "If the rest of the organization perceives skepticism from leadership, then they will not be very serious in their attempt to use these technologies," says Saenz. "There's an element of role-play in terms of being a believer—or at least being seen as one."

External leadership can also serve as a valuable source of guidance when it comes to deploying emerging technologies. Saenz says BCP often looks to global corporations, particularly in the U.S. and Europe, for clues on which technologies are worthwhile investments and which will be slow to deliver returns.

"There's always a trade-off between investing money in a technology that vanishes and missing the train," says Saenz. However, by leveraging and learning from the experiences of foreign first movers, he says BCP has managed to become "leaders regionally but close followers globally."

Observing today's regulatory environment is also critical to timing the adoption and deployment of emerging technologies. Saenz points to digital currencies as a perfect example of an emerging technology that is riddled with regulatory uncertainties. "There's no legislation in the region yet," he says. "We hesitate to invest and then have legislators say they're not comfortable with the technology." In fact, while cryptocurrencies have been explicitly banned in Bolivia, El Salvador is the first country in the world to accept Bitcoin as legal tender. These regional differences make investing particularly challenging for organizations with locations across Latin America.

In light of the risks of early adoption and an ever-evolving regulatory environment, many Latin American organizations are taking a cautious approach to investment. The majority of respondents—65%—are currently making small or moderate financial investments toward the use of emerging technologies, while only 21% are making a significant investment. Among the factors most likely to influence an organization's willingness to invest in emerging technologies in the future is the ability to gain a competitive edge in the market (55%), cost/budget (47%), performance/delivering business benefits (46%), and the speed of return on total investment (44%).

"If the rest of the organization perceives skepticism from leadership, then they will not be very serious in their attempt to use these technologies. There's an element of role-play in terms of being a believer—or at least being seen as one," says BCP's Saenz.

In many ways, partnering with a third party can minimize investment risk and maximize the value an organization reaps from a new technology. For instance, Vista Energy's Biondi says partnerships with technology solution providers "are critical for us because they add technically capable muscle that we don't have internally."

However, opinions differ on which type of partnership is most likely to generate benefits. According to 46% of respondents, locally owned and operated private sector companies have been the most valuable in terms of helping organizations derive business value from emerging technologies, closely followed by private sector companies with headquarters outside the country (42%).

But universities and other academic institutions are also forming valuable partnerships with their organizations, as pointed out by 34% of respondents. Witness what is happening with the Adolfo Ibánez University in Santiago, Chile, which is working with multiple stakeholders across the country, from both public and private spheres, to develop standards that incorporate ethical considerations for the procurement and use of AI and automated decision algorithms.[5]

In addition to exploring private and public partnerships, Latin American organizations are also weighing the skills and expertise needed in a partner. Seventy-three percent of respondents agree that a global partner with broad expertise in a wide array of industries and technologies can best support the use of emerging technologies, while a similar proportion—69%—say a local partner with specific industry expertise and in-depth geographic knowledge of a certain region can best support the management and use of emerging technologies.

Those organizations that carefully assess their business priorities, invest in employees, foster a collaborative culture, establish strong leadership, and partner with experts are most likely to achieve growth through the use of new and innovative technologies.

Cautious Progress

Despite being a region in a constant state of flux, Latin America has a steadfast commitment to emerging technologies. Artificial intelligence, blockchain, biometrics—they are all gaining recognition from IT and business leaders alike. But to achieve quantifiable value from these technologies, organizations must integrate their capabilities into everyday workflows. Examples range from leveraging gen AI to create code for increased productivity to relying on data analytics to optimize transportation routes for greater cost savings.

But moving beyond experimentation to better business outcomes requires overcoming considerable obstacles. Talent shortages continue to plague organizations all over the world, and Latin America is no exception. A lack of commitment to upskilling existing employees threatens to widen skills gaps, while many organizations continue to overlook the importance of a carefully crafted emerging technologies strategy.

However, with the right strategies in place, Latin American organizations can begin to build the momentum needed to unlock the full economic potential of emerging technologies. Investing in employees' professional development can bolster the brain trust needed to succeed. Robust leadership and cross-enterprise collaboration are critical to driving adoption of new and unfamiliar tools. Valuable partnerships also can help organizations rapidly ramp up capabilities.

Certainly, establishing a foothold in a landscape that's constantly evolving—culturally, legislatively, politically, technologically—is a challenging feat. A perfect example of swift change is how industry buzz for the metaverse has been muffled by the cacophony of hype around gen AI. It's up to Latin American organizations to proceed cautiously yet keep pace with important trends. Indeed, those organizations that carefully assess their business priorities, invest in employees, foster a collaborative culture, establish strong leadership, and partner with experts are most likely to achieve growth through the use of new and innovative technologies.

Endnotes

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METHODOLOGY AND PARTICIPANT PROFILE

Harvard Business Review Analytic Services surveyed 372 members of the *Harvard Business Review* audience via an online survey fielded in December 2023. Respondents qualified to complete the survey if they were familiar with their organization's use of emerging technologies and reside in one of seven Latin American countries.

Size of Organization

26% 10,000 or more employees

33% 1,000-9,999 employees

12% 500-999 employees

18% 100-499 employees

11% 50-99 employees

Seniority

32% Executive management/ board members

30% Senior management

23% Middle management

14% Other grades

Key Industry Sectors

17% Technology

12% Manufacturing

12% Education

10% Financial services

8% Consulting services

All other sectors less than 8% each.

Job Function

16% General/executive management

11% Sales/business development/ customer service

8% Administration

All other functions less than 8% each.

Countries

33% Mexico

30% Brazil

10% Peru

9% Chile

8% Colombia

6% Argentina

3% Ecuador

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

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