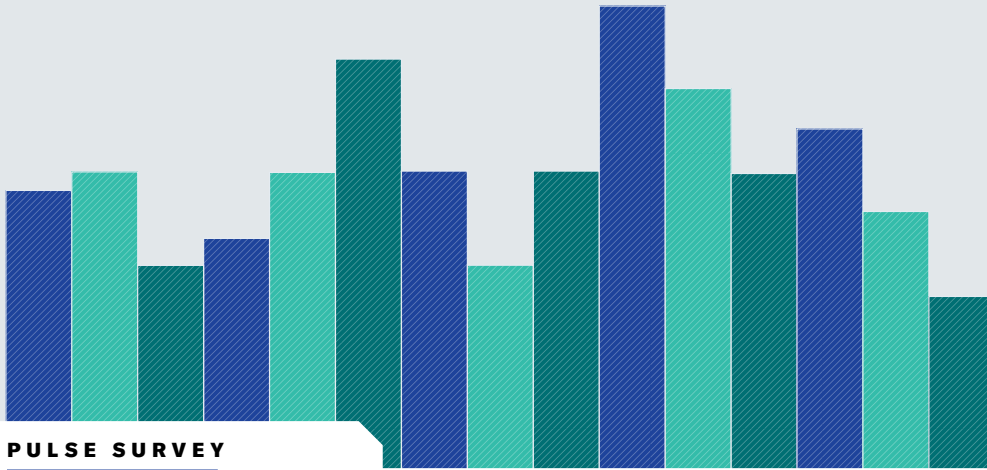




**Harvard
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ANALYTIC SERVICES



PULSE SURVEY

Driving Adoption of Emerging Technologies in Latin America



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Every business has become a digital business, and staying ahead of the curve today means leveraging emerging technologies to support state-of-the-art ways of doing and creating new business models. Latin American companies must invest in innovative technologies as an essential course of action to tackle the challenges they face around their need for growth, productivity improvement, and resilience.

Today, several high-potential technological trends are worth exploring for Latin American companies. But taking advantage of these trends means business leaders must successfully inspire and implement transformations in their companies, such as:

- Assuming higher risks, being open to failure and learning, and shifting from the mindset of “this project cannot go wrong” to “let’s learn as much as we can.”
- Accommodating customers’ and employees’ roles, responsibilities, and relationships. Getting the most out of emergent technologies requires companies to move from “the boss decides” to “our artificial intelligence has suggested a pair of alternatives.”
- Assimilating innovative technologies into company processes and systems to operate in renewed ways, moving from “let’s travel to headquarters for the monthly committee meeting” to “let’s have the monthly meeting in the metaverse.”
- Adapting how the physical world is managed, taking advantage of new technologies, and moving from “let’s wait for the sales results to relocate attendants” to “let’s reshuffle attendants now based on the current foot traffic.”
- Adopting novel or improved business models to directly impact the company profit, moving from “we sell goods” to “we sell non-fungible tokens.”

The possible benefits of bringing into play emergent technologies are massive, but the journey to realize them is not without hurdles. Leaders, for example, must select the most appropriate technologies for the business, propose uses that distinctly profit the organization, obtain funds to make the corresponding investment, and have the right talent for implementation or carry out change management with the people involved.

NTT DATA has sponsored this research by Harvard Business Review Analytic Services to help determine how Latin American companies are taking advantage of emerging technologies and overcoming the hurdles previously mentioned. This study constitutes a unique point of view on how the leading Latin American organizations are innovating using the latest technologies and why they are doing it.

We are confident that this report will be helpful when you are considering emergent technologies initiatives in your organization. We hope to contribute to your success by making the most out of the endless possibilities the future holds for us.



Alberto Otero

**Partner, Head of Americas
Digital Technology**

NTT DATA Europe & LATAM

Driving Adoption of Emerging Technologies in Latin America

Organizations around the world are embracing emerging technologies to reinvent business processes, drive efficiency, and improve customer experience. Latin American (LATAM) organizations are no exception.

Driven by a robust digital infrastructure and consumer behavior, Latin American companies are known for their “willingness to experiment, a predisposition to trying new things, and wish to be early adopters,” according to Felipe Monteiro, professor of strategy and academic director of the Global Talent Competitiveness Index at INSEAD in France.

In fact, according to a May 2022 survey by Harvard Business Review Analytic Services of 316 executives in six LATAM countries (Brazil, Mexico, Peru, Argentina, Chile, and Colombia), 90% of executives say emerging technologies are extremely or very important to an organization’s future success. A similar proportion (87%) say they have leveraged emerging technologies extremely well or very well over the past two years. These emerging technologies include artificial intelligence (AI), the metaverse, blockchain, 5G, biometrics, edge computing, advanced robotics, digital twins, quantum computing, 3D printing, and virtual/augmented reality.

The deployment of emerging technologies is a relatively new phenomenon for LATAM organizations, according to Rafael Heringer, a technology director at Itau Unibanco, a financial services company based in Brazil. In the past, he says, leaders in the region would “wait for a technology to be proven” before investing the necessary time and resources. That’s changing, he explains, as digital transformation, an influx of investor capital, and a thriving startup ecosystem encourage executives to “open their eyes” to the business potential of deploying innovative solutions.

Yet for digital adoption of emerging technologies to become standard business practice, LATAM organizations must overcome considerable hurdles. A scarcity of skilled talent, IT hurdles, and financial constraints are challenging

HIGHLIGHTS



90% of survey respondents say **emerging technologies are extremely or very important to an organization's future success.**



88% strongly or somewhat agree that **the benefits of emerging technologies are worth the cost** of investment.



73% say **talent shortages and skills deficits are impeding the effective adoption** of emerging technologies.

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



Sixty-three percent of executives say they’re using biometric solutions, such as voice recognition and fingerprint scanning—most likely with the intent to accelerate identity authentication and accuracy in today’s challenging security landscape.

organizations to achieve greater success and expand their use of emerging technologies.

This report examines the growing importance of emerging technologies in Latin America; the role they play in boosting productivity, improving efficiency, and enhancing business processes; the challenges LATAM organizations face in driving digital adoption; and the strategies required to derive value from these innovative solutions.

A Willingness to Experiment

Despite the power of emerging technologies to disrupt entire industries (think streaming’s impact on the music industry), many LATAM organizations are turning to solutions designed for more practical purposes, such as speed, agility, and security, which are critical concerns for organizations everywhere.

Case in point: edge computing is the most-used emerging technology among LATAM organizations, cited by 65% of respondents. **FIGURE 1** By migrating compute and storage from a centralized data center to closer to where data is collected, edge computing can deliver greater speed, reliability, and scalability. At the same time, 63% of executives say they’re using biometric solutions, such as voice recognition and fingerprint scanning—most likely with the intent to accelerate identity authentication and accuracy in today’s challenging security landscape.

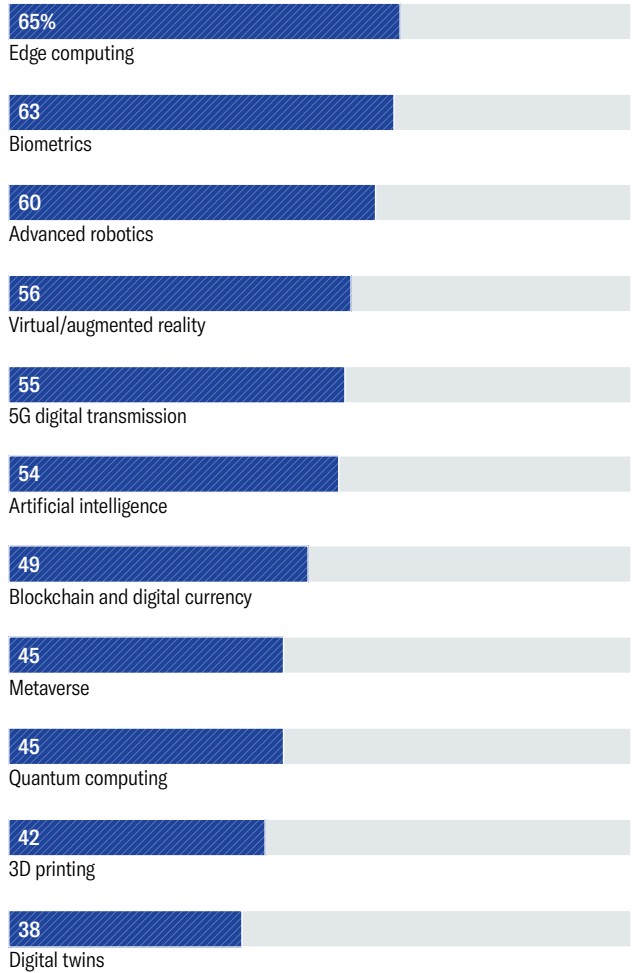
However, there are signs that LATAM organizations are increasingly willing to experiment with less-proven technologies. For example, 55% of executives are planning to leverage advanced robotics—intelligent machines that can provide industries such as manufacturing with a virtual workforce in today’s increasingly tight labor market. Other emerging technologies under consideration include artificial intelligence and 5G data transmission, cited by 52% of

FIGURE 1

Emerging Technologies in Use

Practical solutions are gaining faster mainstream traction than innovative tools.

Which of the following emerging technologies is your organization currently using or developing?



Source: Harvard Business Review Analytic Services survey, May 2022

executives, as well as the metaverse (51%), quantum computing (47%), and digital twins (44%).

By experimenting with more innovative solutions, LATAM organizations are realizing benefits that extend beyond IT infrastructural improvements and security enhancements.

Consider, for example, Itau Unibanco’s foray into quantum computing—a type of computation that harnesses the laws of quantum mechanics to solve problems too complex for classical computers. The financial services company relies on quantum-inspired machine learning algorithms to improve

the accuracy of models currently used to predict customer churn. By developing new quantum methods for training a customer retention model, Itau Unibanco plans to improve the accuracy of predicting which customers are most likely to leave the bank while decreasing run times compared to previous models. Heringer says that Itau Unibanco is also experimenting with quantum computing “to model the risks of regulatory capital”—the capital a bank must hold as required by financial regulators. To satisfy these stringent regulations, the company must classify its assets in an immeasurable number of investment portfolio options—a data-intensive feat that Heringer says “would be made exponentially faster with the compute power of quantum.”

Another emerging technology attracting the attention of LATAM organizations is artificial intelligence. “One of the biggest challenges for airlines is accurately estimating the weight of a flight,” says Juliana Rios, chief information officer for LATAM Airlines in Chile. Airlines depend on this information to determine, for instance, the amount of fuel a flight requires.

For years, LATAM Airlines examined the information contained in its reservations system, such as number of passengers and pieces of baggage, to calculate a flight’s weight. But these estimates lacked precision. However, by creating an AI-powered model designed to “predict a passenger’s gender,” Rios says, the company can “better estimate the weight of any given flight, and using this information, more accurately estimate the amount of fuel needed for a flight.” The result, she says, is not only greater operating efficiency and cost savings for the airline but also “environmental benefits” accruing from lower fuel consumption.

AI algorithms also are helping LATAM Airlines parse real-time data, such as weather patterns, to inform pilots and dispatchers of the optimal routes for travel, thereby increasing fuel efficiency.

Counting the Benefits

Beyond generating business benefits, emerging technologies are enabling LATAM organizations to address issues that are endemic to the region. “A common problem across Latin America is that productivity is low—it’s been stalled for a number of years,” says Philippe Monteiro, a professor at INSEAD. Fortunately, he says, “emerging technologies are enablers to productivity in the region.”

To date, half of survey respondents say, the most-realized benefit they’ve reaped from emerging technologies is increased employee productivity and/or reduced labor costs. **FIGURE 2**

In addition to boosting productivity, 46% of respondents say emerging technologies are helping LATAM organizations improve manufacturing and production efficiency. Consider,

for example, how advanced robotics solutions are automating manual tasks, once performed by plant workers, for high-speed efficiency. Another 40% cite enhanced business processes and/or faster decision making as prime advantages of digital adoption of emerging technologies.

Alejandro Lammertyn is one executive with firsthand knowledge of artificial intelligence’s ability to greatly improve business processes. As the chief digital and information officer

FIGURE 2

Productivity Gains Are Key

Productivity, efficiency, and speed top the list of business benefits.

What business benefits has your organization realized to date from its use of emerging technologies?



Source: Harvard Business Review Analytic Services survey, May 2022



“Top talent is leaving these countries. If companies really want to be early adopters of modern technologies and contributors to these ecosystems, they need to have people who are well-trained in emerging technologies,” says Philippe Monteiro, a professor at INSEAD.

at Tenaris, Lammertyn says the Argentina-based manufacturer and supplier of steel pipes plans to use AI-powered computer models to predict customer demand for the company’s products. Using AI algorithms, Tenaris will be able to not only optimize manufacturing processes and minimize excess inventory but also streamline distribution and delivery in an era marked by supply chain disruptions. “Our customers don’t have to tell us how much material they need or when they need it,” says Lammertyn. “Rather, with AI-driven demand planning and their drilling forecast, we can provide them with the materials they need whenever they need them.”

The least-realized benefits of emerging technologies include more accurate business forecasting and future-proofing the organization, cited by only one-third of respondents—most likely because these are not organizations’ top priorities.

Overcoming a Range of Obstacles

An ever-evolving regulatory environment, data privacy risks, and algorithmic bias all are issues requiring organizations to invest heavily in the time and talent needed to properly select and deploy emerging technologies. Yet 88% of respondents to the survey strongly or somewhat agree that the benefits of emerging technologies are worth the cost of investment. Moreover, 90% of executives indicate that these investments will increase in the next 12 months.

Another factor fueling greater investment in emerging technologies is the short time horizon for seeing value. Seventy-three percent expect to realize a return on their investment in emerging technology within two years—and 36% say it will take just a year or less, indicating high levels of confidence.

Business advantages and rapid ROI aside, LATAM organizations must overcome a trifecta of challenges—organizational, technological, and financial—for emerging technologies to gain greater mainstream traction. Chief among these challenges is a lack of in-house expertise/experience with emerging technologies, as cited by 39% of executives. **FIGURE 3** In fact, nearly three-quarters (73%) of respondents say talent shortages and skills deficits are impeding the effective adoption of emerging technologies.

“A number of countries in Latin America are experiencing brain drain,” says Monteiro. “Top talent is leaving these

countries. If companies really want to be early adopters of modern technologies and contributors to these ecosystems, they need to have people who are well-trained in emerging technologies.”

Heringer of Itau Unibanco can attest to LATAM’s exodus of talent. He says some members of his data science team have left the company over the past four years to work for companies based in other countries. “Finding and keeping talent is the first and biggest challenge,” he says.

A smaller proportion of executives (34%) cite difficulty integrating solutions within existing IT infrastructure as one of the greatest challenges of driving adoption of emerging technologies. A preponderance of legacy systems and data silos can slow the process of deploying new technologies.

“If you want to go from a pilot project to having a real impact, you need to build a solid data infrastructure,” says Lammertyn of Tenaris.

FIGURE 3

Obstacles to Digital Adoption

A scarcity of talent dominates the challenges facing LATAM organizations.

What are the greatest challenges your organization faces when driving adoption of emerging technologies?



Source: Harvard Business Review Analytic Services survey, May 2022

A lack of financial resources to invest in emerging technologies or training is another barrier to digital adoption of emerging technologies, according to 31% of executives, while just 24% cite a lack of leadership vision and commitment.



Strategies for Embedding Emerging Technologies

Fortunately, there are strategies LATAM organizations can use to address the challenges by increasing interest in emerging technologies and driving adoption of these tools. Offsetting the region's brain drain by acquiring top talent, catering to employees' unique digital preferences, fostering a tech-centric culture, and forming beneficial partnerships all are ways LATAM organizations can move forward with innovative solutions.

To bridge the region's persistent talent gap, in the next year more than half (52%) of executives plan to hire talent with specialized skills and expertise in emerging technology.

Organizations are also taking steps to get employees excited about the value that emerging technologies can deliver to their day-to-day work. One approach involves designing a communications plan that outlines the impact of these tools—a strategy 49% of executives are employing to drive adoption.

In an effort to hire and retain much-sought-after talent, Rios says, LATAM Airlines “identified nine pillars that we had to work on in order to become even more attractive to digital talent.” For example, she says, the company completely redesigned its compensation structure to “bring more flexibility” and fairness to the process.

LATAM Airlines also continues to offer digital employees the opportunity to work remotely, even as many businesses begin asking workers to return to the corporate branches. “We decided to remain remote no matter what,” says Rios. “Not only do we want to be able to attract digital IT talent in the cities in which we operate but also attract talent in the region regardless of being physically near our headquarters. We want to be able to access that talent and have them work for LATAM [Airlines].”

It's one thing to attract digital talent; retaining them in a highly competitive marketplace is a more challenging matter. Yet when it comes to selecting emerging technologies, LATAM organizations are more likely to seek solutions that can help them outperform competitors rather than satisfy employees. Nearly half (43%) of executives say they decide what technology is right for them by looking at whether the solution helps them gain a competitive edge in the market.

However, ignoring the technology needs of employees is a grievous oversight. For example, the least-noted criteria for selecting emerging technologies include factors that can

“Employees are at the center of everything we do. In the last two years, we've focused on investing in emerging technologies and making sure all of our employees have the new tools they need to do their job,” says Cesar Andrade, president of technology and operations at Interbank.

significantly impact an employee's experience with a given technology. Only one-third of executives cite ease of use by employees as a litmus test for identifying valuable solutions.

These decision criteria must change for organizations to improve digital adoption of emerging technologies. “Employees are at the center of everything we do,” says Cesar Andrade, president of technology and operations at Interbank, a financial services company in Peru. “In the last two years, we've focused on investing in emerging technologies and making sure all of our employees have the new tools they need to do their job.”

Building a Supportive Culture

In addition to ensuring that tools are accessible and user-friendly, organizations must foster a corporate culture that promotes an appreciation of innovative technologies. In fact, 86% of executives strongly or somewhat agree that an organization's corporate culture is critical to driving adoption of emerging technology.

“Culture has always been extremely important to our bank,” says Andrade. “The capacity to try new technologies, new ways of working, and [adapt] to new rules has been key to our performance.”

Building a corporate culture that promotes the adoption of emerging technologies begins with proper leadership. Sixty-five percent of executives say a C-level IT executive (for instance, a chief information officer, chief digital officer, chief technology officer, or the equivalent) is primarily responsible for identifying solutions best aligned with an organization's strategic objectives. A significantly smaller proportion say



“Alignment between IT and operations teams is essential to move forward with emerging technologies,” says Alejandro Lammertyn, chief digital and information officer at Tenaris.

a CEO, chairman, president, or the equivalent (49%) or a C-level innovation executive (47%) is responsible for the task.

Putting IT professionals in charge of selecting technology solutions makes perfect sense to Rios of LATAM Airlines. “IT teams must go beyond the technology and really understand what problem they are trying to solve and trust that they can stand up and contribute to building better business processes and customer experiences,” she says. “My IT team no longer has IT goals; they have the same goals as business colleagues.”

Non-IT teams must play a cursory role in the technology decision-making process. In the case of Interbank, Andrade says, the company’s CEO “becomes completely involved when IT must make a significant change in IT architecture.” Interbank’s CEO and IT senior partners also meet on a quarterly basis to discuss future IT spend.

Another component of a supportive corporate culture is change management. Given that 69% of executives strongly or somewhat agree that emerging technologies are increasingly taking the place of employees, organizations must introduce change management practices, such as supporting with training and upskilling opportunities employees who might be displaced by innovative technologies.

“Every time a company implements a new technology, there is some resistance, mainly due to a lack of understanding benefits and trade-offs,” says Rios. While some organizations establish a dedicated change management team, she says, “every individual who leads in a company these days must be responsive to changes on a regular basis. Any company needs to evolve and learn how to work together as one team with the same incentives. That’s key to removing friction and eliminating silos.”

These collaborative efforts include understanding the goals of deploying a particular technology, planning ahead for change, and analyzing the impact of an emerging technology on the business.

Lammertyn agrees on the importance of uniting IT and business teams to reap value from emerging technologies. “Alignment between IT and operations teams is essential to move forward with emerging technologies,” he says. “You cannot implement artificial intelligence, preventative maintenance, or digital twins technology if both teams aren’t aligned on new processes.”

Partnerships Built for Success

While internal collaboration is imperative to deriving value from emerging technologies, forming partnerships with third-party service providers is also proving indispensable to LATAM organizations. Eighty-eight percent of respondents say having the right partners in place is critical to support the management and use of emerging technologies.

These partnerships can vary in terms of involvement and expertise. For example, the most sought-after partners, cited by 59%, are those with emerging technology knowledge that can identify and implement business solutions. **FIGURE 4** A slightly smaller percentage (57%) of organizations are using, or plan to use, partners whose services are turnkey and can provide technology, deploy solutions, and ensure ongoing operational success, while 56% seek out academic advisers and thought leaders conducting pivotal research in emerging technologies.

FIGURE 4

Partnering for Expertise

A variety of partnerships are helping LATAM organizations fill skills gaps.

What types of partner relationships does your organization use, or plan to use, to help implement new and emerging technologies?



Source: Harvard Business Review Analytic Services survey, May 2022



88%

**of respondents say having
the right partners in place
is critical to support the
management and use of
emerging technologies.**



“We are always looking with eyes open to new partnerships,” says Rafael Heringer, a technology director at Itau Unibanco.

“The outsource industry in [Latin America] is huge,” says Andrade of Interbank. “For example, we have 1,000 engineers working for the company. Of those engineers, 500 have been hired from vendors or partners.”

In the case of Itau Unibanco, Heringer says, “we are always looking with eyes open to new partnerships.” A perfect example is Itau’s collaboration with multiple entities to help the University of Sao Paulo’s hospital in Brazil launch its first field trial of a 5G private network. More than simply acquiring access to expertise, Rios says, by teaming up with a digital consultancy to better manage customer experience, LATAM Airlines has found valuable partners with which to “share risks, as well as rewards. We work together as one team. The beauty of this model is that we are in this together—we’ve developed the team together, set up ambition together, and our incentives are aligned.”

Innovate for Today, Invest for Tomorrow

Even in these early days of adoption, LATAM organizations are reaping the rewards of disruptive technologies. LATAM organizations rely on a wide range of metrics to gauge the success of leveraging emerging technologies. Topping the list of most-commonly cited metrics is customer satisfaction (for instance, customer satisfaction score, or CSAT, and Net Promoter Score), cited by 56% of executives, closely followed by cost savings (labor, operations) (53%), improved corporate reputation (sentiment metrics, media coverage, etc.) (52%), and return on investment (49%). But the reality is “there are some investments in emerging technology that are hard to measure,” says Andrade.

Companies that adopt and use emerging technologies are investing in their future. At a time when Latin America is experiencing record venture capital investment, worldwide interest from investors, and a startup culture that welcomed 18 new unicorn startups in 2021 alone, innovative solutions such as artificial intelligence, quantum computing, and advanced robotics can set the stage for long-term success, provided LATAM organizations nurture talent, prioritize the needs of employees, and seek partnerships that will facilitate greater integration of emerging technologies with existing IT infrastructure.

LATAM organizations must recognize that “when you invest in these technologies, you’re investing in the business as a whole,” Andrade asserts.

METHODOLOGY AND PARTICIPANT PROFILE

Harvard Business Review Analytic Services surveyed 316 executive respondents drawn from a third-party research panel. Respondents qualified to complete the survey if they were familiar with their organization's use of emerging technologies. The study was conducted via an online survey fielded in June 2022.

Size of Organization	Seniority	Key Industry Sectors	Key Job Functions	Countries
13% 5,000 or more employees	31% Executive management/ board members	25% Manufacturing	26% IT	34% Brazil
41% 1,000 to 4,999 employees	45% Senior management	25% Technology	16% R&D/innovation/ product development	32% Mexico
46% 500 to 999 employees	24% Middle management	9% Financial services	9% General/executive management	9% Peru
0% Fewer than 500 employees		All other sectors less than 8% each	All other functions less than 8% each	9% Argentina
				9% Chile
				8% Colombia

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



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