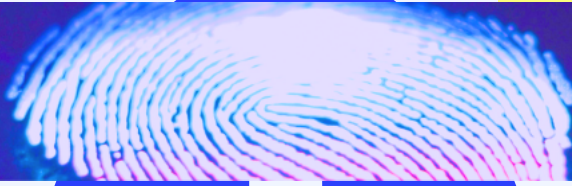


EBOOK

IT TRENDS 2024



ALTERSOLUTIONS |
act digital group

act

INTRODUCTION

Technologies no longer seem like news. Many have remained part of our daily lives for years, yet time doesn't stand still: shifts in the social, financial, and market landscapes drive new solutions - or even new ways of using existing ones.

We, Alter Solutions and act digital, bring forth relevant data and our expertise to identify technological trends that will impact strategies and businesses in 2024.

Enjoy the read!

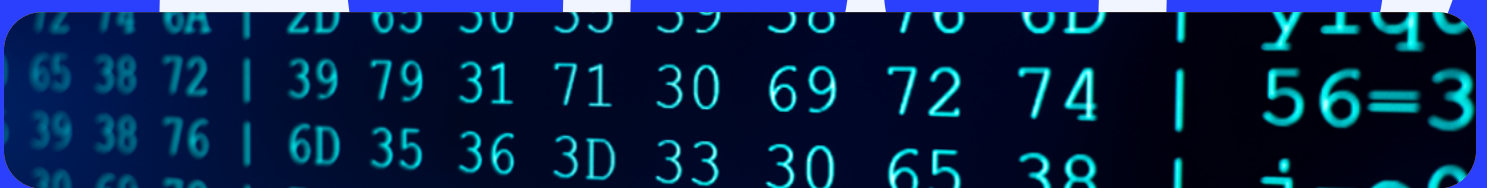


TABLE OF CONTENTS

4 Quantum Computing: reshaping the technological frontier

6 Cloud and Edge Computing as business levers

8 Robotic Process Automation and Artificial Intelligence join force

10 Phygital convergence in various ecosystems

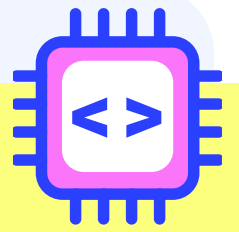
11 Cybersecurity: the key weapon against threat exposure

13 Sustainable technology: Green IT as the future

16 Big Data: the power of data automation

19 Technological partnerships with Africa and Latin America

22 Annex: Trend Snacks



QUANTUM COMPUTING: RESHAPING THE TECHNOLOGICAL FRONTIER

Quantum Computing represents a groundbreaking approach to calculation, leveraging principles from fundamental physics to swiftly resolve highly intricate problems. Presently, it's in a stage of development and experimentation: not yet widely accessible or applicable on a commercial scale, but substantial advancements are underway.

According to the [2023 Quantum Technology Monitor](#), the four industries likely to witness the initial economic impact of quantum computing – automotive, chemical, financial services, and life sciences – could potentially gain up to \$1.3 trillion in value by 2035.

In the upcoming years, key players in quantum computing, alongside a select group of startups, will steadily increase the number of qubits their computers can support. Progress is expected to be gradual: [McKinsey estimates](#) that by 2030, only about 5,000 quantum computers will be operational. The hardware and software required to tackle the most complex problems may not materialize until 2035 or later.

What can already be achieved with Quantum Computing

Quantum computers could solve a myriad of problems — and potentially create many others. Here's an overview of the solutions quantum computing will bring:

- 1. Optimization:** Resolving intricate optimization problems in logistics, finance, and other fields.
- 2. Data Processing:** Although still limited, there's potential to process large datasets more efficiently than classical computers.
- 3. Scientific Research:** Contributing to advancements in physics, chemistry, and materials science.
- 4. Artificial Intelligence and Machine Learning:** Significantly improving algorithm training capability and efficiency.

What are qubits?

Classical computing, the technology powering your laptop and smartphone, is built on bits. A bit is an information unit that can store a zero or a one. On the other hand, quantum computing is built on quantum bits, or qubits, which can store both zeros and ones. Qubits can represent any combination of zero and one simultaneously—this is known as superposition.

Read more

Check out this article on **Quantum Computing: Qubit, cryptography, teleportation and the impact on our future** by Alter Solutions.



CLOUD AND EDGE COMPUTING AS BUSINESS LEVERS

By 2024, the **synergy between Cloud Computing and Edge Computing with generative Artificial Intelligence (AI)** is predicted to reshape technological landscapes—and we wholeheartedly believe it will!

Cloud technology has surged in popularity in recent years and, looking ahead, it will stand as the primary solution integrating technologies that propel businesses and enterprises across various sectors. The cloud adds value to processes, enabling scalable software delivery and ensuring enhanced performance.

On the other hand, **Edge Computing** is a cloud-related paradigm where information is processed as close as possible to its collection point. Hence, the provision of smaller, energy-efficient processors, algorithms with superior memory efficiency, and advanced networks like 5G will contribute to reduced latency at the edge and increased scalability.

Predictions for 2024

According to the [latest Gartner report](#), **global investments in Cloud services** are projected to grow by 20.4%, reaching a total of \$678.8 billion. Regarding Edge Computing, Gartner forecasts that over 55% of all deep neural network data analysis will occur at the capture point in an edge system by 2025, up from 10% in 2021.

Don't miss out!

This year, act digital, Microsoft, and Bradesco discussed the [challenges of the Cloud journey](#). An eBook on the “[Cloud Universe](#)” was also released, along with a YouTube episode on [Cloud Computing](#)—click the links and stay updated!

Note!

By 2027, Gartner predicts that over 70% of companies will use Industrial Cloud Platforms (ICPs) to accelerate their business initiatives, up from less than 15% in 2023.



ROBOTIC PROCESS AUTOMATION AND ARTIFICIAL INTELLIGENCE JOIN FORCES

Robotic Process Automation (RPA) is an emerging software-based technology used to automate organizational processes. According to the “[Forecast Analysis: Robotic Process Automation, Worldwide](#)” report by Gartner, by the end of 2022, over 90% of large organizations will have implemented some form of RPA automation.

The RPA software market is projected to surpass \$3 billion by 2024. This surge comes as more organizations seek to manage the use of various technologies, tools, and platforms to automate business processes, aiming for strategic outcomes.

By 2024...

Further insights from Gartner indicate that **95%** of RPA providers will offer automation through APIs and user interface integration. Additionally, around **80%** of corporate customers that have implemented assisted automation, primarily on a desktop, will shift to a broader user experience, encompassing web interfaces, mobile, and voice devices.

The process automation through RPA can be a crucial prerequisite for the introduction of AI in the corporate world. Generative AI for synthetic data creation is rapidly growing, easing the burden of acquiring real-world data for efficiently training machine learning models. By 2024, Gartner predicts that **60%** of data for AI will be synthetic to simulate reality, future scenarios, and risk AI, up from 1% in 2021.

EXTRA!

Go deeper into the subject:

- * [Generative AI: Beyond the Hype](#)
- * [The Impact of Artificial Intelligence in Education](#)
- * eBook [“AI Helping Anticipate Risks: Artificial Intelligence \(AI\) as an Accelerator in Building Digital Assets”](#)
- * [AI and Money 20/20 Insights](#)



PHYGITAL CONVERGENCE IN VARIOUS ECOSYSTEMS

Practically speaking, Phygital convergence relates to how companies combine physical and digital elements to provide a richer, integrated consumer experience.

The [Conversational Messaging](#) report by Twilio reveals that 77% of consumers want to use conversational messages for product or service selection assistance; 58% would use messaging channels to make a purchase if given the option; 80% of consumers desire brands to offer conversational messaging-style interactions; and 95% of consumers say they would trust a brand more if starting a conversation with it were easier.

As a company, we recognize this trend happening when the phygital connection integrates with hyper-personalization that uses data and Artificial Intelligence. This concept has been applied across various sectors such as retail, advertising, fashion, education, and even healthcare. A practical example of phygital is seen in e-commerce, where many companies invest in online shopping experiences that mimic the feel of being in a physical store, using resources like 3D images, augmented reality, and interactive videos.

Phygital represents a new frontier for human-technology interaction, a trend set to evolve in the coming years, further transforming various sectors and how we consume and even learn.

CYBERSECURITY: THE KEY WEAPON AGAINST THREAT EXPOSURE



The supply chain has become an enticing target for cyberattacks, potentially causing significant financial and operational losses for various companies, ranging from raw material suppliers to retailers.

Cyberattacks have demonstrated that **even major companies with IT experts can become paralyzed** and endure days of damage. This issue is playing an increasingly critical role, especially in logistics and supply chain management, as cybercriminals can access sensitive data due to the growing interconnectedness and digitization of businesses. For instance, an [IBM](#) report reveals that the average costs of a data breach in the industry exceed \$3 million.

Not falling behind, **threat exposure management is considered one of the cybersecurity trends.** [Gartner](#) predicts that by 2026, about 60% of threat detections, investigations, and responses will benefit from exposed data control to validate and prioritize detected threats.

This control is implemented within the domain of **Threat Intelligence**, one of the most efficient responses against hackers. It helps in understanding attackers, responding more quickly and efficiently to incidents, and proactively predicting the next move of criminals, benefiting companies of all sizes. Additionally, adopting an intelligence service reduces risks, prevents data breaches, and maintains reduced costs.

Global spending on Security and Risk Management grows by 14% in 2024

Privacy data and cloud security spending are forecasted to have the **highest growth rates in 2024**, each segment increasing by more than 24% year after year.

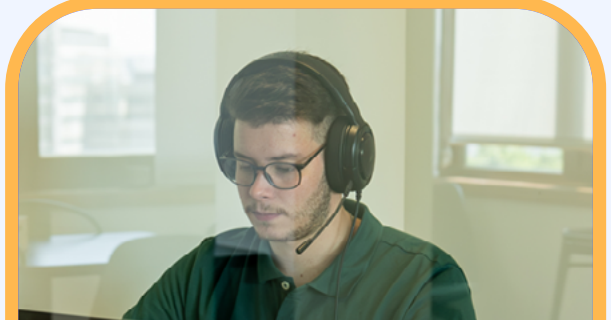
Privacy remains a top organizational priority as regulations affecting personal data processing, including those related to AI usage, continue to emerge. Gartner predicts that, **by 2025, 75% of the global population will have their personal data covered by modern privacy regulations**. Check out the full Gartner report [here](#).

Learn more!

These articles by Alter Solutions delve into specific cybersecurity topics:



*** How Artificial Intelligence is being used for cyberattacks**



*** DevSecOps: How to integrate security into your software development lifecycle**



SUSTAINABLE TECHNOLOGY: GREEN IT AS THE FUTURE

In 2024, the collective focus remains steadfast: on one side, companies and their professionals prioritize developing more sustainable technologies and reducing their carbon footprint. On the other, consumers increasingly favor green solutions in their daily lives as a means of minimizing their personal impact on the environment.

Here are some examples of **green technologies expected to grow in 2024**:

* **Green Cloud Computing:**

Specifically, the use of public clouds contributes to reducing CO2 emissions and electricity consumption, increasingly adopted by businesses.

* **Eco-friendly transport:**

Apart from popular electric vehicles, innovations like hydrogen fuel cells, sustainable aviation fuels, and the use of AI and Internet of Things (IoT) for suggesting safer and more efficient routes are gaining ground.

* **Green gadgets:**

Technology users have more options to reduce their environmental footprint, from smartphones made with recycled materials to biodegradable accessories.

* **AI and its derivatives:**

AI algorithms are increasingly used to optimize smart grids, agricultural practices, and weather predictions, contributing to more effective resource management.

* **Circular economy technologies:**

Capturing and Storing Carbon (CCS) stands out. This set of technologies captures carbon dioxide produced in large factories and power plants, preventing its release into the atmosphere.

Future Challenges

* **Companies:**

Investing in technologies that consume less energy and utilize more renewable resources, such as data storage. It's estimated that by 2025, **50% of companies will measure and monitor the sustainability of their IT solutions.**

* **Developers:**

Incorporating concepts of durability, recyclability, and reusability in the early stages of developing a technological product—circular economy principles increasingly guide IT professionals' work.

* **Consumers:**

Staying informed and vigilant against greenwashing, which means false sustainability claims by some companies aimed at increasing product sales.

What are sustainable technologies?

Innovative digital solutions aimed at increasing IT service efficiency, allowing companies and their clients to contribute to preserving natural resources and ensuring future generations' sustainability.

Advantages for businesses

- * **Cost optimization:** through improved energy performance.
- * **Risk reduction:** renewable materials protect both the environment and businesses from the adverse effects of climate change.
- * **Facilitation of new business models**
- * **Better reputation:** resulting in increased customer and employee satisfaction, leading to better talent retention.



BIG DATA: THE POWER OF DATA AUTOMATION

Forbes magazine says that “**data is the new oil**,” due to its prominence in the current technological world. Simply consider that, in 2023, around 3.5 exabytes were produced daily, and the trend is upwards for 2024.

Therefore, it's only natural for companies that swiftly and proactively adapt to the data revolution to gain a competitive advantage.

What **developments can we expect in the Big Data** domain in the near future?

* **Real-time processing:**

The volume of information collected by technologies like IoT is so substantial that, until now, over 40% of this data went unutilized. In 2024, this paradigm is expected to shift thanks to Edge Computing innovations enabling real-time data processing, preventing data from being stored and losing relevance.

* **Increased automation:**

AI and Machine Learning algorithms are becoming more sophisticated, allowing faster processing of complex data. This enables companies to automatically identify patterns, trends, and anomalies, leading to better decision-making.

* **Embracing hybrid clouds and multi-cloud:**

Businesses placing their data in such solutions ensure greater flexibility and faster information access. It also enhances security in the event of a cyberattack, as data is distributed across various clouds.

* **Integration of data analytics with Augmented Reality (AR):**

Visualization of data increasingly enables better understanding. The application of AR in data analytics opens new possibilities for both consumer entertainment and professional use among data analysts collaborating across different parts of the world.

* **Data democratization:**

Expected as one of the strongest trends in 2024, it involves companies providing business information to all employees, including those not working directly with data. This aims to instill the capacity for data analysis in all professionals, irrespective of their technical background, to foster greater efficiency and productivity.

* **Data lakes:**

Centralized, limitless storage repositories that allow organizations to store vast amounts of data for later analysis. 2024 will witness significant investments in this solution, with an [estimated annual growth rate of 22.4% until 2028.](#)

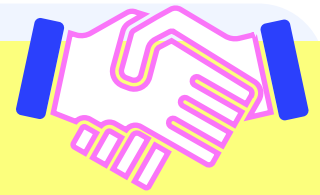
What is Big Data technology?

Software solutions dedicated to extracting, analyzing, managing, and processing large amounts of data, transforming it into useful information for businesses.

Don't miss out!

Read Alter Solutions' article on data career professionals and the challenges posed by Artificial Intelligence.

TECHNOLOGICAL PARTNERSHIPS WITH AFRICA AND LATIN AMERICA



Brazil - Latin America bridge

In 2023, Brazil secured the top position in the [Global Innovation Index](#) within the Latin American context. This recognition signifies, on one hand, increased investment in technology and innovation policies in 2024. On the other hand, it indicates closer ties with neighboring countries, namely Mexico, Chile, Colombia, Costa Rica, Argentina, and Ecuador. How?

*** Host of two key Latin American events**

In 2024, Brazil will host for the first time two crucial Latin American events on open data: the Open Meeting for an Open Region (AbreLatam) and the Regional Conference for Open Data in Latin America and the Caribbean (Condatos). Both aim not only to disseminate technological knowledge but also to foster partnerships for collaborative work in the field.

*** Strengthening international representation at South Summit Brazil 2024**

The [next edition](#) of the event focused on promoting innovation, technology, and entrepreneurship in Brazil expects a “significant increase” in the presence of foreign delegations, aiming to strengthen commercial ties with other countries.

Europe - Africa bridge

In July 2023, the European Union (EU) and the African Union (AU) adopted an **Innovation Agenda** aiming to increase resources for European and African professionals and innovators. This initiative contributes to the generation of products, services, companies, and jobs in four priority areas:

- * Innovation and Technology
- * Green Transition
- * Public Health
- * Capacity for Science

The IT industry marks the beginning of this Innovation Agenda, signifying that **2024 is an essential year for kickstarting this digital transformation partnership.** Some of the planned measures include:

- * Supporting cooperation between technology companies from both continents, employing specific work models (like Nearshore), and using digitization and AI as cross-cutting elements.
- * Backing technology and innovation hubs and developing IT professionals' skills, fostering knowledge exchange and entrepreneurship.

Office in Morocco

A prime example of this technological bridge between Europe and Africa is the recent **opening of Alter Solutions' office in Casablanca, Morocco**, providing crucial specialized support to European clients' services and serving as a pivotal point for acquiring local clients.

In line with the Innovation Agenda, one of Alter Solutions' focuses in 2024 will be to bring its IT services closer to companies operating in Africa.

Why Nearshore in Morocco?

Check out **this article** to find out more.



ANNEX TREND SNACK

The most popular programming languages

* **Python**

Widely used in AI, ML, and data science.

* **Java**

Extensively used in Cloud Computing, IoT, and mobile development.

* **JavaScript**

Dominant in web and mobile development and now increasingly in back-end through integration with other technologies.

* **Swift**

Growing popularity in web development and constructing AI and ML models.

* **C/C++**

They both remain among the most popular languages globally, notably due to their role in building embedded systems and video games.

* **TypeScript**

This JavaScript-derived language is gaining more followers for improving code reliability and scalability.



Global IT investment growth

Projected **global investment in IT solutions for 2024 is \$5.1 trillion**, an 8% increase from 2023, according to **Gartner** data.

Within the IT sector, the markets showing the highest investment growth worldwide will be:

*** IT Services**

Estimated investment - \$1.55 trillion.

*** Communication Services**

Estimated investment - \$1.5 trillion.

*** Software**

Estimated investment - \$1 trillion.

*** Security and Risk Management**

Estimated investment - \$215 billion.

Note!

Cloud Computing as a key factor

The primary reason for the substantial growth in IT services and software segments in 2024 is the investment in Cloud Computing.



Quick facts

- * **3.5 exabytes (EB)**

Amount of data produced daily.

- * **1.7 megabytes (MB)**

Average data produced per person, per second.

- * **5 billion people**

The number of people currently using the Internet.

- * **88%**

Percentage of companies worldwide that have already implemented Artificial Intelligence in their marketing activities. In Brazil, this percentage rises to 98%, making it a leader in Latin America.



Cybersecurity curiosities

*** Fewer competent cybersecurity professionals**

About 54% of cybersecurity professionals believe that the shortage of technical skills to protect their company has worsened in the last two years. This trend is expected to continue in 2024.

*** Increasing relevance of soft skills**

Companies will increasingly demand social skills such as interpersonal communication and conflict resolution from their cybersecurity experts.

*** Prevalent cyberattacks**

With the assistance of generative AI tools, phishing and deepfake attacks are becoming more sophisticated and prevalent. Cybercrimes against IoT devices and the development of ransomware are also expected to increase in 2024.

* **Who are we?**

Alter Solutions is an international IT consultancy and cybersecurity company. It develops and protects IT projects, and empowers teams with Outsourcing and Nearshore services, while being present in countries like Portugal, France, Germany, Belgium, Poland, Spain, Morocco, and Canada.

In 2022, Alter Solutions became part of the **act digital group**, a digital consulting company operating in the USA, Brazil, and Serbia since 2011. Its mission is to accelerate and scale digital experiences for over 100 clients globally through innovative solutions for their business.

IT TRENDS 2024

ALTERSOLUTIONS |
act digital group

act