PROSEGUR RESEARCH

Hybrid Security Series

Technologies **in hybrid security**

2024

PROSEGUR
SECURITY

This is an **interactive** document

HOME

01

Strategic innovation for the present and future security

HOME

01
Strategic innovation for the present and future security

02
From the survival to the exploration mode

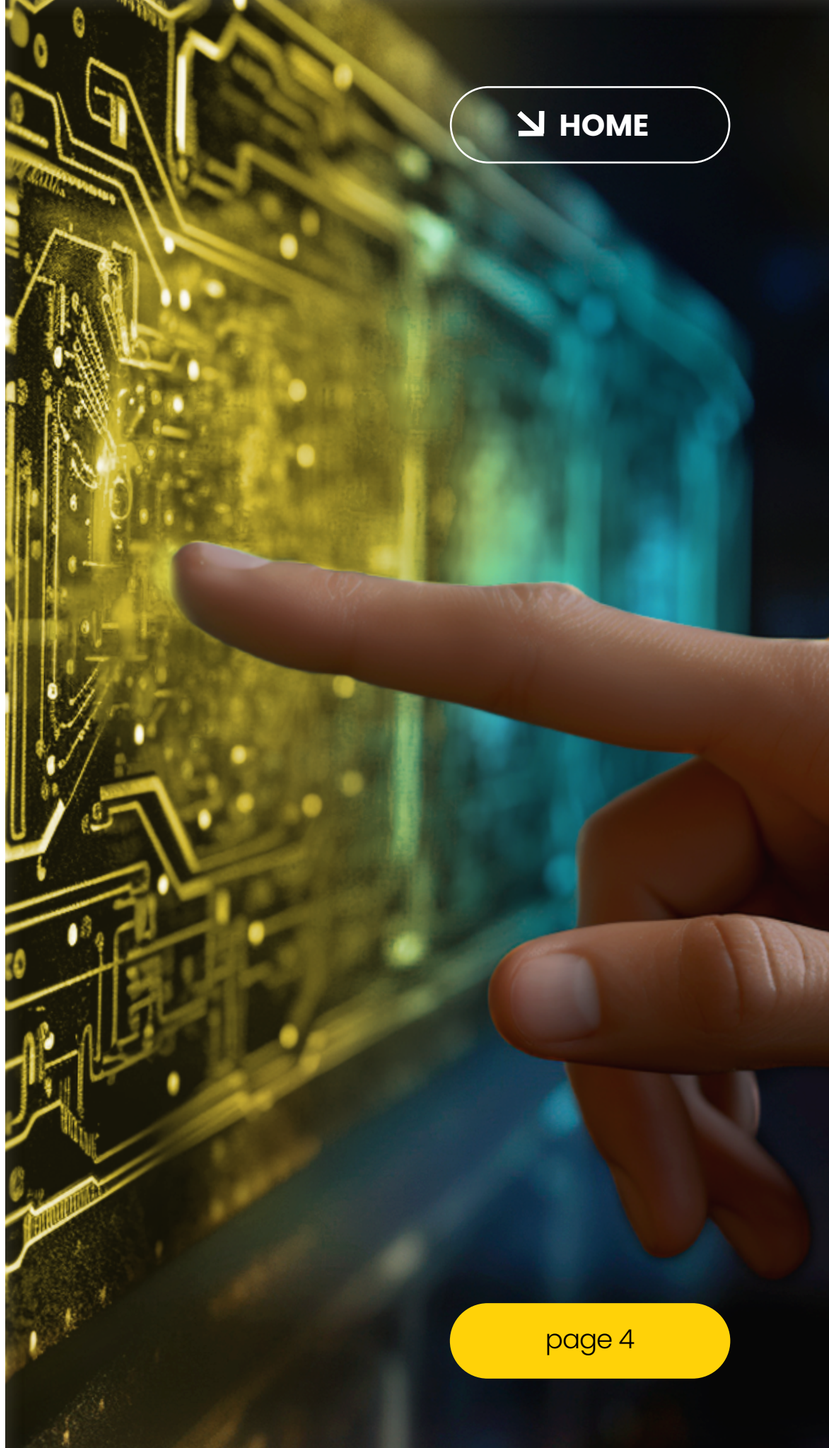
03
Technologies in hybrid security

04
The safest horizon: the technological

01 STRATEGIC INNOVATION FOR THE PRESENT AND FUTURE SECURITY

Sometimes, when conceiving the present and the future, people let themselves be carried away by biases about the past, considering it as a held back, conclusive and without transcendence reality towards the future. **Will Durant** eexplains that people spend too much time on the last 24 hours, while not enough on the past 6,000 years. The technological field is no exception to this. **Exponential and convergent technologies have created products and services that have far surpassed mythology and science fiction,** thus a glance to the past can help to elaborate metaphors and parallelisms applicable to the present and, above all, to the technological future.

In addition, **technological innovation is often thought of as a linear process** in its design, implementation and embracing phases in organizations and society. This unidirectional logic designs an unreasonable path, where the user and technology have an already planned behavior. For this reason, as explained in previous documents, at Prosegur Research we believe that **technological innovation is liquid,** as it breaks with pre-established structures to adapt to the ever-changing world uncertainty.



HOME

HOME

Gathering technological elements in Greek mythology, Some examples are provided below in comparison with current technology:

Hermes and the messaging

As a herald, Hermes served noble and just causes, as a mediator in conflicts and disputes, but was also the patron of thieves and liars. His current technological homonym, the large messaging and parcel service available to us, allows the spurious practices proliferation, linked to cyber-delinquency and frauds, among others. Even so, the **extraordinary messaging and parcel system enables communication among humans and encourages** products and services **immediate availability** for our daily lives, while constantly working to do so with greater security.

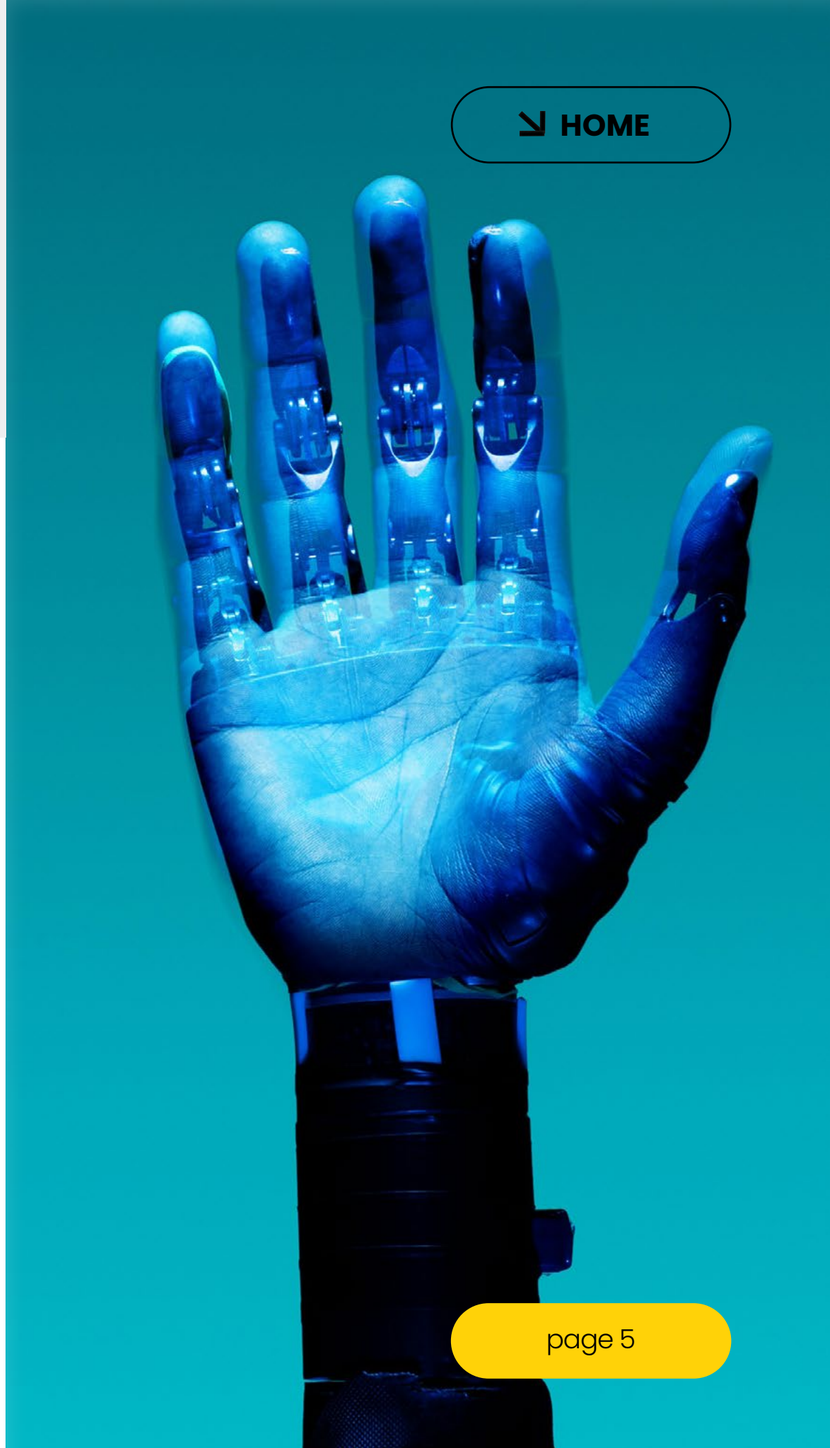
Icarus and the aviation

In both cases, technology has experienced disruptions due to human action. The first, due to arrogance in its use, and the second, by consolidating itself as a tool in conflicts and subversive activities. However, Icaro's wings and the current complex aerial network have allowed overcome natural limitations, reaching new heights with maximum security guarantees.

Daedalus and robotics

Daedalus developed the required technology that gave birth to the Minotaur beast. Meanwhile, robotics is the fusion with others convergent and emerging technologies, such as artificial intelligence (AI), which results in hallucinations and bad practices, like wAIponization[1] that causes security breaches. Nonetheless, both Daedalus creations and today's robotics have boosted human activity, empowering people and experts.

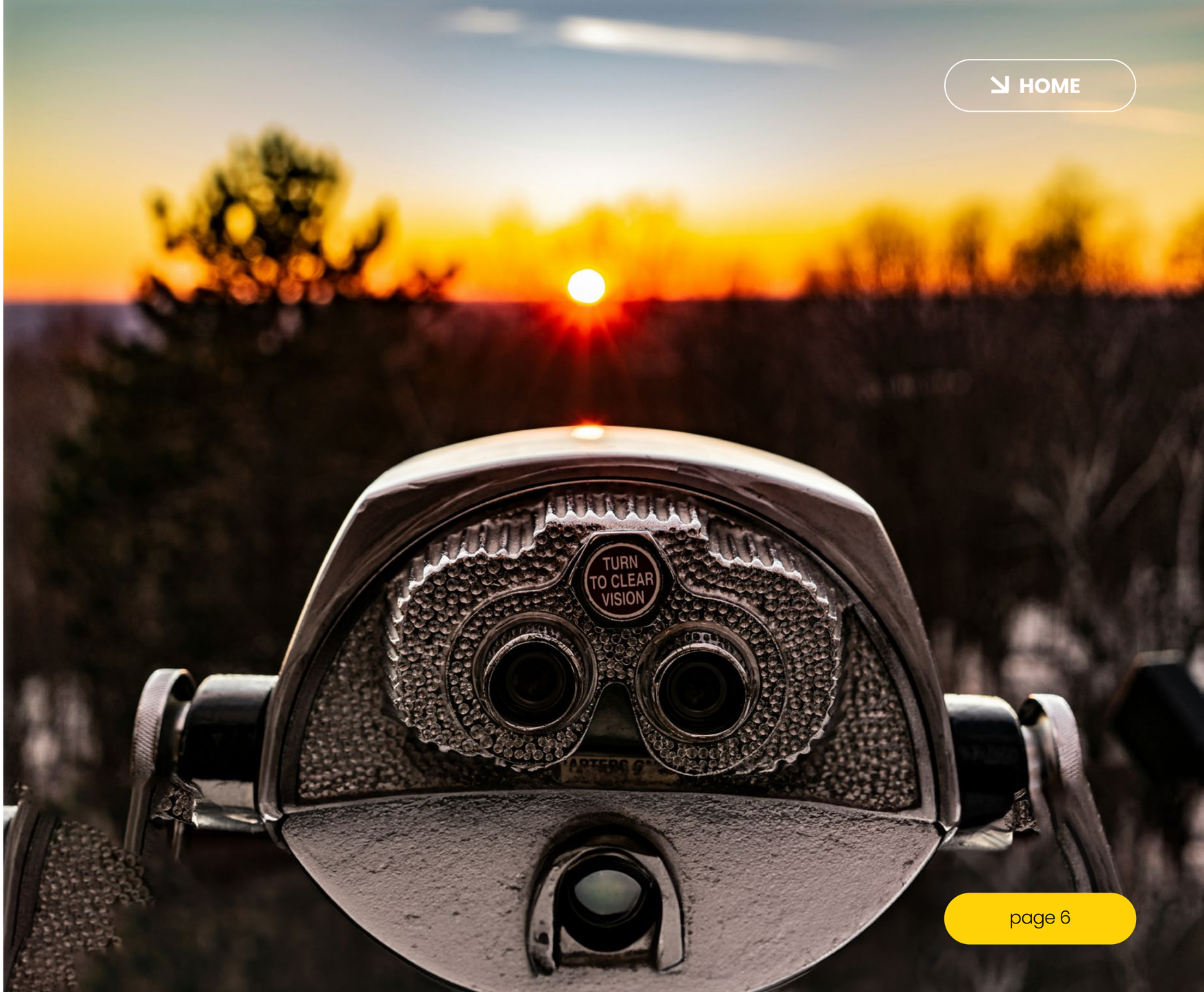
[1] **wAIponization** refers to the artificial intelligence utilization as an all-around weapon, highlighting the different malicious uses as shown by Prosegur Research in its AI waves of change study.



We usually talk about the need to project a broad and deep look at reality, as well as to adjust the focus, depending on its critical aspects. The truth is that **there are as many ways of looking at the world as there are people.** In addition, there are frequently visual issues, such as nearsightedness, astigmatism or eyestrain that result in a distorted and unlearned reality perception. Our training, our biases and objectivity limitations, ideologies, or membership in organizations shape imperfect perspectives.

If **technology is one of the best advanced tools** it is because it allows to refocus on modern times.

In order to go beyond, we must accept our limitations. In this regard, the business sector must be aware that its development side by side with these times and dynamics of the operating environment is the only way to adapt to a changing, changed, and dynamic world, such as the one where we live, extremely complex. To achieve this, is needed **a strategic alliance with technology, in light of breaking with the present and reorient to a promising future.**



HOME

02

From the survival to the **exploration mode**

HOME

01
Strategic innovation for the present and future security

02
From the survival to the exploration mode

03
Technologies in hybrid security

04
The safest horizon: the technological

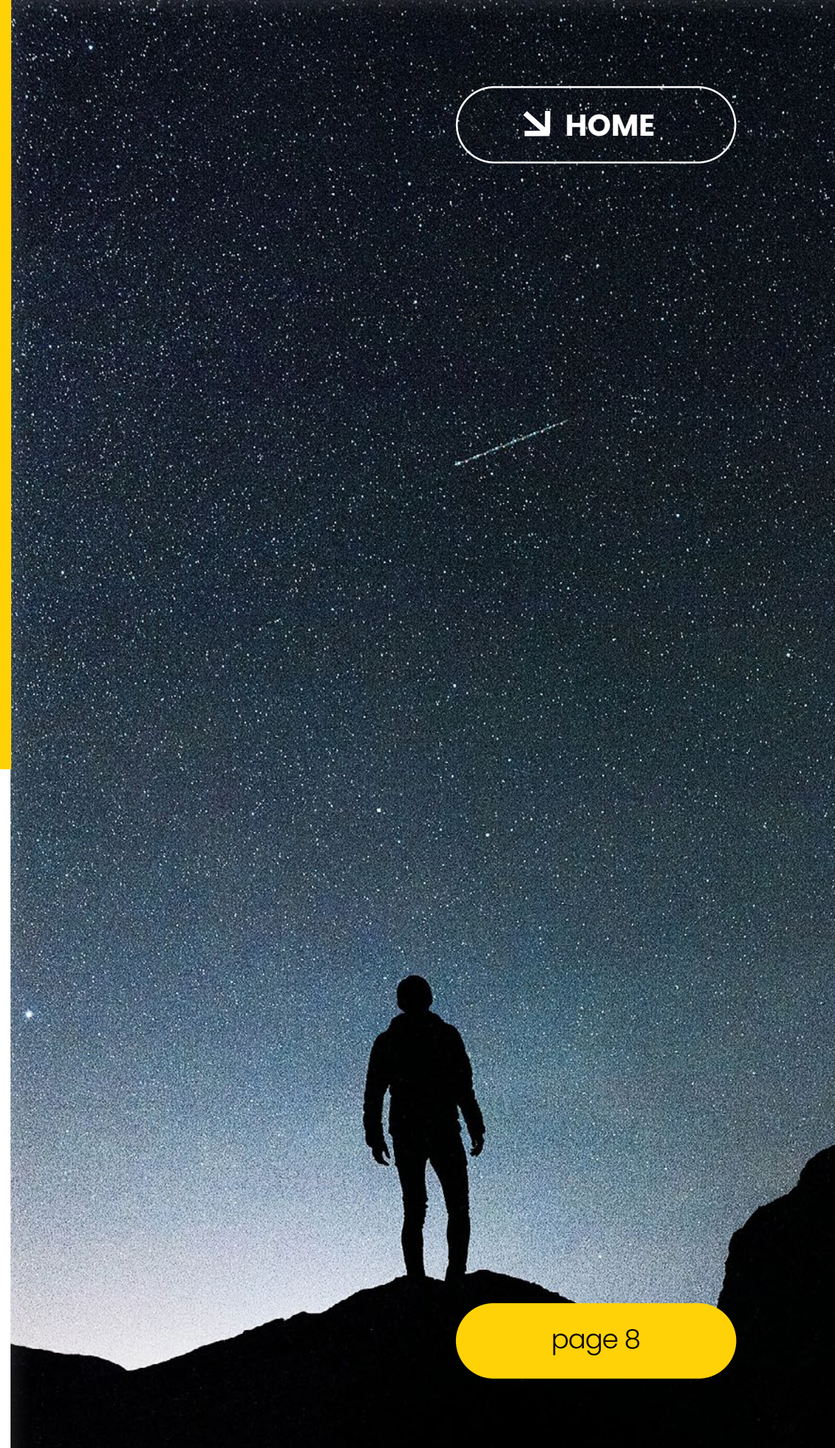
FROM THE SURVIVAL TO THE EXPLORATION MODE

2.1
Technological innovation and security in 3 horizons

Technology has allowed us to hunt, regroup, communicate; has allowed us to settle down in cities, increase our life expectancy, link our ideas... However, it has also fueled wars, ideologic fights or inequalities, and has led us to the brink, to risk humankind nearly to the edge of extinction all for the sake of more powerful technologies. In the end, it is the balance between technology and risk.

Jade Leung

In the current business environment, innovation has become a critical factor for long-term success and survival. Recall that up to **70% of future jobs do not exist yet.** Companies face an ever-changing competitive context, boosted by fast technological development, market interrelationships, and the evolution of customers' trends.



HOME

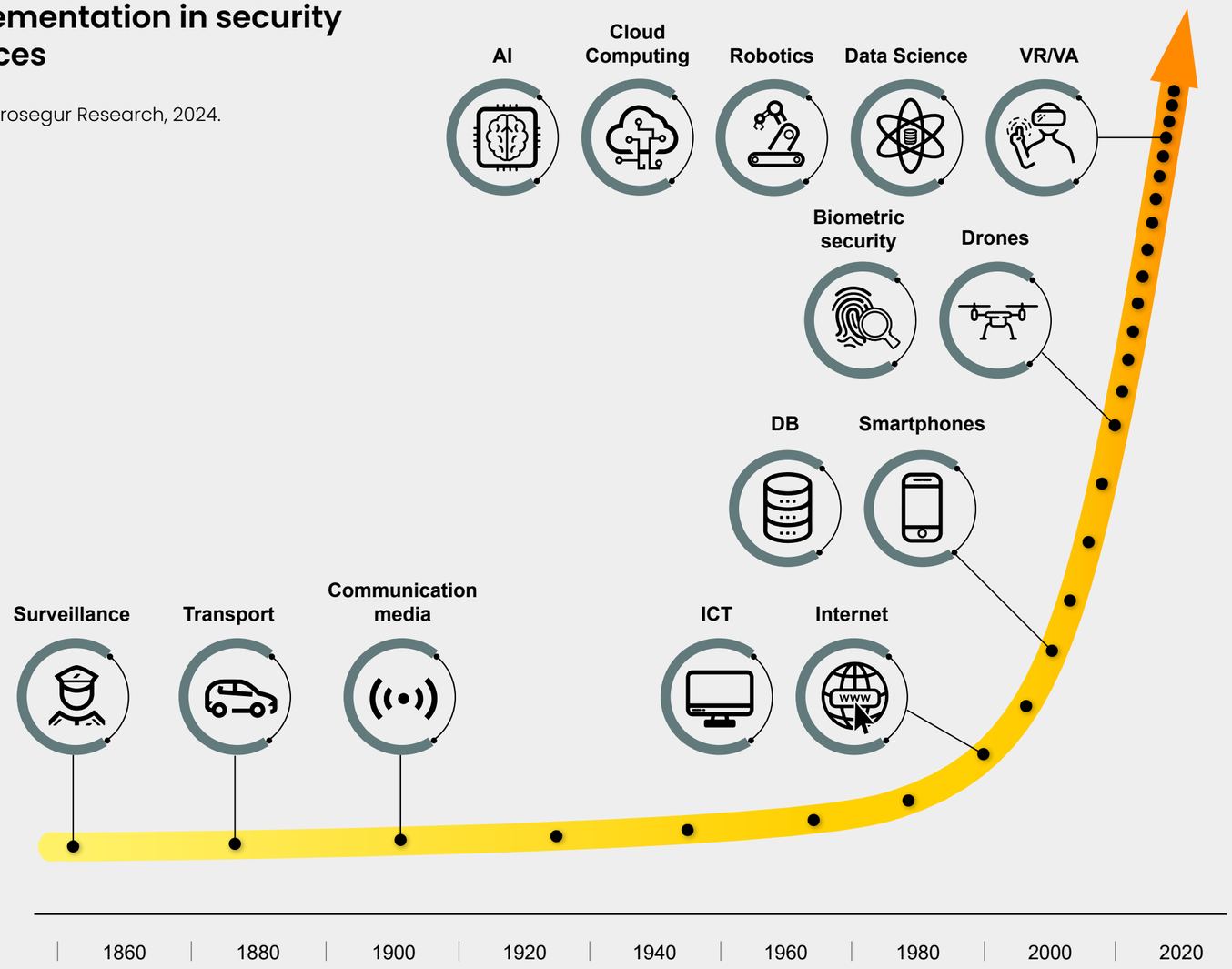
HOME

Throught the ages, technological development has experienced a **progressive acceleration,** reaching a growth rate unprecedented in the last decades. Initially, the progress on surveillance, transportation and communication media meant the beginning of the technological era. Nonetheless, since the 60s and 80s the integration and convergence of Information and Communication Technologies (ICT), databases (DB), Internet, and mobile phones laid down the foundation for the present-day digitalization and connectivity on a global scale.

Over the past decades, technological development has been driven by advanced innovations, such as cloud computing, robotics, data science, biometric security, drones, and virtual and augmented reality. Mostly, these **converging and exponential technologies have revolutionized the security sector tracing a promising horizon,** even though dizzying if risks and opportunities are not properly anticipated. The implementation of technological innovation enhances traditional technological structures in security (surveillance, transportation, and communication media), which, coordinated with the human capacities of security experts, improves professional training, optimizes decision making, and increases security.

Figure 1
Technological development implementation in security services

Source: Prosegur Research, 2024.



Innovation goes beyond new products and services creation. On this matter, **technological innovation** is understood **as one of the best tools for anticipation and foresight.** There are different futures: probable, possible, plausible, preferable. To guide these future possibilities towards desirable ones is the task of an innovative organization going **from strategic thinking to corporate action.**

Emphasis must be placed on the **evolutionary process of technological developments,** which does not follow a linear progression but ups and downs in terms of their market and implementation expectations and applications. **Gartner,** named this process technological hype that consists of five basic steps: innovation trigger, peak of inflated expectations, trough of disillusionment, slope of enlightenment, and plateau of productivity, which allow each technological innovation to be categorized according to its maturity degree. To illustrate, **generative artificial intelligence (GenAI)** is at the hype peak due to the social, mediatic, and corporate significant impact that has experienced the last months. However, it is foreseeable that in the short and medium term its expectations will decrease stepping forward to the trough of disillusionment even before consolidating itself as a technology with a high level of maturity and implementation in organizations.

> If you think technology can solve your security problems, then you don't understand the problems and you don't understand the technology.
>
> **Bruce Schneier**

On this matter, it is key to understand the user's environment through **situational awareness,** analyzing the available information at all levels to be able to identify where we are and where we are going, allowing **strategic decisions making to anticipate changes and even be part of them.**

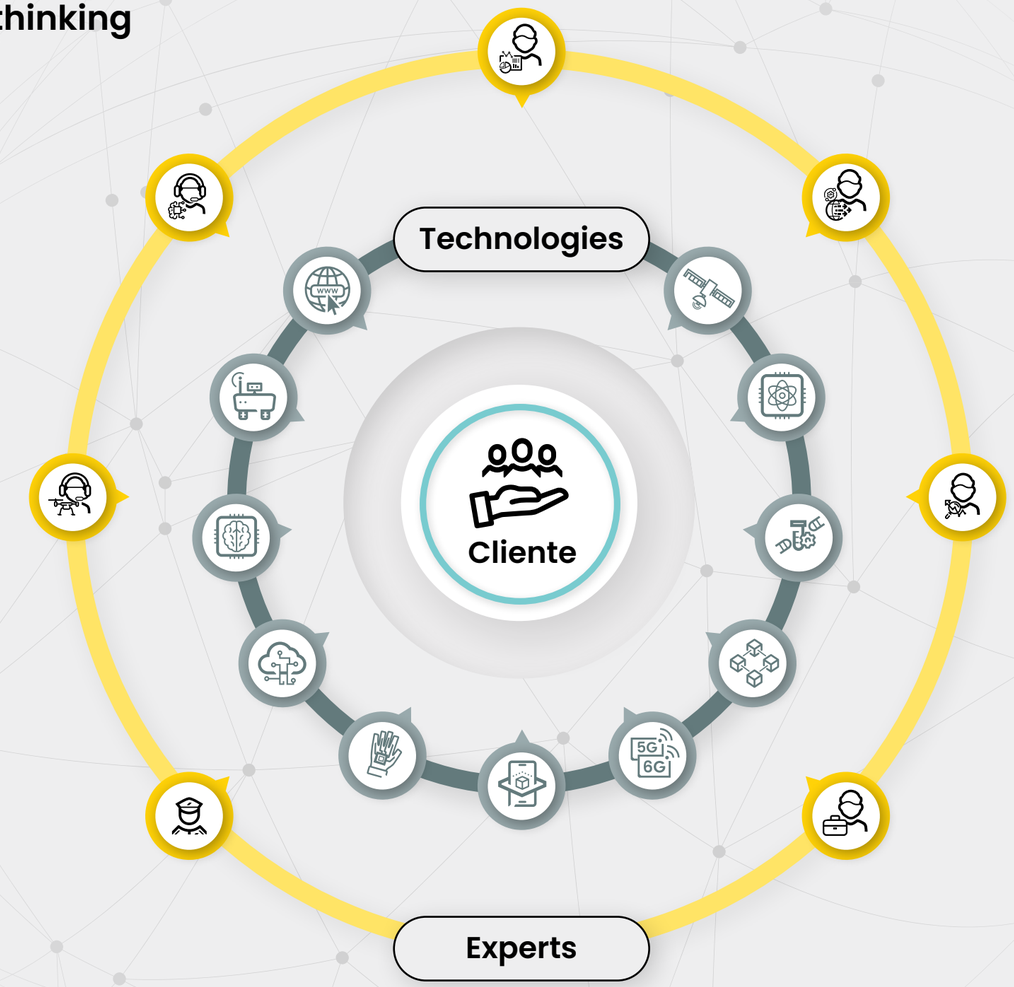
HOME

Through the years, organizations have tried to apply their operating models and services to the different customers with whom they operated. Nonetheless, increased uncertainty, interrelationships at all levels, and today's corporate ecosystem complexity resulting in this model carrying different risks for companies.

Nowadays, it is necessary to **consider each client as unique and in the model's center** providing customized solutions. So then, **the workers provide the differential value** in a security company: analysts, operators, sales representatives, security guards, administrators, etc. They are the ones who run the daily operations to guarantee the proper corporation performance providing solely human value. The employees that are experts in the field rely on cutting-edge technologies like IoT, artificial intelligence, or biometric technology, among others, optimizing their capacities and producing effective answers in complex environments.

In other words, it is about **a new way of thinking:** from an organization-focused model to a customer-focused one. Only then a differential value is ensured in a highly volatile and competitive market.

Figure 2
New way of thinking



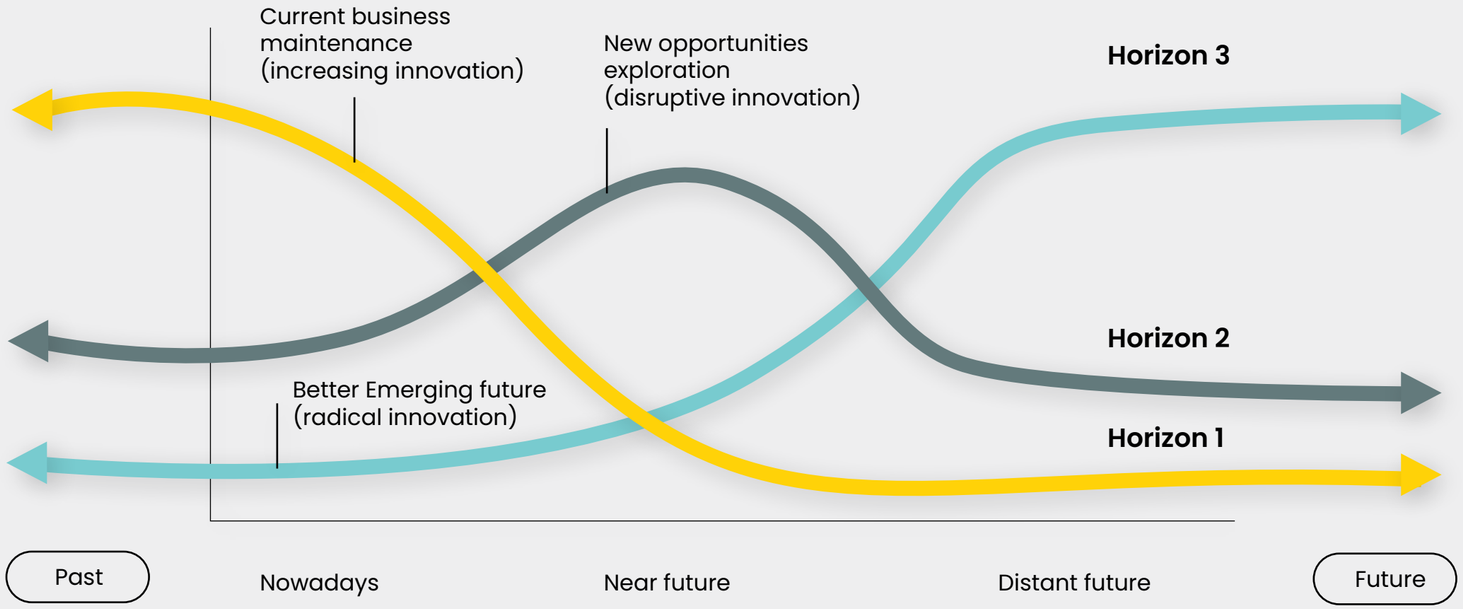
- Internet of things (IoT)
- Robotics for mobility
- Generative artificial intelligence and computer vision
- Cloud technology
- New generation of biometric technologies
- Immersive reality
- 5G/6G
- Blockchain
- Bioengineering
- Quantum computing
- Space-based technology
- Connected security guard
- Dron operator
- iSOC operator
- Data analyst
- Innovation engineer
- Intelligence analyst
- Presales and business person

HOME
page 11

HOME

Figure 3
Innovation in three horizons

Source: Prosegur Research, 2024 based on McKinsey



In this context, the **three horizons of growth methodology** recognize the importance in efforts guidance towards innovation in the short, medium, and long term aligning the company's initiatives with its strategic goals and long-range vision. Thus, each of the three horizons represents a different type of Innovation and its own Implementation deadlines, and processes allowing the companies adaptation and anticipation to fast changes in societies and markets, and ensuring the company's growth.

In the first horizon, based on the present, the companies focus on increasing innovation to optimize existing products, services, and processes. Thus, organizations seek to maintain their current competitiveness and boost operational efficiency in the short term.

The second horizon focuses on growth and expansion innovation. This way, companies explore new opportunities and adjacent or complementary markets in their main business lines. When expansion is oriented to new market sectors and/or developing new projects companies can broaden their reach and increase its growth potential in the medium term.

Finally, the third horizon addresses radical innovation that has the potential to completely transform the industry while creating new markets. Therefore, corporations try to develop and implement various emerging technologies, which may not be directly related to their current niche-market but could have a significant impact in the long term. This approach requires a systemic and holistic view of the business outlook, facing some risks and biases in the innovation subject, such as The Innovator's Dilemma or the Amara's Law.

03

Technologies in **hybrid security**

HOME

01
Strategic innovation for the present and future security

02
From the survival to the exploration mode

03
Technologies in hybrid security

04
The safest horizon: the technological

03

TECHNOLOGIES IN HYBRID SECURITY

Technological acceleration and social practices changes have meant that today's **companies are navigating among paradoxes:** as Boston Consulting Group (BCG) has pointed out, companies have never given much priority to innovation, yet **they have never been so unprepared.**

Security companies must adapt to this chaotical development trend somewhere where the **future is both designed as a field of study and a landscape that must be shaped.** Having said that, **innovation does not guarantee success.** People teams with high security capabilities, knowledge, and skills must be empowered to ensure an appropriate service, which must always be tailored to each client.

Thanks to Prosegur's **hybrid security,** model, technologies are a complement to employees' skills, the true company foundation that promises multiple organizations business continuity due to intelligent data use. Thus, at Prosegur Research we believe that each organization must **evaluate, analyze, and map the different technologies development,** which can concern both the company's services and the social (in) security context, from major developments like robotics or blockchain to the **most emerging technologies,** like reconfigurable platforms or elastocaloric.

HOME

The current context calls for security models far more dynamic and able to adapt quickly to respond and anticipate risks. In short, smarter security models.

Fernando Abós
Prosegur Security CEO

In the security field, continuously adapting operations to the customers particular and complex needs is crucial. **Technology plays an essential role** in all activities from protecting a museum's infrastructure and property to ensuring security at large sporting events.

To guarantee market competitiveness, the simple reaction to events occurring in the world is not the most efficient strategy. Instead, **present and future security needs and how technology can help mitigate them should be analyzed and reflected upon.**

In this context, a**t Prosegur Research we have classified the main technologies for hybrid security in the corresponding horizon,** following the methodology previously mentioned based on the fact that people provide security, who complement their skills with the latest advances in the field of technological innovation.

HOME

Horizon 1
Current business maintenance

- **Internet of things (IoT)**
- **Robotics for mobility**
- **Generative artificial intelligence and computer vision**
- **Cloud technology**

Horizon 2
New opportunities exploration

- **New generation of biometric technology**
- **Immersive reality**
- **5G/6G**
- **Blockchain**

Horizon 3
Better emerging future

- **Bioengineering**
- **Quantum computing**
- **Space-based technology**

HOME

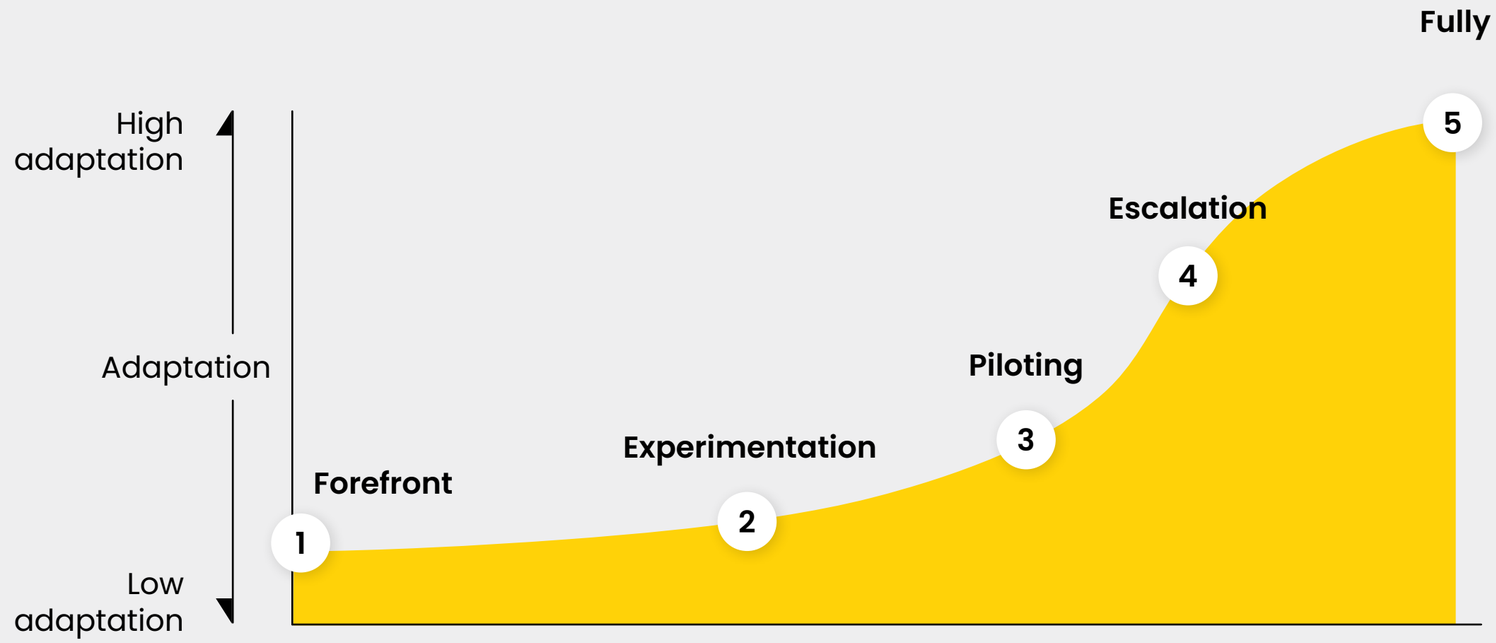
Technologies must be developed following an **appropriate technological cycle.** Fast integration can lead to mistakes in companies' operational processes, while excessive delay may result in loss of organizational competitiveness. Therefore, in addition to the hype, following the Gartner model, the adoption phases of technological developments must be taken into account.

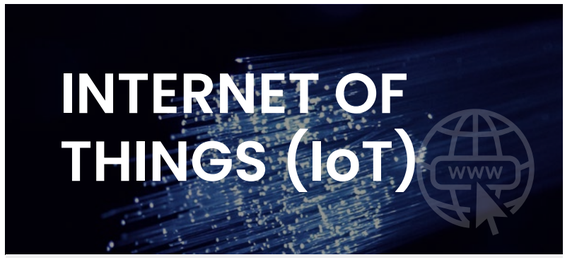
The McKinsey **adoption momentum** explains that technology requires a **trust, preparation, and talent environment** that allows moving forward on the adoption curve.

Next will be presented the **main technologies for hybrid security,** highlighting the main uses in security from a broad perspective, based on the irreplaceable human work.

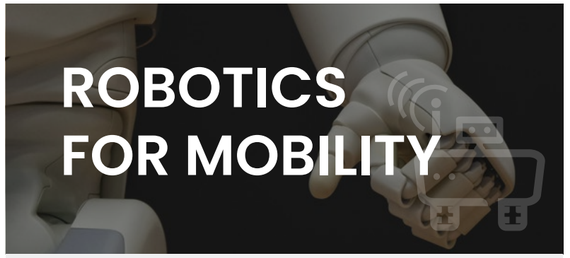
Figure 4
Technology adoption curve

Source: Prosegur Research, 2024 based on McKinsey.



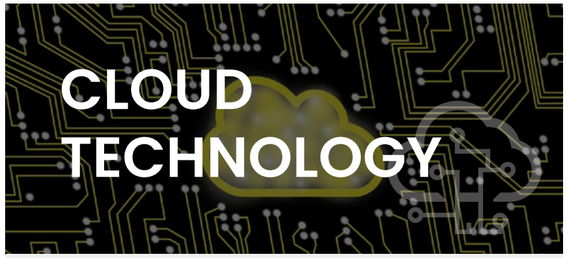


IoT refers to physical objects that, through IT elements, connect and exchange information with other devices via the Internet or other communication networks. All of them are connected through API's (Application Programming Interface) to send, obtain and analyze multiple services data, automate processes, or perform various pre-programmed tasks.

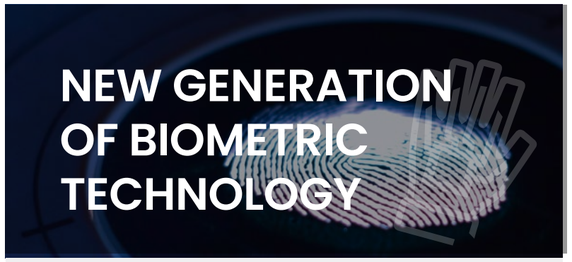


Discipline involving several sciences (computer science, electronics, mechanics, etc.), which deals with the study, design, and creation of automated systems in order to increase the efficiency or human capacities accessibility in the mobility field. The purpose of these machines is to perform the tasks entrusted to them in an automated way with the least possible human intervention.

On the one hand, **Generative artificial intelligence (GenAI)**) is an artificial intelligence branch that enables systems not only to analyze and process data, but also to generate new content from pre-existing models. GenAI can elaborate diverse outputs, such as images, texts, or audios with progressive sophistication, using advanced algorithms. On the other hand, computer vision is a discipline that aims digital images processing through algorithms that allow objects or patterns in real-time to be identified, classified, and analyzed.



Cloud services (or Cloud technology) are provided over the Internet and can be generally divided into: infrastructure (Iaas), platform (Paas), and application (Saas). These services can include from a software for any administrative task to servers, storage, databases, networks, analysis, and artificial intelligence.

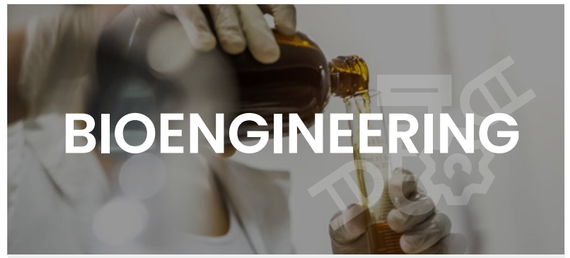


Biometric technology identifies, registers, classifies, and authenticates a person's identity, depending on various biological factors unique to each user, such as the fingerprint. Thus, the new generation of biometric technologies tries to improve accuracy and security in the identification and in data use, increasing users' security and the management of access and privacy of organizations to documents and/or infrastructures of high criticality or sensitivity.

Immersive reality (IR) facilitates interaction with virtual environments, generating an immersive non-physical experience. For this purpose, virtual and physical elements are combined like, for example, virtual or augmented reality glasses. Among the purposes can be highlighted those related to the increase of available information about the environment, with multiple impacts and potential uses in different disciplines, such as health, events management, or construction.

It is a telecommunications technology that provides greater speed, stability (lower latency), and the ability to withstand a larger number of connections, compared to previous generations, such as 4G, thanks to a greater bandwidth. This enables the composition of an increasingly digitalized ecosystem, facilitating many other technologies development using the waterfall methodology (e.g. autonomous vehicles or IoT).

We consider blockchain a digital registry, where each transaction or interaction is transformed into a "block", becoming a decentralized storage chain. Every new block is verified by the members themselves (public blockchain) or administrators (private blockchain) and added to the previous one. In order to access/modify an information packet, all upper blocks must be decoded, which shows a high integrity level.



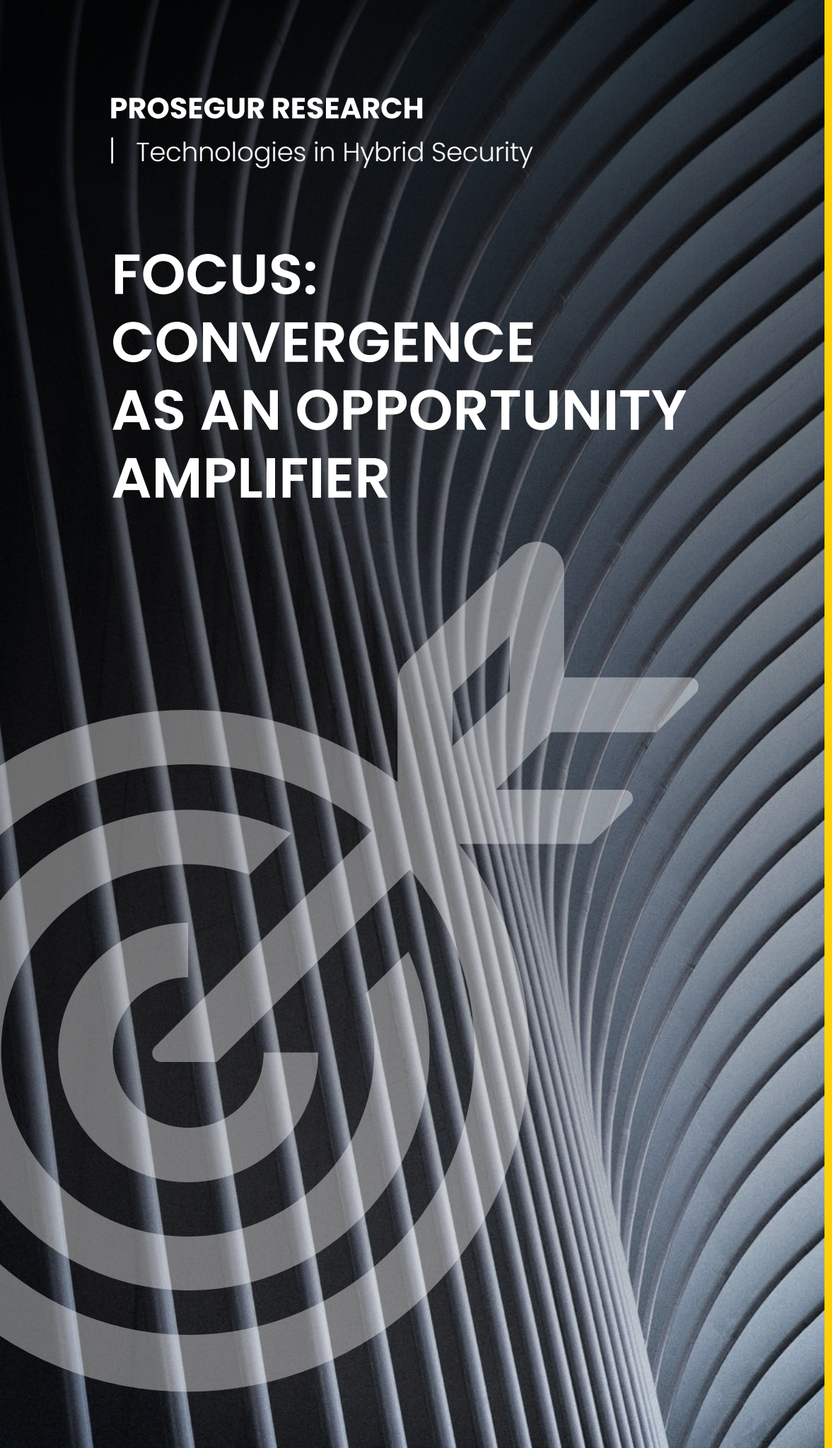
Bioengineering seeks to combine technological advances in the biology field with computational and informatics ones, increasing possibilities in multiple sectors, such as pharmaceuticals, healthcare, or agricultural. Biotechnology helps to create devices and systems, which boost resources sustainability. Given the relevance of the ecological impact of organizations in their operations, bioengineering is shaping up to be a high-value technology in the next decades.

Computer system that, based on the physical principles of quantum mechanics, offers the possibility of developing or solving high complexity problems and algorithms for classical computing. It employs specific software and hardware, using “qubits” instead of traditional “bits”, taking advantage of these and showing many states due to the superposition of the minimal units (0 and 1), expanding the operations and analysis capacity during processing.

It is a technology that uses several tools and systems, including satellites, remote sensing, and other orbiting devices, to collect, spread, and analyze data transmitted to and from the planet. As a result, areas such as connectivity, telecommunications, or climatology can positively evolve and improve, increasing accuracy and efficiency of various operations and business processes.

HOME

FOCUS: CONVERGENCE AS AN OPPORTUNITY AMPLIFIER



The **intelligent use of technologies** early mentioned lies in the value of their **convergence,** since the two or more use and combination of them **significantly expands the use horizons,** allowing companies to reorient their business processes and optimize decision making.

Private corporations face a **constantly changing competitive context,** with high uncertainty and interconnection of the different spheres that make up the productive ecosystem, all driven by fast technological development, the markets interrelation, and the evolution of consumers' trends.

This convergence is also transversal to all technological developments, which complement each other to offer increasingly better and faster services to customers and users. Simply remember that with 3G it took 45 minutes to download a high-definition movie, 4G shrinks that to 21 seconds, and with 5G it takes longer to read this sentence than it takes to download that movie, as ***Peter Diamandis states.*** These **new connectivity generations,** in application to the world of **computer science, blockchain, or quantum computing,** expand the capabilities of States, companies, and users use.

In fact, there are different indicators that show **the convergence potential and relevance for the coming decades:** according to the ***European Strategy and Policy Analysis System*** (ESPAS), 75% will have mobile connectivity and 60% will have broadband access. This way is expected that by 2030 the number of devices connected to the Internet will have reached 125 billion.

Among the main converging technologies there are **artificial intelligence, the internet of things, and robotics,** which are becoming tools that are radically changing the way many organizations around the world work. Specifically in the security sector, for the interconnected services of surveillance, patrolling, access control, and information management, convergence makes it possible to amplify the information transmission and reception at all levels and in real-time, increasing the skills and capabilities of human experts in the field. An example of this might be a robot fitted with **sensors and video surveillance cameras** at a massive event, such as a macro-festival. The use of technologies, such as AI, **computer vision,** or cameras transmits data in a timely manner to security guards, both in the field and at the operations center, increasing the sophistication level of the security services themselves.

For this reason, for companies with future and leadership view, **technological convergence is not an option, but a strategic necessity.** Thus, only those companies that dare to adopt and combine these technologies will not only stay competitive, but will lead the change towards **more efficient, customer-oriented models with a greater social impact.**

HOME

By following the **hybrid security** model, **technology is shown as a key tool** under a new thinking: a **broad and systemic** vision.

The model brain is called iSOC, which is the meeting point for **converging data, professionals, and technologies** due to a continuous and coordinated exchange of security experts. This enables Prosegur Security to **adapt to the changing environments with an unprecedented intelligence level.**

04

The safest horizon: **the technological**

HOME

01
Strategic innovation for the present and future security

02
From the survival to the exploration mode

03
Technologies in hybrid security

04
The safest horizon: the technological

04 THE SAFEST HORIZON: THE TECHNOLOGICAL

Exploring old and new technologies means facing the present and future; to innovate, taking advantage of sophisticated **empowerment instruments from the most human side of our organization.** However, it is extraordinary complex generating innovation environments if the company is not prepared to explore and to give freedom to its workers.

Among our values, we found as an preponderant figure the “dare to disrupt”, setting a **leadership style that promotes empowerment** through training and creativity, assuming that people must experiment in order to evolve, and consolidate what is advanced to guarantee the most innovative security. At Prosegur Research we believe it is crucial to make the most of human nature in the exploration field: these people’s energetic current and flow make our organization a security leader.

How do we take advantage of human nature; the energetic current and flow from people in our organization? Later, will be raised the **main keys in hybrid security framework so that organizations can foster leadership, innovation, and strategy** in the technological horizon and the future of the company.

HOME

1

Theory is key: **understanding one's own behavior.** Products and services cannot be offered without a working model, a corporate strategy, and a strategic approach. Our **hybrid security model** brings a theoretical approach to a practical and meaningful reality.

2

Consider these times: **whet the appetite without overeating.** Creating from actionable innovation with small interventions that promote **technological innovation,** interest and appetite, without falling into large early processes.

3

An organization with a place and time for reflection: **focusing on being someone rather than being somewhere.** To identify the horizons and technologies that will lead us to the next level, it is necessary to reflect deeply on the present and the future, as a complement to observation and experimentation. To draw curiosity as a combination of reason and emotion from the most human part of the company: where **peole** can be genuine and take advantage of all their capabilities, interests, and experiences.

4

The strategy of the strategy: **anticipating is a competitivity advantage unique in the company's inside and outside.** Understand the technology, studying the human behavior, and anticipate the future does not only come from intuition, but also requires strategy, training, and mostly a growing mentality from **three perspectives:** the first, executive, results-oriented; the second, directive, to place the future in the present agenda; and the third, leadership, to help people grow.

5

Leadership commitment: **hiring to transform.** The involvement of the whole company in **the corporation commitment and general purpose** allows establishing an effective addressability, by enabling the creation and convergence of transversal ideas to all sectors and workplaces.

6

Facilitation skills: **training and space to dream.** Organizations that grow from innovation attract **greater curiosity workers.** However, they must be trained, providing them with exploration spaces to innovate. In this way, they could make valuable contributions to the company, breaking with the past in light of a promising future.

7

Looking to the future: towards a new security model. In the same way that the work of an athlete is not limited to competition minutes, nor the work of a teacher to teaching hours; it cannot be said that security guards respond just to incidents. Their preparation must include an extense technological training, which empowers their action. Regarding iSOC, critical information is provided, both in real-time and from previous patterns analysis resulted, establishing a **security concept from strategic anticipation,** or what in our hybrid security model we call "connected security guard".

Documents that inspired us

The Future is Faster Than You Think
Diamandis y Kotler

The Global Innovation Readiness Gap
Boston Consulting Group

The Top 10 Emerging Technologies of 2024
World Economic Forum

The three horizons of growth
McKinsey & Company

Hype Cycle of Technology
Gartner

The Future of Jobs Report
World Economic Forum

Technology Trends Outlook 2024
McKinsey & Company

The Top 10 Strategic Technology Trends 2024
Gartner

State of the Future 20.0
Glen, Gordon, Florescu y Millennium Project Team

research@prosegur.com