

LUISS



Department of
Economics and Finance

Chair of Corporate Finance

Insurance and Artificial Intelligence
Technological Innovation and Investments in the Digital Transition

Focus on the Development of an Experimental AI Use Case in the Google Environment

Prof. Emanuele Tarantino

RELATORE

Riccardo Venditti

CANDIDATO

Academic Year 2023/2024

Table of Contents

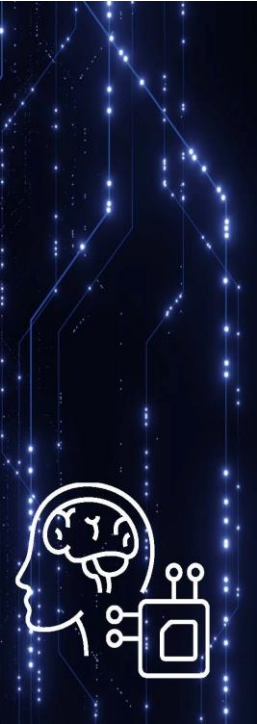
Abstract.....	4
Acknowledgments	5
Introduction.....	6
Methodological approach	8
Main sources.....	9
1. General overview and contextualization of AI with focus on perspectives in the Insurance Sector	10
2. Adoption of the Cloud environment as an enabler for Generative AI use cases	18
3. AI and the Insurance Sector: Market Views by Strategic Consulting and Big Tech ed various examples.....	25
4. Economics, data and investment policies of the digital transition of the insurance sector	32
5.Related Risk management topics – Cybersecurity focus	41
6. Insurance companies as technology providers and data companies in an ESG logic	45
7. Position of Government and Institutions, ethical and social implications and legislative/regulatory scope	51
8. Areas and examples of matrix startups Insurtech	67
9. Skill appealing for the Labor market and related trends.....	79
EXPERIMENTAL GENERATIVE AI IN A GOOGLE ENVIRONMENT	82
The development of an Experimental Generative AI Insurance Use Case in a GOOGLE Environment.....	82
GEN AI AGENTS:.....	85
A. CHATBOT: https://internaldemo-chatbot-genai.ey.r.appspot.com/chatbot	85
B. SEARCH ENGINE: https://internaldemo-chatbot-genai.ey.r.appspot.com/search.....	85
GOOGLE REPORT ON THE CASE DEVELOPED.....	86

«L'applicazione dell'IA comporterà *un'alterazione dell'esperienza umana* finora mai accaduta nell'era moderna [...] L'IA non è un «dominio» che può essere occupato, ma *un «attivatore» di molte industrie e ambiti della vita umana*»

H. A. Kissinger, E. Schmidt, D. Huttenlocher «L'era dell'Intelligenza Artificiale»

«Lo sviluppo dell'IA è fondamentale quanto la creazione del microprocessore, del personal computer, di Internet e del telefono cellulare. *Cambierà il modo in cui le persone lavorano, imparano, viaggiano, ricevono assistenza sanitaria e comunicano tra loro*»

Bill Gates



Abstract

I strongly wanted to give my thesis project an experimental connotation in the context of the adoption of algorithmic models of Generative Artificial Intelligence on a "practical" insurance use case. I managed to activate and harmonize the following 3 information and comparison channels to have a comprehensive overview, insights on data/technology/market and availability of tools that can be used for my experimentation:

- **ANIA** (National Association of Insurance Companies) in the logic of having access to the large amount of public data that Ania manages and "normalizes"
- **DELOITTE** for a market overview from the point of view of strategic consultancy, again in the AI insurance sector
- **GOOGLE** for a technological and model view in the field of Artificial Intelligence and for the use of the Google Cloud Platform for the purposes of my project (among other things, Google and Deloitte have an important global partnership in the field of digital transformation).

I gave my work an "experimental project" matrix, enriching it, as mentioned, with a sort of "use case/business case" which precisely has an experimental declination. The idea on which I discussed with representatives of Google, working on their platforms, was to develop a simulation of "Intelligent Assistance" in understanding the CARD Regulation, i.e. the rule that regulates direct compensation for road accidents. Following my personal study on the topic and the opinions provided by the channels mentioned above, I used a generative Artificial Intelligence algorithm with reference to the complex processes entrusted to the adjusters of Insurance Companies in the field of Motor TPL claims, starting from the "decoding" in AI logic of the CARD Regulation which regulates the specific area of claims management and also carrying out an initial simulation exercise regarding the possibility of "entrusting" the arbitration of a road accident to Artificial Intelligence in the future.

Acknowledgments

I am grateful to everyone who accompanied and enriched me during this very stimulating university path at LUISS Guido Carli University.

To my family, that helped me going through it, to all professors and friends I shared this experience with and to the LUISS context in general, that was extremely rich in terms of opportunities.

The academic experience has been very intensive and satisfying to me and has also really been a life experience which was made even more valuable thanks to all professors and colleagues I had chance to meet.

I thank the following professionals for their important contribution:

- Fabrizio Rosa – Key Account Executive of Google Cloud for the Insurance sector
- Claudio Colmegna – Partner of the Deloitte Cloud Engineering team
- Sergio Desantis – Director of Financial Statements and Statistics of ANIA

I would like to thank especially Professor Emanuele Tarantino, who accepted to support me throughout this work, by directing me in preparing the above-mentioned, other than having been very clear in class explanations and very proactive towards students during the lectures.

Introduction

We are on the threshold of a real technological and economic revolution linked to the digital transition, through the adoption of modern and innovative technologies and through new methods of data management (migration of databases and financial services to the Cloud environment and consequent use of algorithms of Artificial Intelligence). A path of innovation that represents the great challenge of the coming years for the Italian financial sector, with strong repercussions also on the labor market. FinTech, Cloud banking and Insurance, companies are moving their banking and insurance services to the Cloud to reduce costs, improve efficiency and offer increasingly innovative services. All insurance companies are therefore also accelerating; plans structured around new services and new channels, in line with the orientations of the digital market, for an ethical and sustainable Artificial Intelligence/digitalization, with commercial advantages and market positioning and brand reputation, but also in a logic of systemic benefits for customers and country. In fact, it seems truly essential to manage new and challenging systemic risks (healthcare, agriculture, catastrophic events, social security, etc.) at the level of insurance coverage through data and algorithms. Digital technologies are necessary to be ready to compete with new operators (see oriental and big tech examples) on an increasingly global and technological market. Consequently, a real revolution is ultimately transforming the landscape of asset management and asset management. A transformation in which technology plays an increasingly prominent role with the majority of asset managers and institutional investors already focusing on innovative solutions including big data, AI and blockchain to improve investment performance. with a focus also on what the business risk and return on investment may be. A central theme, also in the insurance sector, is the financial impact and investment policies of Insurance Companies and the impact analyzes on their economic accounts in a Risk Management logic. I wanted to give my thesis exercise a connotation of an "experimental project", focusing it on a "use case/business case" which has precisely an experimental declination (hypothesizing and "simulating" the adoption and impact of a new Artificial Intelligence algorithm in the Motor TPL sector and proposing an overview of services, costs and market and business implications for Insurance Companies in this historical phase of digital transition and technological transformation, with an eye also to the related Cyber security issues and ESG), also finding, in support, a contact/interface in one of the big tech companies (specifically Google) to also benefit from a purely technological view and tools. Datas are increasingly central and essential for implementing effective digitalization and Artificial Intelligence strategies and companies are increasingly centered on technology and data for offering development and competitiveness and short and medium term positioning, during a technological, industrial revolution and economic which is also strongly impacting paradigms and opportunities for work and development for young people. The topic in question concerns the digital transition of the insurance sector, i.e. the evolutionary plan and migration of insurance services to the Cloud environment and the tendency to "mount" Artificial Intelligence

algorithms on top of them, of which the Cloud (which is scalable for volume and types of data and guarantees innovative services in terms of performance and security) it is ultimately an enabling factor, also considering the fact that the adoption of the Cloud is increasingly conceptually associated with the modernization and optimization of IT in a sustainable and green way. The topic seems to me to be extremely topical as the Italian financial sector has in fact begun to address it relatively recently and this path of innovation is certainly the great challenge of the coming years (with implications not only commercial and economic, but also of the ecosystem social and ethical) and a large portion of investments both by the 3 Big Techs (Google, Microsoft, Amazon) and by institutional investors (banks and insurance companies first and foremost) are destined for this technological evolution over the next five years

Methodological approach

Below, at a high level, is the methodological approach I followed in my thesis project:

- Insurance sector scouting and specific benchmarks (state of the art, trends)
- Search for sector studies (IVASS perimeter, ANIA, etc)
- Analysis of the government position, ethical and regulatory constraints and public-private partnership initiatives on the topic
- "Quality/quantitative" checks (business plans, investment plans, asset management policies, dedicated budgets, etc)
- Direct contact with a Big Tech (Google) and with Deloitte to understand fintech market trends
- Insights into ESG issues, Cyber Security, etc., related to digital evolution
- Market study on skills/profiles currently attractive for companies with a view to digital transition (with particular reference to Big Tech, Insurance, Big Four)
- **“Grounding” a Generative AI case study with an experimental approach**

Main sources

- “Technological Package” of GOOGLE Cloud Platform
- Industry studies by McKinsey and Deloitte
- Big Tech market views
- Information material and business plans from top insurance players
- Documentation produced by ANIA
- Various contributions specific regulatory field (with IVASS focus)
- Various deferrals relating to Government and Institutional positions on specific issues
- Conference extracts on related Cybersecurity profiles
- Specific feedback on recruiting market trends
- Various material from the Internet

1. General overview and contextualization of AI with focus on perspectives in the Insurance Sector

Artificial Intelligence is not a new technology and many companies have been applying it to their processes and products for years; among these also various insurance companies.

But over the past 18 months, with the disruptive advancement of generative technology, Artificial Intelligence has emerged as a key element in public debate and considerations of institutions, companies and universities around the world.

The significant impact that Artificial Intelligence can have on numerous production processes has become evident, significantly reducing marginal costs, shortening the development times of new products and services and allowing a level of customization of the offer that was unthinkable until recently.

Just as it has become increasingly clear that Artificial Intelligence is not limited to specific applications, but by its nature is capable of enabling innovation in any activity. It is widely recognized as the main driver of development of the contemporary era and its importance is comparable to that of electricity for us today, vitally permeating multiple sectors, becoming a key element for a new industrial revolution. Suffice it to say that it is estimated that the contribution of AI should lead to an increase in global GDP of 7% by 2033, a figure that clearly demonstrates the impact of this technology on economic growth.

We are witnessing a structural change in the understanding and management of the risks that both businesses and citizens require to insure.

On the climate change front, in recent months we have recorded an increasing frequency of catastrophic events which, even in Italy, have caused enormous damage with costly consequences for many companies. In fact, it is estimated that the climate damage suffered by Italy in the last ten years due to Climate Change is close to 35 billion dollars.

Cyber-attacks are constantly increasing, consider that from 2018 to 2023, cyber-attacks on SMEs in Italy grew overall by 79%¹. As the digital transition advances, more and more businesses operate through networked processes, thus expanding the population that can potentially become victims of cybercrime. These attacks put the skills and patents of numerous companies at risk.

In the healthcare field, in many Western countries, a combination of factors is making the tension and difficulties affecting public healthcare systems increasingly evident. Among these, there is the aging of the population, with an ever-increasing number of people requiring assistance, even at home. In our country it is estimated that by 2050, with 35% of the Italian population over 65, it will be necessary to increase annual spending by 2-3 billion euros to maintain the quality of the healthcare service². Added to this are the public budget constraints that many states face and the difficulty in finding medical and paramedical staff.

We are not faced with a gradual evolution of the scenario: but with a strong, profound discontinuity that requires innovative, strong and visionary responses.

Artificial Intelligence, thanks also to the push of generative technology, represents a powerful ally in solving contemporary challenges, both socio-economic and demographic, as it offers cutting-edge solutions that overcome the limits of traditional methodologies.

For example, in healthcare, AI will allow more precise diagnoses and personalized therapies. In the environmental field, it will help monitor climate change by preventing the impact of catastrophic events and support the energy transition by contributing to infrastructure planning, natural resource management and energy demand forecasting. In mobility, it will make transport safer and more efficient also thanks to autonomous driving systems. These are just a few examples of AI's potential to transform key industries to address the challenges of our time.

As a country system, we must be ready to support the spread of AI by investing in two main enabling elements. First of all, infrastructure, since energy, connectivity and data storage are fundamental elements of this technology. Secondly, there is the aspect of education and awareness of the technology, to be promoted in companies, among citizens and in the public sector to encourage a real cultural revolution around AI and maximize its benefits as a result. In parallel, it is crucial to support the development of synergistic technologies, which have the potential to amplify AI results. Among these we find Cloud, Digital Twin, Blockchain and Quantum Computing, just to mention a few.

The relevance of the challenges we face and the complexity introduced by this technology requires open reflection with institutions and operators, not only insurance, in an inclusive and collaborative logic. The promotion of public-private partnerships aimed at the development of new applications, in conjunction with adequate incentives to support innovation, will generate new business models and collaborative infra-sectoral ecosystems: more efficient, synergistic and capable of generating value for all actors involved.

The insurance sector can continue to play a central role, thanks to AI, leveraging know-how and data assets.

In this scenario, the insurance sector has the potential not only to transform internally, but also to bring significant value to the country in various areas in which it has been active for some time. Thanks to its know-how, its technical skills and the wealth of data at its disposal, it can contribute to solving the important challenges we face.

This is precisely where highly dynamic developments in digital technology come in, with Artificial Intelligence at the forefront. This growth provides us with the tools necessary to build management processes, offers and distribution and assistance mechanisms essential to sustainably and competitively cover the new risks that have emerged in our commercial landscape.

In terms of evolving offerings, AI will allow companies to more precisely tailor their products and services to respond to changing customer needs. This will result in greater customer satisfaction and a competitive advantage in the market.

As for improving the operating model, AI will offer advanced tools to optimize internal processes, automate repetitive tasks and improve the overall efficiency of the company. This will lead to greater agility and ability to adapt to market challenges.

Finally, strengthening the distribution model, through AI, will allow Companies to reach customers more effectively and provide a personalized, high-quality experience. This will increase market penetration and consolidate the company's presence in the sector.

In an increasingly challenging competitive context, AI will therefore prove to be a fundamental catalyst for the innovation and success of insurance companies, allowing them to quickly adapt to changing market dynamics and maintain a lasting competitive advantage.

None of these evolutions are conceivable without strong data-based digital innovation. In fact, all the services and innovation we will explore today, including Artificial Intelligence algorithms, are enabled by data. Data represents an increasingly central factor for competitiveness and the ability to manage it effectively and ethically will therefore be a determining factor for the insurance sector of the future. Data is essential for insurance companies not only to manage and cover risks in a rapidly changing world, but also to personalize offerings, innovate services and proactively respond to emerging customer needs.

It is the data that allows us to better understand customer needs and habits, facilitating the creation of personalized insurance policies. Through data analysis, the specific behaviors and needs of individual users or customer segments can be identified, offering tailor-made coverage and services that respond

more effectively to their needs. This personalization increases customer perceived value and can improve customer satisfaction by increasing customer loyalty.

It is advanced data analysis that allows you to evaluate increasingly complex risks. Using big data and machine learning techniques, enormous volumes of information from different sources can be analyzed to identify correlations and trends that would be missed by traditional analytical tools. This means being able to better predict the probability of specific insurance events and adjust premiums accordingly, as well as identifying new emerging risks.

Artificial Intelligence is, therefore, a very powerful tool.

Despite this, in recent months we have often heard concerns about the use of AI to reduce costs and replace personnel, allowing machines to make increasingly relevant decisions.

Artificial Intelligence represents a complement and support to human work. This means freeing people from more repetitive tasks, allowing them to focus on customer interactions; and strengthen the analytical base necessary to evaluate increasingly complex risks. This technology will allow us to adopt sophisticated tools capable of making risks insurable for which, without them, businesses and citizens would face very high costs. Surely, Artificial Intelligence will bring a transformation that we should consciously embrace, driving its integration into various aspects of our lives. A clear example is the world of work, which is set to be influenced by AI. However, with the appropriate upskilling and reskilling interventions, we can improve the productivity of human resources, amplifying their capabilities with AI and obtaining benefits for all.

The recent approval of the AI Act requires countries to define the legislative framework for its adoption, on which the sector hopes to be able to make its contribution. The Sector, while appreciating the legislative effort and the values that inspired it, hopes for a certain moderation and personalization in the transposition of European standards at national level, which takes into consideration the priorities of the sector and the centrality of data. While it is essential to align the regulatory plan at European level to avoid excessive legislative divergence, it is also important to ensure that there are no excessive burdens on companies that develop or adopt AI.

In particular, the sector is available to institutions to solve the country's major challenges and collaborate in order to:

- **Define standards** uniform to ensure the right balance between risk management and the innovation potential that is enabled by this technology, eliminating regulatory disparities in the use of data compared to large technological platforms. Every insurance company is investing in the construction of datasets functional to its business strategies. Therefore, it is

essential to outline and limit the topic of data sharing only to those applications in which, in compliance with the GDPR, compliance is safeguarded and data security is guaranteed.

- A second area on which we are ready to collaborate is related to data. In a new era characterized by AI, in which data represents a crucial resource, access to large, updated and high-quality datasets is an essential factor of competitiveness. And that's why it's important to **establish standards** and infrastructures to access data sources of common interest, in collaboration with the PA (eg national registry, land register, ...).
- Finally, it is also desirable to introduce mechanisms to enhance the sector's investments and reduce under-insurance, consequently improving the safety of citizens and businesses. Companies have long been investing in innovation and AI, making a positive contribution to citizens and businesses, including for example by offering protection against risks of which there is not yet full awareness, such as catastrophic or cyber risks. In this context, the Government could seize the opportunity to leverage the efforts and investments of the Companies, amplifying them through specific interventions.

We explored the many facets and potential that AI offers to our sector, but we also confronted the ethical, regulatory and industrial challenges that accompany this technological revolution.

In particular, we have seen that as a sector we are faced with a unique opportunity to strengthen our role as a protagonist of ecosystems by leading the revolution brought by AI.

To do this we must continue to innovate as we have been doing for some time, fearlessly accelerating the selection and introduction of AI to win this open game, both for individual companies and for the insurance system.

Precisely with reference to the three ecosystems, we have seen that in the Cyber Security field, the sector can significantly improve its cyber risk estimation capabilities and integrate new AI-based defense, response and remediation services to increase the protection, creditworthiness and competitiveness of businesses. With reference to Climate Change, the sector can now estimate risks like never before, as well as verify damage and improve prevention, also introducing AI-based services for the prevention and management of such risks, both for citizens and businesses, with potential benefits for public spending. Last but not least, even in the health sector, the sector can strengthen its role in the ecosystem by introducing prevention and assistance services capable of relieving our NHS, which is already under great pressure.

As emerged during the morning, I would like to reiterate that the sector is available to work with the institutions to resolve the country's challenges and that to do this best it hopes that the necessary regulation follows a moderate and balanced approach that protects citizens and businesses, but at the same time at the same time it does not jeopardize the opportunity to innovate and does not create disparities with other players or other geographies.

Furthermore, the sector once again renews its willingness to strengthen public-private collaboration, not only between the insurance sector and the Government, but also with other actors in the supply chain, in order to share useful data and information (from the PA or from sources third parties), in full compliance with the legislation, and to introduce mechanisms aimed at enhancing investments in the sector and reducing under-insurance to make citizens and businesses increasingly protected.

Finally, I would like to share, in light of what we have heard, some forward-looking reflections on our objectives and the priorities that each of our organizations must pursue to successfully meet these challenges and project our sector towards a sustainable and competitive future.

Last but not least, we want to work to promote the spread of AI culture in the insurance sector, providing training and support for updating the skills necessary to successfully face the challenges of the future. Through targeted training programs, workshops and educational resources, ANIA is committed to spreading knowledge of AI and its applications in the insurance sector, helping companies to equip themselves with all the skills necessary to make the most of this technology.

We are therefore ready to take on this challenge and continue to serve our members so that they are always able to protect businesses and citizens from increasingly complex risks.

With artificial intelligence, insurance companies can ultimately play a key role for the country system.

Artificial intelligence is transforming the insurance world and its role in three main directions. First of all, the operational and technical model is evolving in a logic of efficiency and data-driven, thanks to the extensive use of data from the risk estimate during underwriting to the settlement of the claim. For example, in the claims management sector there are already innovative players who use AI to automatically verify and estimate damage to vehicles and buildings based on images acquired from smartphones, making the entire process 10 times faster. Or again, in relation to climate risks, thanks to AI and the integration of billions of data points, it is possible to estimate and settle a potential claim in advance a few days before it occurs, offering assistance to the insured and taking all the necessary measures in order to reduce the extent of the damage. Furthermore, the role of companies will evolve from single operators to protagonists of multiplayer and multidisciplinary ecosystems, relating to

multiple areas of need for citizens and businesses, offering new services that will go beyond protection, integrating solutions from different players thanks to AI. The ecosystems in which insurance can be protagonists and in some cases leaders of an integrated multi-sector offer are those of health, mobility, climate, home and cyber and business risks. There are already examples of international companies that are building real ecosystems by integrating external players and leveraging AI, both in the health sector and in the mobility sector, and new startups are emerging that will enable integration in other areas too. We will increasingly move in the direction of insurance-centric ecosystems, in which the companies will orchestrate the various actors involved. Suffice it to say that 60% of the most relevant initiatives of insurance companies in the field of AI at a global level are developed in partnership with third parties, such as service providers, insurtech and technology companies and, in some cases, university and research centers. Finally, the transformation of AI will also raise the level of service offered by insurance to businesses and citizens, guaranteeing, for example, an improvement in terms of increasingly personalized and accessible offers, instant settlement of claims and the raising of the level of assistance and satisfaction of needs and greater ease and breadth of protection provided. With these changes, at the same time, the role of insurance intermediaries will also be able to benefit, who, thanks to AI, will be able to evolve their work of personalized consultancy towards insureds and management of assistance needs, thus increasing customer satisfaction and service. of protection provided. These changes will not only affect individual companies, but also the entire insurance system, which will be able to evolve into a driving force in resolving the country's challenges. The entire system will be able to offer information and services to the country and the public administration, increasing the state's ability to ensure protection and development for its citizens and businesses. The transformation started by artificial intelligence has as a prerequisite the full valorization of human resources starting from the distribution networks, from the investments necessary for the renewal of infrastructures and from the adaptation of regulations that protect ethical principles, regulations and privacy, but at while stimulating healthy industry innovation based on AI and secure data integration. To all intents and purposes, artificial intelligence is a "cubed" game (IA3) in which insurance companies can play a leading role in ecosystems, central for businesses but also for society, because they have more than ever 'interconnections' with partners and other players. Furthermore, it is still an open game and characterized by a series of innovations and startups available to all, but which must be framed and selected according to a concrete strategic approach and, finally, must be played with an active, proactive and timely role as tomorrow it might already be late." In 2023 there were 250 million AI users worldwide (x2 from 2020) and expected to surpass 700 million by 2030³. Furthermore, global

investments in startups by venture capital in 2023 decreased (-38%) compared to 2022, but not those linked to startups that use AI, which grew by +9% to reach a global value of almost \$50 billion⁴

2. Adoption of the Cloud environment as an enabler for Generative AI use cases

Perché il passaggio al Cloud è così importante



The Cloud is not just a technology to support business transformation but today constitutes a fundamental catalyst for creating value through technologies, data and ecosystems that drive organizational progress: it is a facilitator capable of allowing organizations to innovate safely and rapidly, modernizing the main activities, promoting the role of data and seamlessly interconnecting distributed ecosystems.

Cloud tools and technologies increasingly influence the future of data science work in two main areas: scaling resources and improving workforce agility. The challenge that organizations face every day is that of managing complex systems while remaining agile and innovative.

The AI race enters a new phase with Microsoft, Amazon and Google set to invest billions of dollars with the aim of integrating AI techniques into their cloud offerings. Let's see how their moves could revive a market that is currently slowing down



The near future of the cloud will be increasingly linked to the universe of artificial intelligence and will be characterized by offers aimed at integrating companies' information systems with functions capable of generating text, images, videos, music or other media in response to specific requests of users.

An important confirmation arrived a few days ago with the latest Microsoft quarterly report. Amy Hood, Microsoft's chief financial officer, said on a conference call with analysts that higher-than-expected AI consumption was responsible for a 3-percentage point increase in cloud activity.

As is known, Microsoft was the big tech that focused the most on this new season of generative AI, allying itself with OpenAI. OpenAI's AI services (ChatGpt, Dall-E) must, by exclusivity, go to Microsoft clouds and in general AI may have been a marketing lever for the company's cloud.

Where does the acceleration towards artificial intelligence come from?

For Microsoft, revenue from its Intelligent Cloud unit, which hosts the Azure cloud computing platform, grew to \$24.3 billion, compared to analysts' estimates of \$23.49 billion, according to LSEG data. Azure revenue rose 29%, beating market research firm Visible Alpha's 26.2% growth estimate.

The push towards generative artificial intelligence and above all the sudden acceleration of the main international players must be read in light of the first, important slowdown in the "Cloud" market which until a few months ago was marked by increasingly faster and seemingly unstoppable growth.

According to the main analysts in the sector, during 2023 the increase in revenues deriving from the digital cloud for the three large companies will settle at around 18%, i.e. a figure equal to approximately half of what was recorded in 2022.

The litmus test in this non-area can only be "Amazon Web Services", which, while continuing to represent the largest cloud services provider, recorded in the last quarter the lowest growth since the birth of the era of the great digital cloud.

To understand how this is not an unexpected result, it is enough to think about how Amazon.com declared at the beginning of October that it would lay off around 9,000 workers throughout the company, starting precisely from the division that deals with the Cloud.

Even Microsoft, which in the special ranking of the world's largest cloud providers is in second place behind AWS, has warned investors that its business in the large cloud is slowing down, also due to the increasingly widespread phenomenon of "cloud repatriation", i.e. of the gradual return of companies towards internal solutions, considered cheaper and sometimes more advantageous.

In a painting characterized for the first time by dark colors, therefore, the high-tech giants have seen in generative artificial intelligence a potential lifeline if not a real driving force towards the relaunch of the Cloud.

At present, in fact, to provide functions similar to those of Chat-GTP it is necessary to have real supercomputers available, capable of processing huge amounts of data in infinitesimal fractions of time.

It is quite clear that such scenarios are only possible within the large data centers owned by Amazon, Microsoft, Google and a few other players around the world.

The first proposals for generative artificial intelligence

In light of what has been seen so far, it is not surprising that cloud service providers are combining promotions of free services, conveyed with increasingly "aggressive" proposals, based on the use of generative artificial intelligence.

Google, for example, said that its AI software, previously available only within its own organization, will be gradually made available to selected customers via its cloud, generating a sense of anticipation among all of its prestigious partners spread across the globe. world.

A case that is leading the way is that of KPMG which initially cut back on the cloud and then returned to investing in an even more significant manner once the first features based on OpenAI appeared in

the Azure ecosystem, capable of allowing integration of artificial intelligence services in business systems.

According to Brad Brown, Global Head of Tax Technology and Innovation at KPMG, “AI is the much-needed advantage that many businesses have been expecting from the Cloud. This will stimulate consumption.”

You also need to consider how smaller AI startups potentially represent large new customers for cloud providers because they require large amounts of computing power to develop and run their apps.

In particular, according to estimates by the venture capital firm Andreessen Horowitz, approximately 10-20% of the revenues generated by generative artificial intelligence apps go to cloud companies, with particular reference to the three largest suppliers, which, having sensed the new trend gold, they try to attract innovative companies by offering them a free "trial" period of their services.

Consider, for example, that:

- **Google has more than doubled the amount of free credits it offers to new AI startup customers**, now covering up to \$250,000 in spending for their first year.
- **Amazon plans to offer some AI startups up to \$300,000 in computing resources** free to sign up for their cloud as part of a new program for generative artificial intelligence startups, people familiar with the matter said.
- **Microsoft, as already mentioned, is investing in AI startups** to build its own AI IT infrastructure and present itself to customers as an "AI-first" company.

Anthropic, an OpenAI rival that also released a new AI model earlier this month, received a more than \$300 million investment from Google this year and agreed to make the company's cloud unit your preferred infrastructure provider. The search company also signed a multi-year deal to spend about \$900 million on Google's cloud services, sources familiar with the matter said.

Race to generative AI, Microsoft leading the way

Born as a cold war in which the world's great players prepared their own strategies "behind the scenes" and studied their opponents as in a great chess game played on a global level, the race towards artificial intelligence (and in particular towards that "generative") is suddenly coming to life, thanks to the increasingly “unscrupulous” moves of Microsoft, Amazon and Google.

The first actor to break the balance was, indeed, the giant founded by Bill Gates who literally shuffled the cards by investing the stratospheric sum of 13 billion dollars in the OpenAI startup, which made headlines thanks to the now famous ChatGPT.

To understand how AI is a strategic objective of Microsoft, just think that it was the CEO, Satya Nadella, who directly illustrated the new vision of the Redmond company to the main clients, partners and stakeholders, which indeed intends, propose solutions capable of increasing the efficiency of organizations by integrating artificial intelligence techniques into Azure.

The run-up of Google and Amazon

Naturally, the main competitors could not remain indifferent to this rift and, albeit with some delay, they started alternative paths aimed at equipping their digital ecosystems with tools at least equivalent to those of Microsoft.

In particular, both Google and Amazon have turned their attention towards Anthropic which, not surprisingly, represents the alter ego of OpenAI, having been founded by managers, engineers and technicians who left the original working group that implemented ChatGPT.

Even though they are not close to Microsoft's investments from a financial point of view (Amazon has forecast spending of 4 billion dollars while Google started with 300 million to reach around 3 billion dollars), the two biggest rivals have sent a decidedly strong, demonstrating that it wants to remain connected to the world of artificial intelligence and, above all, that it wants to propose alternative and differentiated solutions compared to those of the Redmond giant.

Meta too in the "war" of intelligent chats

Meta, the parent company of Facebook, has also entered the "intelligent chat war", albeit still on tiptoe, and in recent months has launched Llama (Large Language Model Meta AI), presented as an "all-purpose linguistic model". "cutting-edge designed to help researchers advance their work in this subfield of artificial intelligence."

To complete the reference context, it is also appropriate to underline how Google, even before financial Anthropic, had actually launched its own proprietary solution, called "Bard" (in honor of William Shakespeare, who is often defined as the "Bard of Avon"), which recently also landed in Italy but whose future remains uncertain in light of the US company's increasingly strong interest in OpenAI's rival startup.

"Internal" solutions and the OpenAI – Anthropic dualism

If the increasingly close union between cloud services and artificial intelligence now appears certain, the panorama of "intelligent chat" offers dominated today by ChatGPT but probably destined to see, at least in the immediate future, a "duopoly" appears not entirely clear operated by OpenAI and Anthropic.

The situation, although still fluid and evolving, seems to recall that of the early days of mobile operating systems which initially saw the proliferation of a series of proprietary solutions to subsequently settle towards the coexistence of iOS and Android.

At present, however, the state of the art is represented by the following solutions.

ChatGTP

The OpenAI product is certainly the most famous chatbot based on artificial intelligence and machine learning.

It is specialized in conversation with a human user and has been developed with machine learning techniques (unsupervised) and optimized with "supervised" and "reinforcement" learning techniques, developed to be used as a basis for the creation of other machine learning models.

Claude 2

Claude 2, which can be considered the most important opponent of ChatGPT, is characterized by the ability to manage up to around 75,000 words, which could correspond to the length of a book (I think the famous competitor stops at around 3,000 words). Users, in particular, can enter large amounts of data and ask for summaries in the form of a memo, letter or story.

Research conducted by Arthur AI, a machine learning monitoring platform, concluded that Claude 2 is the most reliable chatbot in terms of "self-awareness", that is, in accurately evaluating one's knowledge and the limitations associated with the process of training.

The system was created by Anthropic, which, in turn, was founded by Dario Amodei, former vice president of research at OpenAI, his sister, Daniela Amodei, who was vice president of security and policy at OpenAI, and a large group of researchers who left the now famous parent company of Chat GPT.

Google Bard

Google Bard represents Google's first major response to Microsoft's excessive power in the field of generative artificial intelligence. According to Jack Krawczyk, Director of Product Management, the product was created “to explore curiosity and allow ideas to evolve, helping people shape their creativity,” as well as “combine the breadth of knowledge globally with the power, intelligence and creativity of our great linguistic models”.

A particularly interesting element of Bard is connected to its ability to simultaneously draw on information on the web to provide updated and quality answers.

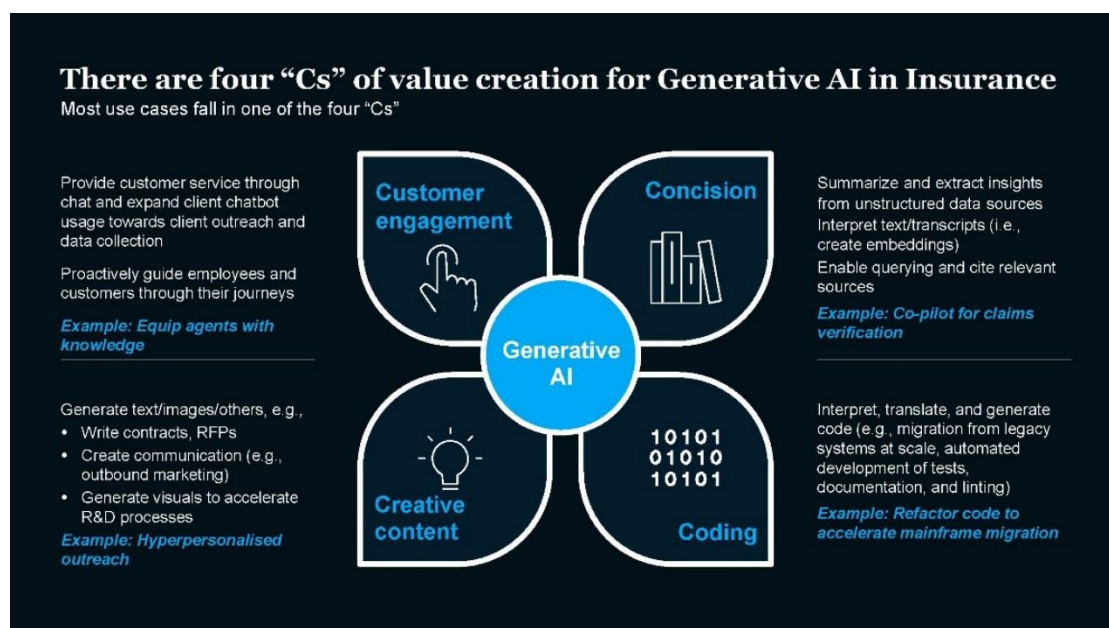
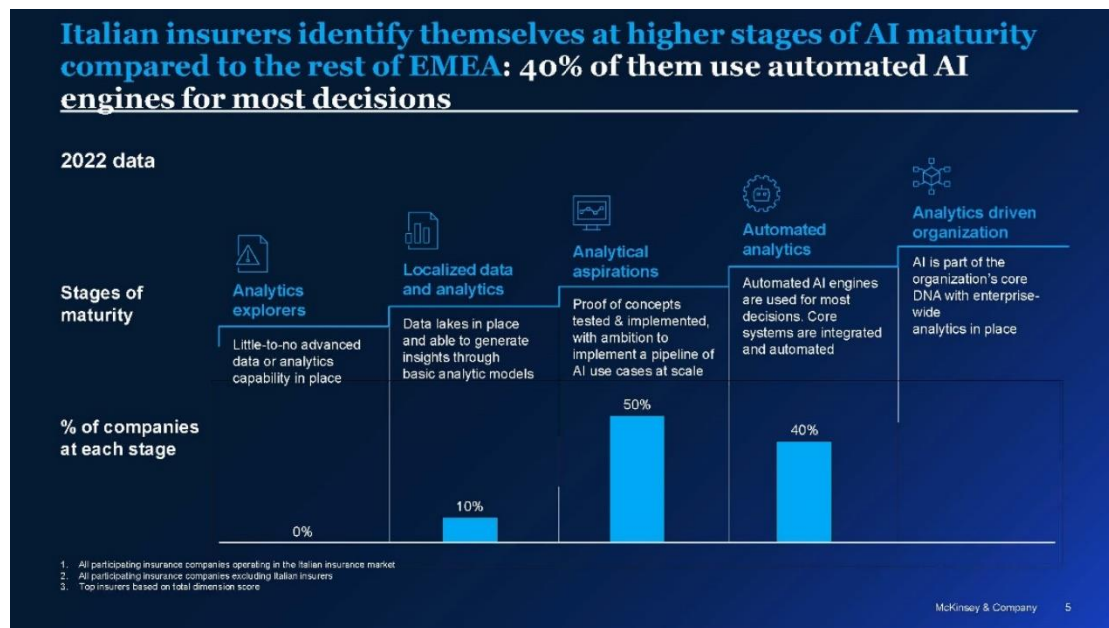
As anticipated, the giant founded by Larry Page has now decided to invest in Anthropic and could, therefore, orient its strategies towards an integration of its flagship product in the field of AI with Claude 2, also given the convergence of a competitor of very close up like Amazon.

Llama2

Llama 2 is the language model developed by Meta, the parent company to which Facebook also refers, to understand and generate human language in a natural and coherent way, imitating the way humans speak and write.

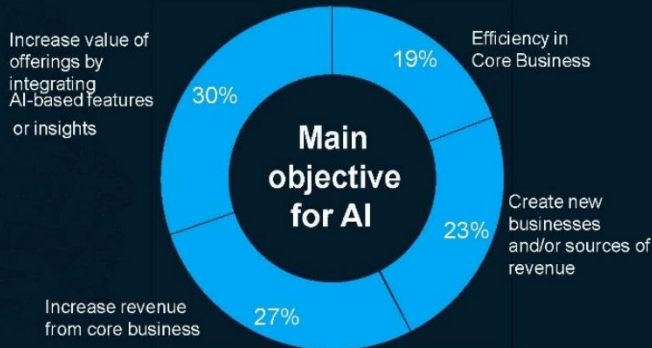
According to the intentions of the multinational founded by Zuckerberg, Llama2 can be used for a series of applications, including the construction of chatbots.

3. AI and the Insurance Sector: Market Views by Strategic Consulting and Big Tech ed various examples



In the most advanced organizations, AI objectives extend beyond efficiency

Top objective for organization's planned generative AI activities, % of respondents^{1,2}



1. Asked only of respondents whose organizations have adopted AI in at least one function
 2. AI high performers respondents who said that at least 20 percent of their organizations' EBIT in 2022 was attributable to their use of AI - n = 45
 3. Excluding Software Engineering
 Note: Figures do not sum to 100%, because of rounding
 Sources: McKinsey Global Survey on AI, 1,684 participants at all levels of the organization, April 11-21, 2023 | The economic potential of Generative AI – The next productivity frontier, McKinsey, June 2023



Potential for productivity lift from Generative AI, % of global functional spending

4-10%
in Marketing and Sales

~30%
in Software Engineering

~12%
in Product R&D³

McKinsey & Company 3

Potential productivity lift from generative AI in Insurance

Increased productivity of the industry's annual revenues

2-3%

Additional revenues
~\$50 – 70B

Insurers have been frontrunners in adopting generative AI



Examples of GenAI applications announced in 2023

Distribution, marketing and sales	AVIVA	Aviva launched an Algorithmic Decision Agent (ADA) that powers hyper-personalized omni-channel marketing across Health, General Insurance, and Savings & Retirement A Life insurance carrier is building a financial planning agent and assistant to support that helps in personalized guidance, nudges advisors with next best action to propose, and proactive lead management support
Underwriting		Insurers are starting to use GenAI for underwriting to increase throughput, accelerate time to market and eventually improve win rate due to better experience and more accurate quotes. For now, we are seeing this primarily in P&C mostly in commercial lines but opportunity to scale to life as well
Customer operations and claims	stripe	Stripe developed a content extraction, classification, and generation engine to support customer service agents with automated customer research, developers with virtual assistant, and fraud team with automated community scans
	Lemonade	Lemonade built AI infrastructure that covers end to end customer journey (e.g., high-impact areas include automated/streamlined claims processing, improved CX during onboarding)
IT		Financial institutions, including insurers, with significant tech debt are starting to use GenAI to convert old mainframe software , programmed in COBOL, to modern, python-based solutions A large Life insurer is currently developing a utility based on GenAI to automatically read policy contracts and code from multiple systems to transfer old legacy contracts to newly acquired systems

Source: The economic potential of generative AI – The next productivity frontier, McKinsey Global Institute, June 2023 | Press Search
 McKinsey & Company 4

GenAI & LLM Insurance Specific Examples



Proprietary - Confidential

Value creation of Gen AI in Insurance - some indicators

WEF Study: Augmentation via Gen AI

Jobs with the highest potential for augmentation



McKinsey Study: Productivity across industries

Generative AI can have the greatest productivity impact on marketing and sales and software engineering.



BCG study: Productivity across value chain

Productivity increase



Google Cloud

Insurers could realize significant value (P&C)

From top Generative AI powered use cases



Boost efficiency and accuracy of the underwriting process

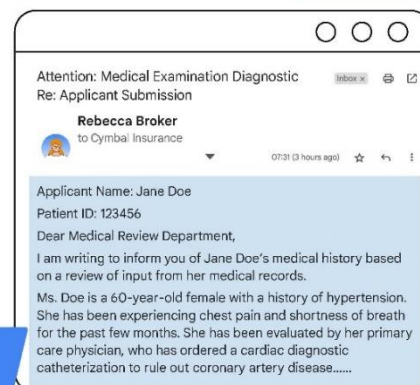
Proprietary - Confidential

Document Gathering, Search & Synthesis for Underwriting

Streamline the underwriting process for an applicant by gathering information and helping determine risk profile.

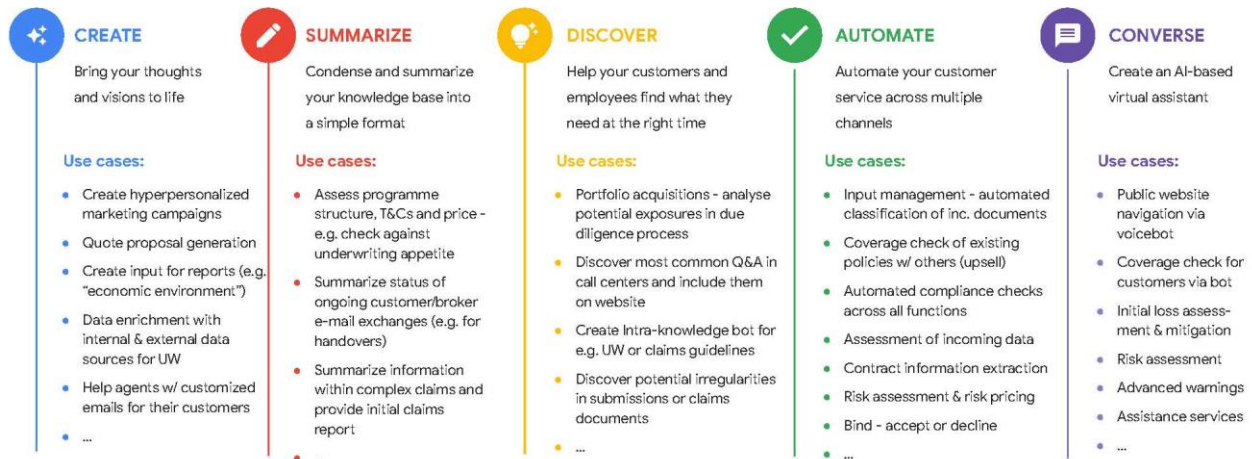
Example: Simplify the risk assessment by incorporating new data sources (e.g. information about age, gender, tobacco use, medical history, prescriptions) and analyzing information to make a more informed decision on risk appetite.

"Write a medical exam diagnostic for Jane Doe as she is looking for a Term Life Policy"



Google Cloud

In which ways Gen AI can add value - a capability driven approach

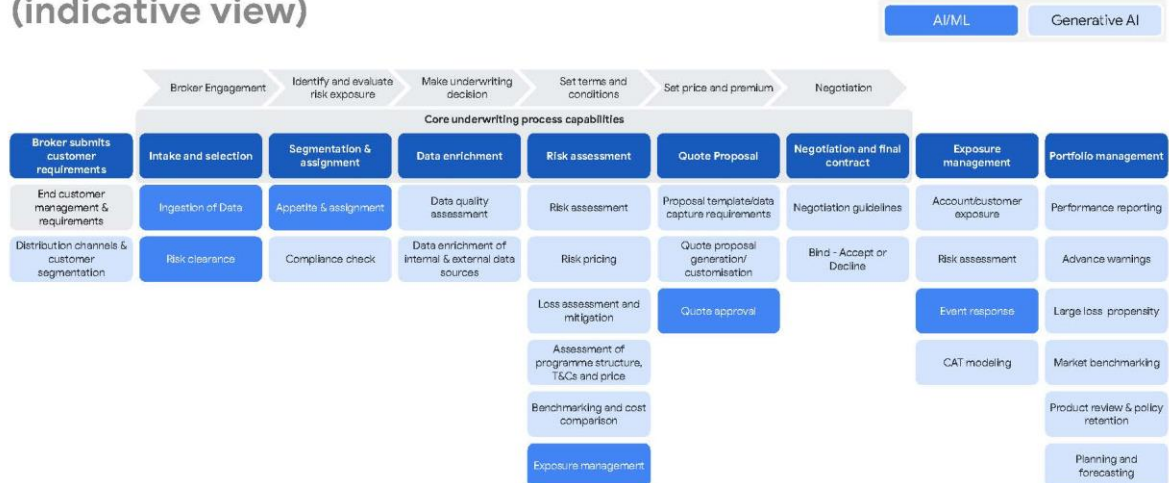


Insurer's focus:

Employees over customers / Augmentation over automation / business impact

Google Cloud

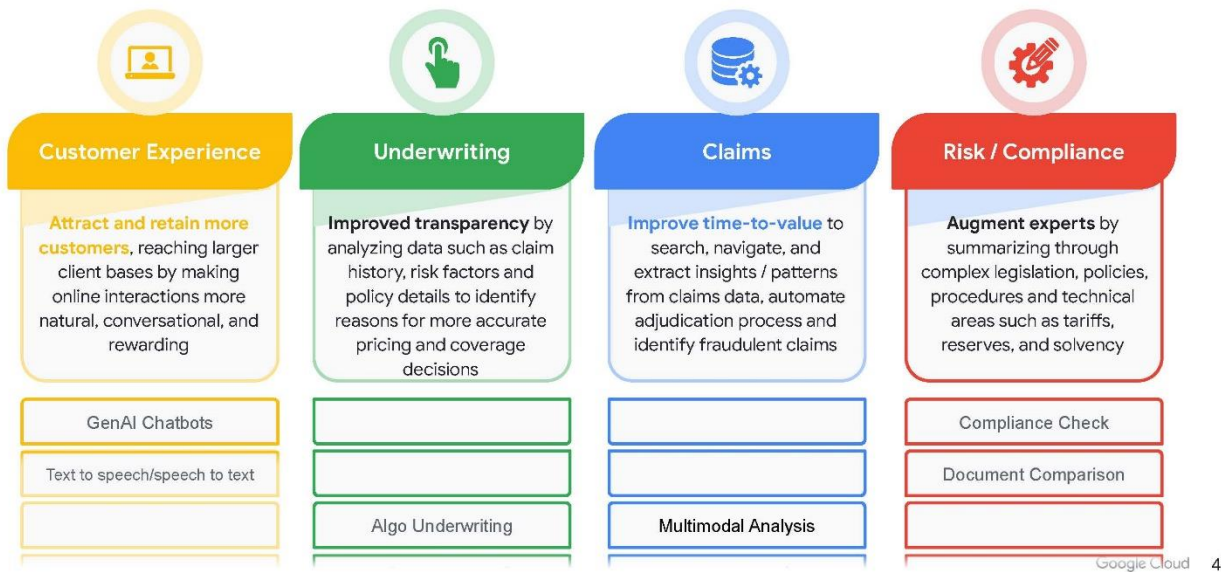
AI mapped to the Underwriting Value Chain (indicative view)



Google Cloud |

Proprietary + Confidential

Generative AI in Insurance



Generative AI in Insurance

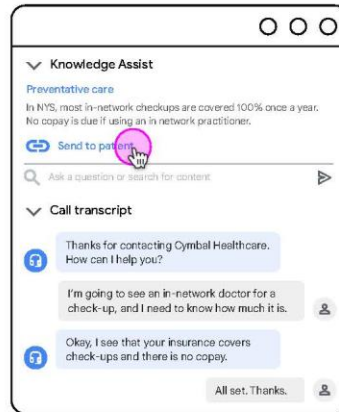


Digital Member Concierge (Health plan focus)

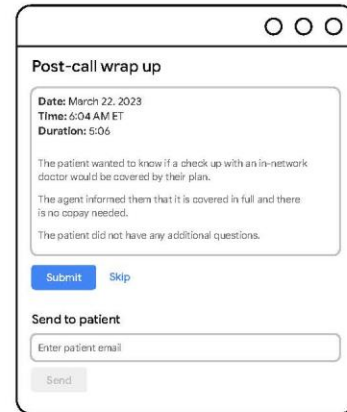
Example only

Locate, summarize, and generate health plan customer service responses to improve operational efficiencies while also improving the customer experience

Example: Using Generative AI, health plans can quickly and seamlessly provide members with answers to their questions about coverage and other health and wellness benefits.



Patient can ask a chatbot specific coverage questions



Post-call summary can be sent to agent/member

Google Cloud

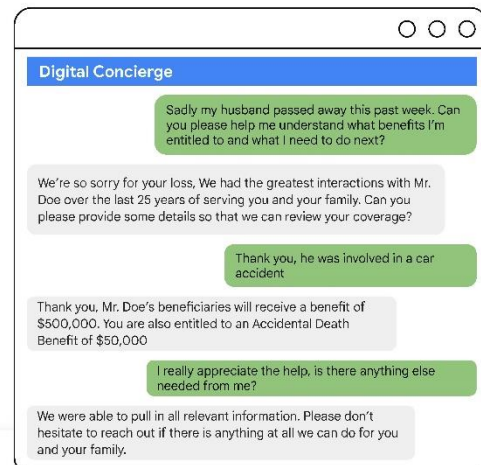
Enhancing Claims Experience for Handlers

Example only

Enhance the claims experience process

Example: Review my spouse's policy coverage, terms and limits to help me understand what type of benefits we'll receive.

Integrated into CRM, EHR, External Data Sources to rapidly build 360 customer view



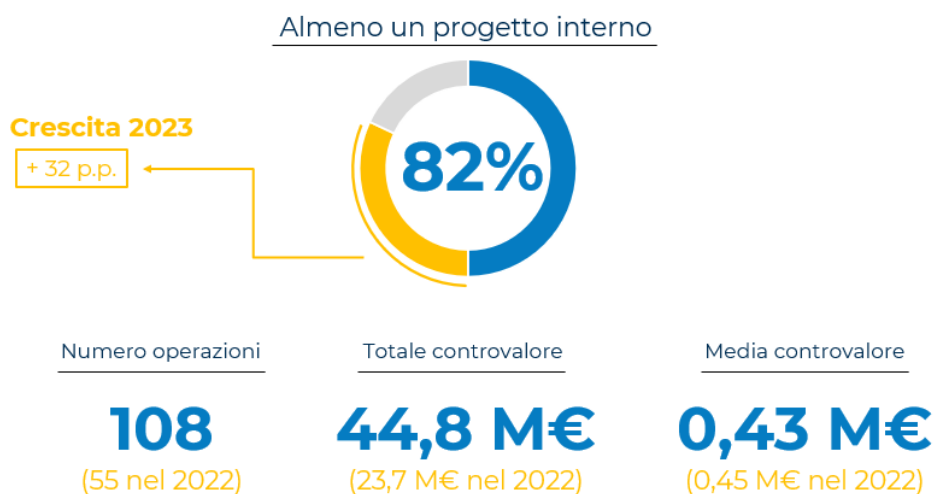
Google Cloud

4. Economics, data and investment policies of the digital transition of the insurance sector

According to estimates by the Italian Insurtech Association and the Polytechnic of Milan, 2024 it will be a record for the insurance market in terms of investment volumes. And a doubling trend is expected for 2025 and 2026 in which a leap to 90 and 140 million respectively is expected. Most of the budget allocated to operation & data management and digitalization and product creation. An increase in sales and marketing components is expected. There are 108 initiatives mapped, up sharply from the 55 in 2022 for a value of 44.8 million. 45 partnerships signed.

I progetti interni Insurtech nel 2023

Insurtech Investment Index
#OsservatoriInsurtech



Market share campione: 56%



Artificial Intelligence is destined to revolutionize the insurance sector. In fact, 2024 will mark a record year for **investments in Insurtech** by the market: by the end of the year, around 50 million euros will be invested in Artificial Intelligence solutions, which could reach 90 million by 2025 and 140 million in 2026.

The investments made to date in AI have mainly been in the operations & **data management** and in the digitalization and creation of products. In 2024, an increase in investments in sales and marketing components is expected, where AI will be used mainly to educate consumers and intermediaries, this will translate into the sale of beneficial policies and an increase in insurance penetration in Italy, a country still heavily under-insured.

This is what emerges from the new edition of the Insurtech Investment Index 2023, created by the Italian Insurtech Association and developed by the Fintech & Insurtech Observatory of the Polytechnic of Milan, which monitors the progress of investments and the degree of innovation of the insurance sector in Italy.

The digitalization of the Italian market is growing

In 2023 the level of digitalization of the Italian market will increase again, obtaining a positive score of 20/30, a clear improvement compared to 14/30 last year. Above all, two factors are driving the growth: the significant increase in the development of internal projects of the companies and of partnerships between the latter **and the insurtech startups**. In fact, there are 108 internal projects (compared to 55 in 2022, with an increase of 96%) for a value of €44.8 million (compared to €23.7 million in 2022, with an increase of 89%). Furthermore, 45 partnerships with insurtech projects were created (compared to 25 in 2022, an increase of 80%).

In the research of IIA and the Fintech & Insurtech Observatory of the Polytechnic of Milan, some predictions emerge for 2024: on the "type of operation" side we will see an ever-increasing growth in the development of internal projects in the insurtech field (67%); on the technological side we will see an ever-increasing use of technological solutions that will revolutionize the **market development**, 91% of which include Data Acquisition & Analysis (AI, Big Data, **IoT**) and 64% Communication & Sales (Chatbots, Rebo-advisors, Social Media, Video Platform).

Skills: 25,000 new "qualified" hires from 2023 to 2025

According to the annual Skills Report, created by the Italian Insurtech Association, the research of **digital skills** in the insurance sector it reached record figures. According to the latest survey, the inclusion of 25,000 new profiles with advanced technological skills is expected in the three-year period 2023/2025. Specifically, figures such as: data manager, cloud architect, **data analytics**, warehousing & business intelligent, project & program management. According to the forecast of the 2024 Skills Report, by June there will be 15,000 figures sought by insurance players and who will be employed in the development of projects relating to AI.

According to the Italian Insurtech Association, the recipe for finding skills will be to develop further partnerships, not only with universities, but primarily with insurtech startups and "young" technology companies that can bring useful and already trained figures to the sector and its development.

AI crucial for 91% of insurance companies

“2023 was a year of recovery for Italian Insurtech. Firstly, the number of insurance companies investing in insurtech startups has increased considerably; however, the most relevant evidence is that the main players in the sector have significantly increased investments in internal innovative projects and intensified partnerships with emerging insurtech startups”, declares Filippo Renga, Director of the Fintech & Insurtech Observatory of the Polytechnic of Milan “A Particular attention must obviously be paid to Artificial Intelligence. In fact, 91% of insurance companies believe that AI and, more generally, technologies for data collection and analysis will play a crucial role in the revolution of the insurtech market in the next decade.”

“What emerged in today's meeting is that projects for developing solutions based on Artificial Intelligence are now on the tables of all the main insurance companies. Let us remember that in Italy the sectors that invest most in AI are the **Telco** and **that Insurance**. We are witnessing an epochal challenge to put services on the ground that will have an enormous impact on the business model of many insurance players.” Simone Ranucci Brandimarte declared President of IIA. “As the data collected by colleagues at the Polytechnic shows, insurance companies are trying to develop internal projects to increase their competitiveness. The main challenge concerns, in our opinion, not only the value of investments, of which we expect a strong increase, but rather finding those competent profiles who will have the arduous task of developing these services.”

Insurtech & Artificial Intelligence: 50 million invested in AI by companies in Italy

Artificial intelligence is set to revolutionize the insurance industry. This is what emerged today during the event "AI and Insurtech: new frontiers and opportunities for an insurance industry that looks to the future", organized by the Italian Insurtech Association, in partnership with Share, focused on shedding light on how the applications of AI will bring an evolution of services and competitiveness in the insurance market. The day saw the participation of several players in the sector, startups and important multinationals who are already experimenting with AI applications, including: Google, EY, Microsoft, Avanade, Gellify, Casaleggio Associati and many others.

During the meeting, the new edition of the Insurtech Investment Index 2023 was presented, created by IIA and developed by the Fintech & Insurtech Observatory of the Polytechnic of Milan, which monitors the progress of investments and the degree of innovation of the insurance sector in Italy.

In 2023 the level of digitalization of the Italian market will increase again, obtaining a positive score

of 20/30, a clear improvement compared to 14/30 last year. Mainly driving the growth are two factors: the significant increase in the development of companies' internal projects and partnerships between the latter and insurtech startups. In fact, there are 108 internal projects (compared to 55 in 2022, with an increase of 96%) for a value of 44.8 million euros (compared to 23.7 million euros in 2022, with an increase of 89%). Furthermore, 45 partnerships with insurtech projects were created (compared to 25 in 2022, an increase of 80%).

"2023 was a year of recovery for Italian Insurtech. First of all, the number of insurance companies investing in insurtech startups has increased considerably; however, the most relevant evidence is that the main players in the sector have significantly increased investments in internal innovative projects and intensified partnerships with emerging insurtech startups". Declares Filippo Renga, Director of the Fintech & Insurtech Observatory of the Polytechnic of Milan. "Particular attention must obviously be paid to Artificial Intelligence: 91% of insurance companies believe that AI and, more generally, technologies for data collection and analysis will play a crucial role in the next revolution of insurtech market. According to estimates from the Italian Insurtech Association, 2024 will mark a record year for investments in insurtech by the market. By the end of the year, around 50 million euros will be invested in Artificial Intelligence solutions, which could reach 90 million. by 2025 and 140 million in 2026. The investments made to date in AI have mainly been in the area of operation & data management and in the digitalization and creation of products.

In 2024, an increase in investments in sales and marketing components is expected, where AI will be used mainly to educate consumers and intermediaries, this will translate into the sale of beneficial policies and an increase in insurance penetration in Italy, a country still heavily under-insured .

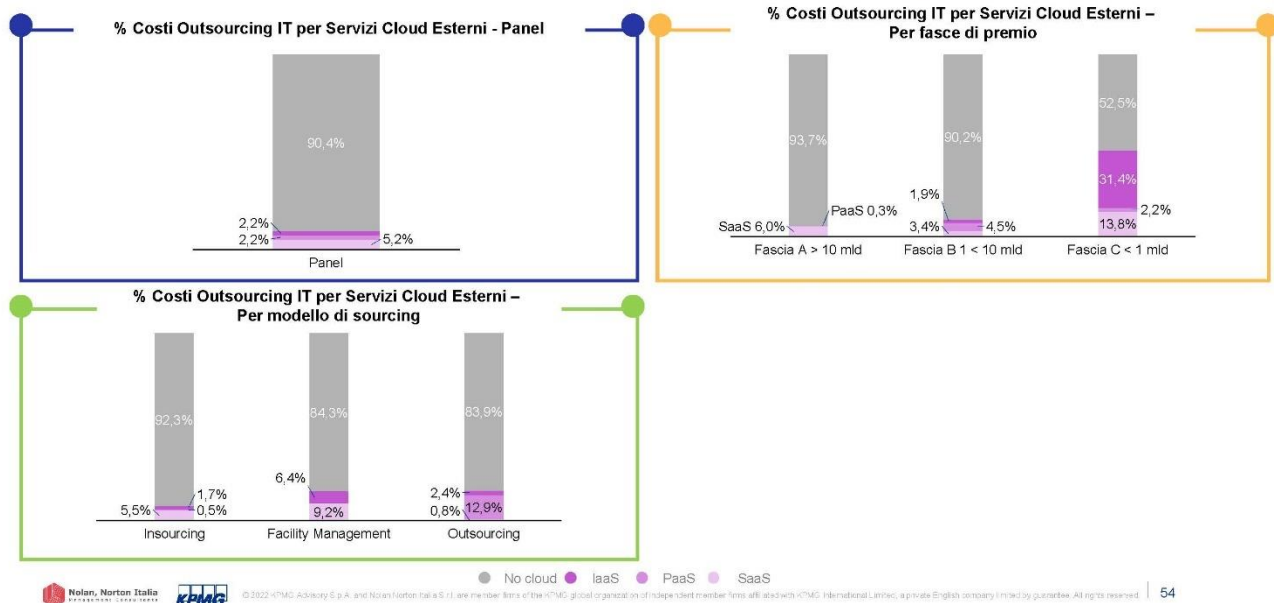
"What emerged in today's meeting is that projects for the development of solutions based on Artificial Intelligence are now on the tables of all the main insurance companies. Let us remember that in Italy the sectors that invest the most in AI are Telco and the Insurance one. We are witnessing an epochal challenge to put on the ground services that will have an enormous impact on the business model of many insurance players". Simone Ranucci Brandimarte declared President of IIA. "As the data collected by colleagues at the Polytechnic show, insurance companies are trying to develop internal projects to increase their competitiveness. The main challenge concerns, in our opinion, not only the value of investments, of which we expect a strong increase, but finding those competent profiles who will have the arduous task of developing these services".

According to the annual Skills Report, created by the Italian Insurtech Association, the search for digital skills in the insurance sector has reached record figures. According to the latest survey, the inclusion of 25,000 new profiles with advanced technological skills is expected in the three-year period 2023/2025. Specifically, figures such as: data manager, cloud architect, data analytics, warehousing & business intelligent, project & program management. According to the forecast of the 2024 Skills Report, by June there will be 15,000 figures sought by insurance players and who will be employed in the development of projects relating to AI.

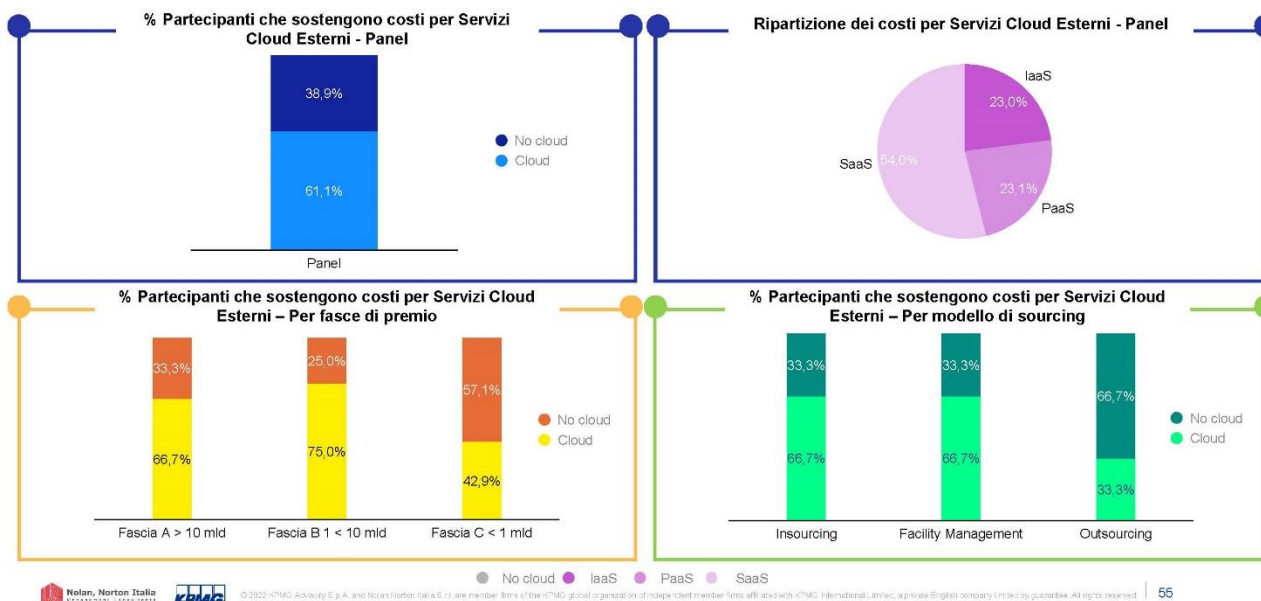
According to the Italian Insurtech Association, the recipe for finding skills will be to develop further partnerships, not only with universities, but primarily with insurtech startups and "young" technology companies that can bring useful and already trained figures to the sector and its development.

Finally, in the research of IIA and the Fintech & Insurtech Observatory of the Polytechnic of Milan some predictions emerge for 2024: on the "type of operation" side we will see an ever-increasing growth in the development of internal projects in the insurtech field (67%); on the technological side we will see an ever-increasing use of technological solutions that will revolutionize the development of the market, among these 91% Data Acquisition & Analysis (AI, Big Data, IoT) and 64% Communication & Sales (Chatbots, Rebo- advisors, Social Media, Video Platform).

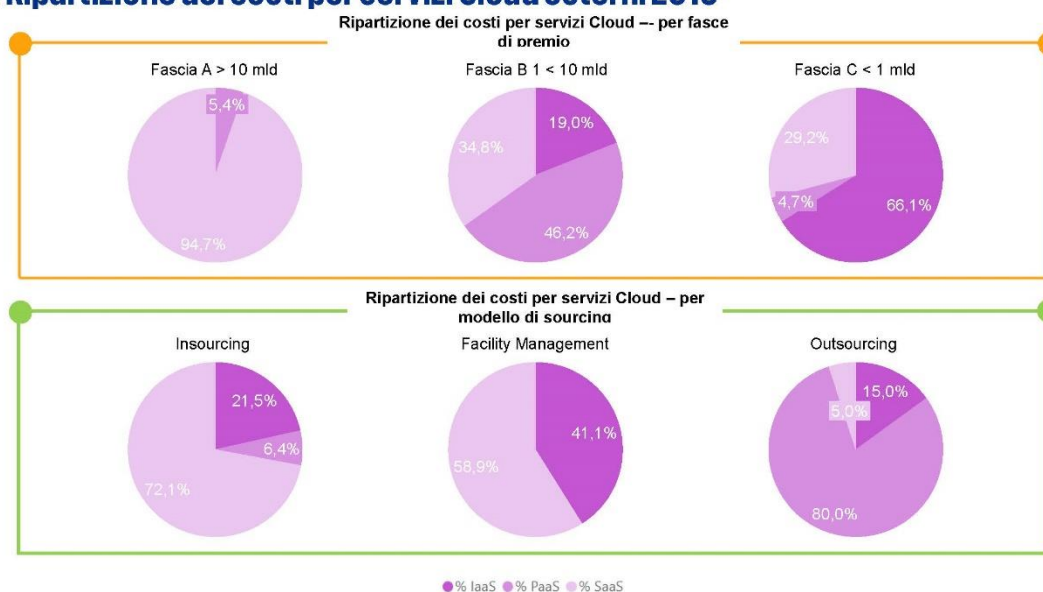
3.4 Spesa per Servizi Cloud 2019 come % dei costi outsourcing IT



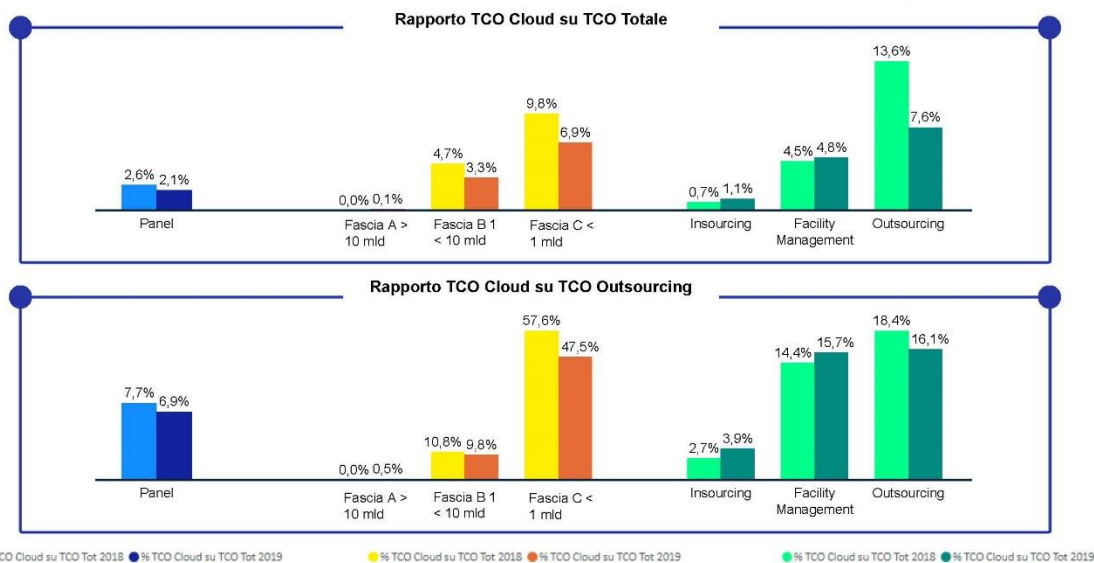
3.4 Spesa per Servizi Cloud 2019 | Ripartizione per numero partecipanti



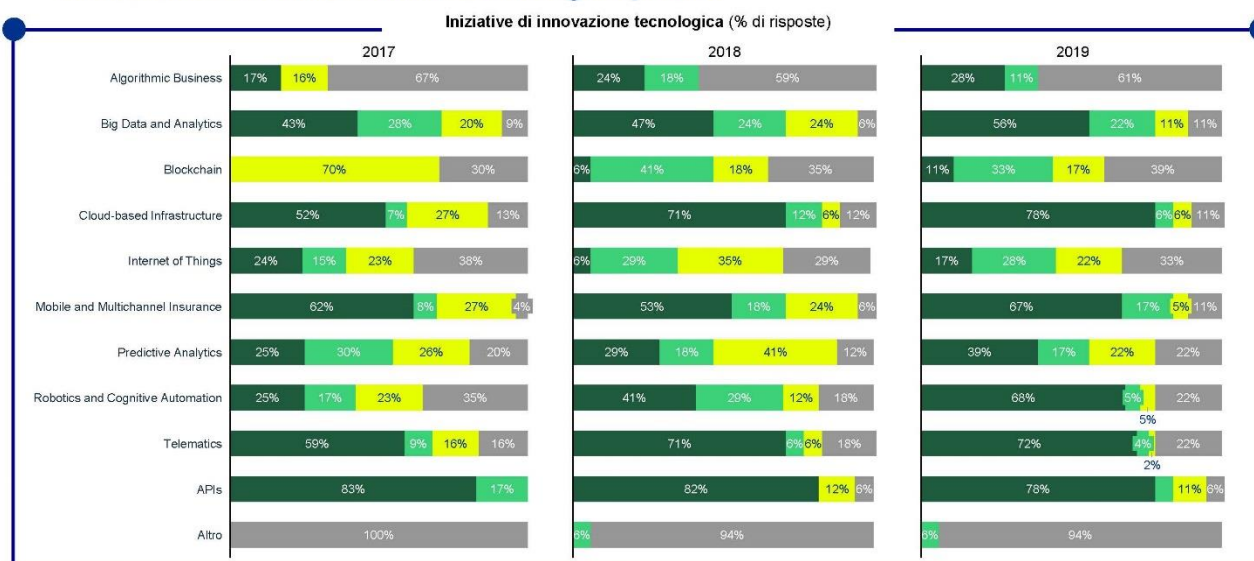
3.4 Ripartizione dei costi per servizi Cloud esterni 2019



3.4 Rapporto TCO Cloud su TCO Totale e TCO Cloud su TCO Outsourcing

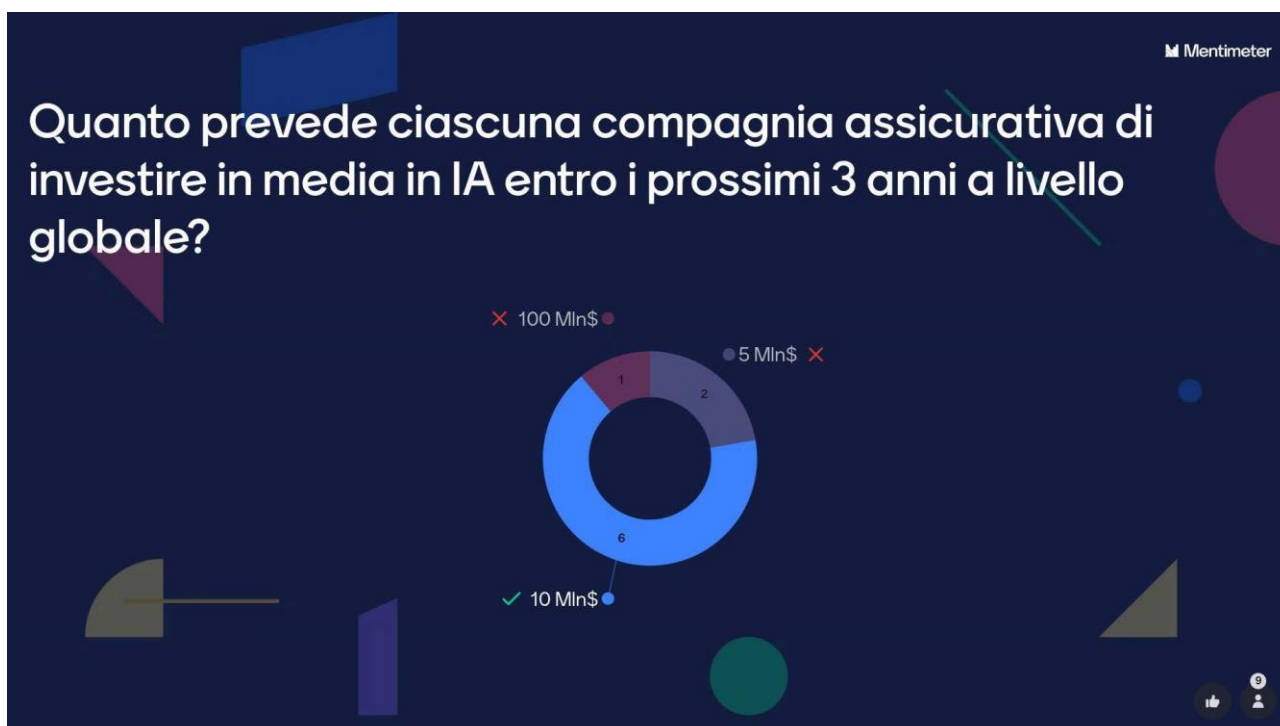
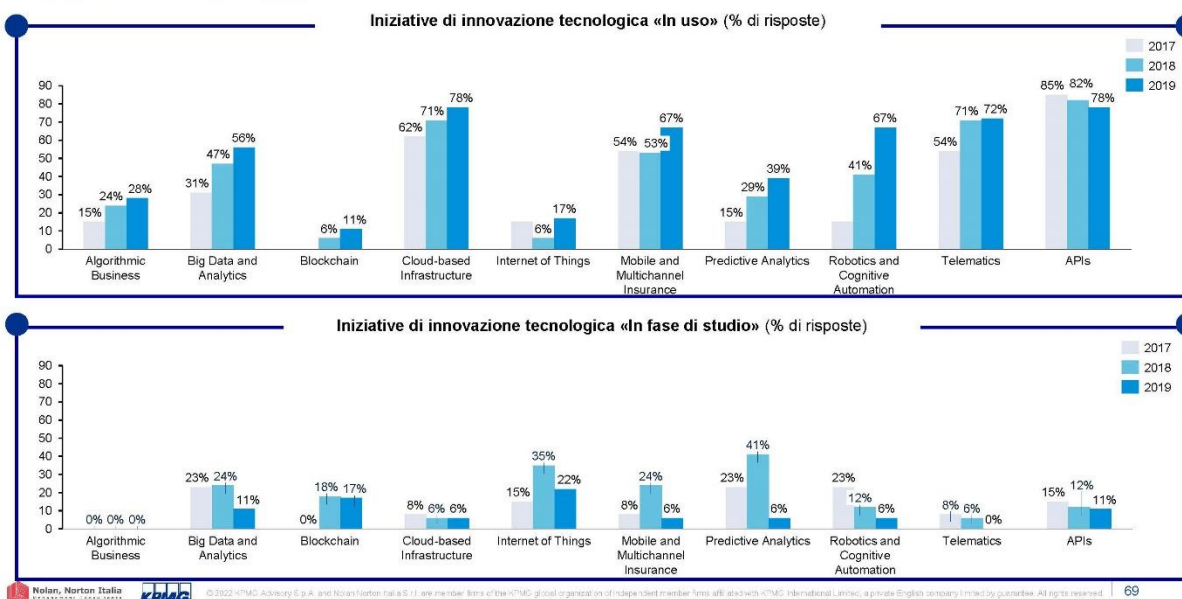


3.8 Iniziative di innovazione tecnologica | Panel

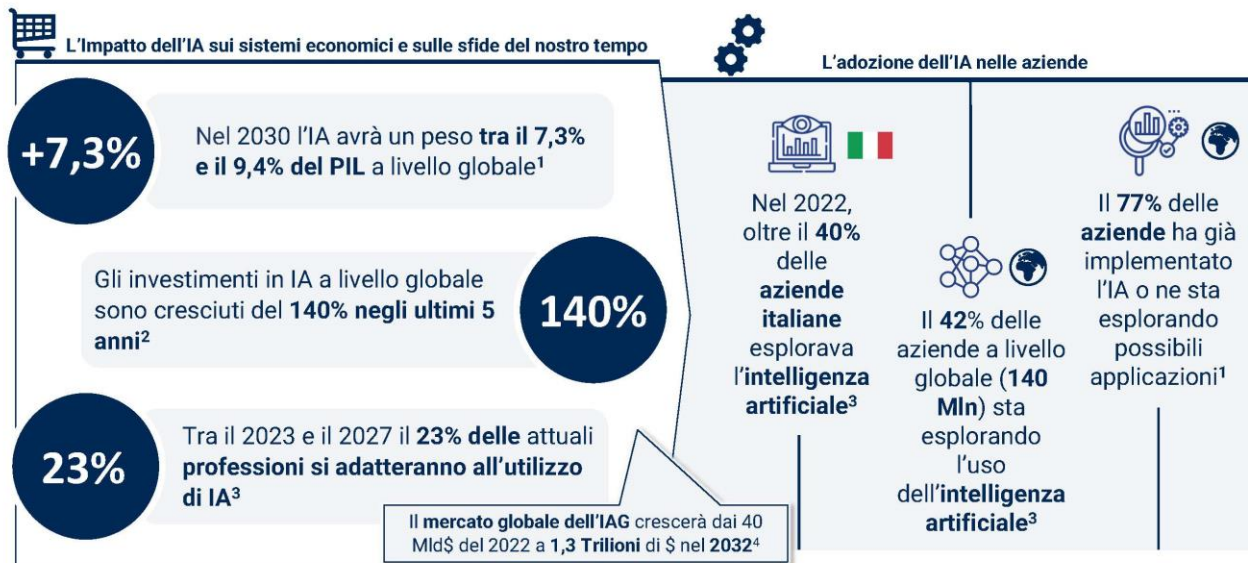


3.8 Iniziative di innovazione tecnologica | Panel

Dettaglio "In uso" e "In fase di studio"



Mercato & Adozione dell'IA



Sources: 1. Statista: Unleashing Artificial Intelligence's true potential: How generative AI could empower innovation, redefine productivity, and transform the workforce, (2023); 2. Stanford Institute for Human-Centered Artificial Intelligence, Goldman Sachs Research (2023); 3. IBM Global AI Adoption Index 2022; 4. Bloomberg: Generative AI to Become a \$1.3 Trillion Market by 2032, Research Finds, (2023)

Mercato & Adozione dell'IA in ambito Assicurativo



Sources: 1. Precedence Research, (2022) 2. Minsait (2023); 3. NASDAQ, (2023);

5.Related Risk management topics – Cybersecurity focus

Technological progress brings with it challenges and opportunities. Today, "on the global and European scene we must deal with the issue of artificial intelligence, a topic of extraordinary importance, a technological innovation that can bring immense benefit to the life of our society". Thus the prefect Bruno Frattasi, Director General of the National Cybersecurity Agency, during his speech at CyberSec2024 at the Palazzo delle Esposizioni in Rome.

At the center of the event, cybersecurity in the era of artificial intelligence. An additional technological tool - as Frattasi states - to improve collective well-being, production processes, associated life. "Applying artificial intelligence systems, for example, to medical and healthcare research, means being able to create new opportunities to fight rare diseases, to treat tumors, and bring benefits by personalizing treatments." AI gives value and transforms a huge amount of data into information.

"But there are also risks", underlined the prefect after having gathered together the many positive aspects which highlight the "great opportunities in terms of improving the quality of life at a global level". "The data processed by artificial intelligence could be subject to manipulation. The problem of AI applied to various sectors immediately becomes a problem of IT security with regards to the protection, protection and vulnerability of the data."

For this reason, a regulatory model is needed such as the text that the European Union is about to approve, the AI Act. A document "that starts with the approach to risk", said Frattasi. "There is no doubt that the European regulatory model is an unavoidable point of reference from which we must start. We will see in the coming months how we will arrive at the conclusion of the process that is leading to the approval of this provision".

The G7 under the Italian presidency will also have artificial intelligence as its "particularly followed track" and will see the National Cybersecurity Agency involved at the forefront. "Parliament will shortly begin examining a bill that the Government has brought to its attention on the subject of cybersecurity", added the prefect. This is a "very complex provision" which regulates, among other things, the criminal response. Highlighting the fundamental role that ACN will have to play, called to deal with IT security also with regard to artificial intelligence systems.

At the end of his speech, Frattasi declared that, on the occasion of the G7, "a permanent group will be established to work on cybersecurity policies so that these policies are the result of sharing"

between international cybersecurity actors. "We have launched it because it seemed appropriate to do so and we have already received positive feedback from other managers of cyber security agencies and centers. We are building the agenda of the work that will take place in Italy in May together with the other colleagues from the other six countries".

In a context where the **cyber threat** is becoming more and more pressing, Italy is moving to strengthen its defenses in the field of cybersecurity. This is confirmed by Bruno Frattasi, director of **National Cybersecurity Agency**, during a hearing at the House Defense Committee.

Frattasi in particular revealed that "new agreements are being implemented with the administrations of the national cyber security perimeter, as directed by a directive from the Presidency of the Council of Ministers, to strengthen the Agency's intervention capacity when it is an impact, establishing an activity protocol that must be followed by our operators and the operators of the administration that suffers the cyber attack".

Frattasi highlighted Italy's delay in responding to the cyber threats, attributable to insufficiently large investments in the cybersecurity sector in past years. "Response times – she explained – can also be long because investments in IT security are complex and expensive and require not only a technological but also an organizational and procedural response".

"The bill 1717 on strengthening national cybersecurity, which has already come to the attention of the joint Constitutional Affairs and Justice commissions – he added – takes inspiration from the latest developments to expand the ability to understand and counter the threat. Knowledge of the threat is in fact the prerequisite for being able to prevent and counter it effectively. The obligation to notify the impacts to which the bill refers aims precisely to ensure that this threat is known to the Agency and allows us to communicate with the person responsible for the ICT services of the affected public administration and with the person responsible for cybersecurity".

An ever-evolving danger

The director also underlined that, although Italy has not recorded attacks capable of compromising national critical infrastructures to the point of endangering national security, we cannot lower our guard. The threat is constantly evolving and the introduction of technologies such as **Artificial Intelligence could increase its offensiveness**.

“In the Agency's observation period we have not recorded attacks that could have put national critical infrastructures in conditions of discontinuity such as to endanger the primary asset that we are required to safeguard, i.e. national security – clarified Frattasi -. It did not happen due to the robustness that the country's digital surface has already achieved, but it is not a definitive and final goal but rather an intermediate one, because it is necessary to continue this process of growth and robustness relating to **Public administration**, businesses and professionals, civil community. However, we cannot rest on this result because the threat is evolving and refining and could lead to an increase in both the number of attacks against our country and the offensiveness of the threat. The intervention of artificial intelligence could in fact make the attacker's danger even more offensive.”

Digital risk is increasing

The director then highlighted how recent historical events, including the pandemic and geopolitical crises, have contributed to a significant increase in digital risk. The increasing digitalization of work and interpersonal relationships has further exposed society to hostile activities in cyberspace, particularly those directed against Western democracies. Among the examples of attacks cited by Frattasi, DDoS ones stand out, which hit public administrations, financial institutions and **healthcare companies**, overloading systems to the point of interrupting service delivery. These campaigns, often claimed by hostile state actors, in addition to causing direct and reputational damage, also convey misinforming messages, amplifying the effect of the attack.

"For companies to protect themselves from AI risks, it is first necessary for them to be aware of the risk they are experiencing." This was underlined by Giancarlo Fancel, Country Manager Italy and CEO Generali Italia, Vice President of Ania, on the occasion of the fourth edition of Innovation by Ania 'Insurance and Artificial Intelligence. Innovation at the service of the country', which was held today in Rome. "To protect companies from cyber risks - explained Fancel - we, as Generali Italia, in collaboration with the Polytechnic University of Milan, have developed a 'cyber index', which measures the ability of companies to defend themselves from possible cyber-attacks". “We - he continued - used a sample of one hundred companies, of which 51 out of 100 showed that they possess effective tools to recognize and protect themselves from possible cyber-attacks”. 60 units, but they are not below the optimal level". To encourage innovation - he underlined - a change in the skills of the figures entering the companies is necessary". “It is essential - concluded Fancel - to develop

ecosystems that work synergistically and accompany this digital transition, in our case for example, this can happen with the integration between insurance and start-ups”.

6. Insurance companies as technology providers and data companies in an ESG logic

An ethical approach to AI is critical in the design, development and use of data and algorithms to maximize sustainable value creation and minimize risks to individuals and society. A priority in Generali's strategy, to strengthen its ambition to be a Life Partner

Since it was invented, artificial intelligence (AI) is having a growing impact within our increasingly interconnected society. The technology can be applied to many different sectors and industries: this is the case, for example, in the healthcare sector, where it is used to dose drugs and distribute various treatments tailored to specific patients and to support surgical procedures in the operating room.

But artificial intelligence also has applications in the financial sector, where it is used to detect and report suspicious activities, such as the unusual use of payment and investment instruments, thus facilitating the work of anti-fraud departments. AI applications are also used to facilitate trading operations, for example by making it easier to estimate the supply, demand and price of securities.

In short, artificial intelligence promises numerous advantages - for example in terms of speed, efficiency and precision - thanks to the advanced use of data and algorithms. Nowadays, public opinion is increasingly aware of this; but at the same time it is increasingly informed about the potential risks associated with the use of these technologies in increasingly numerous areas of work and daily life, in particular the excessive pervasiveness of data and algorithms and the distortions that can result from it.

An example in this sense is offered by the so-called machine biases or distortions, i.e. the effect of incorrect assumptions in the automatic learning processes of algorithms. Such biases reflect problems with data collection or use, in which systems draw improper conclusions about information sets, either due to human intervention or a lack of cognitive evaluation of the data.

A concrete case is offered by a December 2020 study entitled "Investigating Bias in Image Classification using Model Explanations", which shows how biased data can lead to biased classification results. The authors of the study collected a set of images to distinguish those of "doctors" from those of "nurses", testing different percentages of men and women in the two categories in order to detect their impact on the performance of the algorithm. In this case, a

distorted model predicts "nurse" when the subject is a woman, "doctor" when it is a man, without looking at the real characteristics that should be used in the detection (for example the type of gown or the presence of the stethoscope).

In light of these cases, it is therefore of fundamental importance to adopt an ethical approach to artificial intelligence, which concerns the responsible use and sharing of data and algorithms beyond legal obligations to maximize sustainable value creation and minimize the risks for individuals and society.

In the insurance sector, artificial intelligence systems are used with increasing frequency to provide increasingly personalized, accurate and competitively priced products and services: from the protection of health and life, to the definition of premiums, up to the underwriting and evaluation of claims. However, if not adequately designed, developed and used, artificial intelligence systems can lead to significant risks to people's lives, including financial exclusion and discrimination. For example, can AI correctly decide who should or should not receive insurance products and services, or make the decision-making process involving them transparent to end users? There are therefore specific risks and ethical "dilemmas" to which Generali has responded for some time by trying to maximize the transparency of its algorithms and providing human supervision for the most delicate applications. In the meantime, the regulatory authorities are starting to move in order to define standards and controls for the use of AI, with significant impacts also on the insurance sector: this is the case, for example, of European Regulation on Artificial Intelligence ("AI Act"), proposed by the European Commission in April 2021 and whose approval is expected in 2023. The AI Act package includes a series of new obligations.

The objective is to promote responsible development of AI and strengthen Europe's competitive potential at a global level, allowing the maximization of resources and the coordination of investments. Through the Digital Europe and Horizon Europe programs, the Commission plans to invest 1 billion euros per year in AI, mobilizing further investments from the private sector and Member States in order to reach an annual investment volume of 20 billion euros during the digital decade.

Generali welcomes this historic change as an opportunity to strengthen its strategy Lifetime Partner 24: Driving Growth thanks to the integration of their fundamental ethical values into the new strategies of digital natives. The Group's objective is to:

- increase your digital reliability, thus creating a distinctive competitive advantage;
- strengthen its ambition to be a Life Partner for its customers;
- mitigate ethical, reputational and financial risk (e.g. lack of transparency and interpretability of AI systems or unintentional biases and discriminations hidden in the decision-making process of AI systems).

Generali also supports the adoption of the new "reliable AI" paradigm, a combination of legislative frameworks, technical-ethical principles, advanced analysis techniques and organizational transformations that will profoundly change the current way of developing and applying AI, and collaborates with regulators and industry associations to improve legislative proposals on digital technologies by leveraging their technical expertise and business experience.

In this context, for example, the initiative Trustworthy AI, which is proposed to ensure responsible use of data and algorithms to deserve the full digital trust of customers, leading to a sustainable competitive advantage and strengthening the ambition of being a Partner of Life. At the basis of Generali's strategy is the idea of providing guidelines and developing algorithms capable of avoiding risks and ensuring the transparency of all processes, ensuring that there is always human control over the activities and the most delicate decisions.

Artificial Intelligence, in collaboration with international organizations and the AI for Planet initiative, is proving crucial in the fight against climate change



There is more and more talk about **Artificial Intelligence** and the disruptive role it will have on our lives, but perhaps not enough is said about how this revolution can also be used to combat climate change and its effects.

Various international bodies (EU, UNESCO, UN) and the AI for Planet organization (founded by Startup Inside in collaboration with the UN, UNESCO and Boston Consulting Group) have been working on this for some time, which is already helping us in the task of outlining how AI can intervene in the relationship between man and the environment by acting on environmental risk mitigation, resilience and sustainability.

AI and enabled analytics constitute a powerful tool for evaluating the impact of human activities on the environment and for acting preventively so as to achieve "sustainable by design" behaviors.

The world leaders of public and private organizations dealing with sustainability are convinced of this and, in a survey by the consultancy firm Boston Consulting Group in May 2022, say in almost 50% of cases that they intend to use Artificial Intelligence for corporate climate challenges.

But let's go into detail about what it means to use AI to mitigate the effect of human activities on the environment and to adapt to the challenges of climate change.

Let's think about the activities linked to the supply chain: it is estimated that they produce greenhouse gas emissions approximately 11.4 times more than those of a company's production processes and therefore act on better coordination between the various phases of the supply chain, collaborating with partners and suppliers, can make a significant contribution to reducing emissions and waste.

An example comes from the fashion sector: managing to predict the right times for updating the catalog and anticipating consumer tastes, through the learning and demand forecasting algorithms, it is possible to manage the value chain more efficiently and reduce waste, ensuring that the final consumer receives the product he likes best when he needs it.

Another example concerns the possibility of anticipating environmental disasters and preventing disruptive effects on activities and the environment itself.

The ability to control an ever-increasing amount of data and real-time information that comes from IoT sensors and satellites allows us to grasp the signals of a potential risk of environmental disaster and make decisions in advance to remove or mitigate its impact. Think of sensors capable of preventively reporting the rise in sea levels or the water levels of a river and predict when there might be a flood, or to manage water in agriculture efficiently so as to avoid the risks associated with periods of drought.

The adoption of AI opens up the possibility of adopting solutions designed to be sustainable right from the start

helping to build what are the "fundamentals" for sustainable behavior, i.e. using AI in understanding and processing data, refining predictive models of impact on the environment, so as to be able to simulate how an activity can act on the environment and evaluate how it can be made more efficient by reducing the impact on the environment.

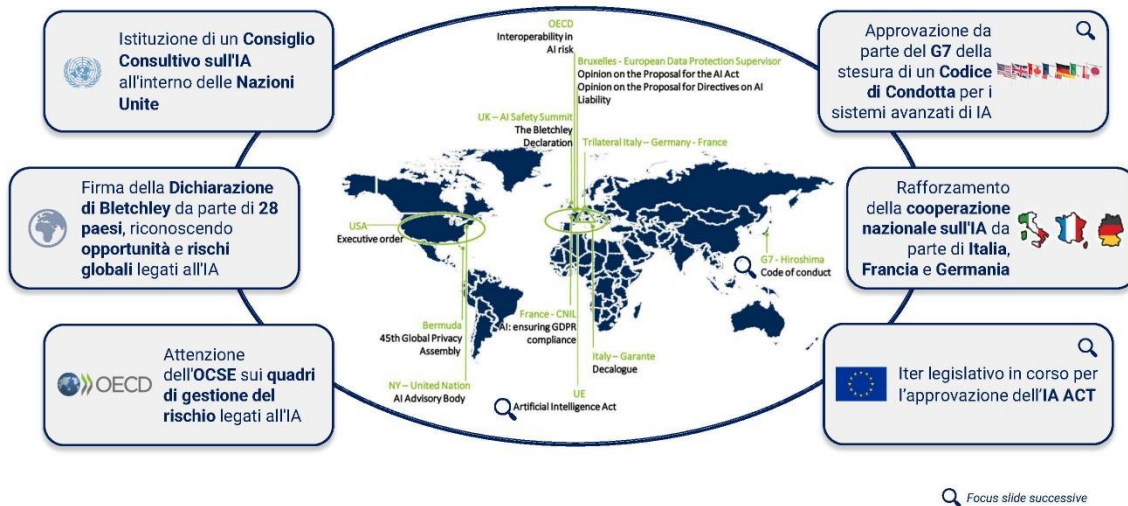
The other side of the coin in the use of AI is that it itself represents an activity with a high impact on the environment, since its operation requires an intensive use of electricity, especially for the operation of the data center.

Those who develop AI solutions, therefore, must first of all be committed to applying the rules for mitigating the impact on the environment, opting for increasingly sustainable data center management solutions and applying the same "sustainability by design" rules that they can be applied to all other production processes.

The AI challenge has just begun and its application to the objectives of the 2030 agenda represents an opportunity to be seized and developed.

7. Position of Government and Institutions, ethical and social implications and legislative/regulatory scope

La regolamentazione dell'IA è un tema centrale a livello globale



L'AI ACT dell'UE



Qual è l'obiettivo?

Assicurare che i sistemi AI utilizzati all'interno dell'UE siano in linea con i diritti e i valori dell'UE, garantendo il controllo umano, la sicurezza, la privacy, la trasparenza, la non discriminazione e il benessere sociale e ambientale.

Cosa prevede?

4 livelli di rischio che una tecnologia di IA potrebbe comportare per salute e sicurezza o diritti a cui corrispondono **obblighi specifici** per i **fornitori** e gli **sviluppatori** di sistemi di IA:



e.g. Sistemi IA utilizzati da autorità pubbliche a fini di valutazione sociale



e.g. tecnologie biometriche, utilizzate da attori privati o pubblici per identificazione, verifica e categorizzazione in tempo reale



e.g. Sistemi di interazione con l'essere umano tra cui le Chatbot



Divieto con poche eccezioni



Test, documenti su qualità dati e quadro supervisione e responsabilità



Utilizzo con pochi requisiti e obblighi trasparenza

A che punto siamo?



Iter approvazione in stallo

• La **manca di un accordo** sta rischiando di compromettere l'intero svolgimento dell'iter di approvazione

• **6 dicembre ultimo trilogio di negoziazione**, cruciale concludere le trattative

[AI Act, stallo per colpa dell'IA generativa: trilogio in disaccordo - Agenda Digitale](#)

Artificial intelligence can become a competitive advantage for Italy and at the same time promote the common good. "We are rooting for this to happen, both public and private." This was the message of the president of the National Association for Insurance Companies, Maria Bianca Farina, at the 'Innovation by Ania' event entitled 'Insurance and artificial intelligence: innovation at the service of the country'. Farina's

appeal to work together, "with a holistic and synergistic approach with the other actors in the ecosystem" and "an ever stronger collaboration with the Government and the institutions", was immediately accepted by the undersecretary to the Presidency of the Council for Technological Innovation, Alessio Butti.

"We are convinced supporters - said Butti - that the public and private sector must work together in the sector" where an industrial policy is still missing and needs to be built. Meanwhile, the value of the artificial intelligence market has reached 208 billion dollars worldwide in 2023, and could increase tenfold by the end of the decade. "The numbers circulating on artificial intelligence are very high and those that have been spent in Italy to date are quite low", observed the CEO and General Manager of Cdp Venture Capital, Agostino Scornajenchi, recalling that he had estimated a few months ago an investable horizon for the next 4-5 years of approximately 3 billion euros.

"When we started - he added - it seemed like a lot, now just over a month has passed, if we were to redo this estimate we would probably have to increase it by a lot, perhaps already double it". The potential of artificial intelligence, particularly in the insurance field, is "extraordinary", according to the analysis of the innovation leader of Deloitte Central Mediterranean, Andrea Poggi. Already today, some innovative players use it to automatically verify and estimate damage to vehicles and buildings based on images acquired from smartphones, making the process 10 times faster.

And, in relation to climate risks, it is possible - according to Poggi - to estimate and settle potential claims in advance a few days before they occur. This is an increasingly relevant issue given that in 2023, natural and climate disasters cost businesses 357 billion dollars between direct physical damage and loss of turnover.

Italy has also experienced natural events above any forecast model, worrying the sector, as highlighted by the CEO and general manager of Allianz Italia and vice-president of Ania, Giacomo Campora: "for Allianz last year we had damage for over 900 million euros when in a normal year we expect to have 120-130 million", that there was a "factor 8 times more serious" than the prediction of the models used at the time. Another priority front of application for artificial intelligence is that of cybercrime which has reached 10,500 billion dollars worldwide, according to estimates indicated by the director of the Postal and Communications Police Service, Ivano Gabrielli.

Gabrielli highlighted that the first quarter of 2024, like 2022 and 2023, was also "challenging" in terms of the number and aggressive capacity of attacks in Italy. The director general of the National Cybersecurity Agency, Bruno Frattasi, highlighted the great need "for investments in digital security" especially for small and medium-sized businesses which, if they do not strengthen, risk being expelled from the market. The country manager and CEO of Generali Italia and vice-president of Ania, Giancarlo Fancel, recalled that

according to the Cyber Index PMI created by Generali with Confindustria, the average level of awareness regarding digital security is 51 out of 100, "below sufficient".

"Among us artisans there are 125 thousand companies that use digital and crimes have increased by 80% in recent years", also recognized the president of Confartigianato Marco Granelli. Artificial intelligence is also being looked at in healthcare to offer answers capable of dealing with demographic ageing, which will see 28% of the population over 65 in Italy in 2030 and 35% in 2050, according to estimates. "We need to find a bridge, a way of building new both by bringing together the public and private sectors and by digitalizing", said the head of the Intesa Sanpaolo Insurance division and vice-president of Ania, Virginia Borla. Innovation is therefore "essential to compete" also in the insurance sector. Ania calls for investments in infrastructure and training and support for public-private partnerships with adequate incentives. It is also pushing for regulatory disparities with large technological platforms to be eliminated and access to data of common interest, for example from public administration, to be regulated.

Insurance, De Polis (Ivass): "Artificial intelligence is an unavoidable evolution, we need to invest in training"

That of applied artificial intelligence to the insurance sector "more than a revolution" it is a "continuous and unavoidable evolution" towards which "the sector has been organizing itself for some time" to use its systems "alongside the more traditional, but no less complex, statistical and actuarial models". The general secretary of Ivass, Stefano De Polis, explains this to Adnkronos, recalling how "the major European and Italian companies have hired data scientists and are experimenting with AI throughout the value chain". They do this, he indicates, "for a better risk assessment, the definition of personalized products, claims management, fraud detection, consultancy via chat bot".

So, continues DE Polis, "we expect that efforts will continue to build adequate governance of data and models, that the results will be monitored for a full understanding of the risks and that a corporate culture based on ethical principles will be strengthened". And then, states the general secretary of the supervisory authority, "dealing with digital evolution in a sustainable and responsible way requires, in companies as in supervisory authorities, investments in staff training and in new professional figures, not only technical but also careful in understanding the ethical aspects of the use of new technologies. Even more detailed about how AI is entering the sector, De Polis recalls an analysis carried out at the end of 2022 by Ivass which concerned the use of AI algorithms. machine learning by insurance companies and the impact on customers. "A still exploratory phase has emerged: algorithms are adopted mainly for the optimization of internal processes and, in still limited cases, in relationships with customers. make sure. 27% of companies use at least one machine learning

algorithm, for a market share of 78% in the non-life sector and 25% in the life sector". As for the areas, indicates the general secretary, they range "from fraud prevention and the management of claims, mainly in the motor insurance sector" but also "to optimize the time needed to manage the claim, identify customers' intentions to change companies early, also in order to adapt the economic offer during the policy renewal phase", concludes De Polis.

AI in insurance supervision- At the moment, the general secretary of Ivass explains, "it may be difficult to hypothesize a massive use of artificial intelligence systems in the supervision" of the insurance sector" but "our experiments allow us to evaluate the benefits and risks for the authority and for the entire insurance system, train people and grow an environment in step with innovation. It is important - he adds - to accompany these changes also through dialogue with insurance companies and innovative start-ups, so as to understand the repercussions on the system and provide indications on the implementation of the rules and the authorities' expectations". Ivass, recalls, "has experimented, also in collaboration with the Bank of Italy and the ECB, AI techniques on claims archives for the prevention of fraud, to facilitate the consultation of regulatory texts, to enrich the indicators on the stability of insurance companies and to classify complaints, allowing them to be handled more easily". As for operators, continues the general secretary De Polis, "the scope of application of solutions based on AI is broad and the potential offered allows them to achieve savings in time and costs, to make decisions taking advantage of all the information available but also and above all to improve the offer for customers, with shorter response times".

The Ai Act approved by the European Parliament- De Polis then defines the AI Act as "an important step forward in the regulation of artificial intelligence". He continues, "it has an approach based on shared definitions and on safeguards and obligations commensurate with the risks" and "the objective of balancing the opportunities of technological innovation with the protection of the fundamental rights of the individual. The approach - he continues - is based on shared definitions and on safeguards and obligations commensurate with the risks, the objective is to balance the opportunities of technological innovation with the protection of the fundamental rights of the individual. Some applications of AI in the insurance sector - says De Polis - can have a high impact on fundamental rights. Let's think about the use of AI in risk assessment and in determining prices for insurance on life and for health purposes, supervisory authorities will have to verify that the obligations are effectively respected, equipping themselves with the necessary skills to carry out this task effectively and efficiently. The industry, for its part, will have to understand which applications

fall within the scope of the AI Act and adopt the necessary safeguards. Come back one more **the theme of good governance is central**, which unites many aspects of the activity of companies, including the effective but responsible and non-discriminatory use of AI", continues the general secretary of Ivass. How much to the risks in the use of AI for transparency, de Polis warns, "companies are already using calculation systems, even sophisticated ones, to define the characteristics of customers, this also in the interest of the customers themselves who must be offered a service suited to needs at costs proportionate to the risk". The AI Act - he states - should increase safeguards in customer profiling and increase the transparency of decision-making mechanisms. "The new European regulation provides that AI is used under human supervision and after assessing the impact on fundamental rights" and "the transparency obligations introduced with the AI Act will allow us to take a step forward and prevent AI systems from being discriminatory and harmful to fundamental civil rights", concludes De Polis. The innovation of digital technology has triggered significant changes in the insurance industry. The transformation was already underway before the Covid-19 pandemic, but the period of isolation to which we have been subjected has accelerated the use of technologies applied to the provision of insurance and financial services. Familiarity with digital has also grown among those segments of the population furthest from these tools, I am thinking for example of the elderly.

Innovation connected to digitalization pervasive and with reference to the insurance activity it affects all aspects: from the design to the pricing of the products, from the methods of providing sales and after-sales services to the role of the distribution networks, from the operational processes of companies and intermediaries to the generation of new relevant data.

A concrete example. Italy is the first country in the world in terms of percentage diffusion of black boxes among motorists. They allow timely information on the dynamics of road accidents and therefore provide useful information for the purposes of compensation for damages by companies; in this sense they also play an important role in combating fraud. Their use has progressively gone beyond that initially imagined. The black box allows the collection of data in real time in order to monitor the style and driving habits of insured persons, making it possible to carry out a more precise assessment of the customer's risk, and at the same time to provide, always in real time, assistance services and emergency in case of breakdowns or accidents. Today it is also functional for the use of artificial intelligence applications.

Different are the application profiles in which digitalization manifests itself in the insurance sector and the challenges it poses for regulators and supervisors are complex; I would like to mention three

important themes: the use of big data, the possible developments of open insurance and the use of artificial intelligence systems.

I will refer to a broad meaning of big data; the set of digital data, of different origins, whose use in the insurance sector can reduce information asymmetries and the inefficiencies linked to them, allowing a better assessment of individual risk and avoiding adverse selection phenomena. The latter factors limit the development of markets and the extension of insurance coverage to segments of the population with a limited insurance history and potentially interested in stipulating contracts with actuarially fair premiums.

In terms of the provision of services, digital technologies can make the assessment of claims more objective, reducing instrumental complaints by companies, the so-called nitpicking¹, and combat - as I mentioned - any fraud on the part of the insured, increasing the mutual trust of the counterparties of the insurance contract. At the same time, they can speed up compensation times, allowing the extent of the damage to be assessed electronically through machine learning techniques: for example, in car insurance with the use of photos taken by the insured, information on the characteristics of the vehicle and data on costs of repairs, it is now possible to receive a well-founded compensation proposal within a few hours of an accident occurring.

Finally, the availability of data on the lifestyle habits of the insured, which can be obtained from multiple sources including from personal devices, will allow the offer of insurance packages to cover different risks. The joint management of heterogeneous risks in fact allows the search for convenient solutions for the insured, also covering (micro) events that are often not individually insurable.

Obviously there is no shortage of points of attention. Contracts based on big data change the characteristics of risk selection through two channels: the decision to be monitored to receive a personalized price is voluntary and this also depends on the willingness of consumers to share their data and therefore on the weight they attribute to the own privacy; furthermore, it is likely that the use of big data can generate an information advantage in favor of the insurer. In other words, it is possible that the insured knows his risk less than the insurer, the so-called inverse selection.

The use of big data can also bring with it consumer lock-in phenomena: since contracts based on big data link the reward to behaviors observed in the past, changing company without being able to take the history of behaviors with them implies a loss of information that the new insurer cannot use to price risk. As a consequence, the incentive to change companies is reduced and the competition to attract new customers is reduced.

To counterbalance this potential anti-competitive effect, a possible policy response could come from the development of open insurance. The latter is part of Open Finance, included among the objectives of the European Digital Strategy and the European Strategy for Data.

Open insurance the debate within the EU on the opportunity to provide structured and legally regulated forms of systematic sharing of data and information, as in the case of open banking created by the PSD2 Directive, is still in its initial phase and is open; today we are in the presence of initiatives based on bilateral or plurilateral collaboration agreements for the exchange of data aimed at offering products or services or more simply at the digitalization of operational processes (e.g. customer onboarding).

In regulating, subject to the customer's consent, the exchange and interoperability of data and information between companies for the offering and pricing of products, it is important to keep in mind the specificities of the insurance business where, depending on the branches of activity, they may become relevant very heterogeneous data. In addition to data on the portfolio of existing coverage and policies dedicated to insurance-pension savings, information relating, for example, to the customer's health, habits and mobility could also be shared (I am thinking of the data collected by black-box and other personal or domestic devices).

An eventuality future - European - regulation must therefore not only concern the methods and safeguards at the time of data acquisition and exchange (datasets to be shared, rules for access, standardization, interoperability, etc.), but also the subsequent treatment methods, which will also be increasingly entrusted to artificial intelligence models. The adequacy of the current regulatory framework regarding the GDPR - General Data Protection Regulation will also have to be aligned with the new needs for greater sharing and better data protection.

The topic of artificial intelligence is today at the center of a global scientific, anthropological, economic and legal debate. IVASS follows and participates with interest in the discussion on the opportunities and risks of AI and is at the same time aware that the market is showing growing interest in the opportunities that can come from this line of digital technologies.

We have set up a company within IVASS Control room on Insurtech issues capable of ensuring an integrated approach to new topics and maintaining constant dialogue with companies and operators in the digital market.

We also have well clear that every initiative in the field of artificial intelligence must be carefully governed and accompanied by a precise definition of the management and mitigation measures for

the risks it poses

To understand the potential of artificial intelligence applied to insurance, at the end of 2022 IVASS conducted a survey on the use of Machine Learning (ML) algorithms by insurance companies in processes with an impact on customers. It emerged that the Italian industry is currently in an exploratory phase and that ML algorithms are mainly used for the optimization of internal processes. However, 27% of companies use at least one ML algorithm in processes with direct impact on customers, for a market share of 78% in the non-life sector and 25% in the life sector. The main areas of use of ML algorithms are: fraud prevention and claims management, mainly in the motor insurance sector; the identification of customer abandonment intentions (churn models), also for price definition purposes, at the policy renewal deadline. Of interest is the data relating to companies' awareness of the risks of using these sophisticated tools: 56% of companies that use ML algorithms declare that they have equipped themselves with internal mechanisms to evaluate fairness towards policyholders and detect unwanted exclusions or discrimination of clients.

From the investigation, it emerged that uncertainty about the regulatory framework that will apply to artificial intelligence³ is considered an obstacle to the development of business models that provide for the widespread use of artificial intelligence systems.

IVASS expects the development of artificial intelligence projects to be directed and monitored within three fundamental organizational pillars of the company: corporate governance, the internal control system and corporate culture.

It is appropriate that the strategies for using AI techniques are decided collegially by the company's governing bodies, and in particular by the board of directors, in deep awareness of the ethical implications that their adoption entails. To this end, the board's action should be supported and strengthened by specific training activities and by effective exchanges and information flows with the company functions that represent the center of specific skills.

The now acquired culture of control today makes companies in the financial and insurance sector fully aware of the importance of the three lines of defense model for risk management, including those connected to AI.

It is essential that solid principles are rooted in the corporate culture: transparency, sustainability, fairness, principles of non-harm and non-discrimination; through corporate codes of conduct they should enter the DNA of managers and employees.

Facing in a sustainable and responsible way the digital revolution requires, in companies as in supervisory authorities, investments in staff training and in new professional figures, not only technical but also careful in understanding the ethical profiles of the use of new technologies.

In conclusion, if on the one hand the new digital context can reduce some inefficiencies and expand the insurance offer, meeting the needs of customers, on the other it is not free from potential distorting effects against which the regulator must keep its guard up.

In particular, the ability of digital technology to personalize premiums cannot undermine the mutuality characteristics of contracts inherent to the insurance method of assuming and managing risks.

1) Defining an Artificial Intelligence (AI) System

The definition of an artificial intelligence (AI) system in the final AI Act is aligned with the most recent OECD definition. The AI Act states that “an artificial intelligence system is a machine-based system designed to operate with varying levels of autonomy and which can exhibit adaptive capabilities after deployment and which, for explicit or implicit purposes, infers from the inputs it receives how to generate outputs such as predictions, content, recommendations or decisions that can influence physical or virtual environments”.

This is a very positive result, especially considering the broad definition in the EC's initial proposal, which had also included software in its scope. Insurance Europe has pushed strongly for a narrowing of the EC definition to ensure alignment with the OECD approach, which places greater emphasis on the machine learning or "inference" aspects of AI, in order to pursue a recognized approach at an international level and avoid the risk of inconsistent and divergent classifications of AI systems.

Insurance Europe expressed concern that the definition proposed by the EC would lead to the inclusion in the scope of systems, techniques and approaches that should not be considered AI and would generally create confusion and lack of legal certainty, noting that potentially even software applications such as Microsoft Excel, which uses statistical formulas to produce output, would be considered AI.

Insurance Europe also raised concerns regarding points (b) and (c) of Annex I of the EC proposal, which listed the different techniques, models and rules-based and statistical methods that would fall within the scope of the definition, many of which they have been used for decades by the insurance industry and should not be considered AI. She managed to get all these elements deleted from the final text.

Furthermore, the corresponding recital 6 of the final text further details the key features of the definition and clarifies that the definition is not intended to cover simpler traditional software systems or programming approaches.

Impact for insurance companies: The alignment with the OECD definition and the narrowing of the definition proposed by the EC to focus on machine learning to the exclusion of software is an important and positive outcome, particularly for the insurance sector. This will help ensure that only genuine uses of AI are included in the scope and that existing statistical techniques and tools used by insurers are not misclassified as AI, thus also effectively narrowing the scope of what would be considered too high risk.

2) *High-risk AI systems*

Although the EC's initial proposal did not include insurance in the list of high-risk applications in Annex III, there has been a strong push to include insurance in both the Council and the European Parliament. Many of these proposals attempted to include the entire insurance industry as high risk (e.g., artificial intelligence systems intended to be used for insurance premium setting, underwriting, and claims assessment), rather than focusing on one case specific use or harmful outcome, and would apply to all product lines.

Insurance Europe's lobbying efforts throughout the legislative process were focused on trying to ensure that insurance was not classified as high risk. However, as it became clear that there was strong political will to include insurance as high risk, it was necessary to at least try to limit the scope of what would be considered high risk.

Therefore, the final agreed wording for insurance is to be considered a significant improvement over the alternative suggestions, with the focus now only on "artificial intelligence systems intended to be used for risk assessment and pricing in relation to natural persons in the case of life and health insurance".

Furthermore, the final text also includes new wording in recital 58 which clarifies that artificial intelligence systems used for the purpose of detecting fraud in the provision of financial services and for prudential purposes to calculate the capital requirements of insurers should not be considered at high risk.

Impact for insurance companies: Although insurance was ultimately included in the high-risk list in Annex III, the final wording is a significant improvement over previous proposals that included insurance. Furthermore, the introduction of the exemption for fraud detection in financial services is a positive development, although there would have been greater legal certainty if such an exemption had been included in Annex III for insurance, as for credit, rather than just in the recitals.

However, many interpretive questions remain about the wording of the high-risk provision on insurance, for example:

- which products should fall under both health and life insurance?
- what about accident insurance, disability insurance, life insurance policies (IBIP), etc.?
- are there likely to be different national interpretations of which products should be classified as health or life insurance?
- what exactly is meant by "risk assessment"?
- how narrowly or broadly might the reference to "prices" be interpreted by regulators?

It will now be crucial to develop potential guidelines by EIOPA/ESA and see to what extent these guidelines can address or seek to clarify these issues. Clearly there will be a strong need for engagement and dialogue with EIOPA in the coming months. It will also be important to see to what extent future EC guidance on the practical implementation of the high risk classification and its list of use case examples (see the following section on the implementation timetable) may impact insurance.

3) *Exemption from high risk classification*

The final text of the AI Act included an important exemption to the classification of an AI system as high risk: if an AI system classified as high risk in Annex III does not pose a significant risk of harm to health, the safety or fundamental rights of natural persons, including not materially influencing the outcome of the decision-making process, will not be considered high risk.

This is the case if the system is intended to: carry out limited procedural activity; improve the outcome of a previously completed human activity; detect decision-making patterns or deviations from previous decision-making patterns and is not intended to replace or influence previously completed human evaluation, without appropriate human review; carry out a preparatory activity for an evaluation. However, if the AI system profiles natural persons, it will always be considered high risk.

This exception allows companies to self-assess their AI system. However, the provider of the AI system will have to document its assessment before such a system is commercialized or put into service and register such AI applications in an EU database for high-risk AI systems. Upon request of the competent national authorities, the supplier will have to provide documentation of this assessment.

Impact for insurance companies: The introduction of a self-assessment mechanism is a positive and welcome development, introduced only at a relatively late stage in the legislative process. This will allow insurance companies using AI systems that would normally fall into the high risk category to assess whether they actually present a significant risk of harm and therefore potentially avoid the additional burden and cost of fulfilling obligations for high risk systems, reducing the impact of falling within the scope of Annex III. This will be particularly relevant for processes that are not fully automated and subject to human review, and for activities considered preparatory in nature.

The practical impact of this self-assessment mechanism remains to be seen and it should not be assumed that vendors of high-risk AI systems always want to classify their systems as not presenting a significant risk of harm. There may indeed be a reputational risk for insurance companies associated with carrying out an assessment declaring an AI system as not high risk, which later turns out to be an incorrect assessment by the relevant authorities.

4) Impact assessment on fundamental rights

One of the proposals introduced by the European Parliament was the mandatory impact assessment on fundamental rights. Public sector bodies, private bodies providing public services (e.g. education, health, housing and social services) and banking and insurance service providers using AI systems classified as high risk will be required to carry out a risk assessment. impact on fundamental rights before implementing a high-risk AI system.

This assessment requires these entities to list the risks, control measures, risk mitigation measures, categories of affected natural persons, expected frequency of use, and user processes for which the system will be used.

The obligation applies to the first use of the high-risk AI system. The user may, in such cases, rely on previously conducted fundamental rights impact assessments, or carry out the assessment in conjunction with a data protection impact assessment, where appropriate.

Once the impact assessment has been carried out, the user must notify the results of the assessment to the market surveillance authority.

The Office of Artificial Intelligence will be responsible for developing a template for a questionnaire to facilitate users to fulfill this obligation in a simplified way.

Despite efforts to have the provision removed from the text, it became an important political point for the European Parliament and therefore its inclusion was agreed in the final text.

Impact for insurance companies: The fundamental rights impact assessment is based on the data protection impact assessment required by the GDPR. While insurance companies already have experience with the latter, the fundamental rights impact assessment will entail additional burdens and obligations for companies implementing high-risk AI systems, such as the obligation to notify the authorities of the assessment results. The development of a simplified questionnaire by the Office of Artificial Intelligence to facilitate compliance with this obligation could be an important step and could help ease the burden to some extent. It remains to be seen whether EIOPA or the ESAs may find it necessary to provide specific guidance for such an impact assessment in the financial sector.

5) Supervision

Recital 158 of the final text of the AI Act (formerly Recital 80) specifically recognizes that EU financial services legislation includes internal governance and risk management rules and requirements that also apply when regulated financial institutions use intelligence systems artificial. To ensure consistent implementation and enforcement of the obligations under the AI Act and relevant EU financial services legislation, authorities competent for the supervision and enforcement of financial services legislation should be responsible for the supervision of the implementation of the AI Act with respect to artificial intelligence systems provided or used by regulated and supervised financial institutions.

Impact for insurance companies: Insurance Europe has supported and pushed for an approach that would see existing supervisory authorities in the insurance sector remain competent for the oversight of obligations under the AI Act. These authorities are best placed to ensure consistent application of AI obligations Act in the context of the existing insurance regulatory framework. However, questions remain on the interaction and coordination between different supervisory authorities, in particular on how the insurance sector supervisors will coordinate with the Office for Artificial Intelligence, the data protection authorities, the competition, etc.

6) Obligations for high-risk AI systems

Vendors of high-risk AI systems must meet rigorous requirements to ensure their systems are trustworthy, transparent and accountable. Among other obligations, they must: Conduct risk assessments; Use high-quality data; Document their technical and ethical choices; Keep records of their system's performance; Inform users about the nature and purpose of their systems; Allow human

supervision and intervention; Ensure accuracy, robustness and cybersecurity. They must also test their systems for regulatory compliance before placing them on the market or putting them into service and register their systems in a publicly accessible EU database.

Impact for insurance companies: In the context of specific insurance AI systems identified in the high-risk list in Annex III, insurance companies will be subject to the specific obligations for high-risk systems. These additional requirements would not apply to high-risk systems that do not pose a significant risk of harm to the health, safety or fundamental rights of natural persons, due to the self-assessment exemption. Otherwise, these obligations will likely result in additional burdens and costs for insurance companies. A positive inclusion in the text is the recognition of existing internal risk management procedures under other relevant EU legislation which would be able to meet the requirements for an Article 9 risk management system.

7) *Additional areas of note in the AI Act:*

The AI Act addresses several important issues beyond obligations for high-risk AI systems. Here are some key points:

Prohibited uses of AI:

The AI Act contains an explicit list of prohibited AI practices:

- * Using subliminal techniques or intentional manipulative or deceptive techniques to materially alter behavior, causing significant harm.
- * Exploiting the vulnerabilities of a person or group due to specific characteristics, causing significant harm.
- * Biometric categorization systems that individually categorize a person based on sensitive information, except for labeling or filtering legally acquired biometric data sets in law enforcement.
- * Social scoring systems.
- * Real-time remote biometric identification systems in public places for law enforcement.
- * Predictive policing based solely on profiling or personality traits, except to support human assessments based on objective, verifiable crime-related facts.
- * Facial recognition databases based on non-targeted scraping (massive data collection).

* Inference of emotions in workplaces or educational institutions, except for medical or safety reasons.

The ban on real-time biometric identification for law enforcement has been the subject of much debate and is one of the most controversial topics among the co-legislators. The ban does not apply when these systems are used for specific listed purposes, such as searching for victims of human trafficking or sexual exploitation, or for the prevention of terrorist attacks. In principle, relying on such an exception will require thorough assessments, technical and organizational measures, notifications and a mandate.

The ban on social scoring also extends to private actors. However, the text clarifies in recital 31 that this prohibition should not affect legitimate evaluation practices that are carried out for a specific purpose in accordance with Union and national law.

General Purpose Artificial Intelligence (GPAI) Models

To take into account the wide range of tasks that artificial intelligence systems can already perform and the rapid expansion of their capabilities, it was agreed to also include general purpose artificial intelligence (GPAI) models in the AI Act.

The AI Act distinguishes between obligations that apply to all GPAIs and additional obligations for GPAI models with systemic risks.

Providers of GPAI models are subject to separate obligations from those for AI systems. Among other things, they must create and maintain technical documentation, develop a policy on how to comply with copyright law, and create a detailed summary of the content used to train the GPAI model.

GPAI model providers with systemic risks have additional obligations, including: Conducting model assessments; Assess and mitigate systemic risks; Document and report serious incidents to the AI Office and relevant national authorities; Ensure adequate cybersecurity protection

Office for Artificial Intelligence (AI Office)

The AI Office will play a key role in the implementation of the AI Act by supporting Member State governance bodies in their tasks. He will be responsible for enforcing standards for general purpose artificial intelligence (GPAI) models. This is supported by the powers given to the Commission by the AI Act, including the ability to conduct assessments of GPAI models, request information and measures from model providers and apply sanctions.

The AI Office also promotes an innovative ecosystem of reliable AI, to reap its social and economic benefits. It will ensure a strategic, coherent and effective European approach on AI at the international level, becoming a global reference point.

Sanctions

Failure to comply with the rules can result in fines ranging from 35 million euros or 7% of global turnover to 7.5 million or 1.5% of turnover, depending on the infringement and the size of the company.

Implementation times

The AI Act will come into force 20 days after its publication in the Official Journal (scheduled for May/June) and will be fully applicable 2 years later, with some exceptions:

6 months: Prohibited uses of AI come into effect;

12 months: Governance rules and obligations for general purpose AI models become applicable;

18 months: The European Commission must publish guidance on the practical implementation of the high-risk classification (Article 6) together with a comprehensive list of practical examples of high-risk and non-high-risk AI system use cases.

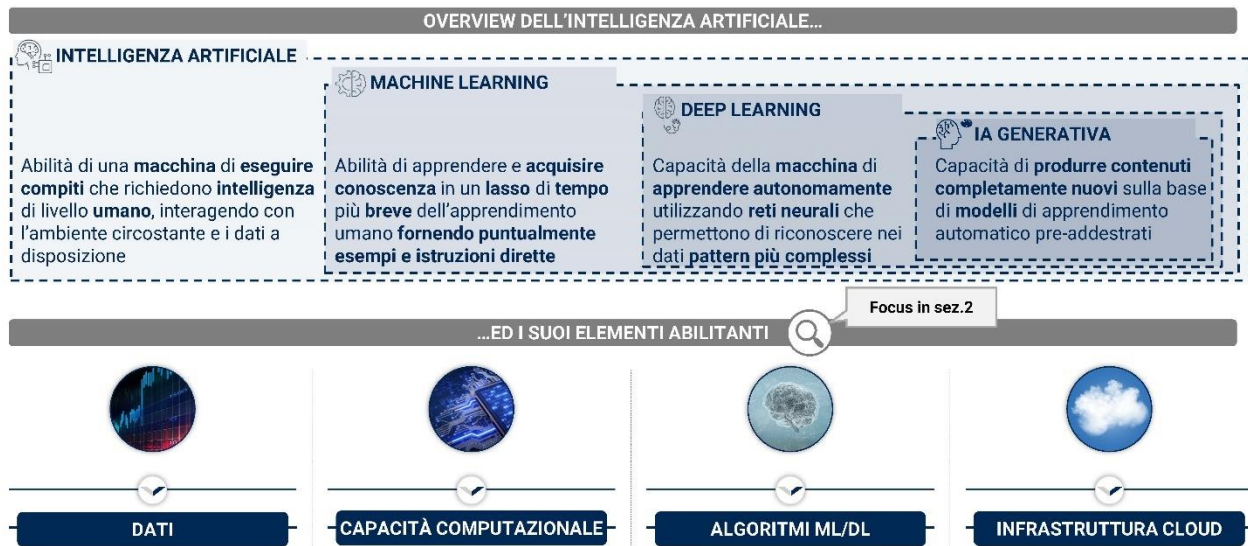
36 months: The rules for high-risk AI systems embedded in regulated products other than Annex III (machines, medical devices, etc.) will apply.

Furthermore, to facilitate the transition to the new regulatory framework, the European Commission has launched the AI Pact, a voluntary initiative that aims to support the future implementation of the AI Act and invites AI developers from the EU and other countries to fulfill the key obligations of the regulation.

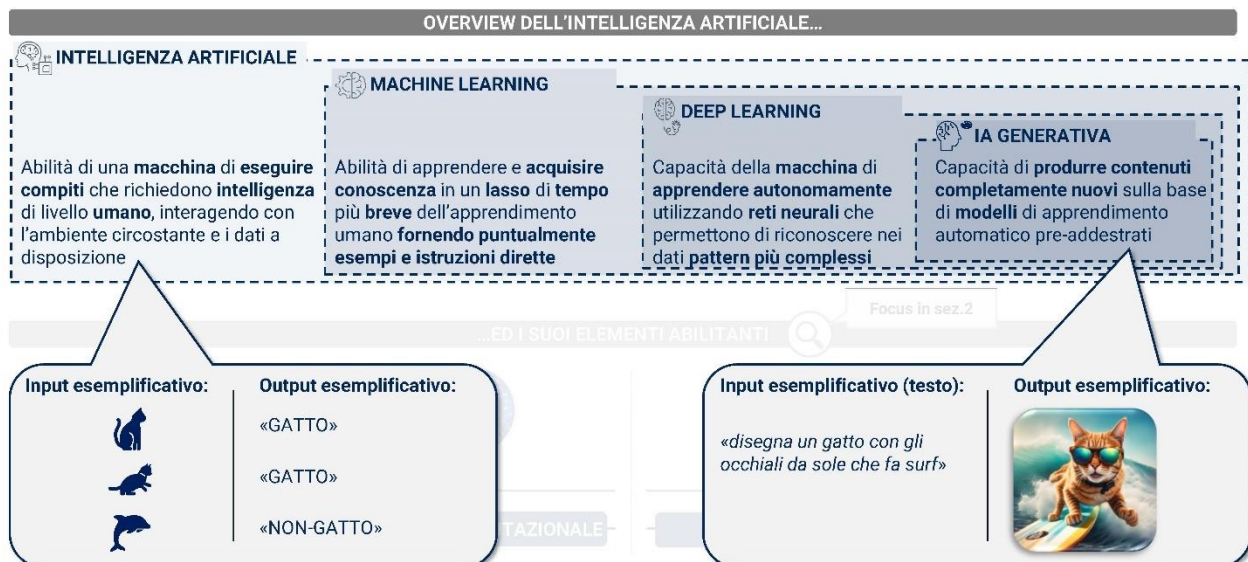
8. Areas and examples of matrix startups Insurtech

The following slides belong to an exclusive presentation by Deloitte for ANIA

La famiglia dell'IA è costituita da una serie di algoritmi il cui funzionamento è determinato da sottostanti elementi abilitanti



La famiglia dell'IA è costituita da una serie di algoritmi il cui funzionamento è determinato da sottostanti elementi abilitanti



Quali sono le capacità dell'IA?



Sources: Statista: Artificial Intelligence: in-depth market analysis, (2023)

I vantaggi dell'IA Generativa – Alcuni esempi

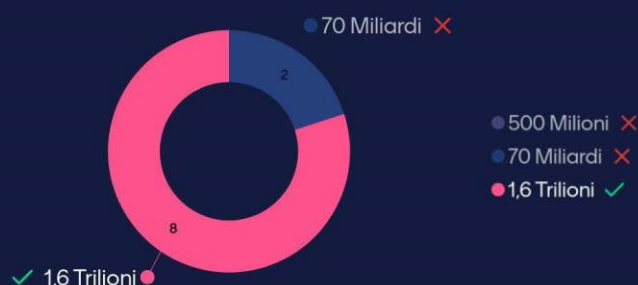


IA GENERATIVA



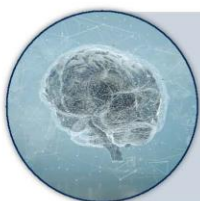
Sources: 1. [Human Resource Director](#), Survey Censuwide, (2023); 2. Statista: Artificial Intelligence: in-depth market analysis, (2023); 3. Statista: Unleashing Artificial Intelligence's true potential: How generative AI could empower innovation, redefine productivity, and transform the workforce, (2023); 4. Attività interna testing Deloitte

Qual è l'ammontare di parametri su cui è stato addestrato Chat GPT?



Come apprende?

APPRENDIMENTO SUPERVISIONATO



il computer riceve una serie di **dati etichettati** e impara a riconoscerne i **pattern** e ad usarli per fare **previsioni** o **classificazioni** su nuovi dati



FACE ID

il computer riceve un insieme di **dati non etichettati** e cerca di **trovare i pattern da solo**, identificando **schemi** e **correlazioni** su tutti i dati accessibili

APPRENDIMENTO PER RINFORZO

Il computer **impara** tramite un processo di **trial & error**, in cui viene premiato o penalizzato in base all'azione svolta, imparando così strategie per massimizzare le sue probabilità di ricevere il premio

APPRENDIMENTO NON SUPERVISIONATO



MARGHERITA



VIOLETTA



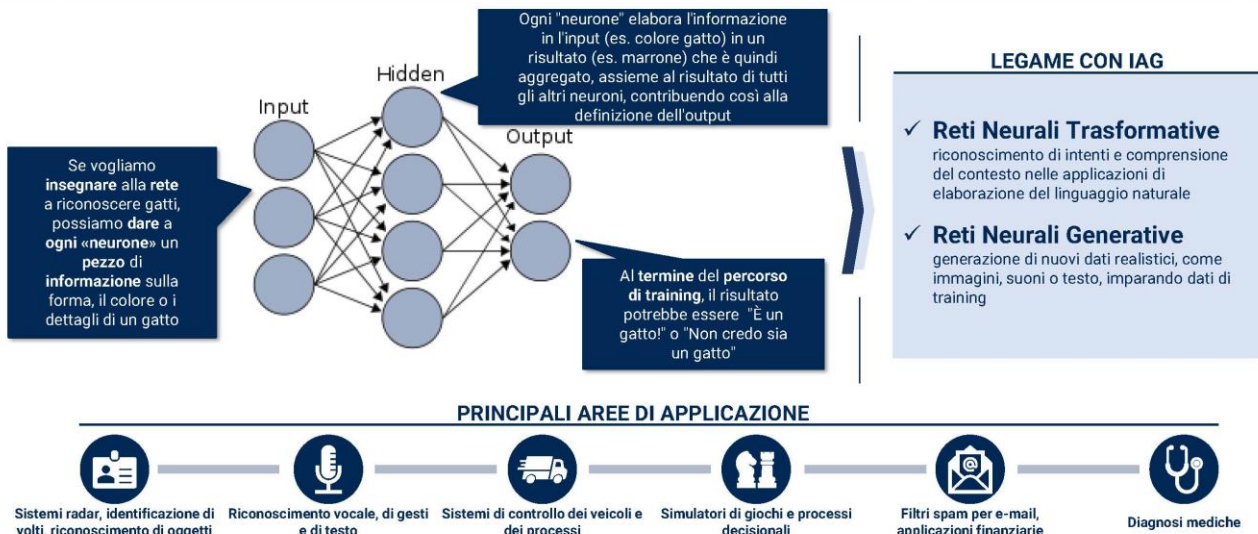
CHESS GAME



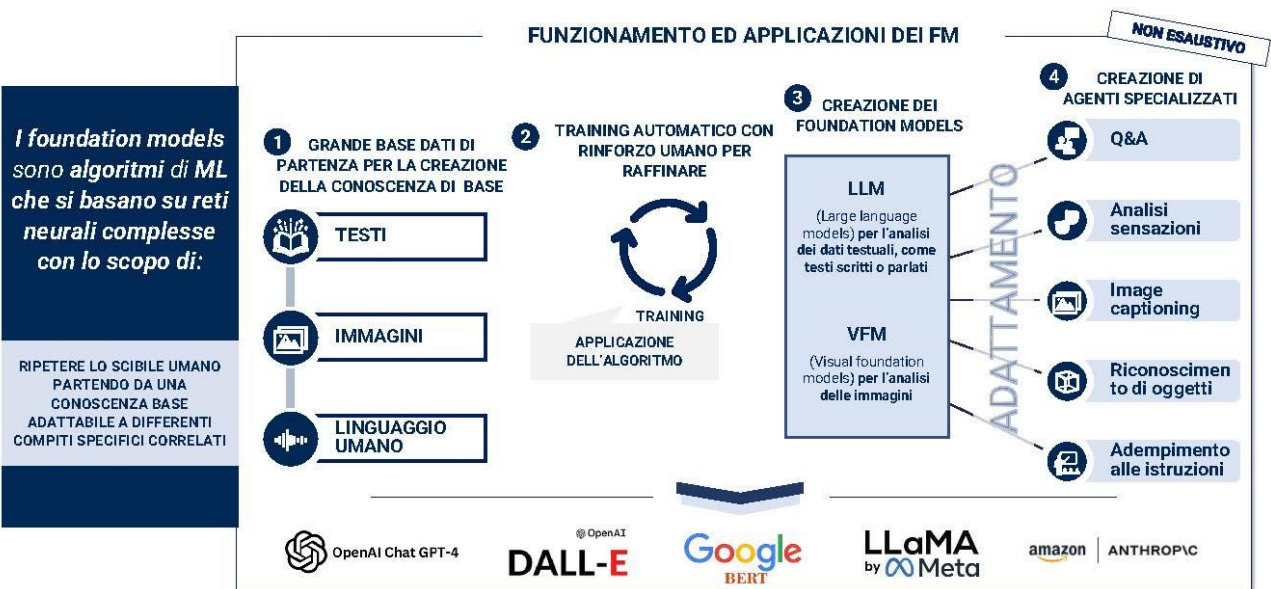
L'IA GENERATIVA CONIUGA L'UTILIZZO COMPLESSO DI RETI NEURALI CON MODELLI AVANZATI DI MACHINE LEARNING, DEFINITI «FOUNDATION MODEL», CHE CAMBIANO RADICALMENTE LE POTENZIALITA' DELLA TECNOLOGIA

Cosa sono i modelli neurali? Perché sono importanti?

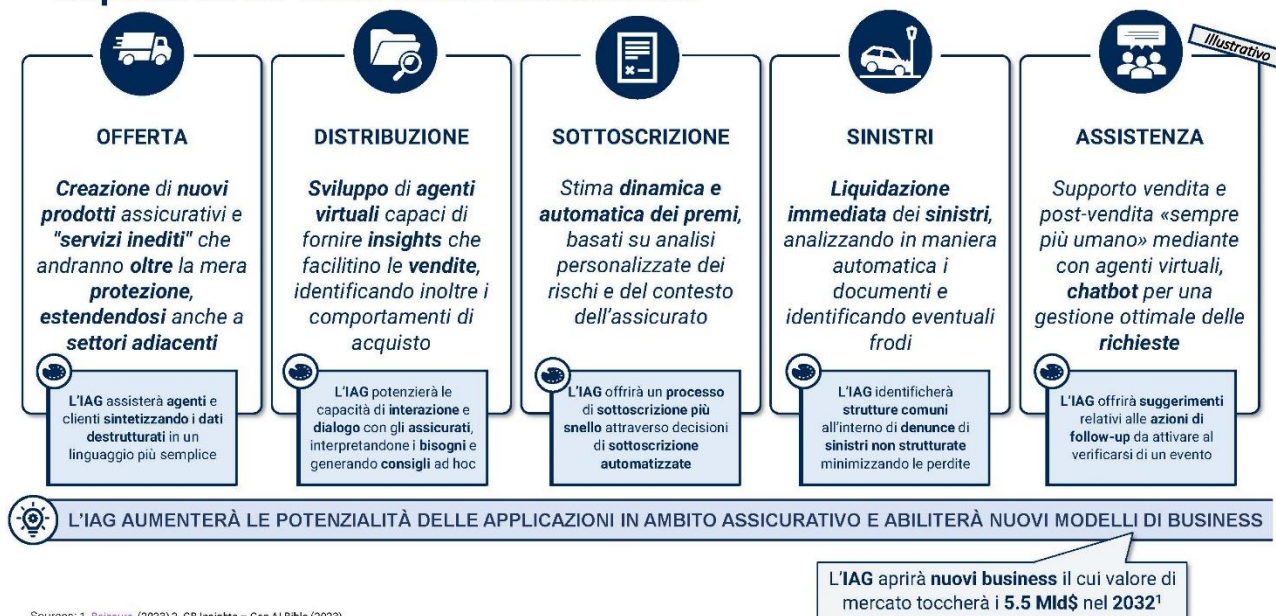
Sono modelli semplificati che replicano il modo in cui il cervello umano elabora le informazioni. Funzionano simulando un elevato numero di unità di elaborazione interconnesse che assomigliano a versioni astratte di neuroni:



Cosa sono i foundation models? Perché sono importanti?



Impatto IA su value chain assicurativa



Sources: 1. [Reinsure](#), (2023) 2. CB Insights - Gen AI Bible (2023)

Principali Player IA

Punti chiave

- ✓ Le principali compagnie tech mondiali stanno sviluppando continuamente nuovi servizi ed applicazioni basati sull'IA
- ✓ I maggiori big player mondiali sono americani

	Google lancia prima Bard e poi Bard Extensions , il software di intelligenza artificiale concorrente di ChatGPT, in più di 40 lingue <i>Lancio a Marzo 2023</i>		Amazon investe 4 mld\$ in Anthropic , creatrice di Claude che genera risposte più simili a quelle umane rispetto a ChatGPT <i>Investimento a Settembre 2023</i>
	IBM realizza Watsonx , piattaforma IA e dati con assistenti IA per accelerare l'impatto dell'IA con dati affidabili in tutta l'azienda <i>Lancio a Luglio 2023</i>		OpenAI realizza ChatGPT e continua a creare nuove versioni, come GPT3.5turbo e GPT4 , capaci di sempre più funzionalità <i>Lancio ChatGPT a Novembre 2022</i>
	Intel investe nello sviluppo di AuroraGPT , addestrata con dati scientifici per accelerare la ricerca e assistere gli scienziati <i>Prossimamente sul mercato</i>		Microsoft lancia Microsoft 365 Copilot , grazie a questa versione le azioni hanno fatto registrare nuovi massimi in Borsa <i>Lancio a Novembre 2023</i>
	Nvidia lancia il chip H100 , il nuovo processore Grace CPU Superchip e Eos , il suo nuovo computer basato sull'IA confermandosi leader nella progettazione di HW per IA <i>Lancio a Ottobre 2022</i>		Meta lancia MetaAI , un nuovo assistente AI che utilizza il modello linguistico di grandi dimensioni Llama 2 , concorrente di ChatGPT <i>Lancio a Settembre 2023</i> <i>Lancio a Ottobre 2022</i>

Sources: Statista: Artificial Intelligence: in-depth market analysis (2023)

Principali Player IA

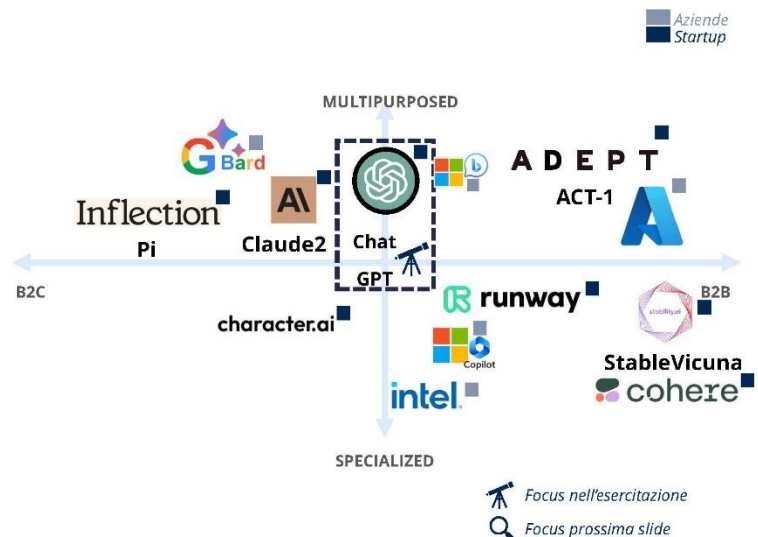
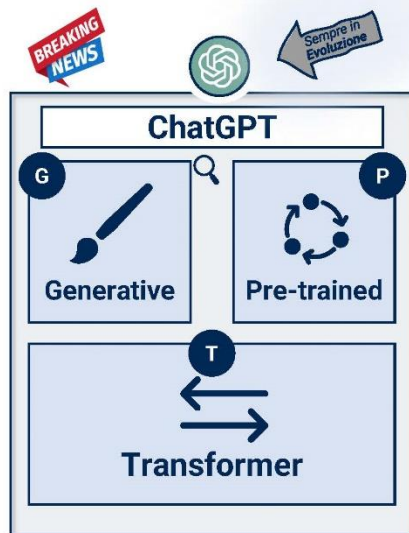
- Punti chiave**
- ✓ Le principali compagnie tech mondiali stanno sviluppando continuamente nuovi servizi ed applicazioni basati sull'IA
 - ✓ Il big player mondiali sono americani

 Google lancia prima Bard e poi Bard Extensions, il software di intelligenza artificiale concorrente di ChatGPT, in più di 40 lingue <i>Lancio a Marzo 2023</i>	 Amazon investe 4 mld\$ in Anthropic, creatrice di Claude che genera risposte più simili a quelle umane rispetto a ChatGPT <i>Investimento a Settembre 2023</i>
 IBM realizza Watsonx, piattaforma IA e dati con assistenti IA per accelerare l'impatto dell'IA con dati affidabili in tutta l'azienda <i>Lancio a Luglio 2023</i>	 OpenAI realizza ChatGPT e continua a creare nuove versioni, come GPT3.5turbo e GPT4, capaci di sempre più funzionalità <i>Lancio ChatGPT a Novembre 2022</i>
 Intel investe nello sviluppo di AuroraGPT, addestrata con dati scientifici per accelerare la ricerca e assistere gli scienziati <i>Prossimamente sul mercato</i>	 Microsoft lancia Microsoft 365 Copilot, grazie a questa versione le azioni hanno fatto registrare nuovi massimi in Borsa <i>Lancio a Novembre 2023</i>
 Nvidia lancia il chip H100, il nuovo processore Grace CPU Superchip e Eos, il suo nuovo computer basato sull'IA confermandosi leader nella progettazione di HW per IA <i>Lancio a Ottobre 2022</i>	 Meta lancia MetaAI, un nuovo assistente Ai che utilizza il modello linguistico di grandi dimensioni Llama 2, concorrente di ChatGPT <i>Lancio a Settembre 2023</i>

Sources: Statista: Artificial Intelligence: in-depth market analysis (2023)



Principali soluzioni di IA Generativa (LLM)



Quali sono i principali rischi dell'IA

Non esaustivo

Diffusione di disinformazione

Violazione della privacy e dell'identità digitale

Mancanza di trasparenza e responsabilità

Possibili Bias e discriminazione



Quali sono i principali bias ad oggi?

I **bias** sono **distorsioni** o **discriminazioni** nelle previsioni o decisioni generate dall'IA, spesso derivanti da dati di addestramento non rappresentativi o preesistenti **pregiudizi culturali**



Esempi di Bias dell'IA



80% in meno di mutui concessi tramite IA a **persone di colore** per via di training selettivo degli aventi diritto basato su dati storici e quindi retaggi razzisti¹



Mancato superamento, per candidati donna, della fase di **screening dei CV** presso Amazon per via di algoritmi basati su dati storici degli impiegati e quindi caratterizzati da una cultura **sessista**²



POTRÀ ESISTERE UN'IA TOTALMENTE PRIVA BIAS?

Aspettarsi che l'IA diventi **completamente priva di bias** non è lo scenario più probabile. Gli esseri umani progettano e addestrano i sistemi di intelligenza artificiale, e i loro pregiudizi possono **influire involontariamente** sul comportamento dell'IA

Sources: 1. [Forbes](#), (2021); 2. [Reuters](#), (2018)

L'impatto odierno dell'IA

L'INTELLIGENZA ARTIFICIALE STA RIDEFINENDO IN MODO SIGNIFICATIVO LA NOSTRA REALTÀ, TRASFORMANDO IL MODO IN CUI LAVORIAMO, APPRENDIAMO E INTERAGIAMO...



Amore artificiale: Un uomo statunitense si è innamorato e ha **sposato** un **chatbot** di IA chiamato **Mimi**.

Avvocato IA: Per la prima volta, l'IA assumerà il ruolo di un **avvocato** in un'aula di **tribunale inglese**.



Consulente finanziario IA: **PortfolioPilot** è il primo **consulente** di investimento alimentato dall'IA **AUTORIZZATO DALLA SEC**.

Alcune applicazioni dell'IA

	MONITORAGGIO PREDITTIVO	LEARNING	E-HEALTH
			
WHAT	 DISPLAID supporta la manutenzione predittiva di ponti e viadotti , a partire da dati raccolti con sensori IoT in loco, quindi elaborati dall'IA e aggregati in KPI e dashboard	 Toko è un app di apprendimento linguistico per studenti che offre chat audio e chiamate realistiche con un'intelligenza artificiale	 Ordaos Bio è un'azienda che utilizza l' IA per accelerare il processo di scoperta e sviluppo di farmaci basati su mini proteine
HOW	Processando dati metereologici e dati da sensori IoT, DISPLAID genera delle dashboard sullo stato di deterioramento dei manufatti infrastrutturali, ottimizzandone la manutenzione	Tramite tecniche di elaborazione del linguaggio naturale , Toko offre un interlocutore virtuale in grado di comprendere il contesto e di valutare e correggere grammatica e pronuncia	Tramite l' IA Ordaos Bio genera sequenze di amminoacidi, valutando miliardi di mini-proteine per poi sviluppare quelle con applicazioni più promettenti in campo medico

Adozione dell'IA nel contesto Aziendale

L'IA è un sistema di supporto e funge anche da tecnologia abilitante per lo sviluppo aziendale. I casi d'uso attuali e previsti nelle imprese rientrano in **cinque** categorie:

CATEGORIA	APPLICAZIONI
 Accelerare <i>Aumentare la produttività accelerando i risultati</i>	 Email outreach  Note taking  Code assistance
 Personalizzare <i>I modelli possono utilizzare dati personali per adattare i contenuti</i>	 Personal assistant  Physical good design  NLP-based email
 Automatizzare <i>Eseguire flussi di lavoro aziendali e tecnici e, in alcuni casi, sostituire gli esseri umani</i>	 Fraud detection  Cloud Email Security  Support chatbot
 Generare <i>Creare contenuti originali come immagini, video, testi e media</i>	 Image logo creation  Short form video  Music scoring
 Simulare <i>Creare ambienti in cui è possibile simulare flussi di lavoro, esperimenti ed esperienze</i>	 3D modeling  Medical testing (R&D)  Marketing campaigns

Illustrative

Applicazioni dell'IA per automazione processi



Supporto allo sviluppo codice



Tabnine è un assistente AI che supporta lo sviluppatore durante le sue attività attraverso **consigli personalizzati per bug fixing e completamento automatizzato** del codice sviluppato, analizzando il contesto aziendale e lo «stile» del singolo sviluppatore.

PRINCIPALI CARATTERISTICHE



Cloud Email Security



Abnormal



1) Security Operation Center: struttura di cybersecurity che ha il compito di monitorare, rilevare e rispondere agli eventi relativi alla sicurezza informatica

Abnormal Security è una piattaforma di sicurezza email basata sull'IA che, analizzando i pattern, **apprende il comportamento** di ogni risorsa all'interno dell'ambiente di **posta elettronica cloud** e analizza il rischio di ogni evento per **bloccare** anche gli **attacchi** più sofisticati.

PRINCIPALI CARATTERISTICHE



Forbes
AI 50
America's Best
AI 50
America's Best
AI 50
America's Best

KPI

- IA RILEVA PRECISAMENTE GLI ATTACCHI
- REDUCE GLI SFORZI MANUALI DEL SOC¹ DEL 95%
- BLOCCA L'INTERO SPETTRO DEGLI ATTACCHI DI POSTA ELETTRONICA MODERNI
- MIGLIORA LA PRODUTTIVITÀ DEI DIPENDENTI

Risoluzione ticket IT & Patching



ninjaOne



NinjaOne sfrutta algoritmi di intelligenza artificiale (es. NLP) per **efficientare il processo di gestione delle attività del team IT** nei contesti aziendali attraverso l'**automazione delle principali attività ripetitive svolte dalla funzione IT** grazie, e non solo, all'analisi e correlazione di tutti i Big Data aziendali.

PRINCIPALI CARATTERISTICHE



KPI

- 3 MILIONI DI END-POINT GESTITI
- OLTRE 40 MILIARDI DI DATI ELABORATI OGNI GIORNO
- RISOLUZIONE DI 200+ TICKET AL GIORNO
- 900 MILIONI DI AZIONI AL GIORNO SUI VARI END-POINT



LINKURIOUS



Linkurious combina AI e link analysis per consentire l'esplorazione visuale delle connessioni e delle relazioni tra soggetti e oggetti al fine di indagare schemi di frode noti o identificarne di nuovi.

PRINCIPALI CARATTERISTICHE



Il Prompt Engineering



*Il **prompt engineering** è una metodologia che si concentra sull'ottimizzazione di un input testuale o richieste forniti dall'utente, selezionando **parole, frasi, strutture di frase e punteggiatura...***



*...per interagire in modo **efficiente** con i modelli linguistici avanzati e ottenere l'**output desiderato***



9. Skill appealing for the Labor market and related trends

Artificial Intelligence (AI) is one of the most innovative and promising technologies we have available right now. And it is radically transforming numerous sectors, from autonomous cars to healthcare, from finance to manufacturing. This technological revolution is also redefining the landscape of professional careers, requiring new skills and opening up new job opportunities. AI is ultimately changing the work landscape. But AI is not just a technology that improves the convenience of our lives. It is fundamentally changing the way businesses operate and opening up new avenues for **professional careers**.

General digital skills and a basic understanding of artificial intelligence are often necessary for workers to use AI applications.

Here are some of the most important and “current” skills:

- **Programming:** Programming is a key skill for working with AI. You need to be able to write code to develop machine learning algorithms and artificial neural networks.
- **Mathematics and statistics:** these two subjects are the basis of AI. You need to have a solid understanding of concepts like linear algebra, calculus, and probability theory to develop AI algorithms and models.
- **Data awareness:** another very important skill is being able to collect, clean and analyze data. And this requires skills in using tools like Python and libraries like pandas and scikit-learn.
- **Specific artificial intelligence skills:** Depending on the industry you work in, you may need specific AI skills. The best known and most transversal ones in this sector are image recognition, natural language processing or robotics.
- **AI ethics:** Considering that artificial intelligence plays an increasingly important role in society, it is essential to understand the ethical and moral implications related to the use of this technology.

Artificial intelligence offers a wide range of career opportunities across different industries. Below we delve into some of the careers related to AI and currently most in demand in the Italian and international job market.

Data Scientist

Data scientists are those professionals who collect and analyze large amounts of data to extract useful information. They use machine learning algorithms to identify patterns and trends in the data.

Machine Learning Engineer

Machine learning engineers develop machine learning algorithms and implement them in practical applications. They collaborate closely with the aforementioned data scientists to ensure that the algorithms are always effective.

Robotics engineer

Robotics engineers develop autonomous robots for a variety of industries, from transportation to manufacturing. They use artificial intelligence to ensure that robots can interact safely and intelligently with their surroundings.

Natural language algorithm developer

These developers work on artificial intelligence applications that understand and generate natural language. They are central to chatbot and virtual assistant technologies.

Experts in ethics

AI ethicists focus on the ethical issues related to the use of these new technologies and develop guidelines and policies to ensure responsible use of artificial intelligence.

Careers related to Artificial Intelligence are among the most promising and growing in the world of work. However, they require specialized skills and a constant dedication to learning. If it is in your best interest to enter this rapidly evolving field, it is important to start investing in your professional development and stay up to date on the latest AI trends. With the right skills and a passion for technology,

The integration of AI into work processes will affect different types of workers and lead to changes in salary structures and skill needs. Therefore, public policies will play a crucial role in encouraging training and ensuring that workers are

The majority of high-impact activities are found in the digital services sector, with specific skills required such as programming, data analysis and artificial intelligence itself.

OECD surveys confirm that the majority of workers developing and maintaining AI possess these specialized skills (Lane, Williams, & Broecke, 2023). However, not all workers involved in AI have these skills to an equal extent, with 10% explicitly stating they do not possess them.

The demand for these specialized AI skills is growing, increasing significantly in recent years, especially in the United States, with a fourfold increase between 2010 and 2019, accelerating further in the last three years (Alekseeva et al., 2021; Acemoglu et al., 2022). Similar trends have been observed in other countries such as Canada, Singapore and the United Kingdom (Squicciarini and Nachtigall, 2021). Furthermore, it is highlighted that specialized AI skills and soft skills such as social skills and management skills are increasingly requested in job advertisements, suggesting that these skills are complementary (Alekseeva et al., 2021; Manca, 2023).

2 figures highly sought after today by Head Kunters are the following, with their respective main skills listed below.

SCIENTIST DATA

Synapse Analytics., regression, classification and clustering models, Time Series, applying Machine Learning algorithms, data transformation and cleansing (ETL) on Azure Databricks with PySpark and Spark SQL, data model creation in Azure Analysis Services and Google Cloud Platform, creation of reports on Power BI, data preprocessing, training and evaluation of models, creation of architectural proposals on MS Azure and Google Cloud Platform for the part relating to the Machine Learning components with particular attention to the workflow and lifecycle of the models ML, optimization of digital channels and creation of reports based on data analysis and measurement of metrics of business interest, data processing and analysis for the implementation of statistical investigations, use of various libraries, data preprocessing, performance improvement, skills statistics and information technology to be applied to decision-making models.

CLOUD ENGINEER and CLOUD ARCHITECT

Design, develop and maintain Java Enterprise applications, management of development and production environments on Google Cloud Platform, project experience in Google Cloud Platform, including configuration and management of cloud services, participation in migration projects from Mainframe (z/OS - Cobol) to Cloud (Linux - Java).

EXPERIMENTAL GENERATIVE AI IN A GOOGLE ENVIRONMENT

The development of an Experimental Generative AI Insurance Use Case in a GOOGLE Environment

The process of creating the experimental part of the thesis is described below.

For this project, Google Cloud services were used, which can be accessed through a drop-down menu in the site's initial dashboard. By viewing all products, one can choose from various families of services offered by Google Cloud, including databases, virtual machines, and development tools. These IT services cover both infrastructure (networking, security, backup, etc.) and application development.

One particularly relevant service is Vertex AI, used in my project. Vertex AI is Google's managed service for creating artificial intelligence models without the need for dedicated hardware, instead leveraging Google's data center infrastructure. This service offers a set of AI models ready to be integrated into applications. The advantage of Vertex AI, and the cloud in general, is access to Google's computational power, with a pay-as-you-go ("pay-per-use") model. This avoids the high upfront cost of installing hardware of its own for AI, since Google already provides all the necessary hardware.

Google Cloud provides numerous machine learning models, such as the new Gemini 1.5 Pro and 1.5 Flash models unveiled on May 14, 2024, as well as models from other companies such as Llama 2 and Llama 3 from Meta and Claude, similar to ChatGPT. Preconfigured solutions such as Face Stylizer are also available. Documentation provided with each service explains how to use it and its costs.

Google Cloud services include "Agent Builder," which offers customizable application "skeletons." The four main types are "Search," "Chat," "Recommendations" and "Agent." I used the "Search" and "Chat" services for my project because they were a perfect fit for my project's needs.

For the creation of the applications, in addition to generating the "skeletons," it is necessary to create a database to store the documents needed by the AI. I placed a number of files in this database and trained the model with this information. Having completed the training, I created the front-end (the GUI) with a script provided by Google, customized to my needs. This code runs on Google App Engine, which allows web applications to be created and deployed in serverless mode, that is, without the need to manage the underlying infrastructure...

The final product is available via a URL and can be monitored at any time via a graphical representation in the Google Cloud dashboard. The web application, running on App Engine, connects to the Agents (Chat and Search) of Vertex AI, which in turn access the database of uploaded files. For the "Search" service, the process leads to the creation of the final product accessible via the provided link. For the "Chat" service, it is also necessary to define a "flow" via a dedicated tool, with a set of parameters that manage the interaction of the chatbot.

GEN AI AGENTS AND THEIR FUNCTIONS

Within both GenAI Agents, several documents related to the field of traffic claims have been included ("fed" to the Agents).

Specifically, the documents included are as follows:

- The text of the Normativa CARD: Convenzione tra Assicuratori per il Risarcimento Diretto. The Normativa Card is an agreement between insurance companies governing direct compensation for damages caused by traffic accidents.
- The normative text "Linee guida per Periti Indipendenti CARD": a document that provides operational guidance to independent adjusters involved in dispute resolution under the Convenzione tra Assicuratori per il Risarcimento Diretto (CARD).
- The Bollettino Statistico IVASS - L'attività assicurativa nel comparto auto: a document that provides information on insurance activity in the auto sector.
- L'allegato al Bollettino Statistico IVASS – Ramo R.C. Auto e Natanti – Portafoglio Diretto Italiano: a document containing statistical elaborations in the field of road claims as of December 31, 2022, managed by the "Servizio Studi e Gestione Dati – Divisione Studi e Analisi Statistiche".
- Other miscellaneous documents such as examples of "modello di constatazione amichevole di Incidente" (CID) related to specific claims and examples of car appraisal documents carried out, also related to specific claims.

Some guidance and example questions related to how to query the two Agents in the most appropriate manner are provided below.

Premised on the fact that being two Agents of Generative Artificial Intelligence they are able to answer almost any kind of question asked, my advice is obviously to ask questions related to the field of road claims and regarding the information contained in the documents themselves. This means that you can ask very general questions (such as "what is the Normativa CARD" or rather "what are the Linee Guida per Periti Indipendenti Card") or more specific questions (e.g., "explain to me Article 10 of the Normativa CARD," as well as questions about statistical data such as "how many accidents fell under the Normativa CARD in the year x"). Obviously, it would be desirable to ask more complex questions, however, sometimes the two Agents may not be able to answer those since they do not have all the necessary information or rather the information requested is too specific and does not fit within those data contained in the documents inserted in the two Agents. In any case, asking questions that as much as possible take their cues from the data in the above documents usually ensures that the two Agents function properly and maximize their capabilities.

Let's now explain what the two Agents specifically are and what their operation is.

The first agent is a "chatbot," which is a computer program that simulates human communication (such as Chat GPT, Gemini, etc...). The questions to ask the chatbot can be of any kind and, in return, it provides concise generative responses to user requests.

The second agent is a Search Engine, which is a "search bar" powered by generative artificial intelligence that, at the time a user performs a search, the engine collects relevant information from all over the web and from the documents given, considering context and intent, and provides informative summaries and summaries. Therefore, the answers are more comprehensive than those of the chatbot, but without having the ability to simulate a human conversation (however by clicking on the option "Chiedi di farti ricontattare", a very similar effect can be achieved). If the search engine does not have accurate information regarding the question asked, he is still able to "justify" himself, sometimes providing information similar to the answer being sought or reminding the user of the kind of responses the Agent can give.

GEN AI AGENTS:

Below is to be found the very **heart of my thesis**, as well as the most important part. These are indeed the two Generative Artificial Intelligence Agents **I developed from scratch**, which encapsulate the essence of my work and concrete evidence of the **experimentalism** and **deep innovation** of my thesis.

A. CHATBOT: <https://internaldemo-chatbot-genai.ey.r.appspot.com/chatbot>

B. SEARCH ENGINE: <https://internaldemo-chatbot-genai.ey.r.appspot.com/search>

GOOGLE REPORT ON THE CASE DEVELOPED

So that I can communicate the seriousness and innovation of the experimentation I undertook, as well as again take the opportunity to thank Google, which followed me throughout my project, I reproduce below the report of Fabrizio Rosa, Key Account Executive, Google Cloud, certifying the use of the latest Google technologies within my thesis project.

Below, the text:

In an era defined by unprecedented technological advancement, the fusion of artificial intelligence (AI) and traditional economic sectors is rapidly reshaping industries. Compared to other technologies like Metaverse or Blockchain that were promising to deeply change societies and businesses, GenerativeAI is expected to have a much higher potential in society overall. Henry Ford said “ There is real progress when the advantages of a new technology are available to everyone” . I believe Generative AI has the potential to progress our society because it’s a technology that everyone can easily access, understand and apply in daily life.

Google has been a pioneer in AI research and development, introducing groundbreaking models like Transformer, which underpins many modern AI applications. Google made significant strides in natural language processing (NLP) with models like BERT and LaMDA, enhancing language understanding in search and other products. Google's DeepMind division has achieved remarkable breakthroughs in AI, notably with AlphaGo's mastery of the complex game of Go. Google is not only developing new technologies, but is also committed to responsible AI development, focusing on fairness, transparency, and safety in its AI systems.

The insurance industry, while essential for risk mitigation and financial security, has historically grappled with the challenges of being Data Rich-Insight Poor. While all core-insurance processes heavily rely on data, this industry is lagging behind other industries when it comes to digitalization. In Google Cloud’s insurance team we work on a mission to “Make Insurance Lovable”. I am personally very involved in this mission because I believe there is a huge opportunity for insurers to evolve and GenAI can be the catalyst for a true digitization.

For these reasons It has been a pleasure to support Riccardo in his master project by guiding him to access the latest technologies available through Google Cloud Platform and brainstorm around the use cases that could bring most value to a typical insurer.

This project used 2 core services available in Google Cloud Platform: VertexAI and APPEngine.

VertexAI is the platform which includes all AI Services from Google and has been used to create (1) a chatbot and (2) a search agent. While a chatbot provides concise generative answers to user prompts, the search agent returns more extensive answers. In both cases, responses were grounded in ANIA specific documents with links provided to throughout the generated answer. The Large Language Model used throughout this project is Gemini 1.5 PRO which is the state of the art Large Language Model available in Google Cloud Platform.

AppEngine is the serverless service to create webApps and was used to create the user interface.

The project also took in consideration the intellectual property and privacy aspect connected with usage of AI Services. Pursuant to Google Cloud service terms, no data used in this project was used to train or fine tune and Google Cloud's model. In addition, all services used in this project were located in a datacenter located in a European country.

I wish Riccardo all the best in his career

Fabrizio Rosa

Key Account Executive, Google Cloud