LUISS

Department
of Business and Management

Course of Business Modelling and Planning

DIGITAL TRANSFORMATION & INTELLIGENT AUTOMATION THE ASSICURAZIONI GENERALI CASE

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Introduction

In a contest like the one we are in today, where the environment in which companies are immersed is constantly and rapidly changing, adaptability and innovation are key factors for success. New technological inventions, legislative environment, social habits and COVID-19 are pushing companies towards an increasing digitalization and exploitation of emerging technologies, such as: artificial intelligence, Intelligent Automation, IoT devices, big data and analytics, cloud computing. Intelligent Automation in particular, is proving to be very useful to simplify processes and to optimize the services dedicated to customers, agents and employees through the automation of operations, the digitization of activities and the modernization of systems.

The first two chapters will therefore contain, respectively, an excursus on the digitalization trends of companies and a focus on Intelligent Automation technologies, with regard to the insurance sector in particular.

The third chapter will deal with the case study of Assicurazioni Generali, a company where I had the pleasure to undertake a working experience as an intern. The internship, which has provided for my inclusion in the area of Customer Experience and Digital Channels, began on March 15th, 2021. I had the opportunity to interface with the company and the people who make it up, who introduced me to all the teams that are part of Digital Channels area and explained to me the structure, activities and objectives of the whole company. I therefore was able to gain experience in a large international company, in an area, such as digital channels, that is constantly evolving, innovative and working with agile methodology.

I was allocated to the Chatbot Project, the virtual assistant designed to be able to handle requests from a user regarding any service. The chatbots are then exploited in the systems of relationship with the final customer and specifically, mainly affects the following functions: Services, Sales & Marketing, Product, HR Management and R&D. For this reason, I have had the opportunity and the pleasure to get to know and collaborate with different business areas, as the chatbot works on different channels (Website, WhatsApp, Generali’s App etc.) and need the collaboration of all the different mentioned areas to be implemented in all its functions. But that's not all, the most performing and "intelligent"

bots use artificial intelligence (AI) algorithms, i.e. automatic natural language processing (NLP) tools and properly trained machine learning systems. For this reason, it was also necessary to collaborate with external companies providing such services.

My role in the Chatbot project consisted of several aspects, including:

- Data base analysis and reporting.
- Study of the interactions between customers and bots to define how to improve the customer experience.
- Strategy development for new flows managed by the bot.
- Test the correct implementation of chatbot updates.
- Collaborate on the strategy of new projects involving the Digital Channels and Customer Experience area.

All of the strategies and interventions that I worked on throughout my internship experience had three main goals:

- Increase average rating that users give to the bot.
- Improve the experience of using the virtual assistant for customers.
- Improve the customer journey in its entirety and across all the different channels.

This experience allowed me to come in direct contact with the smartest and digital side of Generali and with the Intelligent Automation technologies that have revolutionized a traditional insurance company, transforming it into a dynamic and cutting-edge reality.

Chapter 1 - An overview of the phenomenon of Business Digital Transformation

1.1 Digital Transformation, Digital Innovation and Digital Ecosystem

The fourth industrial revolution is underway, and so too is the digital world advancing at impressive speed. This epochal passage of companies from automation to IT is defined as *Digital Transformation*. A change that has not been easy, given the difficulty in embracing innovation, especially on the part of old-style managers and companies.

Digital transformation can be defined as "the combined effects of several digital innovations bringing about novel actors (and actor constellations), structures, practices, values, and beliefs that change, threaten, replace or complement existing rules of the game within organizations, ecosystems, industries or fields" (Hinings B et al., 2018). It identifies the concept of exploiting and benefiting from the potential of digital technologies to build new processes, software and systems that allow the reaching of a higher level of efficiency, more profitable revenue, and greater competitive advantage. But the change is not only technical and based on the application of emerging technologies: it is also a cultural change, affecting the entire human capital of the organization, with the consequent need for specific competences in order to benefit from the digital transformation, and a change in the vision and the business model of the entire company.

Digital transformation is therefore a complex phenomenon, within which we can locate the concept of *Digital Innovation*, i.e. "the process of combining digital and physical components to create novel devices, services or business models, bundling them to constitute and enable market offerings, and embedding them in wider sociotechnical environments to enable their diffusion, operation and use" (Daniel A. Skog et al., 2018). In other words, digital innovation can be considered as both the consequence and the cause of digital transformation and it is driven by large-scale digitalization of the whole society. For this reason, Yoo et al. define digital innovation as self-referential: "it provides enabling and constraining condition for further digital innovation" (Yoo et al., 2012).

Another concept to introduce is the *Digital Ecosystem*, a concept that has been assigned different meanings because of its complexity, often bounding it with a specific technology (e.g. platform). A broader definition is given by D.A. Skog et al., reinterpreting the work of Adomavicius et al., explaining the digital ecosystem as "sociotechnical networks of interdependent digital technologies and associated actors that are related based on a specific context of use*"* (Adomavicius et al., 2008). From this definition comes the characteristic of a complex network of interdependent sociotechnical elements taken up by Kallinikis et al. (2013). In addition, in order to relate subjects and technologies belonging also to different industries, digital ecosystems cross the boundaries of individual industries. This makes it possible for different and very large ecosystems to overlap with each other. Finally, the elements that are at the center of the ecosystem play a more relevant role, hierarchically speaking, being able to influence the other more external elements (Adomavicius et al., 2008).

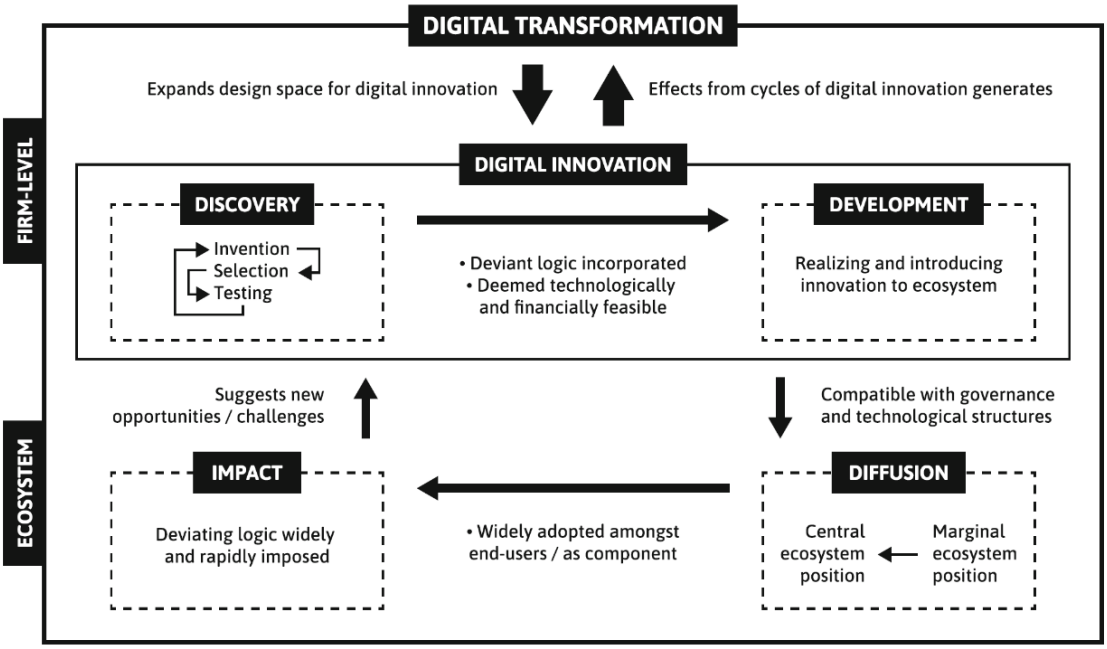


Figure 1 *Conceptual model of digital transformation dynamics* ***(Daniel A. Skog et al., 2018)***

1.2 Business Digitalization Trends

In the early 19th century manufacturing began to change dramatically with the introduction of Industry 1.0, and from there, all operations rapidly developed. The main features of the first industrial revolution were mainly technological, socio-economic and cultural and made possible an enormously increased use of natural resources and the growing mass production of manufactured goods.

The defining elements of Industry 2.0 ranged from railroads construction, mass production of iron and steel, the widespread use of machinery in manufacturing, the considerable increase in steam power, the extensive utilization of the telegraph, oil exploitation, and the beginnings of electrification. This was also the period during which came into use the modern organizational methods for managing large enterprises over large areas.

In actuality, Industry 3.0 refers to the Digital Revolution, or the transition from mechanical and analog to digital electronic technologies. Electronics, such as the transistor and microprocessor, as well as telecommunications and computers, rose to prominence throughout this revolution. This new technique allowed for the creation of tiny materials, which opened up possibilities in areas such as space exploration and biotechnology. For industry, this technological breakthrough gave rise to the era of high-level automation used in manufacturing thanks to two important inventions: automatons programmable logic controllers (PLCs) and robots.

Industry 4.0 is also called the "Industrial Internet," and it not only includes horizontal and vertical value chains digitalization but will also revolutionize the portfolios of companies' product and service, with the ultimate target of better meeting customer tastes and needs. But the special quality of digital change lies in the rapidly accelerating speed of change.

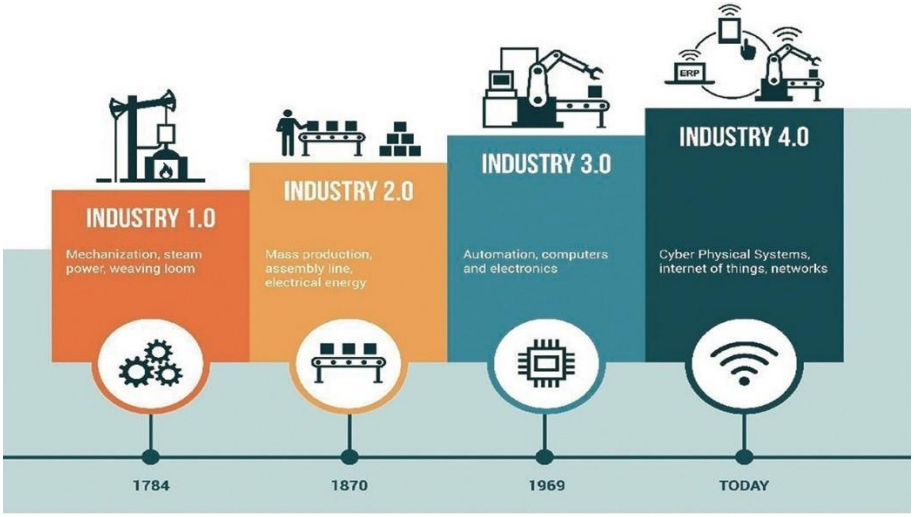


Figure 2 *Industrial revolutions: transforming industries and innovation* ***(Pinterest.com, 2021)***

Advances in connectivity infrastructure, changes in customer preferences, the advent of new market models, as well as environmental patterns and regulatory practices, all affect the pace at which this transition happens. The effect has been most noticeable in the value chain's aftersales level. However, digital is changing R&D, sourcing, assembly, and marketing in major ways. As long as advanced innovations become more available, global demand is met at cheaper costs, resulting in an influx of technologies with ever-increasing connections. Today the total global retail revenue is approximately 16.1% (2020) generated online, and this trend is forecasted to grow to 22% in 2023 (eMarketer, 2020).

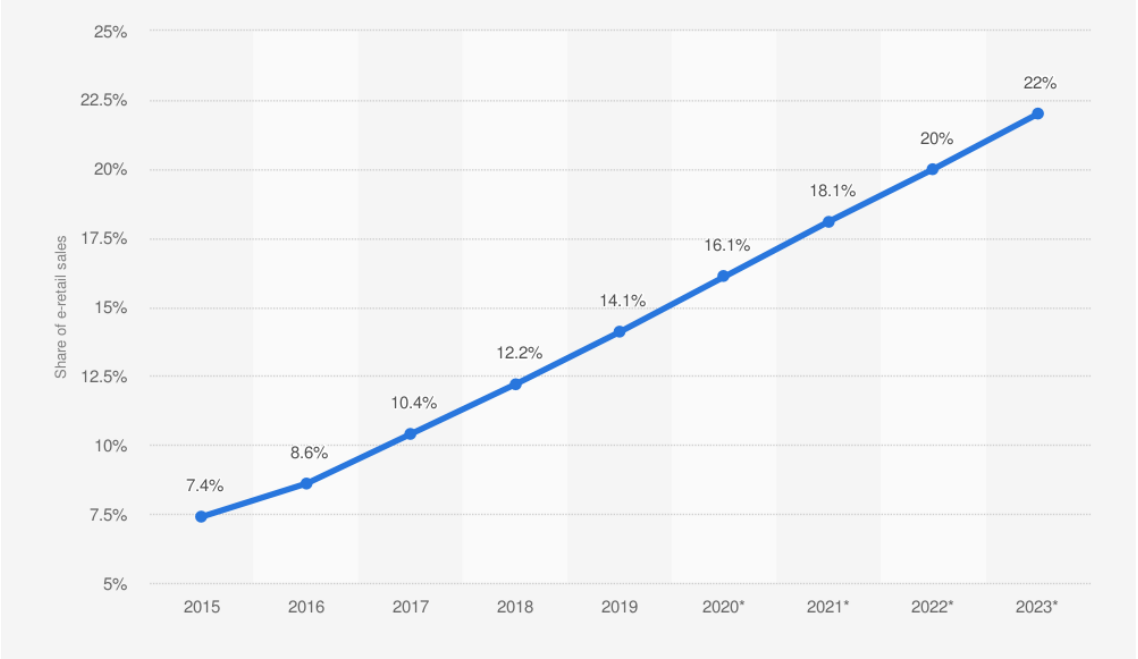


Figure 3 *E-commerce share of total global retail sales from 2015 to 2023* ***(eMarketer, 2020)***

The synergistic impact of these innovations – mobile, cloud, artificial intelligence, sensors, and analytics, to name a few – are exponentially speeding up progress. It is inevitable that the rate of transition will grow much further if we solve physical and intangible barriers that are preventing rapid gains in mass-market developments like energy storage and wireless charging.

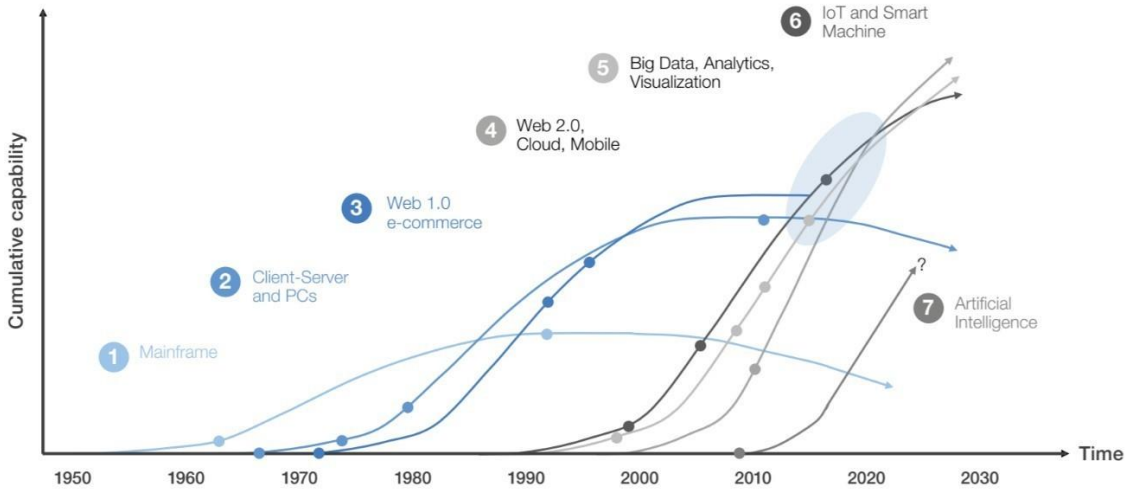


Figure 4 *Combinatorial effects of technologies* ***(World Economic Forum, 2017)***

When technology becomes more prevalent and open to the general public, it has a significant effect on how people interact and what they want. Customers in both the B2C and B2B realms are creating an insatiable appetite for tempo, ease, contextualization, and uninterruptible communication. Furthermore, since younger millennials are being educated as "digital natives," they are not only less likely to be surprised, but they can also envision how technologies can be used to better their lives for themselves. From widening benefit pools to developing innovative business structures to allowing unprecedented access to foreign markets, digital innovation presents industry with unrivalled opportunities for value growth. Fortune 500 firms used to take an average of 20 years to achieve a billion-dollar valuation; today's digital start-ups do so in four years (World Economic Forum, 2017).

We are now witnessing unparalleled degrees of interconnectedness. According to the pattern of digitalization of businesses and culture, the number of Internet users is expected to increase from 4.5 billion in 2020 to 5.3 billion by 2023. (6 percent CAGR). The number of connected devices, on the other hand, is increasing at a 10% CAGR between 2018 and 2023 (Cisco Systems, 2020).

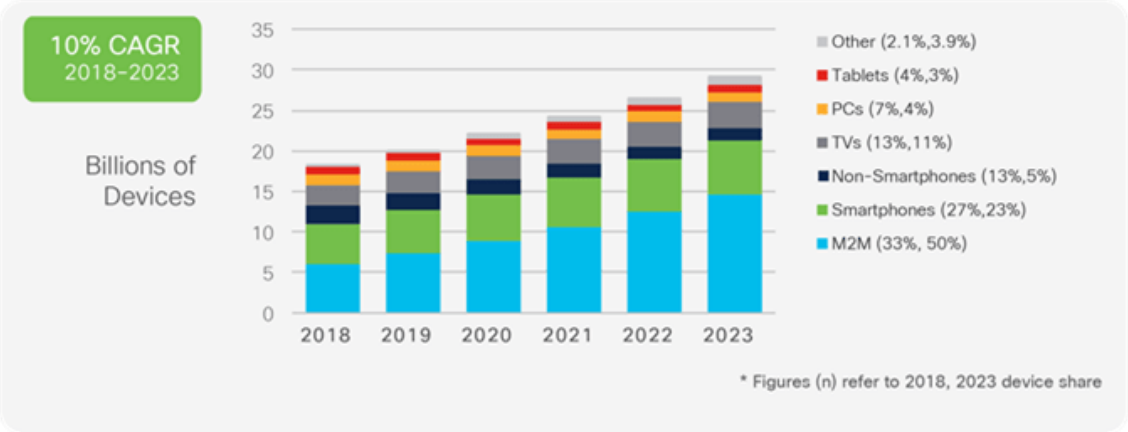


Fig. 5 *Global device and connection growth* (Cisco Systems, 2020)

Globally, internet speeds are expected to rise from 61.2 Mbps in 2020 to 110.4 Mbps in 2023. (20 percent CAGR). By 2023, IoT devices will account for half of all global networked devices (14.7 billion). The introduction of 5G would be crucial in this respect (Cisco Systems, 2020).

Companies must take advantage of the opportunity to use emerging technology to challenge business-as-usual processes and create innovative business models that have

excellent consumer services and accelerate innovation. This involves leveraging digital through functions, business units, and geographies to create data-driven, streamlined organizations. The world is increasingly progressing beyond the stage that digital can be used to literally turn essential pieces of an entity. This is where the digital's combinatorial force comes into play: companies should not miss the opportunity to invest in the most effective innovative technologies, including the internet of things (IOT), Cloud services, Big Data and Analytics, and artificial intelligence to take their performance to another level and be able to compete with the market that is constantly and rapidly evolving. The solutions that are selected are based on established market needs and opportunities. At the same time, enterprises must understand the broadest possible spectrum of how emerging technologies can be used to rethink organizational structures, manufacturing processes, and value chains.

1.2.1 Internet of Things

The Internet of Things (IoT) is gaining traction in a variety of industries and applications, and the data provided by these devices is opening up new market opportunities. It's crucial to manage this data if you want to deliver corporate insights. Furthermore, selecting the right storage system for long- and short-term data storage is critical. "*While IoT is becoming an acceptable term across various application areas, managing and archiving of the data generated from the connected devices is a critical success factor for the industries. Based on that the criticality of data to the application/use-case, redundancy, and granularity of information generated from the connected devices, decision towards level of compression and timelines for storage are decided and implementing the security and governance policies around the storage*" (A. Mukkherjee, 2020).

According to IDC (International Data Corporation), there will be 55.7 billion mobile devices on the planet by 2025, with 75% of them connected to an IoT network. Data generated by connected IoT devices will hit 73.1 ZB (zettabytes) by 2025, up from 18.3 ZB in 2019. The majority of this data comes from defense and video monitoring, but it can also be used for Industrial IoT applications (IDC, 2020).

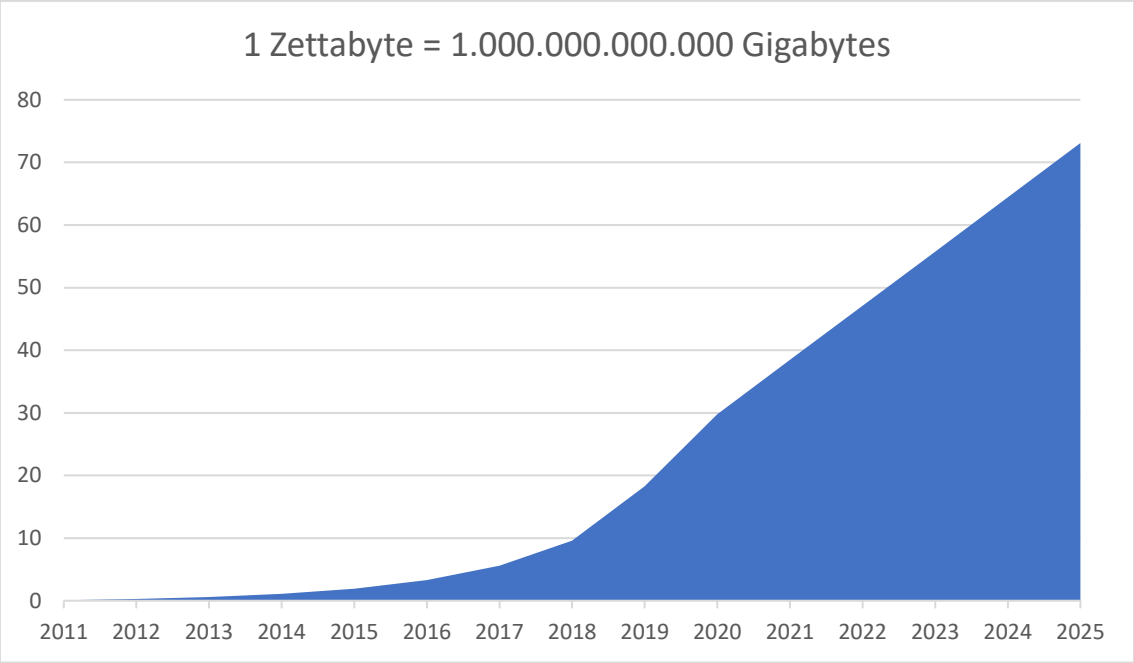


Figure 5 *IoT devices generated data forecast.*

1.2.2 Cloud Computing

According to the definition of NIST (National Institute for Standards and Technology), "cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (NIST, 2011). From a business point of view, Cloud Computing allows to reduce the overall costs of technology as the aggregation of different demand profiles on shared resources allows to achieve economies of scale in addition to enabling the scalable and flexible delivery of services.

In recent years, Cloud Computing has become established in companies as a new and essential model of use of ICT technologies (Information & Communication Technology). In fact, the cloud allows access to updated and technologically advanced services of a service provider through the network, paying them directly on consumption. In this way, the internal management of IT becomes much easier, and the time-to-market of digitalization is considerably reduced. Specifically, it is possible to identify 4 major advantages of Cloud Computing that can be practically applied in any business reality.

- Agility and flexibility: The Cloud makes the company open and scalable with respect to market changes and future business opportunities. Not surprisingly, the Cloud is considered a privileged environment for the use of Agile and DevOps tools and methodologies.
- Time-to-market reduction: With the Cloud, IT staff no longer has to worry about infrastructure management, which raises the bar for enterprise competitiveness. In addition, the continuous evolution of Cloud Providers makes it possible to keep up with technological progress.
- Cost reduction: The Cloud eliminates the costs of managing the physical infrastructure and dedicated staff and any costs of business interruption, improving the availability of resources, and ensuring greater economic sustainability in the medium to long term.
- Safety and reliability: The Cloud presents a leaner service-based model and reduces the risk of over-allocation of resources. The reliability and security of the Cloud service is then guaranteed by the provider itself, which has every interest in maintaining a high level of service.

The COVID-19 pandemic has largely proved to be a catalyst for cloud acceptance and expansion, and it will continue to accelerate the transition to cloud-centric IT. Total worldwide investment on cloud computing, the hardware and software elements underpinning cloud services, and the professional and managed services prospects surrounding cloud services will reach $1.0 trillion in 2024, according to a recent entire cloud prediction by IDC, with a double-digit compound annual growth rate (CAGR) of 15.7 percent (IDC, 2020).

"*Cloud in all its permutations – hardware/software/services/as a service as well as public/private/hybrid/multi/edge – will play ever greater, and even dominant, roles across the IT industry for the foreseeable future. By the end of 2021, based on lessons learned in the pandemic, most enterprises will put a mechanism in place to accelerate their shift to cloud-centric digital infrastructure and application services twice as fast as before the pandemic*." (R. Villars, 2020)

1.2.3 Big Data and Analytics

The sheer amount of market data (terabytes and increasingly petabytes of data) shows that handling and processing it is difficult. Single, homogeneous workloads are no longer effective for data warehouses (DWs).

- In a cloud model, pooling data services allows for greater transparency and rapid innovation in response to changing market demands. Since it offers dynamic resource sharing, virtualization, and drastic economies of scale for handling vast volumes of data, cloud storage has modified the conditions that have imposed conventional relational database constraints.
- Google Big Query web server for big data and Google CloudSQL for relational databases, as well as BI resources.

The global demand for big data and analytics applications, which hit $60.7 billion in 2018, is forecast to rise at a 12.5 percent compound annual growth rate (CAGR) over the next five years (Chandana Gopal et al., 2019). This outlook takes into account three major changes in the BDA tech market: The growing importance of data in the digital enterprise; the continuing transition to public cloud; and the development of artificial intelligence/machine learning (ML) as an enabling technology within data processing and analytics applications are all reasons to consider.

1.2.4 Artificial Intelligence

Over the next four years, global investment on artificial intelligence (AI) is expected to double, from $50.1 billion in 2020 to more than $110 billion in 2024. The spending on AI systems will increase in the coming years as businesses use AI as part of their digital transformation strategies and to stay competitive in the digital economy. For the period 2019-2024, the compound annual growth rate (CAGR) would be 20.1 percent (IDC, 2020).

This data, rather than any other, encapsulates the confidence that businesses have in artificial intelligence technologies, and will continue to have in the future. The explanation is simple: considering all the peculiarities of the industry and the area of

implementation, Artificial Intelligence-based innovations offer businesses enhanced process automation, increased productivity, performance, zero failures, 24-hour service, predictive ability, better supply chain management, easier decisions, and so on. With so many advantages, it's difficult not to invest in bringing theory into motion and incorporating AI technology into one's business model and activities. Organizations must tailor AI's tremendous capacity to their own interests now that the advantages it promises to corporate enterprise have been acknowledged.

"*Companies will adopt AI — not just because they can, but because they must. AI is the technology that will help businesses to be agile, innovate, and scale. The companies that become 'AI powered' will have the ability to synthesize information, the capacity to learn, and the capability to deliver insights at scale*." (R. Jyoti, 2020)

1.2.5 Automation Technologies and Smart Process Automation (SPA)

AI technology empowers companies to serve the dynamic and ever-changing customer needs by changing the way customer service solutions are designed. Apparently, 66% of B2B and 52% of B2C customers stop buying after a bad customer service interaction (Zandesk, 2020).

To reduce customer turnover, companies are studying and deploying AI-enabled solutions for real-time self-service on customer service platforms. By adopting virtual agents or bots, AI-assisted responses can reduce the need for human agents. AI, machine learning, and deep learning skills enable IT systems to recognize client purchase intent, interact with various systems, and complete essential activities in order to meet consumer needs. Virtual agents also synchronize data across numerous platforms in order to better comprehend changing consumer demands. In a matter of seconds, an SPA bot configured to retrieve data can assist in resolving basic yet typical client concerns. Despite the fact that client requirements are always changing, AI technology and SPA tools are upgrading IT systems to accommodate such dynamic client requirements, resulting in SPA tool

adoption.

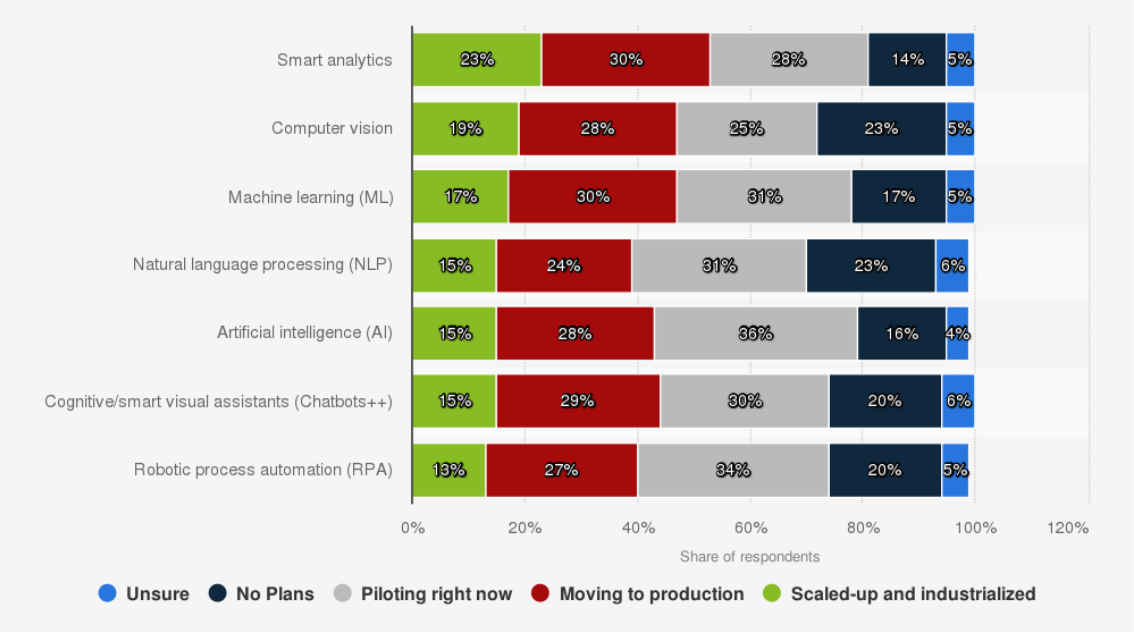


Figure 6 *Adoption rate of Intelligent Automation (IA) technologies in organizations worldwide in 2019* ***(HfS Research ; KPMG ; Statista.com, 2020)***

The market for robotic process automation, is growing at approximately 10 per cent per year and is likely to reach $10.4 billion by 2023. Over the next three years, worldwide spending for AI business automation is expected to grow exponentially and to reach 10.8 billion. Intelligent process automation is also growing at a staggering rate of approximately 30 percent per year and it is expected to reach 13 billion in 2023.

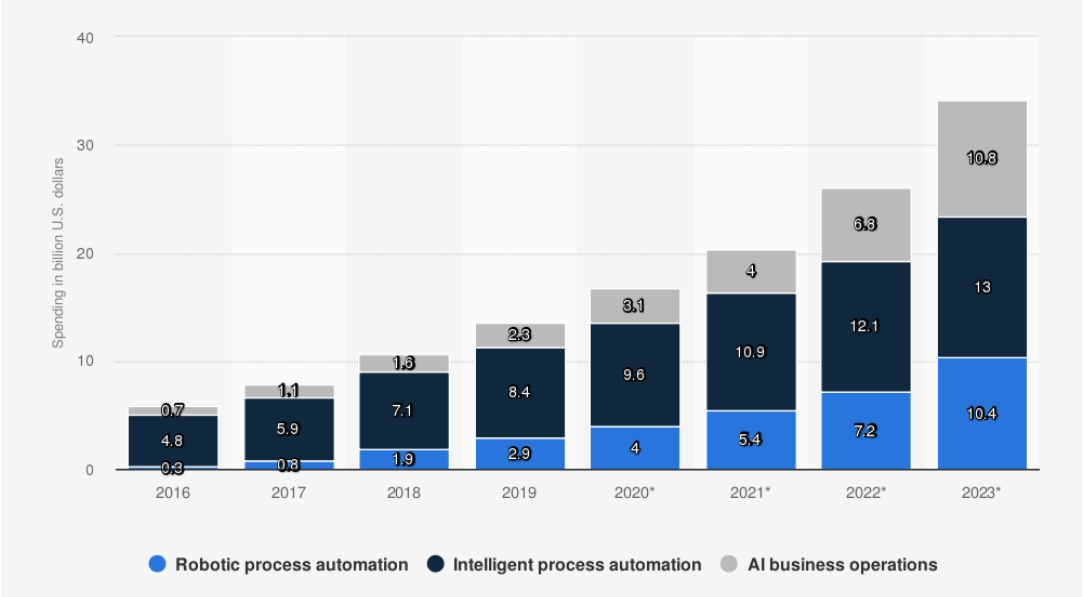


Figure 7 *Robotic/Intelligent process automation (RPA/IPA) and artificial intelligence (AI) automation spending worldwide from 2016 to 2023, by segment (in billion U.S. dollars)* ***(HfS Research ; Statista.com, 2020)***

This presents a significant opportunity to drive innovation and improve productivity redesigning companies' processes and their business model as a whole.

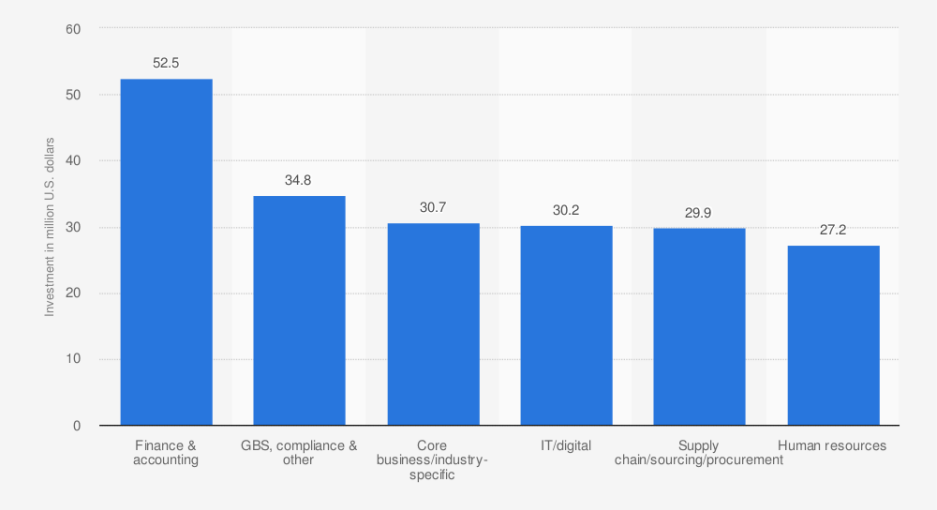


Figure 8 *Investments into Intelligent Automation (IA) technologies in organizations worldwide as of 2019, by function (in billion U.S. dollars)* ***(HfS Research ; KPMG ; Statista.com, 2020)***

According to Markets And Markets the global chatbot market size to grow from USD 2.9 billion in 2020 to USD 10.5 billion by 2026, at a Compound Annual Growth Rate (CAGR) of 23.5% during the forecast period (Markets And Markets, 2021). Chatbots and other Intelligent Automation technologies offer outstanding performance and, above all, the ability to integrate into various aspects of a company's operations: Chatbots may be used to substitute or supplement human operators in customer service management, are highly effective, do not need lengthy wait times, and encourage the organization to refocus workers on higher-value tasks. In this situation, but there are several others that could be listed, the organization receives a direct cost savings as well as a variety of indirect benefits such as increased employee satisfaction, improved consumer knowledge, and more reliability in practice management, both of which lead to a good return on brand credibility. It's no surprise, then, that chatbots are used in a host of other processes and in

support of many company functions, including applicant acquisition and employee management in IT and human resources.

1.3 Insurance Industry Digitalization Trends

Although the insurance industry is recognized by the community as one of those sectors that fall under the category of "old economy", in recent years is an industry that has incorporated a plethora of emerging innovations into its operations. Indeed, the insurance industry is particularly vulnerable to large-scale disruption, so much so that recent technological developments have had a major impact on the value chain.

	Definition	The new reality	Actions to consider
Product and service development	Using customer and market insights to design, develop and deploy products and services	— Core product suite will not change greatly — Acceleration of more creative products (e.g. critical illness riders, health oriented products) and services (e.g. financial wellness). Triggers may include: — Greater focus may occur on retirement planning or income protection products	1. Develop products that leverage telemetrics to discount premium and promote physical wellbeing 2. Develop greater access for customers to protection products that are more suited to changing requirements 3. Digital first concept and adaption to changing customer expectations given the new reality
Marketing	Driving, monitoring and enabling sales and customer retention through brand management, advertising and customer engagement	— Insurers must seamlessly transition to discovering and engaging consumers digitally — Online presence and easy-to-access educational materials are critical for maintaining brand awareness with an accelerated focus on health and preventative techniques (e.g. counting steps) — Changing work patterns are likely to influence how products are marketed such as pensions or retirement savings products — More proactive campaigns to retain customers and increase loyalty through 'emotional connection to the brand' demonstrating empathy and customer support during difficult times	1. Update market messaging to reflect customer sentiment and product positioning 2. Adjust marketing mediums (e.g. print, mail, digital, TV, event sponsorship) and expected impact analysis to align with spend and return 3. Update and align marketing function to new needs, which must consider messages, campaigns, mediums, ways of working, capacity and talent
Distribution and sales	Understanding and strategically penetrating the addressable market to deliver products and services and to generate revenue	— No significant changes to distribution approaches expected in the 'near term' due to COVID-19 — For high-end/wealth segment, the advice model likely to continue — Pensions or retirement savings will be linked to the future shape of employment — Direct-to-consumer will eventually be the primary distribution method for protection products, enabled by digital capabilities — Traditional barriers to sales process will be reduced as will the role of the agent (shift to more usage of virtual / mobile techniques) — Regional differences will continue to occur depending on the regulatory environment or simply due to customer preferences	1. Reassess the balance needed between agent and digital-assisted distribution models 2. Update the stories, based on marketing messages, that distribution and sales will leverage to enable impactful interactions 3. Establish the new operating model for distribution and sales considering
Underwriting	Analyzing risk profiles and premium pricing models to bind and issue policies	— Consumers are becoming more willing to share personal data allowing underwriters to evolve how they evaluate risk and set pricing — Insurers will learn to interpret new data, including unstructured, unlocking data from legacy systems and from the internet of things (IOT) — Continued focus on streamlined processing and better use of data and analytics (e.g. 'no exam/fluids' underwriting)	1. Identify opportunities to source and leverage nontraditional data for underwriting 2. Review opportunities for improved processes and data collection and the use of AI to harness the power of predictive modeling and machine learning 3. Build technical capability in underwriters recognizing that simpler tasks will be automated:

Policy administration	Managing the administrative activities required by the inforce populations (e.g. inquiries, cancellations, changes, billing and collections)	— Reduction of policy servicing costs as consumers become more comfortable with digital interactions — Contact centers will be reimagined, leveraging automation (voice, chat, etc.) — Outsourcing strategy will be reviewed with transfers and renegotiations expected due to automation	1. Review policy admin processes to identify opportunities to automate and enable self-service as a means to increasing efficiency and decreasing costs 2. Understand the consumer experience and the 'moments of truth' during the maintenance of their policy 3. Assess technological capabilities and determine where external resources may be required (e.g. vendors, alliances, partners)
Claims management	Evaluating and settling claims, including payment, reinsurance recovery and litigation, when applicable	— Need to reimagine claims handling, even if claims paid do not end up being significantly higher as a result of COVID-19 — Increased expense ratios will arise from growing volume and potentially limited new business — Insurers will race to create operating models that heavily rely on self-service and automation to process claims — Automation will focus more on back-end processing given claims is the most significant 'moment of truth' for customers	1. Evaluate exposure to pandemic-driven claims and include considerations for potential indirect effects (e.g. fewer accidental deaths, reclassification of other terminal illnesses) 2. Explore and develop automated claims processing capabilities, with focus on developing operating model and staff capabilities to support a more automated environment 3. Invest in automation to expedite and simplify complex handling processes
Asset and investment management	Leveraging and investing assets from policyholder surplus and reserves to generate revenue and provide solvency for liabilities	— Cash and asset management strategies will evolve: — Insurers will closely monitor credit issues and the impact of commercial real estate and loans given the possible shifts in those asset classes — Regulatory focus on credit risk management, particularly illiquid assets, likely to increase in certain markets	1. Evaluate exposure to potentially high risk investments (e.g. commercial real estate, loans) 2. Enhance monitoring of credit risk 3. Assess investment strategies given challenging yield environment and shifting views of economic recovery patterns

Table 1 *Digitalisation of the insurance sector's value chain* ***(KPMG, 2020)***

Significant developments in consumer needs and expectations, such as quicker and more accessible goods and services, increased openness, and personalization, have prompted insurance firms to adjust and adopt the agility expected in an increasingly technical and fast-paced business setting. In this respect, the word "Digital Insurance" was coined to describe a situation in which an insurance firm takes advantage of all possible solutions to make its offerings and operations more flexible and streamlined, while still employing a multi-channel distribution strategy (B. Nicoletti, 2016). Although research suggests that insurance firms have historically been slower innovators, they are increasingly mindful that in order to grow their market share and achieve a strategic advantage, they must reinvent goods, systems, business structures, and organisations rapidly. Specifically, it is possible to deliver different types of services with a deeper examination of individual threats and increase the potential to produce revenue by using technologies, intelligence, and data collected on policyholders. In terms of operations, the use of digital channels such as the internet, social media, and smartphones'apps allows businesses to not only cut costs and, as a result, lower product prices, but also to enable consumers to compare pricing and terms. In addition, Companies must now invest in communications and, taking advantage of the benefits of new technologies, introduce direct distribution platforms to meet end consumers rather than relying on intermediaries. Insurance firms must also not only encourage process reorganization and redefinition in order to reap all

of the advantages of digitization, which have implications for the quality and reliability of their own operations, but also rely on the consumer experience in order to develop strategies by using the ability to research the behavioural characteristics of customers thanks to digital.

The insurance sector, like all businesses, has faced monumental challenges due to COVID-19. A health epidemic has spawned a slew of economic and social problems. It appears that when we emerge from this time, we will be thrust into a new reality that will be vastly different from the one that existed previously. There's no doubt that insurers have a lot of work ahead of them. It's been a long time since the change agenda has been so urgent. Despite this, the industry should be confident in its ability to meet the challenge. One of the most important takeaways from COVID-19 was that companies, like insurance, are capable of much more and much quicker than most people believe and his experience should serve as motivation for looking ahead.

1.3.1 The Advent of InsurTechs

This process of innovation and digitalization has been accelerated by the advent of InsurTech startups. “InsurTechs are technology-led companies that enter the insurance sector, taking advantage of new technologies to provide coverage to a more digitally savvy customer base” (McKinsey & Company, 2017). When the word was first used in 2016, it referred to a technology startup trying to make a name for itself in the insurance industry. Today, the number of options offered has exploded and InsurTech has developed as an environment that puts together diverse sectors to provide insurers and their clients with a quality solution that is more valuable (PricewaterhouseCoopers, 2019). They helped in the stimulation of creativity, the identification of needs, and the integration of existing digital strategies to provide better-performing solutions. So, if on the one hand it is necessary for traditional insurance companies to perceive the competitive risks present in their industry in order to evolve and survive against the threats of BigTech companies, on the other hand it is necessary to collaborate with new InsurTech companies in order not only to streamline processes, but also to attract more specific customer segments willing to receive modular and customizable insurance offers (Capgemini, 2018).

InsurTechs have accomplished more than just establishing a business-to-consumer model in the insurance sector. Executives claim that they have stimulated innovation in the insurance sector by placing further emphasis on carriers and brokers to be more agile in their operations, more straightforward in their sales strategy, and more inventive in how they sell their goods and services to different populations (Harvard Business Review Analytic Services, 2020). Brokers and other aspects of the conventional sales chain are now using technologies to enhance consumer loyalty, maximize purchasing efficiencies, and gather more information critical to the business of assessing and underwriting risk as a result of digital transformation. Thanks to automation, both the client and the broker are working smarter, wasting less time sending data and more time implementing it (Martin Eling and Martin Lehmann, 2017). The positive thing for brokers in this more digitized environment is that when it comes to distribution, digital automation is only in its early stages. While paper production still dominates the insurance industry, cloud and other innovations are beginning to have an influence. Insurers rely heavily on data, and brokers' access to it, and the insurance ecosystem is in the midst of a transformation to better collect and share it. The broker-carrier partnership continues to develop at a time when the insurance market is focusing more on a D2C model, and creativity and technology will be a major part of how successful delivery will be in the immediate future. "*The biggest impact that technology can have on the whole distribution piece is squeezing out all those inefficiencies and making it faster, cheaper, and even more accurate than it's ever been before,"* (Fitzgerald, 2020). "*...It also requires insurers and agents to think about the way they do business. In my experience, brokers are allergic to technology. So, the battle royale is not so much what the broker does for the carrier as what the carrier does for the broker*."

Customers demand incredibly rapid complaint solving. Usually after the first interaction, they need more simplified access to services and information, and customized, high-quality support through all forms of platforms. So, handling the flow of transactions with the insurance provider is essential for value development in the modern age. As a result, these organizations will need to build a customer-collaboration strategy that will allow them to have a more customized and differentiated service, as well as a more consistent relationship that contributes to customer loyalty (Deloitte, 2019).

In order to meet all of these needs, while many companies are turning to InsurTech startups for digital platform agreements, a number of insurers have decided to reach out directly to customers, in turn creating a number of insurance startup incubators (IVASS, 2019).

In the mobility sector, there is an increasing number of companies that are enriching traditional coverage with digital devices and able to offer additional services to solve contingent problems faced by customers.

Technological solutions for risk prevention also continue to evolve in home protection policies. Here the products offered are configured as products that can be purchased in modular form to encourage greater customization and responsiveness to the specific needs of clients.

1.3.2 The Omnichannel Solution

The omnichannel experience, which offers “a consistent experience across multiple channels through well-orchestrated delivery of dynamic, targeted and consistent content, offers, products, and service interactions” (P. Freegard et al., 2015), is becoming increasingly important for insurance providers' business models.

The COVID-19 pandemic is having a significant impact on how people interact with one another through markets and geographical boundaries. Physical separation and other quarantine steps have moved practices that used to include in-person participation to digital and remote networks. This shift will have an effect on insurance delivery both now and in the future, as physical distancing efforts proceed. As we progress toward the "next standard" society's relationship with technology and remote communications is constantly changing and escalating. Many insurance providers have possibly already taken action to counter COVID-19's short-term or immediate effects, such as relocating staff or expanding online customer support networks. Insurers are now concentrating on the next generation of opportunities, which includes rethinking distribution in a more remote environment. A survey of German insurance brokers conducted in April 2020 (four weeks after the lockdown) showed that more than half of the agents saw a 40% drop in new activity (McKinsey & Company, 2020). A survey of US agents conducted in May 2020 showed a similar effect: nearly half of the agents cited remote customer relationship

building as the most difficult task during COVID-19 (Mckinsey & Company, 2020). In the meantime, online insurance aggregators and direct channels are showing equal, if not higher, volumes.

Insurers will need to rethink their distribution strategy in three dimensions to solve these issues: consumers, sales force, and enablers (such as investment in data and digital tools). As a result, they will be more equipped to deal with the unexpected. One of the carrier's highest goals should be the opportunity to integrate life insurance into people's everyday lives and use life experiences as triggers for purchase. People post everyday about life experiences on social media and browse for updates on life insurance, so companies surely have opportunities, but making a smartphone app or creating content on social media isn't enough. It necessitates a paradigm shift in an organization's activities and mindset, with implications ranging from the agent's position to modern, sophisticated data-analytic capability. In this respect, a McKinsey & Company report outlined the various horizons along which carriers would operate: (1) modernization of all consumer service platforms; (2) development of customized solutions based on study of the large and ever-growing body of digital customer data; and (3) interconnection of channels to provide a seamless customer experience (McKinsey & Company, 2017). Such advances will not only enhance the consumer experience, but will also allow for greater organizational efficiency.

Mobile devices have revolutionized the way we get details, select goods, and purchase them in recent years. This is most likely due to the need to still have something at hand with a single click; in reality, computer usage is being extremely restricted, with smartphones and tablets taking their place.

In today's world, client desire for self-service has only increased the value of digital. According to a new market study in Spain, automated insurance access has improved by almost 30% since the pandemic started (Mckinsey & Company, 2020). However, the same study showed that of all industries, insurance has the lowest degree of customer satisfaction with digital distribution. The most common source of frustration was “difficult-to-use tools.” To best improve customer and agent loyalty, insurers would continue to engage in developing and strengthening self-service tools.

Insurance firms have capitalized on this trend by offering options that engage the consumer more and result in a more productive distribution process with substantial time saves. After the IVASS (Istituto per la Vigilanza sulle Assicurazioni) released a provision on "home insurance" with the aim of simplifying and speeding up the interaction between the insurance provider and the policyholder through the use of technology, information has been accessible at any time since September 1, 2013. Consumers who buy a package, in particular, can order the activation of a private area, which they can enter by signing in with their digital keys, to verify their insurance status in real time and, if needed, pay their premium online. This allows businesses to not only keep track of ongoing coverages, premium expiration times, and efficiency trends in the case of financial goods, but also to demonstrate the values of transparency and correctness (IVASS, 2013).

"I mainly see that the insurance market needs to evolve the mode of relationship between consultants and people, and to make sure that this mode can be truly seamless both in presence and at a distance and on all the channels that the different targets will occupy over time." Alberto Corti Head of Digital Channels and Customer Experience at Generali (*Annex 1*)

1.3.3 Artificial Intelligence Application in Insurance

Given that enterprises around sectors are benefiting from Al, it is unquestionable that it would be a crucial enabler for insurance firms to prepare for the threats and opportunities of their digital future. High labour costs, regulatory regulations, increased competition from InsurTech startups, and changing consumer demands are just a few of the challenges that Al can help with.

The automation of claims handling procedures is one of the most well-developed AI applications in insurance (Deloitte, 2017). The claims management department has historically been the most labour-intensive and, as a result, the most costly for insurers (Deloitte, 2020). In the meantime, work in the claims management industry is extremely standardized and rutinary, making it ideal for AI automation. As a result, insurers have strong benefits and a strong chance of automating claims collection. Nowadays an insured customer who has suffered a car accident can turn to the bot of his insurance company to

open the claim, send all the necessary documents and get the eventual compensation that he is entitled to. In this way, the process becomes automated, convenient and extremely fast. Potentially, such a process, in addition to being beneficial to the customer, can also greatly reduce the company's costs, as it avoids intermediate steps in which the customer must go to its agency to resolve the dispute.

But digitalized insurers are, to the present day, also capable of automating a quotation, contract, and other procedures. Many agencies now have an online quoter. Just enter a few details and in a few clicks you'll get a complete quote for auto, health, pet and more. All without having to go to the agency or provide any special documents. Modern AI apps, can boost content awareness, prioritize more intelligently, and even improve consumer loyalty by reducing response time.

Today's insurance buying experience is faster, with less direct participation on the part of both the insured and the consumer. With adequate data on customer actions and AI algorithms building risk profiles, period times for buying a car, commercial, or life insurance policy can be reduced to minutes or even seconds. As telematics and in-home IOT systems proliferate and pricing algorithms mature, auto and home insurance providers will begin to refine their ability to issue premiums directly to a larger spectrum of consumers. We will see a new generation of mass-market instant issue products as AI pervades life underwriting and carriers develop the opportunity to recognize risk in a far more granular and advanced way.

Customer self-service tools such as biometrics authorizations and, more prominently, chatbots are currently common AI technologies for effectiveness benefits, as shown by a number of existing insurance case studies (Ernst & Young, 2018). Insurance will become more customized, according to the forecast, and insurers using AI technology will be able to better identify what their customers need. Insurers would be able to save money by accelerating workflows. They will also explore potential sales sources as AI-driven research uncovers new markets for industry and cross-selling. Above everything, the AI solutions mentioned above will make interacting with insurance providers simpler for consumers. People could be more inclined to buy insurance as a result of this (Towards Data Science, 2019).

Chapter 2 - Intelligent Automation, Evolution and Applications

2.1 Robotic Process Automation Overview

In the near future, the growth of the digital labour phenomenon and the ever-increasing use of new Intelligent Automation technologies will have important impacts on companies, both from an organizational point of view and in terms of human resource management. Many companies have already started programs and initiatives to automate some business activities, but often in a context of very fragmented and still undefined information systems. In many cases, there is a general uncertainty in defining the application areas of these initiatives, when to start them and, above all, how and how much to invest. Among all the Intelligent Automation technologies, today the one of greatest interest is Robotic Process Automation.

In the last years, software robotics has gotten a lot of attention. This involves both mainstream and observer press speculation on the effect on unemployment and the possible impact on offshoring and outsourcing. Software robotics' promise is to provide a technology that will quickly automate manual back-office and customer-facing operations, making them quicker, considerably more cost-effective, and improving performance and regulatory enforcement, all with a return on investment of less than one year. Many of the world's largest banks and insurers have successfully piloted robotics solutions, but only a handful have been able to scale up the benefits. The scale of the prize on offer, both in terms of cost reduction and service automation, puts advancing and industrializing software robotics squarely on the agenda for most financial services companies' C-suites.

The expression Robotic Process Automation refers to those "intelligent" softwares able to automatically perform some repetitive activities, imitating the behaviour of the operators and interacting with the applications in the same way as a person would do, that is "taking control" of mouse and keyboard. With the acronym of RPA we refer to the category of "software robots", i.e. those applications that relieve the human being from manual tasks and duties related to repetitive activities (Il Sole 24 Ore, 2019).

There are different types of RPA: in particular we can distinguish two UI-Automation technologies that refer to how Robotic Process Automation is implemented and exploited (IBM, 2018):

- Attended RPA: robots that automate interactions with users' desktop applications are executed within each user's own desktop environment, working "side-by-side" with each user.
- Unattended RPA: robots work on a separate server or virtual machine (or more than one), automating interactions with applications from "behind the scenes", thus performing their task if and when triggered by other software systems and they can be scheduled.

In the first case, the main advantage is that the user has control and the ability to decide when to use the automation and thus be able to see when the automations benefit from changes or improvements and intervene in case of problems. In the second case, however, the main benefit of automated execution is that it completely removes some tasks from the users' concerns, significantly streamlining their work and the business processes they participate in. Centralized operation also makes monitoring and control data easier to collect and manage.

During a live customer call, a call center agent will get assistance from an attended RPA bot in near real time. The attended bot, for example, will identify customer data from one program and automatically type it into another. As a result, the call center agent will waste less time moving between processes and will be able to concentrate on high-value activities including resolving the customer's issue. Under the NHS, patient data is stored in a variety of applications. When a patient is referred to urgent care, an attended bot can easily access patient records so that medical providers are informed of their medical histories and existing prescriptions and can triage them as quickly as possible. At this point in the procedure, speed and precision will make a big difference in the patient's result.

An unattended automation approach, in which activities and actions within a workflow will be engaged by the automation robots themselves, may be well-suited for a health insurance business with vast volumes of claims processing, invoices, and other documentation functions, resulting in a more efficient accounting and data management

operation. But also, the auto-sending emails after customer purchases or other operations on an ecommerce website is a good example of unattended RPA.

Robotic Process Automation software is used to map out existing or new processes, to link them to existing applications, and schedule them to run on one or more robots as required. RPA software's individual components are not new. However, combining all of the capabilities into a single, mature kit that integrates with existing platforms may be a compelling solution to core-platform inclusion or substitution in many situations.

2.1.1 Robotic Process Automation Benefits

Adaptability: One of the greatest benefits of RPA is its ability to be used in different, even opposing, contexts and its ability to be able to accomplish a wide variety of activities. A task that is particularly well-suited for automation reflects a set of well-defined, repetitive, rule-based actions. Automation means that any process can be mapped as a business process and assigned to a software robot that is capable of managing its execution and therefore responsible for the work, just as a human would. Called the "automation of automation" (IRPA, 2015), by detractors, RPA combines automation with adaptability. In fact, this technology is capable of learning and responding to problems that would have blocked traditional automation systems, or that it was even unthinkable could be automated. These features give RPA that extra something to elevate itself from traditional automation systems. The RPA does not go to form a part of the company's technology infrastructure, but rather goes to adapt to it. This means that even large companies are able to implement this technology quickly and efficiently without altering the existing infrastructure and systems. Having said that, it can be concluded that some industries are much better suited to accommodate RPA, as they have processes that are more rule compliant and are particularly suited to be automated. These industries include healthcare, banking, and insurance since they all have a large amount of work to do that could very well be entrusted to software robots.

Morrison Utility Services is an infrastructure services provider that partners with national energy networks and publicly owned organizations to restore, upgrade, refurbish, and manage the world's gas, electricity, and renewable energy systems, with a particular

emphasis on decarbonization to help the country achieve the goal of becoming a Net Zero economy. The firm employs over 4,500 people in the UK, the majority of whom work in two-man field support teams (Morrison Energy Services, 2021). Many of the business processes that sustain the company's day-to-day activities are rule-based and transactional in nature, which are the types of tasks that RPA excels at. Morrison Utility Services realized right away that an RPA platform could help with a variety of organizational and business processes. The 'safety kit,' which must be produced before any job is done with a major water, electricity, or telecom business, was the first process where RPA was used. This is a time-consuming operation since the firm manufactures over 25,000 packs every month. They began working with Sopra Steria, a consulting company that used the UiPath RPA platform[1] to demonstrate that a robot could produce highly reliable and error-free safety packs 24 hours a day. The first phase began in March 2018 and was planned to take nine to twelve months to finish, but it was completed in just six months, saving the corporation over 3,800 hours a year, or about £145,000 in savings. The safety pack project showed how an RPA system could be built and deployed rapidly and efficiently. Initially, the RPA device was responsible for the production of 5% of the company's safety packs. Today, more than 60% of the packs are automated, making the whole operation more flexible and effective (UIPath, 2019).

Improvement on data Analytics: In addition to a higher degree of intelligence, RPA also becomes important for data analytics on all fronts (customer analytics, data mining, social media analytics, and big data warehousing). As the integration of this technology becomes more consistent, the company will be led to improve data collection by going in and rethinking certain processes to improve their productivity and adaptability to automation. This will lead to the execution of targeted and sophisticated data analysis

[1] UiPath is a Windows desktop automation platform that uses Robotic Process Automation. It uses drag-and-drop capabilities to simplify repetitive/redundant operations, without the need for human interaction. This tool comes with a variety of editions that serve all kinds of users, as well as an engaging forum to help with problems. UiPath is ranked No. 1 in North America in Deloitte's 2019 Technology Fast 500. Multinational corporations such as Airbus, Nasa, Autodesk, DHL, HP, Paradise, and others use it. As the industry leader, it is attempting to appeal to all kinds of audiences, whether they be fresh graduates or seasoned professionals employed in top corporations, by offering different editions.

with increasing speed, quality and scalability (Leslie Willcocks, et al., 2015). Every task the robot performs is tracked and produces data that, once extracted, can be the subject of very interesting analysis aimed at studying and understanding customer behaviour, or discovering and addressing inefficiencies in business processes, and more.

Max Healthcare Institute Limited, headquartered in New Delhi, India, is a hospital network. Max Healthcare runs and maintains healthcare facilities in Delhi's NCR, North India, and the western port city of Mumbai. Max Healthcare deals with a variety of patient transaction details on a regular basis as it is one of the biggest hospital networks in North India. (MAX Healthcare, 2021).

All requires a high degree of accuracy and reliability, from logging consumer information to processing claims to reconciling records for federal health plans. Manually handling such vast amounts of data is not only time-consuming, but it can also lead to many mistakes and security concerns. Robotic Process Automation has not only resulted in a significant decrease in turnaround time (TAT) in existing operations, but has also opened the way for the company to progress more quickly on its digital transformation journey. A new data entry solution for the Central Government Health Scheme (CGHS) and the Ex-servicemen Contributory Health Scheme (ECHS) schemes was developed using RPA techniques. The robot accesses the ECHS site by using URLs from 17 separate hospitals and TPAs (Third Party Administrators). Similarly, there are 12 separate affiliated hospitals with their own URLs under the CGHS system. The Robot reads patient transaction documents and validates the status of the entries after accessing their URLs. It sends an email to the appropriate department after of successful data validation. TAT for claim handling was cut by half, and CGHS and ECHS saved between 65 and 75 percent of their time (UIPath, 2019).

Lower costs and higher accuracy: The key outcomes that a business can expect from RPA implementation are a substantial increase in ROI due to the lower cost expected relative to a formal and more costly complete IT approach, as well as tangible productivity gains. Companies have traditionally benefited not just from cost savings but also from shortened processing time due to ease of operation; a versatile cost system, because bots can be configured and scheduled according to the company's needs (i.e. putting more robots on urgent processes); improve accuracy as long as all errors and exceptions are

tracked; accurate data collection provides customers with a variety of reports that can be used to facilitate additional process changes, as previously reported. By deploying RPA, typical transactional errors such as incorrect data inputs, skipped moves, and rule-application mistakes are minimized, human errors are reduced, and activities being automated are able to reach 100% accuracy (Tarquini T., 2018).

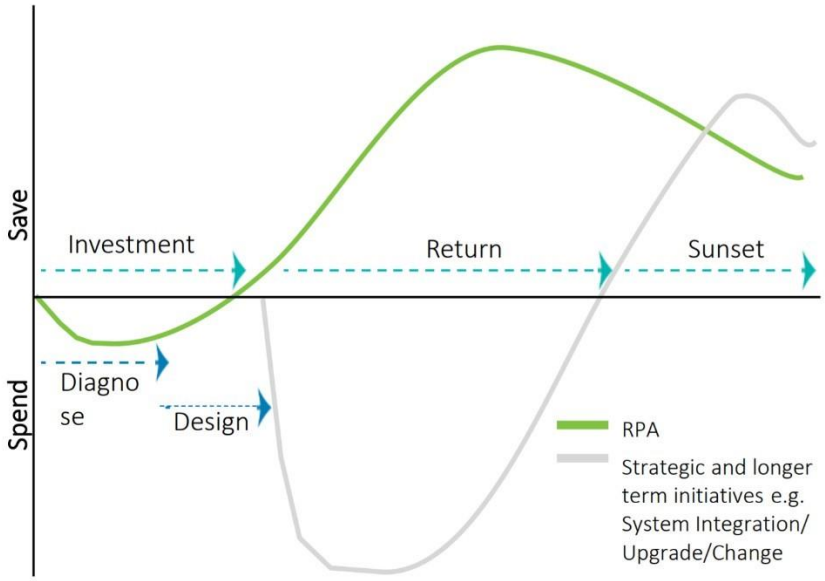


Figure 9 RPA strategy implementation's cost and benefits (Deloitte, 2020)

Paramount Residential Mortgage Group (PRMG) is a leading company in the mortgage industry founded in 2001 in California (USA). Today, they employ over 2,000 with nearly 180 branches throughout the United States (PRMG, 2021). With a record number of loans, it was obvious that the loan estimating and acceptance process needed to be automated if they were to keep up with demand. RPA was specifically used to automate: retrieving disclosure packages, sending disclosure packages to the broker, sending closing packages to the broker, creating a system notification that there is intent to finalize a loan, entering payment data into the system, and downloading, organizing, and transferring data between systems. The findings demonstrate how effective the PRMG RPA software has been in only a few months. The RPA infrastructure currently handles 550 automated activities every day and is rising. Each job saves four minutes, resulting in a daily savings of about 40 hours of manual labour. PRMG expects to save $1.2 million in the first 36 months, with an expected return of $6 in annual savings for

every $1 spent. Aside from reducing the time it takes to approve loan applications, there have been other advantages that have a more direct effect on operational costs. Underwriters have seen a 50% improvement in underwrites everyday thanks to RPA, resulting in a $2 million save. PRMG anticipates an additional 25% increase in efficiency as a result of increased underwriting precision and pricing. (UIPath, 2021).

Organizational performance: The biggest benefit of using RPA is that it improves organizational performance in terms of time, expense, and human capital, as well as reducing manual activities and workload and increasing productivity. Reduced maintenance costs were at the top of the priority list. RPA technology has been shown to cut the cost of human resource-related spending by 20–50% (The Institute for Robotic Process Automation, 2015), and can minimize the cost of transaction processing by 30–60% (Deloitte, 2015), based on quantifiable metrics such as the number of fulltime equivalent workers (FTEs) replaced by robotics. Time savings have resulted from the elimination in manual duties and workload, as demonstrated by dramatic reductions in operation cycle time, job handling time, waiting time, and so on (from 30% to 70%) (Lacity, 2016). According to one survey (Lacity, M., Willcocks, L., 2018), businesses see RPA as a platform to help them have superior customer support, whilst another study (Convergys, 2018) claims that RPA can provide ground-breaking customer interactions.

Through two perspectives, increased efficiency is equally emphasized. To begin with, the fact that robotics can run nonstop 24 hours a day, 7 days a week is an apparent contributor to increased productivity. Second, RPA can relieve humans of monotonous and time-consuming activities and, as a result, “employees can participate in more value-added activities that involve personal interaction, problem solving, and decision making.” (The Institute for Robotic Process Automation, 2015).

Telkomsel is currently Indonesia's biggest cellular provider, with over 170 million subscribers. The company has installed over 233,000 BTS to service customers in Indonesia, including rural areas, outer islands, and border areas. They have also continually deployed cutting-edge network technologies, and were the first in Indonesia to commercially introduce 4G LTE cell networks. Telkomsel aims to grow its digital business as it enters the digital age, including Digital Advertising, Digital Lifestyle, Mobile Financial Services, and the Internet of Things. They have MyTelkomsel software,

Telkomsel Virtual Assistant, as well as a 24-hour call center and GraPARI facilities scattered throughout Indonesia, to satisfy the needs of consumers (Telkomsel, 2021).

As part of this transition, Telkomsel worked to introduce an Intelligent Automation (IA) program that uses Robotic Process Automation to remove redundant back-office operations (RPA). Telkomsel's accounts payable unit was inundated with about 3,000 invoices each month prior to implementing an IA platform. Until being uploaded into the payment system, each invoice had to be checked for errors.

The revamped and streamlined systems saved the business between 30% and 70% in production time. The development of the regular tax catalogue, which maps vendors to various tax codes and forms, is one example. This job used to take three to five minutes per sale, but technology has cut the time in half. The use of IA enables organizations to provide customers with 24/7 surveillance and consulting systems, as well as minimize employee workload, releasing them from drudgery and enabling them to concentrate on strategic facets of the enterprise (Deloitte, 2021).

“The next step is to create a strong Centre of Excellence (CoE) to ensure effective governance, delivery, and support when new robots are added to the virtual workforce. The CoE will enable alignment across opportunities, people and processes, towards the same vision and business objective. We would like Intelligent Automation to become an organisation-wide capability,” said Saurabh Punjabi, Telkomsel’s Head of IT Technology Advisory.

Security and compliance: RPA's early adopters have indicated that it helps them reduce risk and increase compliance. An RPA robot executes tasks without bias or deviation, unlike humans, which can miss a process phase or not be reliable in the processing of a transaction. This gives credence to the automation agenda's goal of risk management and minimization. RPA can handle a variety of exception management activities in which humans will normally make routine, simple decisions based on data or requirements. RPA can do these kinds of tasks as long as workflows are recorded accurately and specifically. This relieves the routine workload and probability of error from the human resources executing these tasks. Since the robots are designed to obey the normal operating procedure and thus execute the job in the same manner every time, RPA encourages strict implementation of guidelines and conformity to control mechanisms for decision making.

By greatly reducing error within a company's structure, this continuous operation helps to minimize harm.

RPA software can also be very useful to maintain a database of the work done to ensure that the procedures and processes being automated are compliant with regulatory specifications, according to the literature. Companies should be assured that they are meeting their existing standards for the latest up-to-date, industry-specific requirements incorporated into the RPA platform, and they will not have to start from scratch every time they plan for an audit or submit files. Furthermore, since workflows are streamlined, businesses can waste far less time looking for and entering massive volumes of data. Automation of compliance procedures results in a repeatable, managed collection of activities that automate the operation, collect compliance data into a single structure, and expose any omissions. RPA systems will save enforcement professionals' lives while saving their employers millions of dollars in fines, particularly in sectors like insurance and healthcare that have strong regulatory platforms.

The U.S. **Office of Financial Innovation and Transformation** (FIT) is a government agency that develops and implements novel financial management strategies that help government departments become more efficient and transparent. (FIT, 2021).

In 2018, FIT was charged with piloting a project for the Department of the Treasury's Bureau of Fiscal Service to see how RPA could strengthen financial processes. The most prominent field of government RPA implementation is accounting, and this practical area of government is well adapted for many forms of automation. FIT and its contractor would build bots to help streamline traditional financial management procedures at federal agencies during the pilot project. Bots work in tandem with an agency's accounting system to simplify routine processes like data entry, data migration from one program to another, and strengthen financial controls and reduce the time required to prepare financial statements (FIT, 2018).

The pilot discovered an overall 60 percent reduction in the time it took to complete all activities in the seven automatic systems. Furthermore, without adding human resources, throughput was increased by 30 times, and manufacturing power was increased. RPA achieves 100% accuracy in automating tasks because it executes tasks exactly as established (assuming bots are properly configured) (Deloitte, 2019). Bots may be

configured to collect and manage full audit logs and simplify documentation for a stronger audit process, in addition to following specified protocols and procedures with precision. Links to further audit data in a structured, accurate, transparent format, as well as electronic reporting that allows auditors to concentrate on research and decision-making rather than manual data gathering and consolidation, are both advantages for auditors.

2.1.2 Risks in RPA projects

As is often the case with elements that bring strong disruption to organizations, there are significant challenges to be faced in addition to numerous benefits. Organizations frequently set ambitious targets and standards for RPA adoption, or use it for a one-off, isolated region, even though RPA can accelerate productivity and maximize competitiveness. This leads to a scenario where RPA struggles to deliver on its pledge of increased value, and any RPA programs are under-resourced as a result. Organizations who use RPA solely to reduce costs by lowering FTE[2] (Full-time equivalent) headcount rather than to innovate and change how work is performed are lacking in strategic aim and end-point design in their RPA ventures. Implementing a solid, future-proof target operating model and the right intelligent process automation software is needed to mitigate the risk associated with RPA strategy.

Often, on the wave of enthusiasm, companies start Robotic Process Automation projects by identifying a series of repetitive activities that can be automated, without questioning the real feasibility of the project. It is necessary to understand, first of all, what the objectives of these projects are and, secondly, to evaluate the applicability of automation to the various activities identified. This path is not just a mere choice of activities and processes, but a study that must be seriously addressed with methodologies and a replicable and robust approach, accompanied by analysis of processes from a digitization perspective.

[2] Full-Time Equivalent, also known as a whole-time equivalent, is a unit that represents an employee's workload in such a manner that workloads or class loads can be compared across contexts. FTE is often used to monitor cost savings in an enterprise or to assess a worker's or student's participation in a project.

The main elements on which to base the analysis to identify the activities to be automated are: the simplicity of the activities, the number of exceptions faced by humans in performing these tasks, and the stability and nature of the information systems used. In the absence of careful analysis, tasks are often chosen that humans find slow or want to avoid, without questioning why they really want to abandon these tasks. In many cases, the answer is that these are not repetitive tasks, but just poorly organized activities using inadequate or malfunctioning information systems. These are the so-called "false positives," which should be avoided in RPA projects and managed, instead, using other technologies, such as orchestration platforms. It is no coincidence that today we no longer speak only of RPA, but of Smart Process Automation, which is the synthesis of lean methodologies, orchestration platforms and low code, case management, RPA and cognitive services.

Stakeholders buy-in is needed at various levels throughout the organization, including the executive suite, IT, staff, and even external stakeholders such as consumers and service partners (Capgemini, 2020). RPA is often dismissed by IT departments as a hyped-up invention of poor utility and the potential to jeopardize peace and protection. Not to mention the possibility that workers will see RPA as a threat to their careers and deliberately delay or derail enforcement. Making the company mindful of the importance of constructive stakeholder participation through the enterprise in reaping the benefits of effective RPA adoption and execution.

When robots are implemented without a suitable operating model, operational risks arise (Deloitte, 2018). It can happen that when bots go into development, tasks may be blurred, and human RPA managers can get uncertain about their individual duties if companies do not identify roles and hurry into preparation. Owing to the high load of shifting procedures and exception management, RPA programs introduced by companies to minimize headcount and achieve more savings often collapse. Simply put, they frequently lack the tools needed to create a stable RPA approach, resulting in them purchasing the incorrect method, making incorrect decisions, cutting corners, and jeopardizing protection and enforcement. Implementing a digitally enhanced workforce, which can be applied at scale to achieve sustainable market outcomes, can easily eliminate the risk associated with organizational execution. Your activities are at risk due to an inadequate coordination strategy, a lack of executive and grassroots buy-in, and a lack of

organizational models. Underestimating and under resourcing change management practices will jeopardize the implementation lifecycle's proper integration with policy, procedures, technologies, and personnel, resulting in HR challenges, setbacks, and lost opportunities. The effectiveness of a transformative RPA implementation depends on having a strong, practical, and well-communicated change management plan in place.

RPA Proof of Concepts are currently mostly initiated and configured by the company, with little to no input from IT (Deloitte, 2018). When the project moves beyond the proof of concept, IT expertise is required for tasks like hosting, governance support, stability, scalability, and assurance of the RPA solution. Tasks like finding the best processes, modelling these processes, and setting the technology vision also entail business expertise. This ensures the company and the functions and duties for governing and regulating RPA are shared, which is in contrast to the traditional division in most organisations. RPA can be implemented on a small basis within a single operating agency because it is a scalable and lightweight approach. Sometimes, the development project is only discussed within the department, and the original project only needs minimal managerial assistance. As a result, RPA has a limited, local influence in the beginning. The need for RPA in other departments isn't obvious, and the organization's added value isn't readily apparent. This lack of visibility of the technology and its added benefit will result in a lack of corporate interest and adoption of the solution, preventing an enterprise-wide implementation.

As companies hit maturity with their initial rollout and start scaling RPA across various business units and geographies, they frequently run into issues like rapid expansion of automation demands, duplication of efforts across departments, and bot underutilization. Other threats include unaltered labour and process silos, a lack of planning for the advancement of technology into cognitive technology, and a shortage or loss of RPA expertise. To mitigate the risk of maturity, a Center of Excellence must be established that can deploy simple, automated technologies as well as quality enhancement to increase automation performance.

To summarize, transformative technologies are intended to be disruptive – but with gains comes danger. It is critical to employ a holistic and coherent transition approach in order to address the challenges just addressed. This strategy should take into account not only

technological developments, but also changes in individuals, roles, and organization. Having a practical perspective on RPA and learning to reduce risk will go a long way toward ensuring that the RPA programs achieve their full potential.

2.2 What is SPA and how it is revolutionizing business processes?

In an environment characterized by incessant technology-driven change, the focus of a profitable company are performance, sustainability, and creativity. The driving force behind this focus is a strategy that can embrace Intelligent Automation (IA) as well as managing the impacts to workflows and workforce composition, but they also can be considered added layers of complexity to an already difficult business transformation process.

Since, as Deloitte points out, the potential cost benefits in automating operations can be up to threefold as compared to outsourcing, innovative companies started coding custom automation for some of the most tedious, standardized activities (Deloitte, 2015).

Automation, according to management consultancy firm A.T. Kearney "represents a third wave of back-office arbitrage that is in rapid development". Kearney added that "automation, combined with business process-as-a-service (BPaaS) has the potential to be an even more powerful force for disruptive change" (A. T. Kearney, 2016). Scripts, run books, schedulers, and data digitization applications like optical character recognition (OCR) and web scraping were among the first generation of automation tools. Since they concentrate on one region of a broader framework and solely accelerate cost savings rather than digital transformation, they are both strategic options. Early automation attempts were beneficial, but end users soon discovered shortcomings in the form of dynamic, end-to-end business operations, as well as the maintenance workload on IT teams. Also, with the best rules-based automation software at their side, IT found it more difficult to keep up.

Robotic Process Automation shifted the dynamic by converting rules-based automation into a service for running business technology desktop user interfaces (UIs) and organized data flow. Robotics offered incremental savings by reducing the IT pressure of writing code and allowing traditional rules-based automation deployment quicker and more modular. These robots perform tasks like opening and closing programs, copying data

from spreadsheets into business applications, and comparing organized report data, among others. IT divisions have discovered a new burden for desktop robotics: exception management. Since robotics-as-a-service does not have a human "checker" for bot-created work, when procedures or formats change, the bot must be retrained, which includes internal or vendor maintenance. Rules-driven bots cannot process unstructured data, so they can't do the most labour-intensive parts of a typical end-to-end corporate business process.

Business operations have become more nuanced and diverse as a result of accelerated technological development, which has resulted in a plethora of unstructured data. Intense marketplace rivalry, around-the-clock distribution, increased consumer needs, and rising regulatory pressures are all adding fuel to the flames. Businesses have discovered that cutting headcount is not the only or cheapest way to boost productivity. To concentrate on real problem solving, customer service assignments, and addressing exceptions, human workers must be rid of the burden of boring, routine jobs. Arbitrage, scripting, and robotics actually do not have the level of functionality that end users need to achieve their goals. Human employees must work harder, and robotics must work smarter as well.

When RPA was first invented, corporate operations and IT founders envisioned it as a transformational powerhouse. Users will automate at the UI stage all the way up to the true dynamic and unpredictable depths of an enterprise business process with Smart Process Automation (SPA). This higher degree of service delivery automation is being widely applied across a wide variety of sectors, with financial services and insurance, healthcare and high-tech leading the way (Everest Group, 2016).

Typically, companies would begin with RPA and look to automate low-value activities in order to reach a degree of scale of benefits by automating a large number of transactions (IRPA, 2016). However, there is a stage at which the incentives cease to accrue Artificial intelligence systems can read, predict, and foresee based on available knowledge and historical evidence, while RPA systems can verify, analyse, collate, measure, and orchestrate routine and rule-based processes. This enables companies to examine end-to-end operations and develop Intelligent Automation programs strategically to reduce costs and maximize sales opportunities.

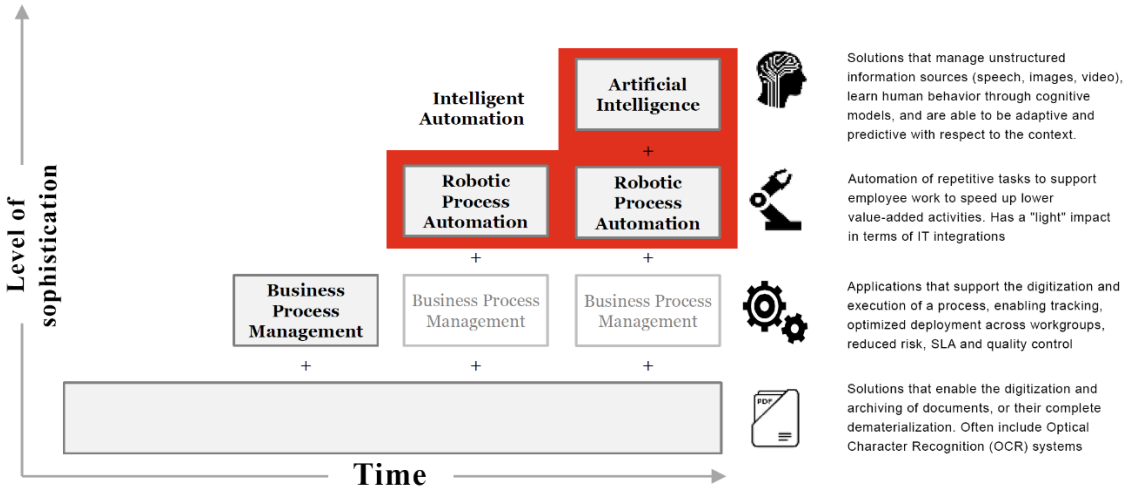


Figure 10 *The growing sophistication of automation technologies is providing insurance companies with increasingly powerful and effective tools* ***(PwC, 2017).***

Smart Process Automation is a logical progression of RPA Technology, in which robots are tied together with AI technologies (such as Natural-Language Processing, Natural-Language Generation, and Machine Learning) to perform cognitive tasks and simulate human behaviour, such as perceiving, collecting data, and thinking, in order to unlock higher-value opportunities. SPA "takes the robot out of the human" (McKinsey & Company, 2017).

Rather than just transferring hierarchical data from one program to another, it enables companies to:

- Distinguishes dynamic systems from discrete functions.
- Identifies operations that can be automated right away using rule-based robotics.
- Integrates, qualifies, and oversees human employees (FTEs or vendor workforces) via judgment-based activities.
- By using mathematical quality control, ensures the consistency of both computer and human worker productivity (SQC).
- Uses a range of machine learning algorithms to apply the high-quality pattern data produced by humans.
- Chooses the algorithm for the best results.
- Deploys the algorithm in development with human-in-the-loop exception control, resulting in the development of new automation guidelines.

2.2.2 Benefits of Smart Process Automation

According to Market Research Future, the global intelligent process automation market was valued at USD 8200.3 million in 2019 and is projected to hit USD 1,4392.4 million by 2024, growing at a CAGR of around 11.91% (Market Research Future, 2019). Organizations are debating whether Intelligent Automation will add value to their activities as economies expand, and the crux of their questions often centers around return on investment (ROI). The total return provided by automation technology, as well as the total cost of ownership, must be weighed when calculating ROI.

When considering automation, companies often focus on direct labour savings. SPA can normally drive cost efficiencies by releasing human capacity on its own. More specific human skills can be streamlined, and AI/cognitive can be used to supercharge sales and promotion efforts to maximize revenue, resulting in far greater cost savings. As a result, it is clear that Intelligent Automation has a wide range of advantages and thinking about them in quantitative and qualitative terms is a good way to learn about them.

Quantitative benefits are helpful in building a business case for Intelligent Automation and justifying investments. These advantages include:

- Reducing Operating Costs: with fully loaded FTE benefits from human effort automation, indirect FTE benefits to management and often back office workers (who serve as interfaces between systems), cost avoidance benefits from adding new employees/replacing staff, decreased missed payment interest costs, and labour arbitrage benefits between outsourcing, Intelligent Automation and automating, as well as promoting accommodation and maintenance expenses, may minimize an organization's cost base. Intelligent Automation has been seen to reduce enterprise process costs by anywhere from 25% to 40% on average in terms of direct savings (Nizri, Gabby, 2018).
- Growing the top line: Intelligent Automation can generate revenue by reducing customer retention with qualitative approaches (for example, using AI to boost streaming video site search results), reducing "revenue leakage" with timely and reliable payment collection, the customer share-of-wallet (personalized deals to

current customers), and targeting new customers (using a combination of micro-segmentation, and digital 1-to-1 marketing).

- Greater speed and velocity: Improved cycle times and throughput are also needed by Intelligent Automation, which is powered by robots that work 4 times as many hours as a person, are 2-3 times faster, and can operate 24 hours a day, 7 days a week. Furthermore, automation allows for a decrease in the number of human (and machine) hand-offs, streamlining procedures even further.

Qualitative benefits point to more fundamental changes enabled by SPA, such as improving customer attention, increasing corporate agility, and creating happy workers. These advantages help executives understand how Intelligent Automation can impact their companies, and they include:

- Improved customer experience: Intelligent Automation allows businesses to make greater use of customer data and anticipate their needs, resulting in better customer interactions. Furthermore, it will eliminate consumer pain points such as the need to replicate details due to human error.
- Greater return on human capital: One of the most significant advantages of Intelligent Automation is the ability to liberate information workers from tedious, low-value, repetitive tasks within complicated systems, allowing well-educated and well-paid professionals to concentrate on higher-value customer support and creativity activities. Cognitive automation will do the work of between 110 million and 140 million intelligence employees worldwide over the next ten years, according to McKinsey Global Institute report (Mckinsey & Company, 2019).
- Improved employee morale: Employees may be refocused to more lucrative and higher-value operations, such as insights and analytics, when jobs and procedures that are most suited for automation are usually the most onerous and least appreciated. (Lowes, Peter, et al., 2017).
- Acceleration of innovation within an organization: Implementing Intelligent Automation technology will also encourage companies to make "big bets" on next-generation Intelligent Automation workforce skills, allowing the whole company to become more adept at embracing a "test and learn" approach and rapidly finding potential monetization opportunities.

- Improved process quality: Intelligent Automation allows for increased transaction precision, monitoring, and standardization. Furthermore, data capture allows for comprehensive analytics, which may reveal potential for process change.
- Greater levels of flexibility and scalability: Intelligent Automation enables task execution to be scheduled, objects to be reused for other processes, and automation systems to be reassigned as more relevant processes occur.

2.2.3 Smart Process Automation Costs

Implementation, servicing, and ancillary expenses all contribute to the overall cost of ownership of Smart Process Automation. Both of these costs must be balanced against the incentives to provide a more realistic sense of ROI. While installation and maintenance costs are more easily quantifiable, ancillary costs can vary from the expense of extra preparation to the cost of hiring new roles to track the success of Intelligent Automation solutions.

Implementation costs involve expenses associated with planning, implementing, configuring, and deploying Intelligent Automation systems in a company's IT setting. These costs are more specifically:

- Costs associated with software and hardware rollouts, include capex costs such as development, configuration, implementation, and testing; opex costs often involve licensing and infrastructure costs.
- Data governance, hardware governance, device governance, IT governance, and even an Intelligent Automation Center of Excellence (CoE) are all examples of governance costs associated with emerging organizational systems needed to handle automation roll-out.

Maintenance costs include expenses for the continuing maintenance of Intelligent Automation systems as well as paying labour. These are the costs:

- Until new development work is needed, software and hardware repair costs, including ongoing licensing costs and any labour required to maintain software,

provide additional configuration, provide additional integration, and labour to maintain/upgrade equipment, will all be opex dependent.

- Ongoing labour costs for managing parameters for where automation can and cannot be used, as well as setting policies for method implementation.

Ancillary costs are expenses incurred as a result of one-time activities. There are some of them:

- Costs associated with analysing, monitoring, and making decisions on Intelligent Automation systems are being tracked.
- Company and professional personnel training expenses to learn how to use automation tools, analyse data, and record troubleshooting requests.
- Costs associated with switching from one manufacturer to another or transitioning technology maintenance from an external vendor to in-house (new employees and associated fully installed costs).

The cost depends on whether RPA or SPA systems are used (RPA is usually less expensive), whether implementation is done in-house or by a manufacturer, and the automation scale.

2.2.4 How is SPA being used?

Because of its cognitive ability, SPA is a game changer for consumers, capable of performing a wide range of tasks that are much more complex than pure robotics. According to Alec Ross, author of "Industries of the Future," cognitive automation is a significant step forward for companies that rely heavily on intelligence workers. “Cognitive automation has made machine learning and powerful AI a much more accessible commodity than we would have imagined five years ago,” he writes. “And what this means is that they’ll increasingly get into the work of knowledge workers” (SearchCIO.com)

This assumes that business consumers can now elevate the application of their human employees by automating the tasks that should be performed by them. The value of using technologies for higher-level insight or more advanced decision-making is stressed by

research firm Gartner. “Such capabilities go beyond typical business rule-processing capability, offering predictive analytics in real time” according to Bruce Robertson Gartner analyst (Gartner Inc., 2015).

Within large, data-intensive activities, SPA has a wide range of applications. High volume, routine processes loaded with unstructured data are common in active use cases. These usage cases include lower-level "head job" that does not require substantial subject matter experience, such as categorizing and removing unstructured data from various sources, in addition to traditional desktop UIs and structured data. The following are several high-profile, typical examples of perfect SPA usage cases (IRPA, 2016).

- Anti-Money Laundering (AML): can benefit from Intelligent Automation in the monitoring process (for Suspicious Activity, Money Service Business (MSB), Trade surveillance) and the reporting (Alert management, Compliance reporting, Legal support services).
- Know Your Customer (KYC): can benefit from Intelligent Automation in the onboarding process (Document management, Costumer profiling and risk assessment, Quality assessment, FATCA compliance) and Enhanced Due Diligence (EDD) (Customer screening, Data stream validation/notification.
- Settlements In some companies the artificial intelligences that guide the SPA process are able to estimate the entity of the damage suffered by the client which is the object of the claim and automatically settle the compensation due.
- Reconciliations: The configuration and maintenance of an account reconciliation system is significantly simplified with Intelligent Automation and machine learning applications. It removes the need to pre-process data, add classifications, or manually refresh the system if the data changes. Self-service implementations of new use cases will save time and effort.
- Claims processing: Claims automation digitizes a variety of sources of data, such as scanned papers, emails, voice calls, and internal processes, and then validates the data against policyholder data, eliminating the need for most manual data entry and validation. Also the payments of claims can be automated, so that once the claim is approved, the payout is triggered in one click and the finance: department do not have to prepare hundreds of money transfers day in and out.

- Marketing compliance: Marketing automation systems have long been a useful method for tracking leads and customers based on different profile categories, calculating ROI, and providing advertisers with a holistic view of the consumer lifecycle. In a world ruled by GDPR, these networks are becoming more relevant. Companies who do not have an automation infrastructure in place risk seeing disorganized data, which can lead to expensive penalties. A marketing analytics tool can assist you in tracking and verifying GDPR-compliant data management (Adobe, 2018).
- Drug coding: artificial intelligence can be combined with machine learning to enable automated coding of drugs names. It can also provide Anatomical Therapeutic Chemical (ATC) in compliance with the latest regulatory expectations (Uppsala Monitoring Centre, 2021).
- Regulatory compliance: Manual, tedious regulatory assessments, documentation, and submissions can be performed by bots under the supervision of regulatory experts, freeing up time for planning activities, the advancement of new skills, and improved resource management. Using constructive and predictive technologies to the regulatory system could lower enforcement costs while still allowing for transformational reform (Deloitte, 2018).
- Inventory/logistics management: Automation technologies today are more adaptable than ever before. Thanks to improved vision technology that allows them to handle items presented in random locations, fast-picking systems can now handle 1000 to 2,400 picks every hour. Warehouses can handle rapidly evolving multichannel and omnichannel standards and improve service levels to enable same-day and next-day distribution by leveraging technology (McKinsey, 2017).
- Customer experience management: Automating complex customer service management functions allows for the development of formal procedures which aids in customer experience management (CX program). It becomes much easier to find bottlenecks and exchange information, and building transparency within teams becomes much easier as a result. CX automation has a number of advantages, including reduced operating costs and better service efficiency. Businesses of all sizes will benefit from it thanks to the growing proliferation of mobile applications and software-as-a-service (SaaS) solutions. Consumer

experience automation answers the increased customer demands that come with today's on-demand economy (Lumoa, 2020).

The removal of siloed, point methods for data ingestion and transformation, as well as the substitution of human workers for sorting, prioritization, extraction, and confirmation, support both of these use cases.

2.3 Impact of Intelligent Automation on the Insurance Industry

Many companies are seeing fast advancements as a result of new automation technology and changing consumer preferences. The insurance market, on the other hand, has been slower to recover from these breakthroughs in the past. Many businesses continue to rely on manual procedures at the detriment of their clients, who must wait for lengthy stretches of time as workers sort through complicated paperwork.

In the insurance industry, traditional Robotic Process Automation and Optical Character Recognition (OCR) have seen modest success. Smart Process Automation, on the other hand, will teach the industry the way forward. IA will help these companies change how they work in order to satisfy rising consumer needs and perform more efficiently. Although all of these technologies are new to the insurance industry, they will assist in scaling processes and creating resiliency in the face of traumatic incidents. IA can address complicated problems in insurance by automating not only a single process but an entire enterprise function using a variety of technology such as digitization, RPA, and artificial intelligence/machine learning (ML).

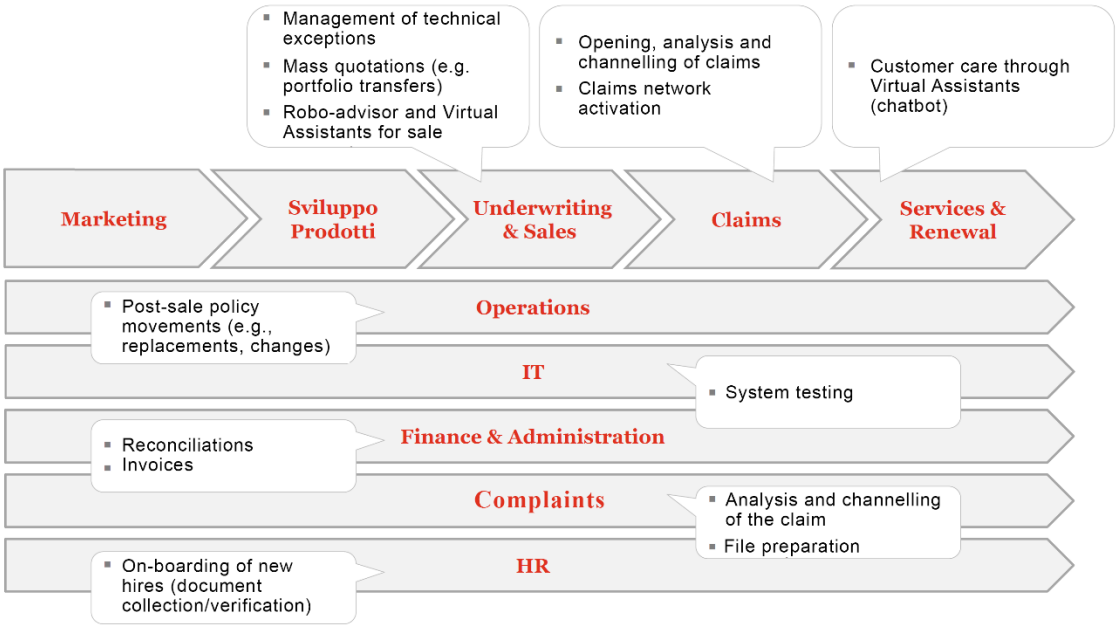


Figure 11 *Significant cost reductions can be achieved in many processes in the insurance value chain through Smart Process Automation* ***(PwC, 2017)***.

2.3.1 Why the insurance industry has been slow to adopt automation

In the insurance industry, there are a number of roadblocks to fully using automation's ability. RPA has previously been used to automate previously digitized, repetitive, automated, rules-driven, high-volume operations. But what happens if these automation requirements are not met? These limitations will greatly narrow the reach of what can be automated due to the complexities of the insurance sector and the underlying processes. Issues including input data uncertainty, stakeholder relationship sophistication, and dynamic decision-making are all hallmarks of the insurance industry, and have traditionally made RPA implementation difficult with mixed outcomes.

One of the inherent challenges with process automation is that the data required by most insurance systems may be organized, unstructured, or semi-structured. Furthermore, this information is often exchanged through the insurance network through a variety of platforms, including emails, PDF attachments, online directories, contact center calls, internal phone calls, and faxes. Another complication: handwritten material is often included in insurance records, especially in first reports in loss (FNOL), changes of name

or address, and beneficiary documents. Data is often extracted from extremely unstructured email requests, unstructured legislation, and employee compensation records, such as dental, revenue security, long- and short-term disability, and medical documents, by insurance companies and collection agencies. Physical reference books and binders or slips, which may be lengthy and use contradictory terminology to explain the same definition, will often need to be validated and details obtained.

In the end-to-end insurance lifecycle, several third parties are concerned. The insured party, agent, lawyer, claim administrator and adjuster (both of whom may be outsourced or in-house), ambulance services, car shops, and other specialist professionals may all be involved with what appears to be a straightforward job of handling an insurance claim. Each stakeholder contributes to the uncertainty of what can be automated and what cannot. For example, one party may prohibit something that resembles screen-scraping, while another may object to the idea of "emailing a robot." Automation with a poor performance rate and a high demand for human control will quickly sabotage the potential of an automation program. Before trying to use RPA or SPA in the insurance industry, each of these considerations, as well as a few others, must be taken into account.

Another impediment to conventional automation is the need for certain insurance processes to comprehend the meaning and nuance of a request. Working for missing knowledge is often difficult to stop. Since process automation fits well for systems that have straightforward and unambiguous “IF-THEN” laws, adapting them to the insurance industry's ever-changing world may appear insurmountable, resulting in inaction.

2.3.2 How the insurance industry can benefit from advances in automation

Despite the issues listed above, technological advancements have allowed the insurance industry to benefit from technology more than ever before. There are several promising use cases for new Smart Process Automation methods that incorporate the most recent developments in digitization, RPA, and AI/ML. There are several candidates for Intelligent Automation that insurers could take advantage of:

- New Business Quote Intake: When brokers submit risks for quotations, they usually submit their own forms, which are always incomplete. Intelligent Automation can take any content, in any format, and upload it into the networks,

where it can be triaged and quoted by the relevant underwriter. This is especially important for commercial insurers, which may use expensive tools like underwriters to input data before deciding whether or not to quote the risk.

- Physician and medical assessments: In the field of life insurance, healthcare providers may provide patient records in a variety of formats to insurers. Intelligent Automation will take this data, digest it, and make sure it gets to the underwriting team in a timely manner. This allows the team to make fast and accurate pricing decisions. Similarly, as care professionals are making reports on claimants, the same technique should be used.
- Payments processing: It is the responsibility of insurers to release funds to claimants and service providers. In order to process payments, they would usually include invoices and receipts. Both standard OCR and ML-based digitization products can be used to handle invoices and receipts.
- First Notice Loss (FNOL): When insurers get more advanced with their insurance processing, they will be able to make decisions on write-offs as soon as a claim is filed. This avoids a long back-and-forth between the defendant and the insurer and allows for immediate resolution of auto claims.
- Real-time auto damage assessment and repair estimate: Loss or risk assessment in the form of car insurance is a time-consuming iterative process that relies on highly qualified estimators. Some AI-powered solutions allow for the real-time evaluation of car damage and the expediting of lawsuits and settlements.
- Disaster analysis appraisal: AI will analyse and speed up the appraisal process by using satellite data. They will take pictures of the damage and estimate the cost of reconstruction.
- General data insights, prediction for classification and evaluation: Targeted AI/ML-based tools that provide analytical data to insurance companies to properly identify and compare commercial companies can help commercial insurance dramatically.
- Insurance Contact Centre support: Conversational AI is gaining traction in a variety of markets, including insurance. Chatbots are also commonly used across

markets, handling up to 50% of online client communications, lowering operating costs and improving end-customer loyalty.

- Underwriting: To assess and minimize the risks associated with a program, data must be gathered from different sources and analysed. Health risks, financial constraints, creditworthiness, and duplicate policies are among the data examined. When completed by staff, the underwriting process will take weeks. Insurers can speed up a variety of processes with automatic technologies, including data processing, populating data fields in internal structures, and updating and generating feedback based on a customer's previous claims experience.
- Regulatory compliance: Job reports and building report trails are subject to stringent rules that vary constantly in the insurance industry. Breaching these laws will result in hefty fines and a tarnished image. Internal reports may be used to track enforcement and reduce the chance of non-compliance bots whose activities are all logged. This information helps businesses to monitor regulatory enforcement in real time and plan for external audits. Intelligent Automation often removes the need for workers to perform several administrative activities, which often result in mistakes and, as a result, regulatory violations.

2.3.3 How claims intake can be automated through Intelligent Automation

Let us look at a particular example of a process that has been automated using an Intelligent Automation approach: claims intake or FNOL. This form of process may have been considered a bad candidate for RPA only a few years ago. Claims collection is a time-consuming and labour-intensive operation that irritates both insurers and consumers. Employees must collect and validate evidence from a variety of sources, including patient documents, identity cards, images of broken property, and police reports, which can take days. Owing to human error, it can take much longer. Since the claims intake procedure is the first time someone other than the complainant is aware that an insurance application is required, it is very difficult to automate. If an argument is forwarded to a third party, the party is often confronted with astronomical complications. Incoming data, for

example, can come from a variety of insurers. Each insurer may submit claim details in one of ten, twenty, or more email models, often in a semi or entirely unstructured format.

Working with standard OCR and RPA will be very time consuming and deliver a relatively poor performance rate with these inputs. OCR necessitates in-depth custom construction for each insurer's template variety, resulting in thousands of OCR models that must be configured. The knowledge cannot be processed if it is not always present in the same area or on the same line of a template, resulting in manual labour and workarounds. Without looking for unique keywords or assuming that the email sender uses consistent email titles and wording to explain a term, unstructured email feedback is almost impossible to automate with RPA. Both tactics have a notoriously poor success rate.

While the claims intake process is exclusive to the insurance industry, it reflects a broader set of concerns that affect insurers, dealers, and BPOs. Administrators devote a considerable amount of effort to high-volume operations. Setting up an argument in an internal framework, for example, will take 10-20 minutes of manual labour. What if you had to do this job a hundred times a day, on top of everything else? If a method as intricate as FNOL can be solved effectively by Intelligent Automation, the prospect of further automation is extremely appealing. By automating the claims management workflow, businesses can save up to 80% on manual labour, helping them to process significantly more claims for the same number of employees (Nexus FrontierTech, 2020). As a result of the fast feedback and fewer back-and-forth with customers during an already difficult period, the customer service improves.

Insurers seeking to digest unstructured data (such as email attachments, handwritten notes, PDFs, and unlabelled data), which accounts for about 80% of all data in every business, will switch to cognitive computer reading (CMR). In comparison to conventional, manual processes, a CMR-enabled Intelligent Automation platform can analyse and process vast volumes of unstructured data and complex business contracts in a fraction of the time. Insurance providers should use this Smart Process application to resolve the error-prone, labour-intensive, and time-consuming issues that come with human-driven systems.

2.3.4 Virtual Agents

Digital agents (Chat and Voice Bots) with language comprehension features work at the front desk, answering requests, completing tasks, and resolving issues such as policy and claim status reports, case next steps, instalment payment processing, and so on. Back-office systems like cognitive Optical Character Recognition and Robotic Process Automation gather information from physical databases like proposal and claim forms and correct it in the central insurance system. APIs (Application Programming Interface), BPM (Business Process Management), optimization, artificial intelligence, and analytical capabilities are also used to make processes easier (R. Syed et al., 2019). Machine learning and cognitive capabilities have been added to these automation programs in order to get the best out of them. Thanks to advanced Smart Process Automation, specialist underwriters and claims adjusters can focus on intellectual decisions, resulting in higher revenue, improved operating efficiency, and cost savings.

Chatbots are computer programs that use natural language and artificial intelligence to mimic human conversations. A chatbot was created to make human-computer contact easier. Many chatbots are inconvenient because they can only respond to frequently asked questions and frequently stall when a conversation veers slightly out of focus. The best insurance chatbots will be able to have a natural-language dialogue with the client and guide them through the process, offering customized tips to lower the quote and leading them from start to finish (Deloitte, 2017). Advanced conversational AI chatbots for insurance can include omnichannel, round-the-clock, and multilingual service, to name a few obvious advantages. They can also help to provide exclusive, high-quality consumer interactions.

Many insurance companies have smartphone applications to help their clients, but they are restricted. Customers have been reluctant to maintain communications through various networks by transferring, for example, from their cell phone to their smart home computer, so these applications can normally only be reached from one or two channels. In addition, many smartphone applications do not have end-to-end assistance. To complete their operations, users must eventually go to a database, where it can be impossible to locate the exact details a client needs, or a call center, where long lines, time constraints, and language barriers can be a major hindrance. This is why AI chatbots

in insurance have proven to be the most effective ways to improve customer experience while lowering operating costs (R. Syed et al., 2019). Chatbots help consumers handle their insurance cases effectively and easily, while also acting as a listening tool that offers actionable insights into consumer attitudes and desires. This knowledge enables insurance companies to provide customized rates and better deals that are tailored to the specific needs of each customer. The lower the risk of human error and the higher the savings in operating costs, the more effective a customer service is.

According to a Juniper Report, the use of conversational AI chatbots for insurance will save about $1.3 billion by 2023, up from $300 million in 2019. This is up from $300 million in 2019. This can be a differentiating factor that allows insurance companies to remain ahead of the market (Juniper, 2019).

Chapter 3 - The Assicurazioni Generali Case

3.1 Generali Assicurazioni – Company Overview

The Generali Group, founded in 1831 in Trieste, is one of the largest global insurance and asset management providers, with a successful history of 190 years. It is headed by Assicurazioni Generali S.p.A. and is present in 50 countries, with more than 72 thousand employees serving 65.9 million customers (Generali, 2021).

The group's deep foreign vocation has distinguished them from the start and remains one of their biggest assets. Generali is a large, Europe-focused organization with a well-balanced geographical diversification plan that includes developed markets such as Italy, Germany, and France, as well as markets in Eastern Europe with strong growth potential and developing markets in Asia and Latin America. They are the biggest insurer in Italy and Germany, respectively, and are ranked eighth in life and property and casualty (P&C) insurance, as well as seventh in accident and health insurance, in France (A&H).

Figure 12 *Generali, one of the leading insurers in the world* ***(Generali, 2021)***

The company also has a strong position in Austria, Central and Eastern Europe, and Russia, where it is an undisputed pioneer in terms of profitability, with one of the highest overall ratios in the industry. In the Czech Republic, Hungary, Austria, and Slovakia, they are in the top three industry leaders (Generali, 2021). Global Business Lines, which

consists of four units: Generali Global Corporate & Commercial, Generali Employee Benefits[3], Generali Global Health, and Europ Assistance[4], aims to grow companies with a global scope by providing access to customized insurance and assistance programs to cover business costs related to staff and properties connected to property and individuals.

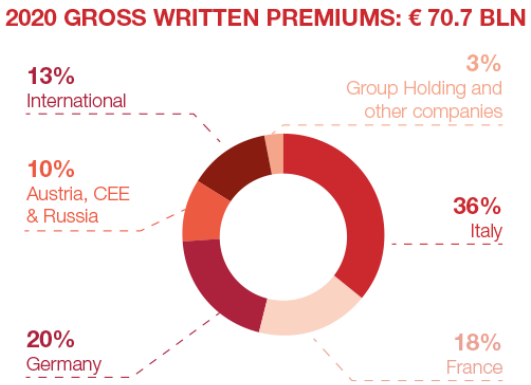


Figure 13 Generali Italia 2020 gross written premiums

	2020	2019
GROSS WRITTEN PREMIUMS	70,704	69,785
OPERATING RESULT	5,208	5,192
NET PROFIT	1,744	2,670
GROUP SHAREHOLDER'S EQUITY	30,029	28,360

Table 2 *Generali Italia economic performance 2020 vs 2019*

This in which we are living is a period of evolution and transformation for the insurance industry and in this context customer needs and expectations are constantly changing. For

[3] Generali Employee Benefits (GEB) is a strategic business unit of the Generali Group that offers insurance solutions for the employees of multinational companies. The strong and long-standing relationships with both partners and clients, coupled with industry expertise and integrated network, make this the leading player in the market. (GEB, 2019).

[4] Established in 1963, Europ Assistence (EA), which falls within the scope of responsibility of the Country Manager France, is one of the leading global brands in the field of private assistance. EA offers insurance coverage and assistance in the travel sector, the automotive area with road-side assistance, and personalised coverage for assisting the elderly, cyber-security, and medical and concierge services.

this reason, they have gone through a big strategic reorganization in recent years that has helped them to concentrate more on their core market, have more consistency in asset management, and have easier, more transparent governance. Generali has entered a new phase as a result of this operation, which includes more productive market models, creative commercial tactics, and a larger, more global brand.

3.1.1 The Company Strategy

The insurance industry faces unprecedented challenges. COVID-19 may have increased the strain, but it has only intensified a trend that has already begun, revealing where value is made. With family-run agencies and decades-old broker ties, many insurance partnerships have thrived on inertia. Human relationships are still important, but the focus of sales effort has changed to seeking real solutions to real business issues. Consumer behaviour is being influenced by the rapid spread of technical advances and rising digitalisation, which is changing operational processes and working methods. In addition, the insurance market is confronted with a number of other major contemporary issues: instability of geopolitics and finance; data security; climate change; aging and new welfare.

The emphasis in the insurance industry is moving away from "products" and toward "customers," from "safety and pay out" to "prevention and operation." In order to secure and expand their investments, customers are constantly searching for products that combine life and wealth management. As a result, Generali wants to become a "life-time companion" for its customers, following them at every stage of their lives and providing for all of their needs.

With *Generali 2021 "Leveraging strengths to accelerate growth*", the three-year strategy implemented starting at the end of 2018, the Group committed to achieving earnings per share growth, with a target compound annual growth rate of between 6% and 8%, for the period 2018-2021. Contributing to the achievement of this target are, among other things, increasing core profitability from Generali's insurance and asset management businesses, increased efficiency with a target of further expense reduction of € 200 million in mature markets by 2021, active management of interest expenses and capital reallocation to support profitable growth initiatives. Generali is also committed to delivering higher

returns to shareholders through sustainable dividend growth, for a target payout ratio of between 55% and 65% over the course of the plan. In addition, in order to achieve an attractive level of profitability, an average Return on Equity target of more than 11.5% has been set.

"Generali's clear and distinctive strategic vision leverages our strengths to consolidate leadership in Europe, focused on retail and SME clients, expand operations in high-potential markets and develop a global asset management platform. At the same time, Generali will continue to focus on generating and managing capital to fund growth opportunities in key markets and drive innovation and digital transformation wherever we operate. Through these initiatives, Generali will achieve average annual earnings per share growth of between 6% and 8% over the course of the plan." Philippe Donnet, Group CEO

Before going into detail in analysing the key points of the aforementioned Generali 2021 strategy, let's introduce the four underlying assumptions that differentiate Generali's position in the market:

- European insurance markets will continue to remain attractive.
- Retail and SME markets are driving profitable growth.
- An offering that integrates insurance and asset management is key for clients around the world.
- Physical distribution networks are strengthened and not replaced by digitalization.

The Generali 2021 strategy is based on three founding principles that guide its execution:

- Make people leaders and ready to face the future. Generali continues to foster an innovative, customer-centric culture, growing global leaders and talent while valuing their diversity.
- A new "brand promise". Generali is developing a consistent and distinctive brand experience, built on the promise of becoming a "life time partner" for its customers.
- Ongoing commitment to sustainability. The strategy is aligned with the Group's commitments in the area of sustainability.

Generali 2021 is based on three strategic pillars comprising a set of initiatives, each of which contributes to achieving the Group's financial targets (Generali, 2018):

Pillar 1 - Profitable Growth:

Strengthen leadership in Europe and consolidate first position:

- Consolidate leadership positions in Italy and Germany.
- Continue on the path of successful turnaround in France.
- Invest in growth markets and segments (CEE, health, benefits, assistance).
- Launch new initiatives.

Focus on high-potential insurance markets: 15%-25% compound annual profit growth rate 2018-2021:

- Achieve profitable growth in Asia and Latin America.
- Strengthen the offer for SMEs.
- Enhance employee benefits offering.
- Develop a value-added insurance services offering.

Develop a global asset management platform: 15%-20% compound annual growth rate in earnings 2018-2021:

- Become a global franchise from a strong European base.
- Continue to expand multi-boutique product platform.
- Invest in distribution and marketing.
- Accelerate expansion with disciplined acquisitions.

Pillar 2 - Capital Management and Financial Optimization

Increase capital generation: exceed €10.5 billion in cumulative capital generation 2019-21:

- Increase share of low capital-absorbing life products.
- Grow fee income and business in Non-Life, Health and Protection lines of business.
- Implement proactive capital allocation to maximize return on investment.

Increase cash remittances: +35% cumulative cash remittances to 2019-21 holding company:

- Increase cash generation of operating entities.
- Increase the level of fungible capital remittance to the Holding Company.

Reduce debt level and cost: €1.5 - €2 billion reduction in debt to 2021; €70 - €140 million reduction in annual gross interest expense to 2021:

- Reduction of the entire amount of debt.
- Reduction in ongoing financing costs.

Pillar 3 - Innovation and Digital Transformation

Approx. €1 billion total investment in internal strategic initiatives in 2019-21 Become "life-time partner" for customers:

- Offer maximum flexibility through modular products.
- Expand service offerings with comprehensive 24/7 coverage.
- Support customers with 360° advice.

Promote the digital transformation of distribution:

- Launch a pan-European mobility platform.
- Develop a B2B2C ecosystem.
- Digitize the relationship between agent and customer.

Transform and digitize the operating model:

- Continue to simplify processes and organization.
- Increase automation and artificial intelligence in core operations.
- Increase the share of fully digital policies.

The global transmission of the COVID-19 pandemic poses a considerable danger to people's welfare, as well as a massive economic recession and a great deal of instability in capital markets. As a result, in 2020, Generali conducted a thorough review of the plan to see if it was still relevant and coherent in light of the current circumstances. Because of three main reasons, they were able to assert that they are strong and completely committed to meeting their financial goals by 2021:

"Our Generali 2021 strategy remains effective and even more valid in the current market context. The Group is navigating the most serious post-war global crisis by leveraging

its strengths: disciplined strategy execution, focus on technical excellence, strong distribution network and a diversified business model. These strengths, combined with our solid capital position and excellence in innovation, allow us to fully commit to the financial targets of our strategy and to be well-positioned to capitalize on future opportunities. Two years after the launch of the plan, we are maintaining our commitments to all stakeholders, thanks also to the empowerment of our people, an increasingly strong brand and our growing commitment to sustainability." Philippe Donnet, Group CEO

The assembly subsequently approved the 2020 budget, which recorded, for the second consecutive year (but in this case despite the pandemic), the historical record of the group's operating profit, which reached 5.208 billion euros (+0.3% from 5.192 billion in 2019). Net income was also good, albeit down to 1.744 billion, but above all the company's top management was keen to emphasize the excellent capital position: "The 2020 results," Donnet said at the opening of the meeting, "confirm the validity and resilience of our business model with a record operating result at 5.2 billion for the second year running, a record in capital generation at 4 billion and a solvency at 224%, better than our competitors. We effectively minimized the impact of the pandemic through our leadership with a diversified business model." Another strong point, submitted to the vote of the shareholders' meeting, which obviously approved, is the generous dividend policy that Generali was able to recognize to its shareholders despite the initial limitations of the regulatory authorities (Generali, 2020).

2020 has also been the year of M&A operations, which Donnet has been careful to define as "disciplined and coherent": the most important operation is certainly the acquisition of 24.4% of Cattolica Assicurazioni, but there has also been shopping abroad, particularly on the Mediterranean axis. Generali has in fact incorporated the Portuguese Seguradoras Unidas and in December took over the activities of Axa in Greece, a country where it has also extended the bancassurance agreement with Alpha Bank until 2040.

3.1.2 Generali Business Model

Generali successfully met the market's challenges by relying on its key strengths: a consistent vision, an emphasis on technological competence, a powerful delivery network, the Group's strong capital base, and a diversified business model that proved robust even in a dynamic context like the pandemic. For their clients, they created easy, integrated, personalized, and cost-effective Life and Property&Casualty insurance options, ranging from savings, individual and family safety plans, unit-linked policies, as well as motor third-party liability (MTPL), residential, crash, and health policies, to advanced coverage for commercial and industrial hazards and tailored plans for multinational companies. They added wealth management tools for institutional (pension funds and foundations) and retail third-party clients to their portfolio. To allow for customized solutions and faster product creation, they focus on creativity as a key driver for future growth. From a social and environmental perspective, Generali is also dedicated to high-value-added technologies (Generali, 2021).

They use a multi-channel approach to distribute their products and provide all of their services, as well as emerging technologies: Customers can access information on substitute options, review alternatives for the chosen product, purchase the selected product, and focus on outstanding after-sales support and expertise through a global network of consultants and financial advisers, as well as dealers, bancassurance, and direct networks. The Generali brand is promoted across proprietary networks, which are a vital and important tool for the business model. Their job is to dialogue with and assist consumers at their finest, aiming for customer service excellence.

Customers pay fees to Generali in order for them to enter into insurance arrangements. They are investing responsibly in high-quality assets. Upon death, accidents, or the incidence of the covered disaster, they pay claims and compensation to policyholders or their survivors. The pay-out is often assured by asset-liability management plans that are reasonable.

Generali is revising and reappraising structures, computer programs, policies, and functions around the whole Group hierarchy during this time of radical digital transition. They are redesigning systems of design thinking, involving both industry professionals

and others who are personally involved, and incorporating emerging automation technology. Artificial Intelligence-driven technologies are being developed; they are launching new tools to handle customer relations in mobility or, where possible, online, and they are developing ground-breaking products based on data provided by Internet of Things sensors.

Employees can be reskilled and upskilled by online learning tools and high-level training courses as part of the *GPeople 2021*[5] initiative, allowing them to obtain and improve unique digital skills in the manufacturing landscape, so that they can carry out tasks more efficiently when relying on data and records created by advanced analysis and intelligent process automation systems.

Externally, digital transformation has a huge effect, especially on consumer offering and the experience of agents. Generali plans to build and consolidate digital access points that will allow users to access content and resources while also providing a rich, convenient, and fast experience through multiple digital platforms. They are also continuing their technology observation and research process in order to facilitate the digitalization of their operating model and environment. New systems, automated software, digital image processing software, and biometric technology are helping the Group's clients, collaborators, and businesses to transform processes, including those that are extremely complex.

[5] GPeople 2021 is the new Generali People Strategy for the three-year term 2019-21, which will lead the Group's goals and programs. To create the latest Generali People Strategy, the firm embarked on a co-creation process involving over 400 people around the organization at various levels (Generali, 2021).

Figure 14 *Generali Assicurazioni Business Model*

3.1.3 A Focus on Generali Italia

With an overall market share of 16.1%, Generali maintains its leading position in the Italian insurance industry, having been able to depend on a totally refreshed range of products, including innovative insurance solutions for its clients in both the Life and Property & Casualty categories. In terms of distribution, owing to the utilization of remote sales tools made accessible to the sales force, the multichannel approach, which has been a major focus in recent years, ensured high levels of inflows and premiums even during the lockdown times. The company's business remains heavily reliant on agents, with a significant presence in the direct Life and P&C channels, thanks to Genertel and Genertellife, Italy's first online insurance companies. The Group can provide its customers a wide range of insurance, pension, and savings solutions thanks to its cooperation with Banca Generali. Generali offers three unique brands to the Italian market, each with a specific strategic positioning: Generali (retail and SME), Alleanza Assicurazioni (households), and Genertel and Genertellife (alternative channels) (Generali, 2021).

Generali Italia went on with the introduction of its Lifetime Partner program in 2019, with the goal of becoming the business with the greatest customer experience via useful

consulting, the use of all relationship channels, an ever-expanding variety of preventive and protection services, and investments in new technologies and ecosystems. Jeniot, a business founded by Generali Italia at the end of 2018 that creates novel Internet of Things and linked insurance services related to mobility, home, health, and work, grew as well.

In response to the pandemic, Generali Italia took all necessary precautions, beginning with its own employees, to protect their health and continue to serve its customers. Customers were served by the first Genertel remote insurance contact center. The organization addressed the issue of working remotely through its agents, allowing them to be constantly linked and ready to satisfy the demands of consumers, even in an emergency, by utilizing new technologies and platforms. It became the first remote network to service Italian houses remotely in just a few weeks, with a workforce of 12,000 agents. Customers, residences, and enterprises have all benefited from the company's presence. It has aided SMEs in the retail sector, which has been hit hard by the pandemic: its first objective is to provide immediate, real assistance to business owners, providing a daily allowance for each day of closure to nearly 6,000 businesses across Italy. It also helped over a million workers through newly developed health insurance policies that cover COVID-19.

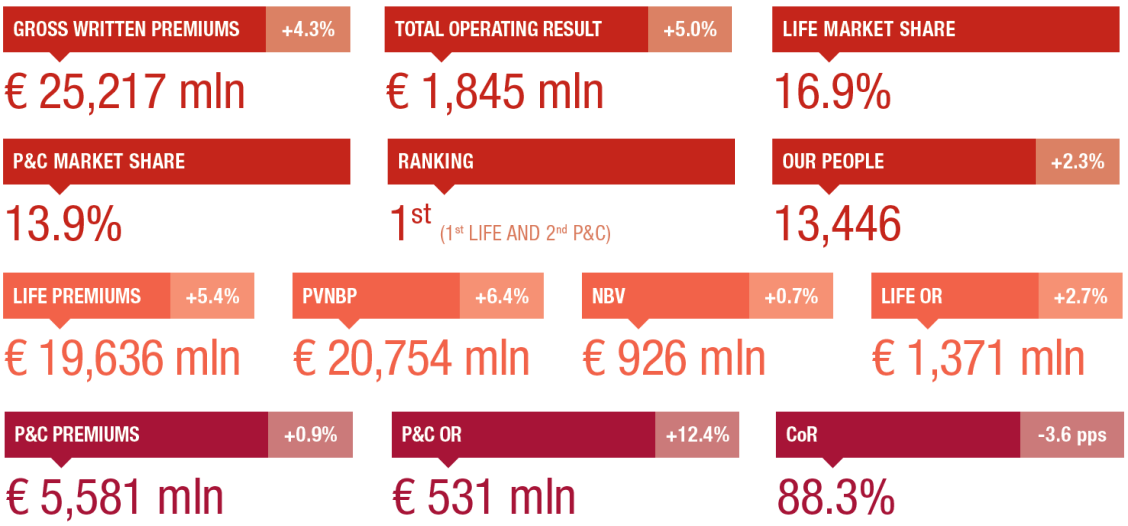


Figure 15 *Generali performance in Italy* ***(Generali, 2021)***

Today, Generali Italia is simpler for clients, who are asked only once to provide information for the stipulation of the contract. The latter takes place with a single meeting

and can be signed electronically. More innovative thanks to the new IoT and connected insurance technologies (the company has patented Real time coaching and is first for behavioural telematics), it continues to develop analytics and automation (launched the first insurance chatbot and video chat and launched a parametric product for agriculture). More profitable: as of December 31, 2019, over €24 billion in total premiums, 2.1 million connected customers. Finally, it is more sustainable, a very important value for Generali's strategy that operates, through concrete projects consistent with the business, on issues of high social impact such as: welfare, education, environment and natural events, art.

In addition to Generali Italia, today in our country, the Group includes 3 other insurance companies: Alleanza Assicurazioni, organized with its own network of consultants, Genertel, a direct life and non-life company and DAS, a company specialized in legal defense.

And also, other realities:

- Welion: integrated welfare company that offers families, businesses and workers innovative and easy-to-use services in the areas of health, welfare, flexible benefits and non-self-sufficiency.
- Jeniot: company dedicated to the development of innovative services, in the field of Internet of Things and Connected Insurance, related to urban mobility, smart home, health and the world of connected work.
- Genagricola: the largest Italian agri-food company, and among the main ones in Europe.

Figure 16 *Generali Italia group structure* ***(Generali, 2021)***

3.2 Generali Digital Strategy

Generali is undergoing a significant transformation as a result of the interplay and cumulative impacts of different technological developments: The Internet of Things, cloud services, cognitive computing, advanced analytics, Robotic Process Automation, Artificial Intelligence, 5G, and the evolution of mobile networks are all contributing to the creation of a new operating environment that will improve efficiency, operations, and closeness with customers, agents, and workers. Cyber risks, like as assaults aiming at stealing information or disrupting operating operations, have grown exponentially as a result of technological advancement.

The organization formulates and analyses consumer data - while ensuring anonymity - to deepen client relationships and be able to tailor the offer and anticipate their requirements, thanks to unique technologies and skill sets. Because of the growing corporate culture, they have been able to combine platforms that allow us to exploit synergies from RPA

and cognitive technologies, allowing more complex processes to be automated, improving quality and efficiency.

The Group's new cyber security strategy, *Cyber Security Transformation Program 2*, 2020-2022, aims to significantly improve security posture through the deployment of innovative and sophisticated technologies, as well as the gradual standardization and centralisation of cyber services. Appropriate risk management is therefore critical not only to limit potential economic and operational consequences, but also to maintain, in particular, consumer confidence in the processing of their often sensitive data (Generali, 2020).

One of the three pillars of change driving the *Generali 2021* strategy is innovation and digital transformation. For staff and customers, the company's goal is to become a genuinely innovative, digitally empowered, data-driven, and agile organization. Generali Lifetime Partner Behaviours are connected with five Digital Enablers to achieve this goal:

Innovation: inspire and equip the Group to execute innovative ideas that solve problems and provide value. The goal of the Innovation Digital Enabler is to start a movement that will democratize innovation across the whole organization. Not only is innovation critical to long-term success, but it also gives Generali the potential to lead the insurance industry's transition process. Its goal is to promote and encourage innovation in all places and for all people.

Internally, they emphasize the promotion of creative initiatives and solutions that progress the business across the value chain, as well as organized procedures and techniques for knowledge exchange and cross-fertilization across the many functional areas and business units. As part of the Innovation & Digital Transformation pillar, the Generali Innovation Fund was established in 2020 to promote creative activities within the Group. By sparking and feeding local and global creative ideas, the goal is to encourage and accelerate innovation within Generali. Externally, the company engages with top technological peers (ranging from start-ups to huge industry giants from throughout the world) to create new high-potential services or scalable business models inside the Group.

Customer Relationship Management: Customer journeys will be transformed, touchpoints will be expanded, and transparency and interactivity will be improved.

Generali intends to increase transparency and quality of relationships while also transforming customer and agent journeys. Through collaboration through the CRM Centre of Excellence, they want to redefine customer, agent, and employee journeys, assuring convergence and worldwide standards.

"The digitization of indirect insurance companies passes through the interpenetration of the self and assisted factors, and the use of the digital channel as a channel that allows for a rapid, and totally conscious, transition from the self to the assisted part." Alberto Corti (*Annex 1)*

They must guarantee that their products and offers change for the digital era and deliver tailored insurance and value-added services in a seamless omnichannel environment to drive the CRM transformation and help the Group in fully exploring the commercial opportunities that sophisticated CRM can give. To provide value-added, individualized insurance and non-insurance services, products and propositions must develop for the digital era, providing 24/7 access to product and service portfolios.

Intelligent Automation: Generali seeks to encourage and support Intelligent Automation adoption by optimizing operations, minimizing time-to-market, and maximizing business impact through a strategy defined by convergence, enhanced cooperation, and innovation, in order to accelerate process automation through reengineering and new technology adoption.

Intelligent Automation is a cutting-edge way to generating commercial value that has transformed the Group's operations and user experience. It accomplishes this through collecting and simplifying interactions, as well as recording behaviours, contents, and information. By identifying reproducible operations and understanding how they are conducted, as well as replicating specific human behaviours, it is feasible to speed up processes and decrease repetitive jobs.

Intelligent Automation is based on a set of developing software technologies that, when paired with established process redesign approaches, may be scaled up in certain value chain domains. This can be accomplished with little disruption to current systems and minimal intrusion into underlying IT applications. The introduction of rules for the automation of whole processes or specific activities, as well as the reduction or deletion

of physical documents, are among the most prominent examples of Intelligent Automation.

Generali's objective is to further leverage Intelligent Automation's benefits to have a direct impact on business, utilizing global experience and merging Group assets to assist expedite local projects and scale out projects across regions. Through the automation of operations, the digitization of their activities, and the modernisation of the backend systems, Intelligent Automation will enable them to further simplify processes and enhance customer and agent services, as well as staff experiences.

Data, analytics & AI: Generali wants analytics to fuel their Lifetime Partner transformation and pervasively support everyday operations to generate actual business value. They aim to help business decision-making, empower their people, and improve competitive advantage by harnessing data and modern technology.

Customers will be able to benefit from full customisation in terms of products, price, services, contact channel, and claims management; distributors will be able to depend on insights derived from a mix of online and offline information to increase new business and customer management; and staff will be able to profit from analytics-driven insights and Intelligent Automation for improved decision-making, efficiency, and the capacity to offer a personal touch.

Agile organization: Generali aspires to be a lean, agile, and empowered organization, allowing it to respond to challenges more swiftly. As an organization, being Agile entails concentrating on a new style of working, digitizing the employee journey, and eliminating bureaucracy.

Generali must revolutionize its way of doing things in order to be customer-centric and generate value for all the stakeholders, functioning in a rapid-learning and fast-decision-making manner. The goal of the new style of working is to discover and implement approaches and technologies that will help the Group accomplish its lofty goals faster. As a result, they are hastening the adoption of Agile standards and methodologies, as well as the technology tools required by the DevOps strategy (a combination of software development and IT operations).

Employees are a crucial stakeholder in the Digital Strategy, thus digitizing their journey demonstrates the concern for them and displays the dedication to simplifying their everyday tasks, updating corporate procedures, and enhancing their participation.

To eliminate bureaucracy, adopt the following tactics to gradually address three of its key causes:

- Enhancing managerial behavior in order to empower employees and provide decision-making training to management.
- Employee IT systems should be simplified, digitalized, and modernized.
- Reducing the amount of work that employees have to do (e.g. fewer approval steps, clearer accountabilities, etc.).

3.3 Intelligent Automation application in Generali Assicurazioni

3.3.1 Generali Intelligent Automation Strategy

Intelligent Automation is already a successful approach for Generali to assist legacy system modernization and process digitalization, allowing specialists to analyse, simplify, and reinvent the way the organization operates, due to greater computing capacity and data management capabilities. Insurers have substantial hurdles in serving consumers and communicating with agents and distributors, including minimizing manual and paper-based procedures, responding to consumer demand for speed and simplification, and avoiding skilled personnel performing low-value repetitive jobs.

"Intelligent Automation in Generali occupies a position of primary importance. After a first phase of study, analysis and prototyping performed in 2017, Intelligent Automation has become a three-year program of Country Italy that takes the name of Smart Process Automation. In this program converge those technologies aimed at process automation, so not only AI but also, for example, Rpa. The objective of the program is to intervene, automating with new technologies, on some of the processes to speed them up and improve them. This goal is now possible thanks to what was done in terms of process simplification in the previous industrial plan, which in fact, laid the groundwork for

automation. In terms of processes that are more candidates for automation, we are obviously talking about processes with medium-high volumes and high standardization." Daniele Martini, project manager in the office of Smart Process Automation and Innovation of Generali Italia (Martini, 2020)

Intelligent Automation is more than just optimizing operations for Generali. Due to increased market pressure, with consumers seeking more options, 24/7 adaptable services, and simple omni-channel interactions, such as in claims management, it has become critical to responding with agility: a powerful essential digital enabler of the Generali Digital Strategy. They're using Intelligent Automation to speed up digital transformation: by integrating Robotic Process Automation and Artificial Intelligence, they can manage not just repetitive chores but also complicated procedures, boosting customer experiences and agents' everyday work. For example, they may access their knowledge base by automating the processing of various sorts of documents or using virtual assistants such as chatbots and Voicebots. Generali is also increasing its digital footprint by eliminating paper-based operations and delivering new unattended services, such as digitalizing and managing claims in real time.

"Generali Italia aims to be recognized as a Life Partner for its clients: in this perspective the main benefits of Intelligent Automation are to be found in the speeding up of processes, as well as in greater accuracy and better management of information. These improvements, which on some processes means reducing up to 90% of the throughput time, are aimed at meeting the needs of customers for better and faster services." (Martini, 2020).

To help accelerate the Intelligent Automation journey, Generali has established a Intelligent Automation Center of Excellence, which draws on the most advanced experiences developed in some Business Units to provide centralized services, as well as a dedicated Community of Practice, which is made up of experts from various functional areas who collaborate to define priorities, Identify the most relevant procedures and scale up local success stories, sharing lessons learned and promoting strategic projects across regions. Furthermore, Intelligent Automation is part of the upskilling program established in conjunction with Generali Academy and available to all workers through the online platform Welearn and the soon-to-open "New Role School," with the goal of preparing

the specialists who will lead the journey, in line with the Innovation and Digital Transformation pillar of the Generali 2021 strategy.

I had the pleasure of interviewing Andrea Pietrasanta, Head of Smart Process Automation and Innovation at Generali. I asked him several questions about the evolution of the unit that deals with Intelligent Automation in the company at the organizational and project level. He also described to me which projects have been automated over time in Generali and what results have been achieved in terms of ROI.

Smart Process Automation is a field in which Generali has been a pioneer in the Italian insurance sector, both in terms of operational model and initiatives. The SPA section of the company had the objective of being able to automate some of the business processes that no one thought they could. In the 19-21 strategic plan, Generali looked at how to scale the innovations so that they could be applied across all business units and with what operating model. They shifted in 2018 from a project-type responsibility, whereby the Intelligent Automation area develops the initiative and then handovers to the area for which the automation was developed, to a vertical responsibility over the automation issues that remain with the team: a centralized team was created that has complete responsibility for all SPA and RPA projects and whose people are allocated to a particular project that they follow. In particular, the implementation, operation, precision and efficiency of the automation are the responsibility of the unit (including maintenance), while the correct use of the technology (following ad hoc training) is clearly the responsibility of the area for which they developed it. Thanks to the establishment of the Center of Excellence, all projects are developed within the same unit. This ensures that there is a lot of synergy between projects and therefore very high efficiency. Pieces of software have been created (e.g. topic detection, data extraction algorithms based on geometric distance) that are fully configurable and reusable not only on existing projects but also on future ones.

The Intelligent Automation area is composed as follows:

- Automation Experts: they have the responsibility of the end-to-end project implementation; they deal with process mapping and redesign and project management Automation (they design the process and coordinate and supervise the whole implementation).

- Automation Engineers: have end-to-end responsibility for automation KPIs, deal with detail process segmentation and develop algorithms, are also the people who interact with Data Scientists.
- Data Scientists: they develop the machine learning model.
- Cloud Architects and Service Managers: they do the architectural design, industrialize the software and do the service management.

To date, there are around 28 automated processes in Generali, 70% of which concern document management. In particular, an example of Intelligent Automation adopted by Generali in its early stages is the sorting of incoming mail (communications received via any channel). These are addressed to Generali but have to be processed by many different offices. Today, the process of acknowledging communications and sorting them to the right office is fully automated, saving the company's employees hours and hours of work. Another example of an automated process is managing the response to agency service requests. In this case, the level of complexity is higher, because the questions could be informative, but also consultative or dispositive: the bot must not only give information, but also perform operations on the systems to solve the agency's problem and then communicate whether or not the problem has been solved. In addition, within the service request it may happen that there are multiple questions included at the same time. At Genertel, the document validation process has been automated when a policy is written. The automation recognizes the contractual document in question and understands what is written on it. Considering that approximately one million communications are handled each year, the gain in terms of efficiency and FTE savings is very high. There are also active automations that work on complex decision-making processes, based on structured data such as, for example, the automatic assessment of channelled claims. When a Generali client is the victim of a claim, he is directed to a car workshop that Generali, as the insurer, must pay for directly. The process of assessing the damage, deciding on the conformity of the estimate by the body shop and settling the claim is now a fully automated and highly complex process.

Intelligent Automation of business processes at Generali has been very impactful in terms of benefits. As Andrea Pietrasanta reported, almost all projects undertaken by the SPA area were able to pay back the investment within the year. Over the past 3 years, the

company has invested around €4 million per year in process automation, thanks to which it has seen many benefits including:

- Increased speed and efficiency of the automated processes and consequent impact on the volumes of activity performed.
- Increased accuracy of the operations performed by the bots (automations reach an accuracy close to 100%, recognizing the tasks that they cannot manage and referring them to a human operator).
- Once data management processes are automated, the quality of the data itself that is entered and exchanged on the systems also increases dramatically.
- Impact in terms of ROI, as automation generates 200 FTEs of efficiency per year, which equates to around €15 million in recurring cost savings, to which must be added the saving of several million euros in external costs.
- From a technical point of view, one benefit is the possibility of standardizing and therefore extending sample checks on the various company processes, so as to uncover and subsequently resolve any inefficiencies.

3.3.2 Leo the virtual assistant of Generali Italia

Chatbots have the potential to improve insurers' digital experiences and consumer interaction, but they also have the ability to boost the productivity of actual employees. This is becoming increasingly true as improvements in automation, machine learning (ML), and natural language processing (NLP) have enabled conversational assistants to provide client interaction on par with live agents, to the point where bots can completely replace staff. As a result, chatbot implementations can streamline processes, allowing workers to devote more time to non-trivial tasks like client acquisition, allowing insurers to grow their businesses. As a result of the ongoing increase in calls from current clients, Generali sought to find a better approach to handle communications as its business grew. To do this, it implemented Leo, a chatbot system that has both basic and advanced features, to maintain a positive customer experience while freeing up human people to expand the company.

Leo is the virtual assistant of Generali Italia. It was launched in 2019 and handles about 30,000 interactions per month on Generali.it website, MyGenerali app, WhatsApp and soon via voice channel. Its central nervous system consists of "Convy AI" technology (developed by Expert System in partnership with Eudata) based on "Cogito" artificial intelligence, which through understanding natural language automatically responds to requests for assistance and information from customers. It is able to recognize about 90% of the intents with a semantic confidence of 86-100% and responds in real time 24/7.

Leo is present on several channels and performs several functions for customers:

- Public site - login and registration support
- Customer area - do-it-yourself support
- WhatsApp - claims opening and reimbursement of medical expenses, car quote (FastQuote Auto)

Expert System's Cogito platform combines the accuracy of semantic understanding and natural language processing with the benefits of other Artificial Intelligence technologies, such as machine learning, to enable organizations to extract and analyse strategic information from diverse sources in real time. Cogito can be integrated into business intelligence platforms to maximize their capabilities, adding the intelligence needed to process relevant information more accurately and thus deliver more efficiency, quality and speed. In other words, Cogito is the semantic engine that enables the chatbot to understand and interpret all queries typed by users.

"*Monitoring sentiment and mitigating risks, understanding the conversations taking place on the web to identify trends, improve customer service and support product innovation: these are the main objectives of social listening today*," said Marco Varone, President and CTO of Expert System. "*Cogito leverages artificial intelligence to offer several functionalities useful to achieve these goals starting from the activities of identification, extraction and complete and accurate analysis of any unstructured content.*" (Expertsystem, 2018)

Eudata[6] ed Expert System[7] joined forces in 2017 to work alongside companies to innovate the relationship with their customers, harnessing the power of artificial intelligence in service activities, sales support and marketing. The integration between Cogito cognitive technology and Eudata's omnichannel suite, will give companies the opportunity to rapidly deploy conversational systems (chatbots). Such systems generate a shift from the model where people adapt to the computer to one where the computer adapts to people's expectations, with a twofold benefit: offering users new ways to access information of interest through automated human-like dialogue, i.e. expressing themselves freely as they would via chat; increasing the operational efficiency of companies by automating recurring tasks that do not require specific skills or specialized expertise (standard information retrieval, more common service needs, requests for quotes, common offers, etc.). "*Today, we are seeing an exponential increase in conversational interfaces that users live with and expect to use in their dialogue with companies*," said Sandro Parisi, CEO and founder of Eudata. "*This turns into significant volumes of interactions for our clients to manage. To improve the customer experience and not drive costs out of control, the quickest solution is to take advantage of bot"*.

The result of cooperation between Eudata and Expert Systems, Convy is the artificial intelligence that acts like a human helping enterprises to better interact with their clients and agents to be focused on the value-added transactions. It is an orchestrator for all the components involved in the customer journey (Front End, CRM, TT, ...) valuing them

[6] **Eudata,** an innovative industrial group founded in Milan in 2006, operates in the world of Customer Engagement with the objective of maximizing the effectiveness of interactions between customers and businesses. The Eudata solution enables interaction with digital users active on any channel, guaranteeing centrality of information, simplicity of engagement and efficiency. The solution provides the ability to combine traditional interaction systems, such as voice contact centers and CRM systems, with Eudata's own omnichannel solution, Eudata WCS, and its artificial intelligence system, Convy A.I. (Eudata, 2021).

[7] **Expert System,** listed on the AIM Italia market of the Italian Stock Exchange, is a leader in Cognitive Computing and Text Analytics. Through its proprietary Cogito technology, based on semantic analysis, Expert System innovates the way companies process information, offering its own artificial intelligence tool to understand the meaning of large quantities of documents, and derive strategic knowledge from big data to increase their competitive advantage and improve decision-making processes (Expert System, 2021).

and taking "conscious" decisions and is a single service that can be provided as Chatbot or Voicebot to manage traditional voice channels. Thanks to Convy, Generali created an Omnichannel Enterprise bot to optimize the interactions between customers and the group's brands: the company's customer area is now not Self Service, but Assisted Service.

Leo’s approach is designed to convey trust and reliability. Thanks to the quality of its engine, Leo recognizes the needs of the customer expressed in natural language and responds in a timely and comprehensive manner. He interprets and understands the meaning of documents and requests. At the end of the Experience, it proposes a survey to receive feedback on the usefulness of the conversation. The graphics and the style of the client interface have been realized in line with the branding choices and the standards of the client portal creating continuity in the navigation. The engagement with the customer can come from a static or proactive button, customized in the different pages of the portal and based on the behaviour of the customer. Being inside the Customer Area, the bot, the moment it is activated, recognizes the user and already has all the information about him.

Since it was introduced in October 2019, the chatbot has assisted customers to find the information they are looking for in their Customer Area on the Generali website or app. From that time to now, more and more topics have been introduced that the bot can handle and assist with. On the other hand, when the user requests something that the bot does not yet handle, it refers the user to an operator, so that the customer is always able to solve their problem.

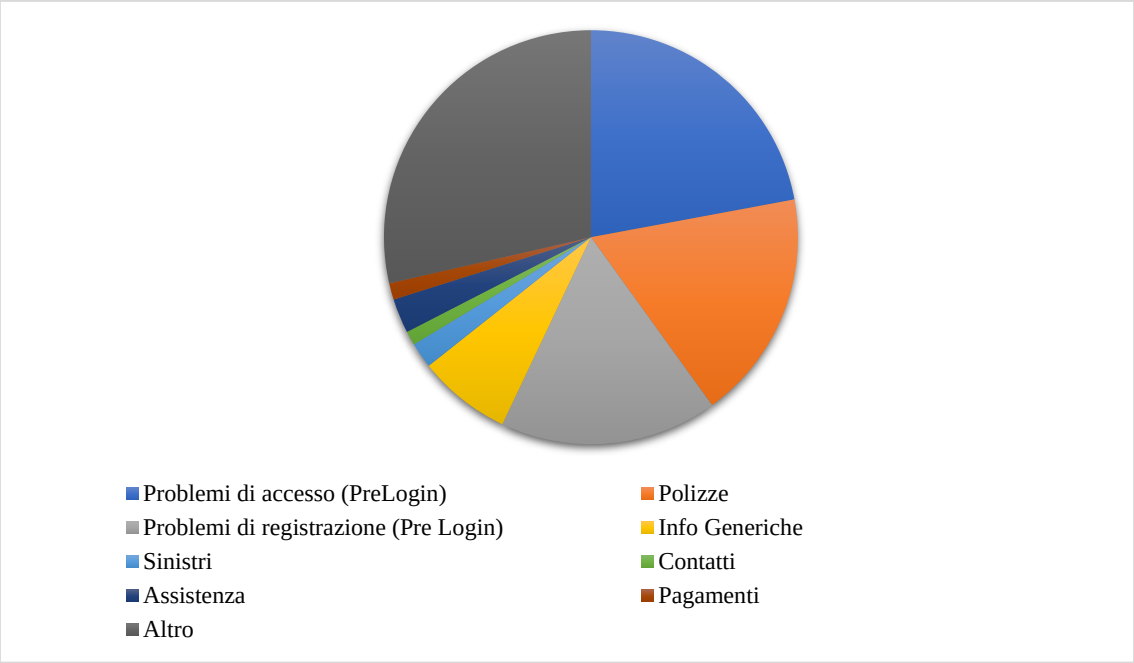


Figure 17 *Subject areas managed by the Chatbot most requested by users* ***(Generali , 2021)***.

Over time, the average number of sessions undertaken by customers with the bot has increased more and more, reaching an average of over 30,000 sessions per month. This is due to several reasons including:

- The increase in the number of Generali's clients
- The progressive digitalization of the company and therefore of the customers themselves, who are increasingly used to managing their relationship with the insurer online and using chatbots.
- The ever-increasing number of topics and themes that the bot is able to manage and help clients with.

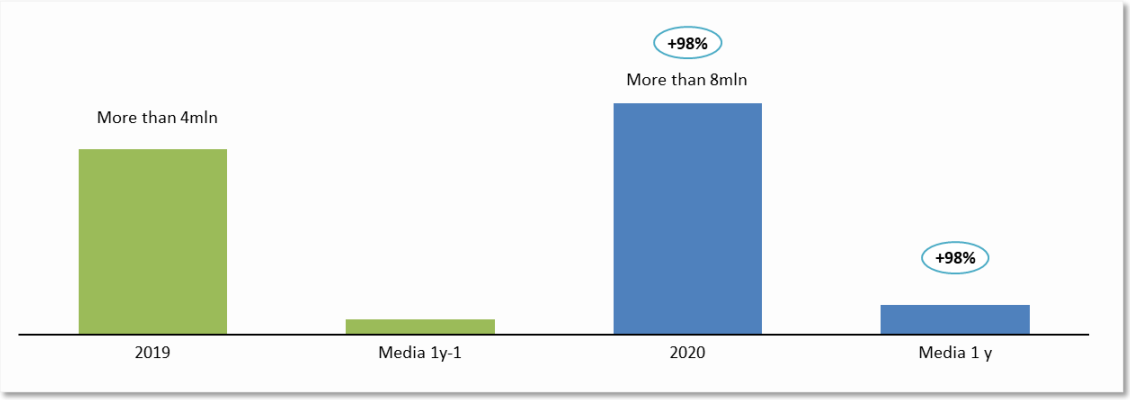


Figure 18 *Total Annual sessions in Area Clienti and My Generali App 2020 vs 2021* ***(Generali , 2021)***.

The frequency of visits of users in the Customer Area undergoes cyclical phenomena, in fact there are periods in which customers are driven more to interact with their insurer and therefore perform more accesses on the online portal and have more frequent need to interact with the Chatbot.

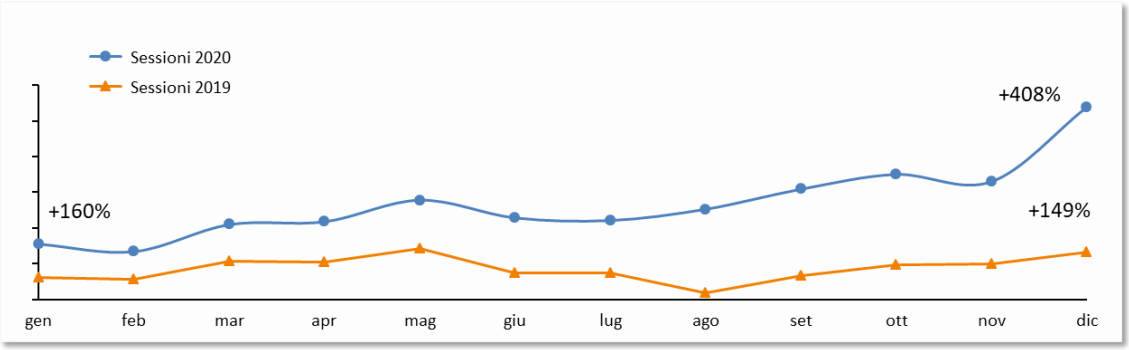


Figure 18 *Monthly sessions in Area Clienti and My Generali App 2020 vs 2021* ***(Generali , 2021)***.

A comparison of 2020 vs 2019 shows strong growth in Generali Italia Customer Area traffic volumes (web/app). This increase is mainly due to the app channel, which in 2020 represents 58% of total traffic (vs 49% in 2019). The great increase in traffic is due, in addition to the greater customer base reached, to the initiatives conducted (My Generali advertising and direct email marketing) and innovative services (IoT and dispositive), which generated a strong boost to engagement considering the context of the year (digitalization from the "coronavirus effect").

In 2020, the number of Customer Area sessions exceeded that of the public website, reporting overall traffic volume of Generali Italia's Digital Channels in strong growth compared to 2019. But in addition to Area Clienti on the website and app, another fast-growing channel is WhatsApp, which hosts two other Generali chatbots: the Claims Reporting bot and the new FastQuote Auto. The Claims Reporting Chatbot was introduced in June 2020, and to date the number of sessions has increased by 200%.

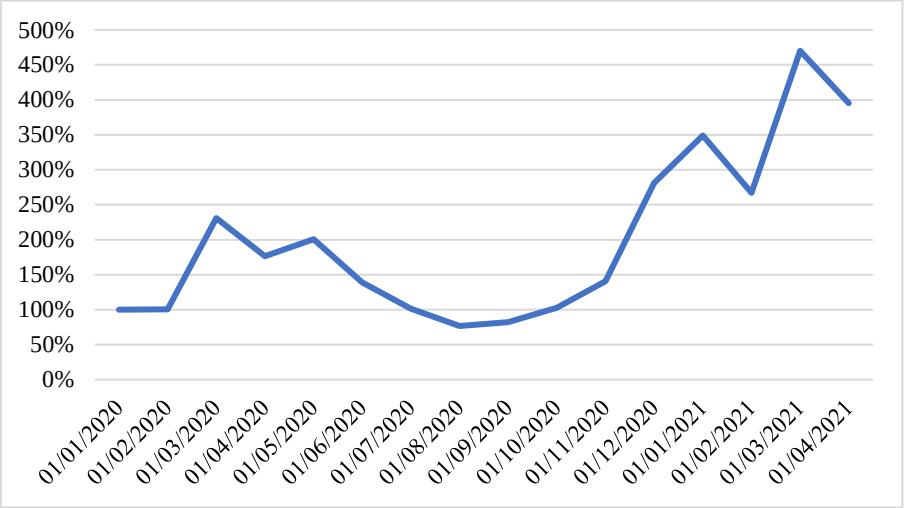


Figure 19 *Monthly sessions Chatbot Pre/Post Login and WhatsApp* ***(Generali , 2021)***.

As mentioned earlier, the Chatbot, when it cannot solve the customer's problem, has a way-out to assistance, either IT (for technical problems) or business (for information on policies and various). Although this solution allows the customer to always get an answer to his needs and therefore to the customer journey to be smooth and effective, it runs the risk of overloading the assistance office for the number of requests that would be opened by bots. This problem has been solved with a correct implementation and revision of the chatbot flows:

- Introducing an increasing number of managed topic flows.
- Reviewing already released flows to eliminate inefficiencies.
- Analysing user conversations to understand which unmanaged topics are most in demand so that they can be introduced in the future.
- Adding a survey at the end of the conversational flow so that we can understand if the customer is satisfied with the service provided by the chatbot and where they can improve.

It is therefore interesting to see how, although the number of sessions has increased dramatically over time, at the same time the number of service reports has dropped until it has stabilized in recent months. The number of active customers interacting with the Chatbot will increase more and more, but at the same time the problems that do not allow a satisfactory support experience to the customer are found, analysed and solved.

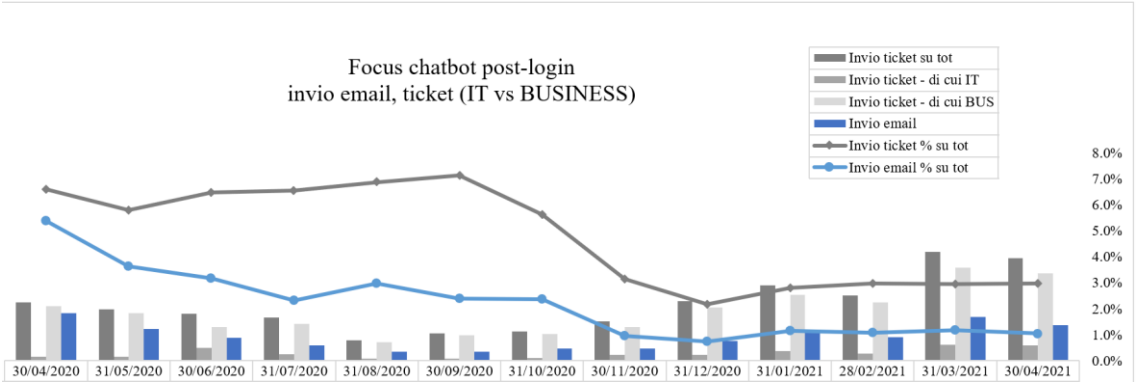


Figure 20 *Focus on PostLogin - Opened support tickets (IT vs Business)* ***(Generali , 2021)***.

3.3.2 Generali Claims Management Chatbot

Insurance firms, like all other businesses, see digital transformation as a key aspect for long-term survival and success. The visible embodiment of this transition is the customer experience, which is enhanced by customization and automation. Internally, automation is the most important factor in increasing efficiency. Artificial Intelligence and Intelligent Automation makes the procedure for an insurance firm easier and more viable. Customer-facing deployment of insurance claims chatbots or internal activities, such as settlements, are examples of AI use cases. Customers value smooth interactions and a speedy and effective claim settlement procedure in these scenarios. At the same time, insurance companies want to resolve the claim as soon as possible and make sure that they can discover fraudulent claims. They must be able to verify the claim's authenticity as well as the amount payable based on policy conditions and the degree of the damage. Insurers must achieve a careful balance between client pleasure and cost-effectiveness.

There are several strategies to speed up the claims procedure. You will be able to hire additional personnel and implement technology solutions. Both of these solutions need investments and ongoing expense, and an insurer's primary concern is being profitable while improving client happiness. Inefficiencies in claim settlement procedures can lead to litigation, which puts a strain on resources and harms a company's reputation, hence insurance firms want to prevent it as much as possible. Chatbots might anticipate whether future claims will have similar outcomes and offer preventative steps by recognizing commonalities in data from previous claims that resulted in litigation.

Consumers, on the other hand, place a premium on the convenience with which they may file claims. They will, understandably, not be in the greatest of spirits while filing the claim. Even little challenges might cause tension and unhappiness, depending on the circumstances. With more people traveling and commuting and geographical boundaries growing, limiting where consumers may file claims may not be the greatest experience insurance firms can deliver. Customers like it when service providers offer proactive updates on the status of their insurance claims. Making clients work for this knowledge will almost always result in unpleasant feelings. This is the most important element; if clients believe the claims settlement procedure is lengthy and time-consuming, they will be dissatisfied.

One solution to these needs and objectives is automated claims management through Intelligent Automation. This is the background to Generali's Claims Reporting Chatbot on WhatsApp, which gives policyholders the opportunity to report a claim from the comfort of their homes using their smartphone. Leo, the virtual assistant that is also present on this channel, makes it possible to improve the customer experience, making the process of reporting and monitoring the claim faster and easier. Everything from the first contact, data collection, document upload and follow up on the progress of the claim, to the final settlement of the claim can be done in a convenient chat with a virtual assistant. Customers may be able to update their claims more easily with the help of an insurance chatbot, and this update can be triggered by both the consumer and the chatbot. The chatbot can anticipate the requirement for further information and tell the user; the consumer may then update the necessary information. On the other hand, the customer can also request an update by informing the bot. The bot can then process the request after due verification. In this way, policyholders have the opportunity to have an immediate

response to their requests, but at the same time always have the possibility to switch to interaction with a human operator if they want or need it.

"One of our goal points is to be able to create a bot that allows us to manage quickly, at any time and in a channel-neutral way, all the operations that a client may have the pleasure, comfort and speed to do by himself. But that also has to allow us the process of handover to our network of agents." Alberto Corti (*Annex 1)*

Another goal of the project is clearly to automate a process that would traditionally be very complex, time consuming and employing multiple parties. In this way there is a large savings in terms of labour hours saved. In addition, there is a benefit of increased data quality and completeness, as the conversation cannot move forward if the client has not provided all the data requested by the bot (*Annex 2*). Fuelling this benefit are the various checks implemented, to verify that the format, and combination of data provided is correct and relevant to the question asked.

Since it was introduced in June 2020, the Claims Reporting Chatbot has seen a strong increase in usage. This is due to the marketing campaigns carried out by the company to push the channel, and the improvement of the channel itself, which is becoming more and more reliable. The growing coefficient of use, as already mentioned, will lead Generali to greater efficiency in terms of reducing the time taken to handle claims and saving costs that are always linked to management.

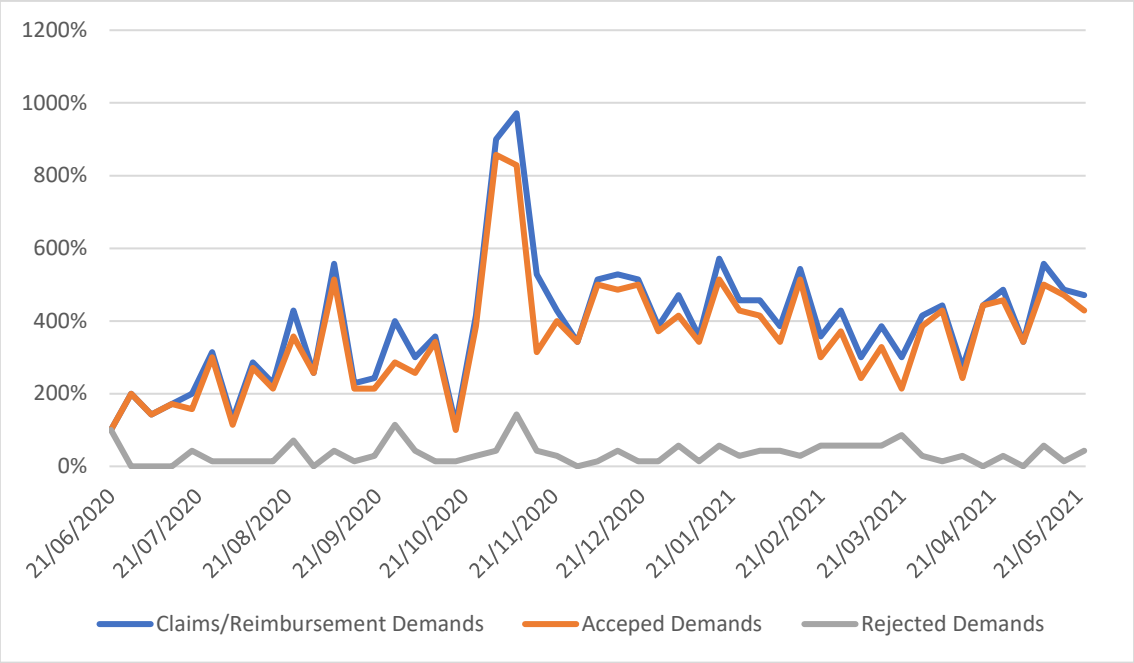


Figure 21 *Trend of opening requests for claims and reimbursement via Chatbot* ***(Generali , 2021)***

Generali's Claims Reporting Chatbot handles auto, home, accident and health claims (*Annex 3*). Claims recognized as Health Claims are routed by the bot to the dedicated flow. In this way, the necessary data are collected thanks to ad hoc requests and, at the end of the flow, the report is routed to Generali Welion which handles health claims.

Another peculiar flow is that of Fast Cash Settlement, i.e. the flow through which the claim, in addition to being reported and opened, is also processed and settled automatically by the Chatbot. Only claims that have certain characteristics follow this flow: it must be the case that the customer is right, there is only one vehicle involved besides the user's and there are no injuries. So, the claims that have these characteristics have a separate management that provides, in addition to the requests of the standard flow, the upload of the complaint, documents and files such as photo, video and car to support the report (*Annex 6*).

Chatbots can distinguish between fake and legitimate claims because to Machine Learning skills paired with Natural Language Processing and Pattern Recognition. By collecting relevant information from invoices, photos, and other documents, the insurance chatbot can verify that claims are recognized. These talents enable people to determine

whether or not a medical report, diagnosis, or treatment is legitimate. Similarly, in the case of auto insurance, it may examine the patterns of damages and repairs to evaluate whether or not a claim is likely to be false. Its powers grow as AI collects more data with each transaction, and the accuracy of its predictions improves. After that, the bot may process the genuine claims as quickly as feasible.

As well as opening the report and processing it, this process also makes it possible to exploit algorithms developed by Generali's Advanced Analytics division to process the files and draw up a settlement proposal for compensation for damage to the car, which the client may or may not accept. The algorithm recognises and manages to process the photos of the damage to the insured party's car so as to be able to give an estimate of the extent of the damage. At the end of the process, the customer is sent a damage settlement proposal.

There are several issues that have been addressed to move the project forward:

- When a car accident happens, external parts of the car, visible, and internal parts, not visible, can break.
- The car is a complex object, the algorithm must be able to recognize every part of it (to date about 2000 have been registered and the list is of Open Universe[8] type).
- There are biases in the damage assessments made by the human being: the assessment of the same accident is always different if made by different people, therefore, the assessment history is characterized by different and discordant values.

In order to overcome these criticalities, the experts had to proceed knowing that it is not possible to solve the listed problems in a perfect way, trying to avoid overestimates (dangerous for the company's performance) and trying to avoid underestimates as much as possible. They then tried to calibrate the algorithm to intermediate valuations.

To do this, they created a chain of algorithms that performs several cascading tasks:

- One looks at the photos uploaded by the client and tries to figure out, for each of the 17 external components, which ones are involved. It then establishes a

[8] Open Universe: the list is not finished, but in continuous updating because the characteristics and the components of the cars are in continuous change and evolution.

probability for the operation to be performed (repair or replacement) and the time taken it.

- Another algorithm compares the data inserted in the compiled friendly statement with the photos uploaded by the insured. If there is a match, the flow goes on, if not, the flow is passed to a human operator who tries to manage the claim.
- Next step is to understand if the damage estimate is above or below 1000 euros. If we are above 1000 euro then it will be a more serious accident that needs more attention (trivially, internal parts not visible could have been damaged). The flow then passes to a human operator. In addition, most likely in this case the customer's need to have a settlement in a very short time will also be lost.
- Finally, the algorithm tries to estimate the range of costs. If the range is very wide, then it will mean that there is a high uncertainty and therefore the claim will be handled by an operator again. If the range is not wide, then the dynamics of the claim are not uncertain, so the algorithm makes an intermediate assessment and proposes a settlement to the client, who can accept or reject it (*Annex 8*).

The usage trend of FastCash, which was introduced in January 2021 shows peaks in usage due in part to channel awareness campaigns, but it has a fairly stable trend, although it has been made available for too little time yet to analyse the trend. Also, the algorithms and flows that underpin it are still being perfected and a change in them may affect the trend of use and the ratio between eligible and ineligible claims.

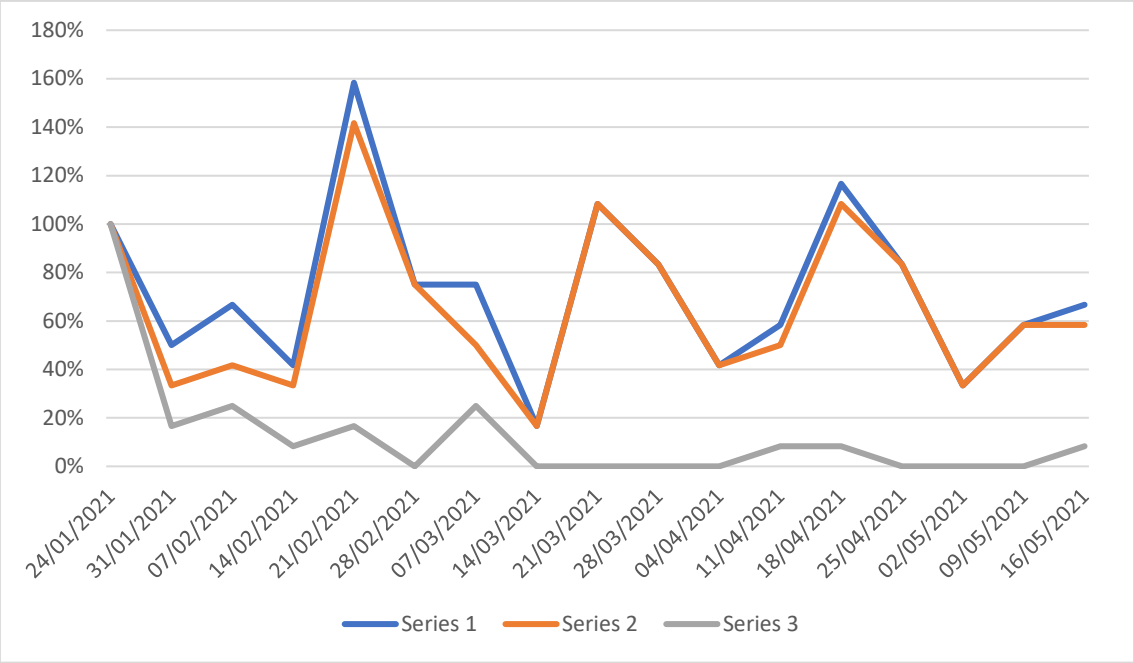


Figure 22 *Trend of claims handled via Fast Cash Settlement* ***(Generali , 2021)***

The process is currently not fully automated. Because the channel and automation are still recent adopters and the algorithm needs to be refined, after the claim is processed automatically, it is supervised and approved by an employee. With more and more experimentation and refinement of the channel, Generali expects to turn it into a fully automated process. All those claims that the bot does not recognise as categorizable in the Fast Cash Settlement are routed to the generic Claims Reporting flow whose way out is to send the open file to the claims office, which will manage the request (*Annex 6*). The claim will then, thanks to the Omnichannel strategy, be monitored through the Customer Area of the website or app.

Conclusions

The course of studies that I have undertaken, has allowed me to approach issues such as innovation, digitization and, in particular, how these contribute over time to evolve and transform the business model and operating model of a company.

It is now clear that the focus of companies has shifted to the customer, trying to understand their needs and perhaps even anticipate them. All companies with an effective strategy now include a multichannel approach to reach customers wherever they are and wherever they are needed.

In addition, with the advent of Intelligent Automation, it has been possible to achieve unprecedented levels of efficiency with minimal capital investment and the ability to scale automation across the enterprise. Automation has enabled companies in all industries to completely redesign some of their business processes. The most repetitive and simple (as well as time-consuming) processes especially have been made much faster, more efficient, accurate and qualitative. In addition to this, there is the advantage of being able to allocate resources, previously in charge of these activities, to other tasks.

I have therefore included in the study the Generali case, a company that has given me the opportunity to confront these innovations, to become part of the Digital Channels and Customer Experience area and to approach all the topics that I have dealt with, such as RPA, SPA, Artificial Intelligence, Chatbot etc. It allowed me to see first-hand how a traditional company, which has been part of the insurance industry for 190 years, has come to embrace change and is increasingly trying to innovate and innovate to stay one step ahead of its competitors.

For years now, Generali has placed innovation and digitalization at the heart of its strategy as keys to its success. It is an example of a company that over time has been able to adapt to the changes in the environment in which it finds itself: sometimes managing to drive change, sometimes chasing change, but in each case successfully.

It makes it clear, however, that the search for novelty is not an end in itself and does not distort the spirit and values of the company, but rather enhances them. Generali has always taken as its competitive advantage the greater value of its products or services as perceived by the client. From this point of view, innovation should not serve the mere

purpose of increasing efficiency by reducing costs, but also and above all to provide a better experience, first for customers and then also for all those who work in the company.

To achieve this goal, the user experience must be seamless: it must include the ability to take advantage of all digital channels and to perform activities in self mode, but at the same time it must allow the user to have human contact with a consultant(assisted). The technology should therefore not create distance between the insured and the company, but eliminate any kind of distance, facilitating interaction.

An example of this is Generali's Chatbot project. The virtual assistant allows the company to be more efficient, to reduce costs and to allocate employees to other activities, but its main advantage is that it gives the customer the possibility to have the answer he is looking for when he wants, immediately and through the channel he wants. But the chatbot is at the same time an enabler of communication between service or agency and the customer.

Annex 1 *Interview with Alberto Corti, Head of Digital Channels and Customer Experience at Generali*

How has the insurance industry evolved in recent years in relation to digitalization?

"The insurance world has arrived at the digital evolution of processes, products and services with a certain delay, and is therefore at a disadvantage compared to other sectors. Unfortunately, current customers can benefit from a mode of service, relative to digital channels, that is far removed from the average services that telcos, banks and even the public administration have.

The key point is that if from the customers' side, they are having a disadvantage, from the point of view of the insurance company we can instead consider it almost an advantage. Because if you move now, you move on more established ground, we do not have to invent anything new to give a good digital service, but we do have to be able to adapt the innovations and technologies that have emerged to the processes of the insurance sector.

To understand why we are lagging behind, we must first discuss Who is lagging behind. There is a big difference between the situation of indirect insurance companies, where customer relationship management, both in the sales phase and especially in the post-sales phase, is mainly entrusted to agents, and direct companies like Genertell that have a good quality digital follow-up. The case where insurance companies are lagging behind is where they have an intermediated business.

The answer to the question about why they are lagging behind also stems from a lot of confusion that exists in the marketplace about the definition of "digital." Most people, even at the professional level, confuse "digital" with "self". They therefore mistakenly believe that a service is available in digital mode if and only if it is a service that you can use in self mode, i.e. that you can use without being assisteb by an operator, but these are not synonyms. A lot of excellently realized digital services can be realized without them being self.

One of our goal points is to be able to create a bot that allows us to manage quickly, at any time and in a channel-neutral way, all the operations that a client may have the pleasure, comfort and speed to do by himself. But that also has to allow us the process of handover to our network of agents. The digitization of indirect insurance companies

therefore passes through the interpenetration of the self and assisted factors, and the use of the digital channel as a channel that allows for a rapid, and totally conscious, transition from the self to the assisted part.

This is where a fairly well-known concept in the omnichannel sector comes into play, which is that of "seamless". So I am dialoguing with a bot and I am following an autonomous digital process, a "self" process, which can be inside a form, on a page of the site or app, or in dialogic exchange on WhatsApp with a bot. At some point in this process I need to talk to someone. But not with someone generic, not the classic operator of a call center, but someone who cares about my position, and someone who represents the impersonation of an insurance company that is based on an agency network, whose commercial and relational strength lies in its network.

So if we break this relationship of trust and build on pure self, and not on assisted, what we get is the impoverishment of the value of the relationship, and consequently of the value of the company itself as perceived by the customer. Threfore, the central point is that our digital channels and bots need to be enablers of dialogue with agents.

This is to say that the slowdown in the digitization of indirect insurance companies is also very much related to the fact that it was not necessary to digitize so quickly. Because in any case the relational value, the value perceived by the client, resided in the advice that agents offer. Often, the drive to digitize is also driven by customer demands and regulatory requirements, which for the insurance industry have arrived much later than in other sectors. And customer demands, precisely because in the presence of brokered business, have not arrived so quickly as well."

What are the goals of the Digital Channels and Customer Experience business unit?

‘‘The first of the objectives is therefore to create this self-assisted binomial by improving the user experience, giving them the possibility to carry out operations independently, so that they have the answer to their needs quickly and through the channel they most desire; but at the same time making them feel that there is someone inside Generali who assists and accompanies them.

Another important point is to increase the quality of the customer experience in order to be able to offer a mixed process that is adaptable to the needs of the insured and retemption, but at the same time decreases costs. The step in data imputation, even in an assisted process through a digital channel, lowers the amount of errors and incompleteness of the collected data. This is because it forces the assisted and the assistant to fully enter the data to move forward in the flow, so it should lead to vastly reducing the number of times the assisted and the assistant are required to perform additional tasks.

Another great purpose of digital channels is to get to the point where they are no longer needed, as quickly as possible. In the sense that a company that has internalized digitization and has a digitization-driven corporate culture does not need a unit that deals with digital channels. Or rather, this should only perform a technical function of channel management. A digital company should not need someone who is forced to figure out from individual business stakeholders what they need to do, and then translate that into something digital. The individual business units should be able to design a process that is already digital, and then the digital channels unit should just do a quick implementation job. But to date, there is not the culture in many companies to do this. The goal, then, is to sufficiently contaminate the enterprise to accelerate digitization, and thus to ensure that a digital transformation unit, the architect of this transition, will no longer be needed in the future, except for extremely technical and specific tasks.

Any body, therefore, including an organization, must transform itself continuously. A company may need departments that accelerate a certain type of transformation during certain periods of time. The fact that there are companies that always need to have a transformation department permanently active derives from the fact that they are companies that have failed to include transformation, and consequently innovation, in their DNA."

What does Generali and in particular the Digital Channels and Customer Experience business unit set out to do to achieve these goals?

"In addition to the need to create a digital model that combines the self to the assisted, we have the mission to increase the customer experience as much as possible and to preside over, not only the owned channels, but also the earned ones.

Today we are mainly addressing digital channels that belong to us, such as our website, our apps, etc., while we increasingly need to look for customers where they already are. From this, derive the experiments we are doing on WhatsApp or as we have done moving heavily towards the world of connected mobility.

Sometimes we forget the etimology of the term "channel", the Digital Channels group does not do services, but channels. If you have to go from a point A, Generali, to a point B, the customer, the best channel is the one that arrives where subject B is already and bring it towards point A. While apps and sites are great channels because they allow you to engage the customer where they already are, they are not the ideal channel. Because the ideal channel is, not only where the customer is physically in terms of device, but it is where the customer is, internal to use case. So, where is it that customers spend most of their time when they have the mindset to handle business or family related things? On Google, Facebook or WhatsApp, at least in the target audience from Generali. To get even closer, I would have to be able to do that thing that really sets digital native players apart from non-native players going digital: total digital identity management. If I know exactly who you are, and I can always reach you by always giving you the right content where and when you need it, you don't need to come to me anymore."

How do you think the insurance industry and Generali will change over the next few years?

"I mainly see that the insurance market needs to evolve the mode of relationship between consultants and people, and to make sure that this mode can be truly seamless both in presence and at a distance and on all the channels that the different targets will occupy over time.

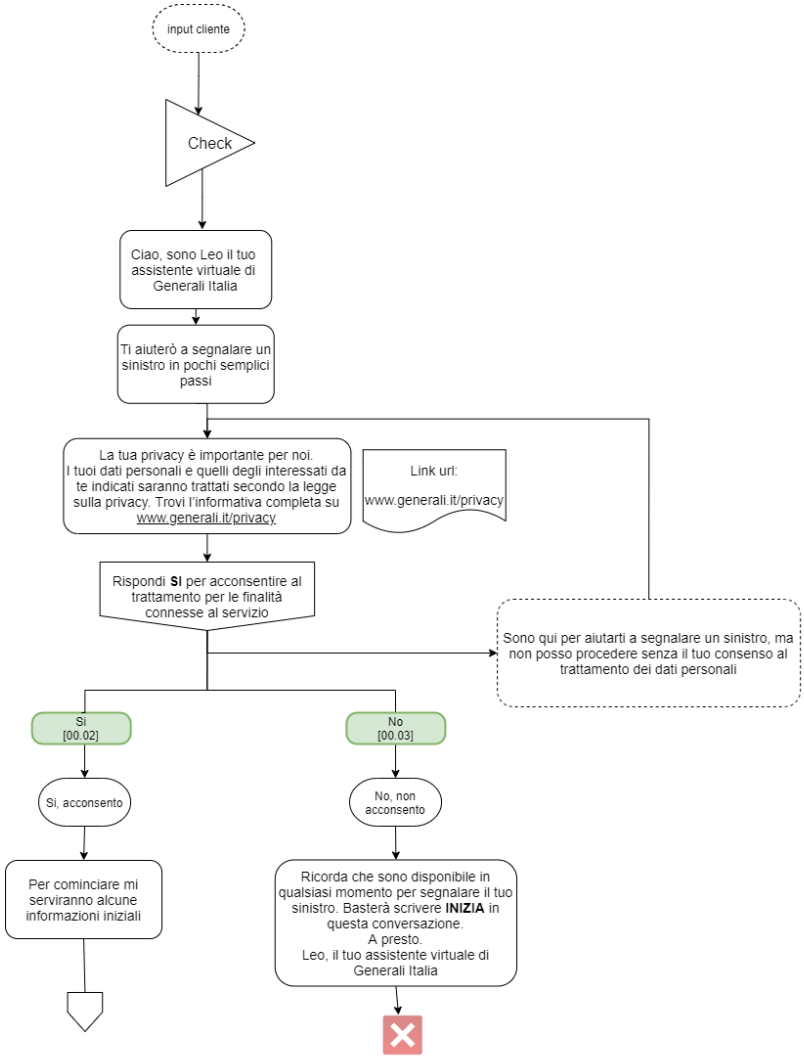
Another thing that I see, and that applies especially to Italy, is the need for insurance companies to take on an educational role, because Italy is an underprotected country. I

find it senseless that, in a developed country like Italy, there are so many uninsured people who only rely on chance.

The third frontier is linked to becoming an active part of a work of protection and prevention related to the aging of the average age of the population. We are a country that is irreversibly destined to have a very high average age growth, with an increasing number of people who will reach old age without a child or with few children. So, when the next generation reaches an advanced age and needs assistance, there will be no more family, because the disintegration of the family unit is becoming an increasingly evident reality. So insurance companies need to focus on the Long Tearm Care sector.

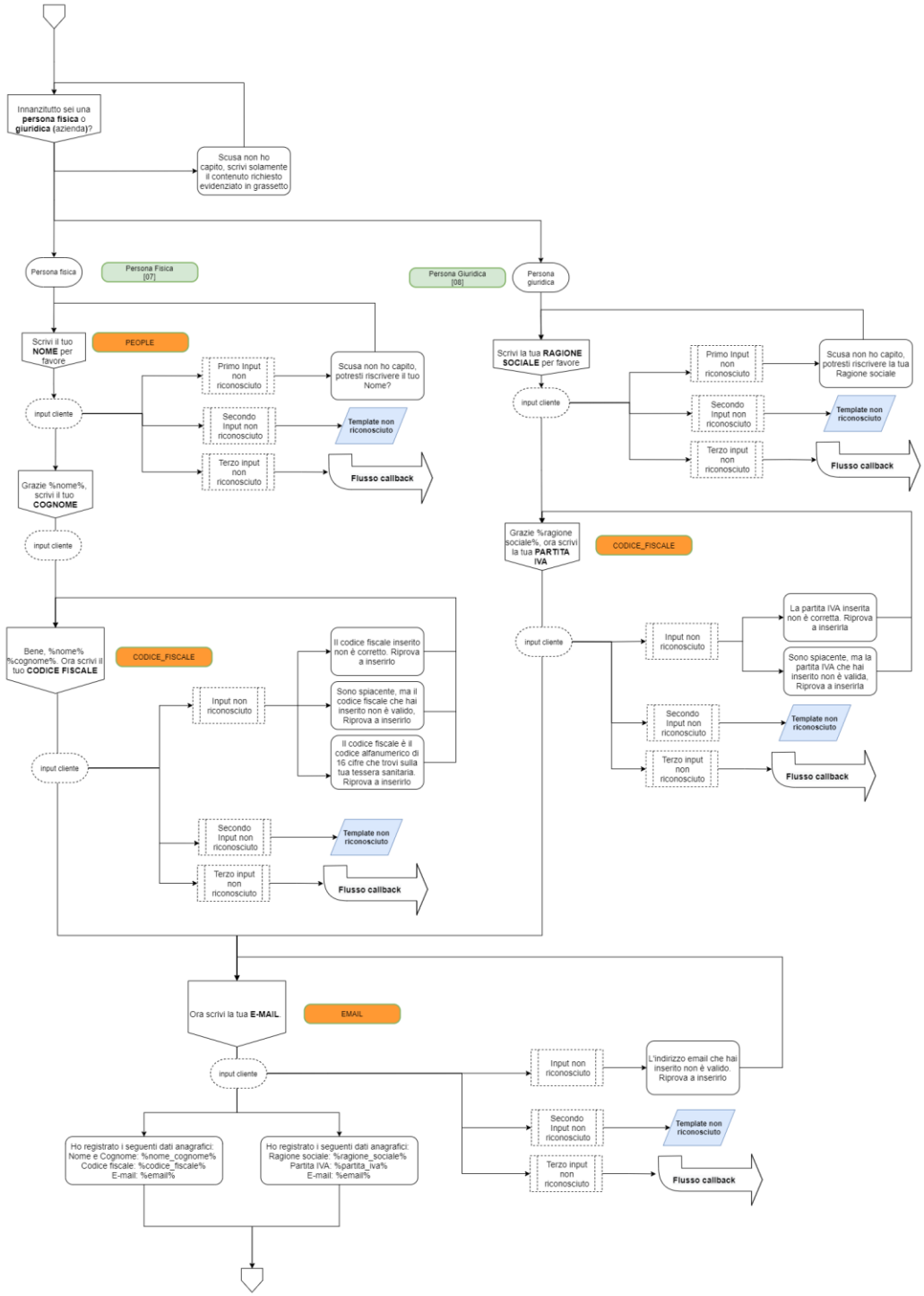
As for Generali, it is too big a player in the insurance world not to have the same goals as the insurance industry as a whole. One perspective for the company, but this also applies to everyone, is to greatly increase quality and attention to detail. The quality of the customer experience lies in the details. In 2021 we will hardly find a wrong process, but we can find a badly written email, an intent not understood by the bot, a tracking that instead of being updated in real time is updated 24 hours later. We can not claim to have missing processes, but we also can not boast that we have all the processes perfect."

[9]**Annex 2** Input flow and introduction, Generali Claims Reporting Chatbot.



[9] All conversational flows have been simplified for corporate privacy reasons

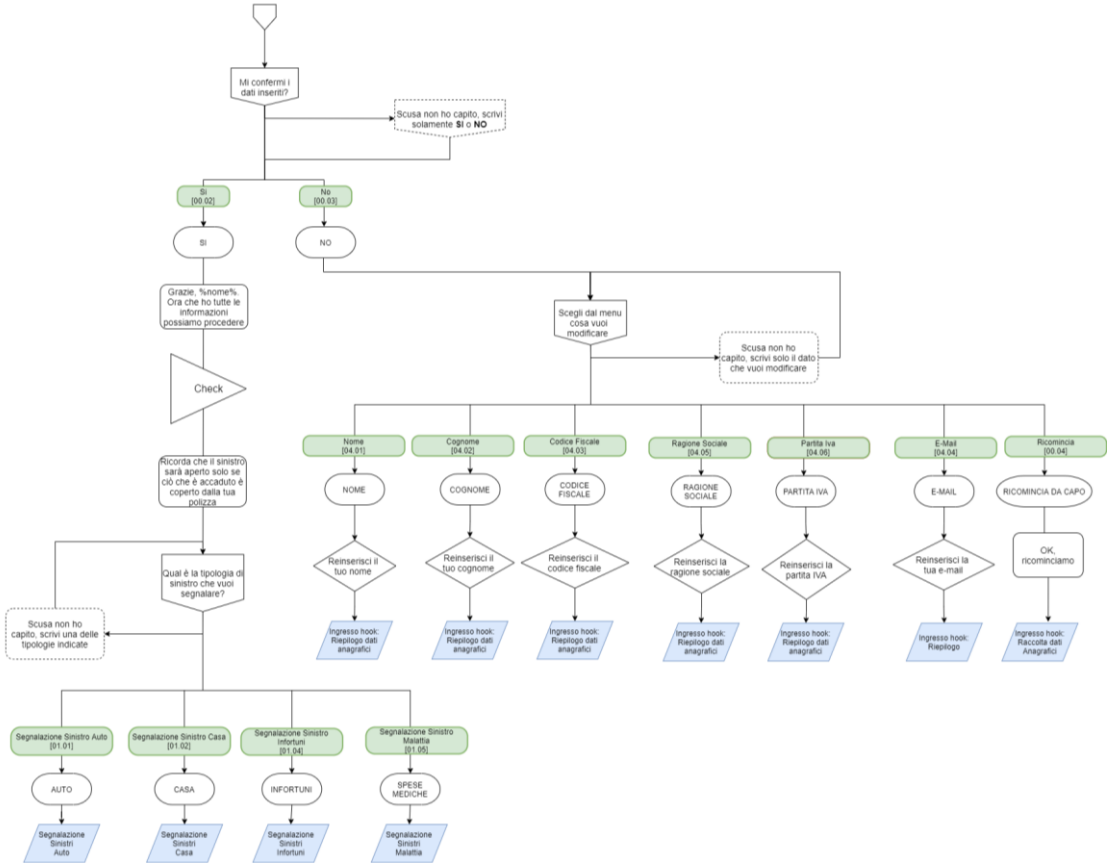
Annex 3 Collection of personal data of the policyholder Generali Claims Reporting Chatbot



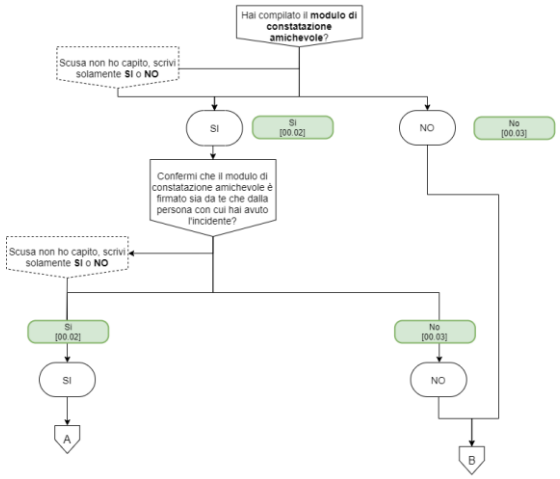
[10]

[10] All conversational flows have been simplified for corporate privacy reasons

Annex 4 Confirmation of master data and routing to the right claim flow Generali Claims Reporting Chatbot

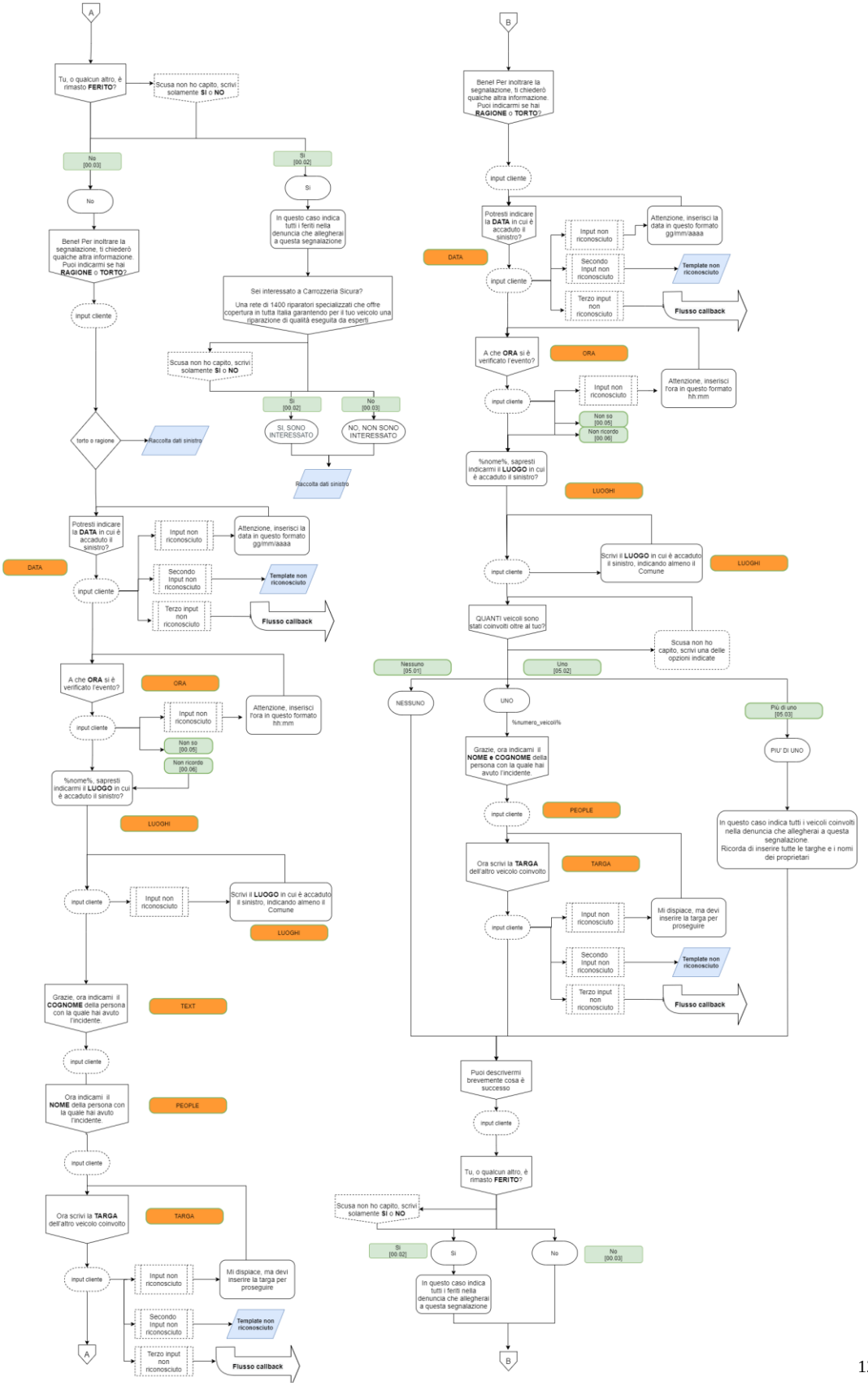


Annex 5 Collection of data related to the claim, Generali Claims Reporting Chatbot



[11]

[11] All conversational flows have been simplified for corporate privacy reasons



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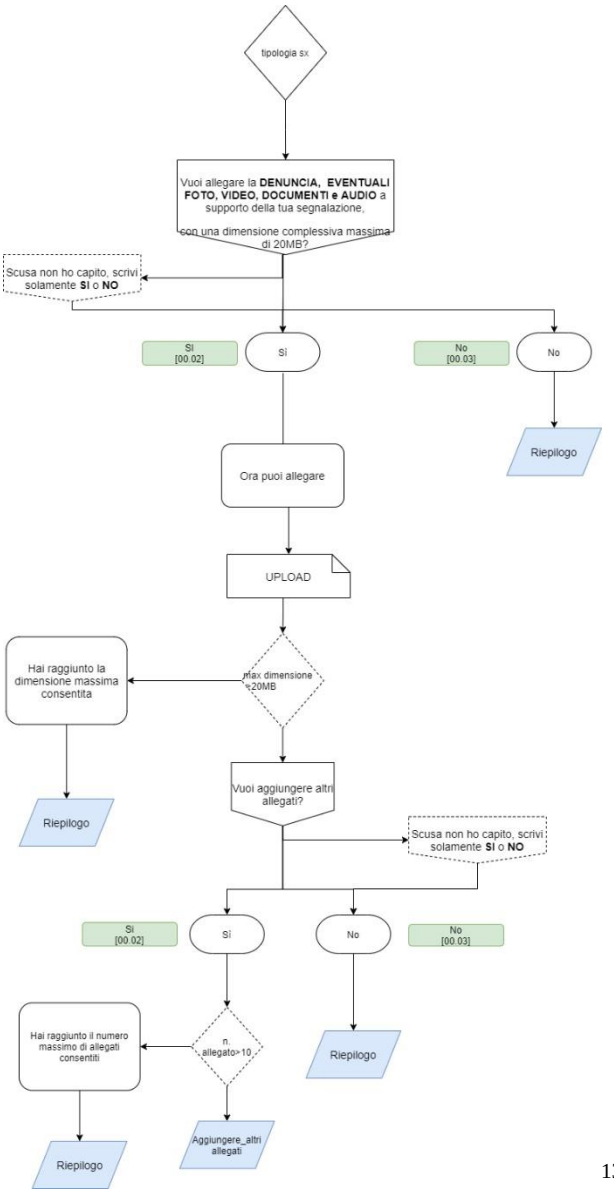
[12] All conversational flows have been simplified for corporate privacy reasons

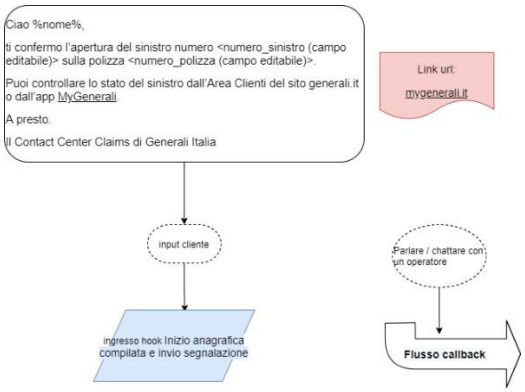
Annex 6 Request and upload claim documents, Generali Claims Reporting Chatbot



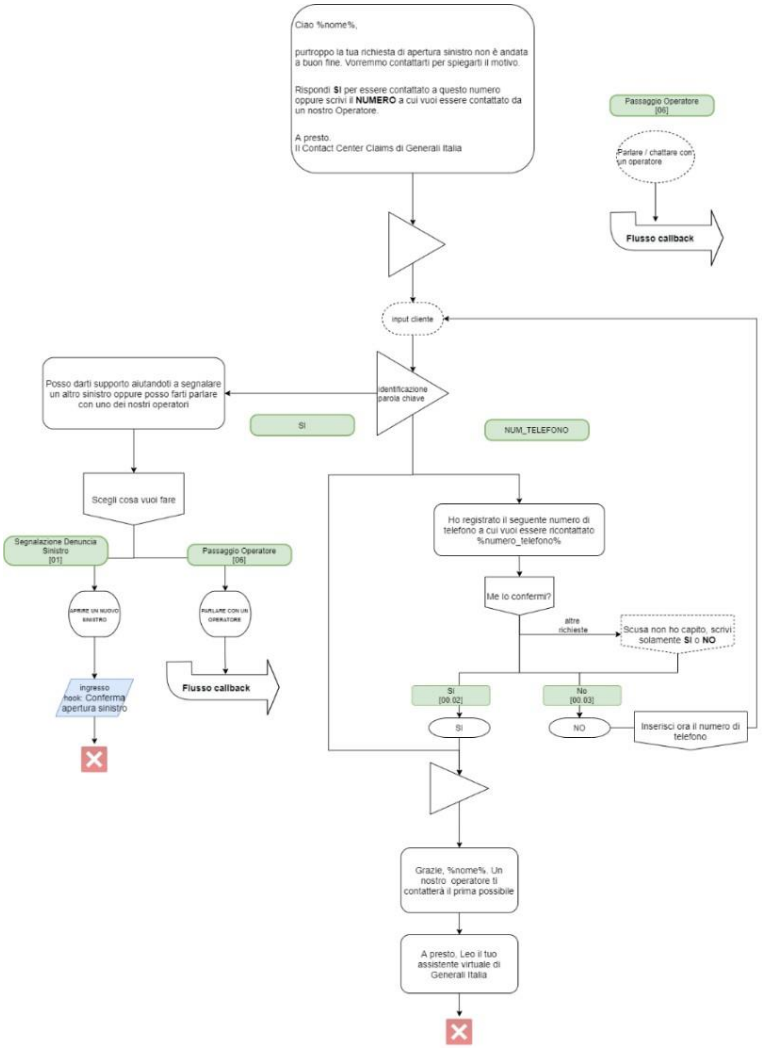
[13]

[13] All conversational flows have been simplified for corporate privacy reasons

Annex 7 Claim opening request accepted, Generali Claims Reporting Chatbot



Annex 8 Claim opening request refused, Generali Claims Reporting Chatbot



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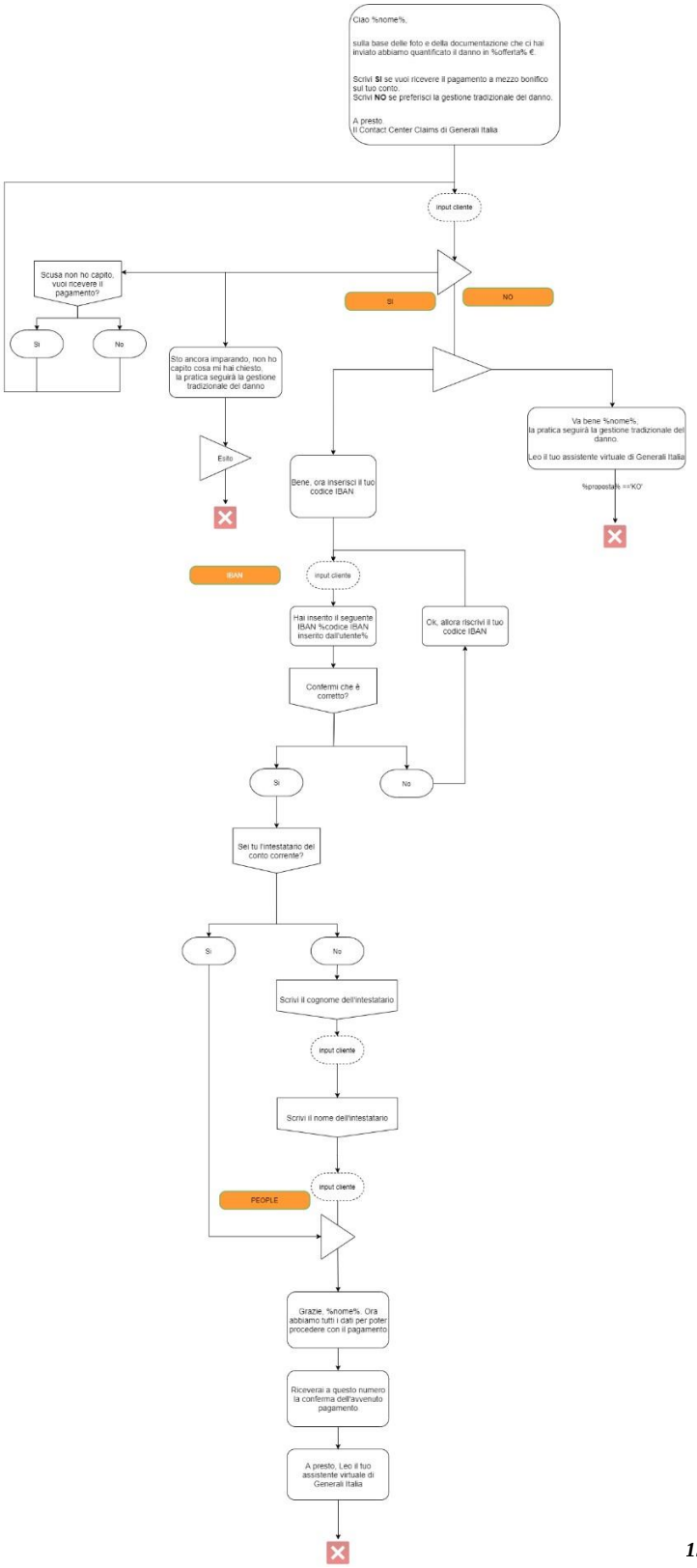
[14] All conversational flows have been simplified for corporate privacy reasons

Annex 9 Claim settlement flow, Generali Claims Reporting Chatbot



15

[15] All conversational flows have been simplified for corporate privacy reasons

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Executive Summary

Digital transformation can be defined as “the combined effects of several digital innovations bringing about novel actors (and actor constellations), structures, practices, values, and beliefs that change, threaten, replace or complement existing rules of the game within organizations, ecosystems, industries or fields”. It identifies the concept of exploiting and benefiting from the potential of digital technologies to build new processes, software and systems that allow the reaching of a higher level of efficiency, more profitable revenue, and greater competitive advantage. But the innovation is not only technical and based on the application of emerging technologies: it is also a cultural change, affecting the entire human capital of the organization, with the consequent need for specific competences in order to benefit from the digital transformation, and a change in the vision and the business model of the entire company. This not only includes the digitization of horizontal and vertical value chains, but will also revolutionize companies' product and service portfolios, with the ultimate goal of better meeting customer needs. But the special quality of digital change lies in the rapidly accelerating speed of change and advances in connectivity infrastructure, changes in customer preferences, the advent of new market models, as well as environmental patterns and regulatory practices, all affect the pace at which this transition happens.

Although the insurance industry is recognized by the community as one of those sectors that fall under the category of "old economy", in recent years is an industry that has incorporated a plethora of emerging innovations into its operations. Indeed, this sector is particularly vulnerable to large-scale disruption, so much so that recent technological developments have had a major impact on the value chain. Significant developments in consumer needs and expectations, such as quicker and more accessible goods and services, increased openness, and personalization, have prompted insurance firms to adjust and adopt the agility expected in an increasingly technical and fast-paced business setting. In this respect, the word "Digital Insurance" was coined to describe a situation in which an insurance firm takes advantage of all possible solutions to make its offerings and operations more flexible and streamlined, while still employing a multi-channel distribution strategy Specifically, it is possible to deliver different types of services with a deeper examination of individual threats and increase the potential to produce revenue

by using technologies, intelligence, and data collected on policyholders. In terms of operations, the use of digital channels such as the internet, social media, and smartphones'apps allows businesses to not only cut costs and, as a result, lower product prices, but also to enable consumers to compare pricing and terms.

The omnichannel experience, which offers "a consistent experience across multiple channels through well-orchestrated delivery of dynamic, targeted and consistent content, offers, products, and service interactions", is becoming increasingly important for insurance providers' business models. The COVID-19 pandemic has been an accelerator of change and is having a significant impact on how people interact with one another through markets and geographical boundaries. Physical separation and other quarantine steps have moved practices that used to include in-person participation to digital and remote networks. To address these challenges, insurers will need to rethink their distribution model across three dimensions: customers, sales force, and enablers (such as investment in data and digital tools). Doing so will empower them to prepare for the unpredictable. One of the carrier's highest goals should be the opportunity to integrate life insurance into people's everyday lives and use life experiences as triggers for purchase.

In this context of digital innovation, enterprises around sectors are benefiting from Al. It is therefore unquestionable that it would be a crucial enabler for insurance firms to prepare for the threats and opportunities of their digital future. With adequate data on customer actions and AI algorithms building risk profiles, period times for buying a car, commercial, or life insurance policy can be reduced to minutes or even seconds. As telematics and in-home IOT systems proliferate and pricing algorithms mature, auto and home insurance providers will begin to refine their ability to issue premiums directly to a larger spectrum of consumers. We will see a new generation of mass-market instant issue products as AI pervades life underwriting and carriers develop the opportunity to recognize risk in a far more granular and advanced way. Customer self-service tools such as biometrics authorizations and, more prominently, chatbots are currently common AI technologies for effectiveness benefits, as shown by a number of existing insurance case studies. Insurance will become more customized, according to the forecast, and insurers using AI technology will be able to better identify what their customers need.

In the near future, the growth of the digital labour phenomenon and the ever-increasing use of new Intelligent Automation technologies will have important impacts on companies, both from an organizational point of view and in terms of human resource management. Many companies have already started programs and initiatives to automate some business activities, but often in a context of very fragmented and still undefined information systems. In many cases, there is a general uncertainty in defining the application areas of these initiatives, when to start them and, above all, how and how much to invest. Among all the Intelligent Automation technologies, today the one of greatest interest is Robotic Process Automation.

The expression Robotic Process Automation refers to those "intelligent" softwares able to automatically perform some repetitive activities, imitating the behaviour of the operators and interacting with the applications in the same way as a person would do, that is "taking control" of mouse and keyboard. With the acronym of RPA we refer to the category of "software robots", i.e. those applications that relieve the human being from manual tasks and duties related to repetitive activities.
RPA has a lot of benefits for companies

- Adaptability
- Improvement on data Analytics
- Lower costs and higher accuracy
- Organizational performance
- Security and compliance

Typically, companies would begin with RPA and look to automate low-value activities in order to reach a degree of scale of benefits by automating a large number of transactions. However, there is a stage at which the incentives cease to accrue Artificial intelligence systems can read, predict, and foresee based on available knowledge and historical evidence, while RPA systems can verify, analyse, collate, measure, and orchestrate routine and rule-based processes. This enables companies to examine end-to-end operations and develop Intelligent Automation programs strategically to reduce costs and maximize sales opportunities.

Smart Process Automation is a logical progression of RPA Technology, in which robots are tied together with AI technologies (such as Natural-Language Processing, Natural-

Language Generation, and Machine Learning) to perform cognitive tasks and simulate human behaviour, such as perceiving, collecting data, and thinking, in order to unlock higher-value opportunities.

Because of its cognitive ability, SPA is a game changer for consumers, capable of performing a wide range of tasks that are much more complex than pure robotics. This type of Intelligent Automation permits companies to:

- Reduce Operating Costs
- Grow the top line
- Have greater speed and velocity
- Improve customer experience
- Have greater return on human capital
- Improve employee morale
- Accelerate innovation within an organization
- Improve process quality
- Have greater levels of flexibility and scalability

Within large, data-intensive activities, SPA has a wide range of applications. High volume, routine processes loaded with unstructured data are common in active use cases. These usage cases include lower-level "head job" that does not require substantial subject matter experience, such as categorizing and removing unstructured data from various sources, in addition to traditional desktop UIs and structured data.

In the insurance industry, traditional Robotic Process Automation and Optical Character Recognition (OCR) have seen modest success. Smart Process Automation, on the other hand, will teach the industry the way forward. IA will help these companies change how they work in order to satisfy rising consumer needs and perform more efficiently. Although all of these technologies are new to the insurance industry, they will assist in scaling processes and creating resiliency in the face of traumatic incidents. IA can address complicated problems in insurance by automating not only a single process but an entire enterprise function.

Let us look at a particular example of a process that has been automated using an Intelligent Automation approach: claims intake or FNOL. This form of process may have been considered a bad candidate for RPA only a few years ago. Claims collection is a

time-consuming and labour-intensive operation that irritates both insurers and consumers. By automating the claims management workflow, businesses can save up to 80% on manual labour, helping them to process significantly more claims for the same number of employees. As a result of the fast feedback and fewer back-and-forth with customers during an already difficult period, the customer service improves. Insurers seeking to digest unstructured data (such as email attachments, handwritten notes, PDFs, and unlabelled data), which accounts for about 80% of all data in every business, will switch to cognitive computer reading (CMR). In comparison to conventional, manual processes, a CMR-enabled Intelligent Automation platform can analyse and process vast volumes of unstructured data and complex business contracts in a fraction of the time.

In the context of the digitalization and Intelligent Automation, Generali fits in, a company that is making great strides to meet all the challenges that come with the progress of innovation.

The Generali Group, founded in 1831 in Trieste, is one of the largest global insurance and asset management providers, with a successful history of 190 years. It is headed by Assicurazioni Generali S.p.A. and is present in 50 countries, with more than 72 thousand employees serving 65.9 million customers The emphasis in the insurance industry is moving away from "products" and toward "customers," from "safety and pay out" to "prevention and operation." In order to secure and expand their investments, customers are constantly searching for products that combine life and wealth management. As a result, Generali wants to become a "life-time companion" for its customers, following them at every stage of their lives and providing for all of their needs.

Generali 2021, the strategy that the company designed for the period 2019-2021, is based on three pillars:

- Profitable Growth
- Capital Management and Financial Optimization
- Innovation and Digital Transformation

Generali successfully met the market's challenges by relying on its key strengths: a consistent vision, an emphasis on technological competence, a powerful delivery network, the Group's strong capital base, and a diversified business model that proved robust even in a dynamic context like the pandemic. To allow for customized solutions

and faster product creation, they focus on creativity as a key driver for future growth. From a social and environmental perspective, Generali is also dedicated to high-value-added innovations as the multi-channel approach to distribute their products and provide all of their services and emerging technologies. The company is therefore undergoing a significant transformation as a result of the interplay and cumulative impacts of different technological developments: The Internet of Things, cloud services, cognitive computing, advanced analytics, Robotic Process Automation, Artificial Intelligence, 5G, and the evolution of mobile networks are all contributing to the creation of a new operating environment that will improve efficiency, operations, and closeness with customers, agents, and workers.

Because of the growing corporate culture, they have been able to combine platforms that allow us to exploit synergies from RPA and cognitive technologies, allowing more complex processes to be automated, improving quality and efficiency. Intelligent Automation is already a successful approach for Generali to assist legacy system modernization and process digitalization, allowing specialists to analyse, simplify, and reinvent the way the organization operates, due to greater computing capacity and data management capabilities. Insurers have substantial hurdles in serving consumers and communicating with agents and distributors, including minimizing manual and paper-based procedures, responding to consumer demand for speed and simplification, and avoiding skilled personnel performing low-value repetitive jobs.

Intelligent Automation is more than just optimizing operations for Generali. Due to increased market pressure, with consumers seeking more options, 24/7 adaptable services, and simple omni-channel interactions, such as in claims management, it has become critical to responding with agility: a powerful essential digital enabler of the Generali Digital Strategy. To help accelerate the Intelligent Automation journey, the company has established a Intelligent Automation Center of Excellence, which draws on the most advanced experiences developed in some Business Units to provide centralized services, as well as a dedicated Community of Practice, which is made up of experts from various functional areas who collaborate to define priorities, Identify the most relevant procedures and scale up local success stories, sharing lessons learned and promoting strategic projects across regions.

Generali's objective is to further leverage Intelligent Automation's benefits to have a direct impact on business, utilizing global experience and merging Group assets to assist expedite local projects and scale out projects across regions. Through the automation of operations, the digitization of their activities, and the modernisation of the backend systems, Intelligent Automation will enable them to further simplify processes and enhance customer and agent services, as well as staff experiences. Intelligent Automation of business processes has been very impactful in terms of benefits for the company. Almost all projects undertaken by the SPA area were able to pay back the investment within the year. Over the past 3 years, the company has invested around €4 million per year in process automation, thanks to which it has seen many benefits including:

- Increased accuracy of the operations performed by the bots
- Impact in terms of ROI, as automation generates 200 FTEs of efficiency per year, which equates to around €15 million in recurring cost savings, to which must be added the saving of several million euros in external costs.
- From a technical point of view, one benefit is the possibility of standardizing and therefore extending sample checks on the various company processes

One example of Intelligent Automation that is worth analysing is that of Chatbots, which have the potential to improve insurers' digital experiences and consumer interaction, but they also have the ability to boost the productivity of actual employees. Digital agents (Chat and Voice Bots) with language comprehension features work at the front desk, answering requests, completing tasks, and resolving issues such as policy and claim status reports, case next steps, instalment payment processing, and so on. Machine learning and cognitive capabilities have been added to these automation programs in order to get the best out of them. Chatbots are computer programs that use natural language and artificial intelligence to mimic human conversations. A chatbot was created to make human-computer contact easier. Advanced conversational AI chatbots for insurance can include omnichannel, round-the-clock, and multilingual service, to name a few obvious advantages.

Leo is the virtual assistant of Generali Italia. It was launched in 2019 and handles about 30,000 interactions per month on Generali.it website, MyGenerali app, WhatsApp and soon via voice channel. Its central nervous system consists of "Convy AI" technology

(developed by Expert System in partnership with Eudata) based on "Cogito" artificial intelligence, which through understanding natural language automatically responds to requests for assistance and information from customers. It is able to recognize about 90% of the intents with a semantic confidence of 86-100% and responds in real time 24/7. Leo's approach is designed to convey trust and reliability. Thanks to the quality of its engine, Leo recognizes the needs of the customer expressed in natural language and responds in a timely and comprehensive manner. He interprets and understands the meaning of documents and requests. At the end of the Experience, it proposes a survey to receive feedback on the usefulness of the conversation. Since it was introduced in October 2019, the chatbot has assisted customers to find the information they are looking for in their Customer Area on the Generali website or app. From that time to now, more and more topics have been introduced that the bot can handle and assist with. On the other hand, when the user requests something that the bot does not yet handle, it refers the user to an operator, so that the customer is always able to solve their problem.

In Generali, an important project concerns the automation of the management of claims settlements. That is why a chatbot has been released that allows customers to report a claim directly from their smartphone, on WhatsApp. Customers value smooth interactions and a speedy and effective claim settlement procedure in these scenarios. At the same time, insurance companies want to resolve the claim as soon as possible and make sure that they can discover fraudulent claims. They must be able to verify the claim's authenticity as well as the amount payable based on policy conditions and the degree of the damage. Insurers must achieve a careful balance between client pleasure and cost-effectiveness. Inefficiencies in claim settlement procedures can lead to litigation, which puts a strain on resources and harms a company's reputation, hence insurance firms want to prevent it as much as possible. Chatbots might anticipate whether future claims will have similar outcomes and offer preventative steps by recognizing commonalities in data from previous claims that resulted in litigation.

Leo, the virtual assistant that is also present on this channel, makes it possible to improve the customer experience, making the process of reporting and monitoring the claim faster and easier.

One of the Chatbot flows that is worth analysing in detail is that of Fast Cash Settlement, i.e. the flow through which the claim, in addition to being reported and opened, is also processed and settled automatically by the Chatbot. Only claims that have certain characteristics follow this flow: it must be the case that the customer is right, there is only one vehicle involved besides the user's and there are no injuries. So, the claims that have these characteristics have a separate management that provides, in addition to the requests of the standard flow, the upload of the complaint, documents and files such as photo, video and car to support the report. As well as opening the report and processing it, this process also makes it possible to exploit algorithms developed by Generali's Advanced Analytics division to process the files and draw up a settlement proposal for compensation for damage to the car, which the client may or may not accept. The algorithm recognises and manages to process the photos of the damage to the insured party's car so as to be able to give an estimate of the extent of the damage. At the end of the process, the customer is sent a damage settlement proposal.

Everything from the first contact, data collection, document upload and follow up on the progress of the claim, to the final settlement of the claim can be done in a convenient chat with a virtual assistant. Another goal of the project is clearly to automate a process that would traditionally be very complex, time consuming and employing multiple parties. In this way there is a large savings in terms of labour hours saved. In addition, there is a benefit of increased data quality and completeness, as the conversation cannot move forward if the client has not provided all the data requested by the bot.