

## Chapter 18.

# KEY INFORMATION TECHNOLOGIES IMPACTING THE ADVANCEMENT OF THE INSURANCE INDUSTRY

As of recently, the insurance industry has been at a pivotal point marked by significant innovation and transformation. The advancements in automation, AI, distribution channels, and cloud computing have established a robust foundation for a more dynamic future focused on customer needs.

Looking ahead, these trends are expected to intensify, with efforts directed toward scaling solutions, improving processes, and tackling challenges such as regulatory compliance and skill shortages. Insurers are increasingly utilising generative AI to revolutionise areas like claims processing and customer support. Additionally, embedded insurance models, where coverage is integrated directly into the customer journey, are becoming more prevalent, redefining the value insurers provide.

Process automation is transforming the insurance industry by moving beyond just reducing costs to becoming a key driver of operational excellence. Insurers are increasingly investing in advanced IT solutions to streamline core back-office functions like claims processing, underwriting, and policy management. This shift aims to eliminate inefficiencies by replacing outdated legacy systems with innovative technologies such as Robotic Process Automation (RPA), Artificial Intelligence (AI), and Machine Learning (ML).

Automating these processes helps insurers minimize delays, improve accuracy, and respond more quickly to customer needs and market shifts. The advantages extend past cost savings, leading to greater operational efficiency, faster service delivery, and higher customer satisfaction. It also enhances agent performance and employee retention. Overall, this comprehensive automation approach enables insurance companies to operate more smoothly, stay agile, and remain competitive in a fast-changing industry. By harnessing the power of process automation, insurers free up the fuel for innovation, sparking a transformation that reshapes their business model to thrive in today's fast-moving, ever-changing market landscape. Cloud computing continues to be a vital enabler, offering the necessary agility, scalability, and compliance support for the industry's ongoing digital transformation. Overall, these trends will significantly influence how insurers operate, innovate, and connect with their customers.

## 1. INSURANCE COMPANIES' MIGRATION TO CLOUD SOLUTIONS

Insurance companies are going through an intensive process of digital transformation, with cloud technology as an important factor in modern business. Insurance companies have traditionally been wary of adopting cloud technologies and have been slower in moving to cloud solutions compared to other financial sectors. The reason behind the slower transition to cloud solutions is the complex legislative framework that requires additional adjustments and compliance with regulations such as GDPR<sup>504</sup> and Solvency II<sup>505</sup>. However, cloud technologies are becoming more advanced and more secure, which is why insurance companies are increasingly investing in migration to cloud platforms.

Digitisation and advanced technologies such as artificial intelligence further highlight the need to move to cloud infrastructure. According to the Global Insurance Market Report 2024<sup>506</sup>, digitisation and AI are significantly improving insurance processes, reducing costs and improving customer experience. However, challenges such as high liquidity risks and cybersecurity risks require careful management. This is exactly where the cloud plays a key role. It gives insurance companies a scalable infrastructure for data analysis, effective risk management and optimisation of business operations.

All these factors increase the adoption of cloud solutions, especially in the segments of data processing, service personalisation and risk management. Companies that recognise these advantages and move to cloud infrastructure gain a greater competitive advantage.

### **Current situation and accelerated migration to cloud solutions**

The regulatory framework governing the use of cloud technologies in the insurance sector is becoming increasingly clear. It allows companies a faster and more secure migration from traditional IT infrastructures. Previous strict regulations and uncertainties around compliance were the key factors that slowed down insurance companies' transition to cloud solutions. However, the new IFRS

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<sup>504</sup> General Data Protection Regulation regulates the way of collecting, processing and storing EU citizens' personal data.

<sup>505</sup> The EU regulatory framework related to insurance and reinsurance companies.

<sup>506</sup> International Association of Insurance Supervisors (2024). *Global Insurance Market Report (GIMAR) 2024*, Basel: IAIS, p. 3.

9 and IFRS 17<sup>507</sup> standards put pressure on insurance companies to improve data management and financial reporting transparency, making the cloud a more attractive choice<sup>508</sup>. Also, more and more regulators recognise cloud technologies as a safe and effective solution, provided that data protection, information independence and risk management requirements are met.

Software-as-a-Service (SaaS) is becoming an increasingly dominant model in the insurance sector, as it allows faster implementation, reduces initial costs and easier integration with artificial intelligence (AI) and analytics tools. According to a January 2025 Carrier Management<sup>509</sup> report, insurance companies are increasingly embracing cloud computing and SaaS technologies due to their agility, scalability and cost effectiveness. By 91% of the world's insurance companies have started migrating to cloud technologies, which is a sharp rise compared to only 37% in 2020<sup>510</sup>. According to Abbas et al. (2015)<sup>511</sup>, cloud computing enables more efficient management of large amounts of data through advanced recommendation systems, which helps insurance companies optimise offers and reduce operating costs. This trend is especially true for personalised insurance plans that rely on data analysis and automated decision-making processes.

## **Key factors driving the shift to cloud infrastructure**

Insurance companies are increasingly moving to cloud infrastructure because it improves operational efficiency, flexibility and data security. Cloud solutions reduce IT infrastructure costs, improve process automation and allow for more efficient management of large amounts of data. In addition, they enable faster analysis and data-driven decision-making, which is key to insurance product optimization and risk management. According to Mateen et al. (2023)<sup>512</sup>, cloud technology brings insurance companies greater scalability and makes them more

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<sup>507</sup> International Financial Reporting Standards are issued by the International Accounting Standards Board (IASB) and refer to financial instruments and insurance contracts.

<sup>508</sup> International Association of Insurance Supervisors (2024), op. cit., p. 5.

<sup>509</sup> <https://www.carriermanagement.com/news/2025/01/07/270162.htm>

<sup>510</sup> <https://www.capgemini.com/news/press-releases/91-of-banks-and-insurers-have-initiated-their-cloud-journey-yet-many-are-unable-to-realize-full-business-value/>

<sup>511</sup> Abbas, A., Bilal, K., Zhang, L., & Khan, S. U. (2015). A cloud based health insurance plan recommendation system: A user centered approach. *Future Generation Computer Systems*, 43, p. 100.

<sup>512</sup> Mateen, A., Khalid, A., Lee, S., & Nam, S. Y. (2023). Challenges, issues, and recommendations for blockchain and cloud-based automotive insurance systems. *Applied Sciences*, 13(6), 3561, pp. 19-20.

resilient to challenges such as data security and fraud prevention, enabling more efficient real-time data storage and analysis.

Cloud technology plays a key role in the implementation of artificial intelligence and advanced analytics, allowing for more accurate risk assessment and faster claim handling. According to Sandhu (2021)<sup>513</sup>, big data and cloud computing are closely related because technological changes allow for distributed processing, parallel technologies, large storage power and real-time analysis of heterogeneous databases. This allows insurance companies to analyse vast amounts of data faster and more efficiently, which improves insurance product personalisation, fraud detection and valid decision-making. Also, the use of big data technologies improves fraud detection, identification of the insured behaviour patterns and optimisation of policy prices.<sup>514</sup>

In addition to analytics, cloud technology brings significant benefits in security and regulatory compliance. Modern cloud providers offer end-to-end encryption, multi-factor authentication and zero-trust architecture, which reduces the risk of cyber attacks and data loss. Mateen et al. (2023) emphasise that cloud infrastructure enables insurance companies to better control data access and have greater resistance to cyber threats, thereby increasing transparency and user trust.<sup>515</sup>

Due to these advantages, more and more insurance companies are rapidly moving to the cloud, not only to reduce operating costs, but also for a better ability to adapt to market changes. Investing in cloud technologies is no longer an option, but a strategic necessity for insurers who want to remain competitive and respond to the growing demands of the digital economy.

### **The impact of cloud technologies on competitiveness and risks in the insurance sector**

Insurance companies that timely adopt cloud technologies become more competitive because they can innovate faster, optimise business processes and improve user experience. By using cloud platforms, insurers significantly reduce IT infrastructure costs and speed up decision-making thanks to advanced analytics and process automation. According to the Global Insurance Market

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<sup>513</sup> Sandhu, A. K. (2021). Big data with cloud computing: Discussions and challenges. *Big Data Mining and Analytics*, 5(1), p. 36.

<sup>514</sup> Handoko, B. L., Mulyawan, A. N., Tanuwijaya, J., & Tanciady, F. (2020). Big data in auditing for the future of data driven fraud detection. *International Journal of Innovative Technology and Exploring Engineering*, 9(3), p. 2904.

<sup>515</sup> Mateen et al. (2023), op. cit., p. 19.

Report 2024<sup>516</sup>, digitisation and AI technologies reduce costs and improve customer experience. At the same time, regulators increasingly focus on the risks associated with the application of artificial intelligence and cloud infrastructure.

On the other hand, companies that delay the transition to the cloud face increasing operational risks, regulatory challenges and loss of market share. Outdated IT systems make it difficult to comply with new regulations and prevent rapid adaptation to market changes. Global Insurance Market Report (GIMAR) reports<sup>517</sup> show that insurance companies that do not optimise processes using cloud technologies are losing their competitive advantage, as their traditional systems face slower data processing and increased operational costs. The growing use of cloud solutions brings greater operational efficiency as it reduces costs and automates business processes. Research shows that switching from outdated local IT systems to the cloud can reduce IT infrastructure and maintenance costs by around 30%.<sup>518</sup> Such savings derive from economies of scale and cost per use, eliminating the need for large capital investments in hardware. In addition, cloud technologies enable insurers to optimise workflows, reduce manual errors and speed up data processing.

In the long term, cloud technologies will play a key role in the development of the insurance industry, allowing insurance companies to connect with advanced technologies such as blockchain, IoT and artificial intelligence. As digitisation advances, insurance companies will need to adapt or risk losing their competitive advantage over those that have already fully implemented cloud strategies.

## **2. GROWING IMPORTANCE OF LOW-CODE/NO-CODE PLATFORMS IN INSURANCE**

In the modern insurance sector, technological innovation is becoming a key factor in competitiveness and sustainable growth. Increasing demands for agility, operational efficiency and faster delivery of digital solutions are driving insurers to adopt low-code/no-code platforms. These technologies enable accelerated implementation of software solutions, business process optimization and flexibility in adapting to dynamic market conditions. In addition, their application significantly reduces IT development costs and increases the involvement of business users in the creation of digital products and services.

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<sup>516</sup> International Association of Insurance Supervisors (2024), op. cit., p. 23.

<sup>517</sup> Ibid, p. 17.

<sup>518</sup> <https://inubesolutions.com/resource/exploring-the-transformative-benefits-of-insurance-cloud/>

## Low-code/no-code platforms vs. traditional software solutions

Low-code and no-code platforms are becoming key tools for insurance companies to accelerate product development, automate processes and empower non-technical staff. The primary advantage of these tools is the speed of implementation. Traditional development of insurance software solutions can take months or even years, especially due to complex business rules and regulatory requirements. Low-code platforms simplify this process by providing visual interfaces and predefined templates, which significantly shorten development time.<sup>519</sup> Insurers are seeing significant improvements in speed of functionality, with most insurance companies adopting low-code technology reporting at least a 30% increase in development speed.<sup>520</sup>

Faster application delivery allows insurers to more easily adapt to customer needs, which is critical in an era where fintech and insurtech startups are innovating at high speed. The greater scalability afforded by the low-code methodology means that insurers can test new products or processes within weeks and then adjust them based on feedback. This agility in product development directly contributes to growth, as it allows insurers to market innovative products (e.g. on-demand insurance or usage-based products) before competitors.

Another key advantage of low-code/no-code technologies is process automation. Many insurance processes involve repetitive tasks that are amenable to automation. Low-code development enables the rapid creation of applications or workflows that automate routine tasks, often through integration with existing core systems. For example, low-code solutions have been used to optimise claims processing by enabling automatic data entry, validation and communication, thereby reducing errors and speeding up the claim settlement process.<sup>521</sup> Similarly, low-code tools can implement automated risk assessments, allowing insurers to make faster and more accurate decisions. By using low-code platforms, insurance companies can increase operational efficiency, reduce costs and improve user experience.

Many insurance companies have already realised significant benefits from the implementation of low-code/no-code technologies. For example, Allianz, one of the world's largest insurance companies, used low-code platforms to digitise

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<sup>519</sup> <https://insurance-edge.net/2024/08/02/low-code-platforms-revolutionizing-the-insurance-sector/>

<sup>520</sup> <https://www.mendix.com/blog/low-code-the-insurance-modernization-toolkit/>

<sup>521</sup> <https://insurance-edge.net/2024/08/02/low-code-platforms-revolutionizing-the-insurance-sector/>

internal workflows and accelerate the development of customer service applications.<sup>522</sup> Allianz has developed a modular “Building Block Platform” for the flexible creation of “plug and play” digital ecosystems. Another example is Zurich Insurance Group, which has adopted low-code tools to improve operational efficiency and create innovation for clients. Their team used low-code platforms to build applications, including an advanced claims processing tool and the “FaceQuote” app, which allows customers to get an insurance premium estimate using a photo.<sup>523</sup> These applications have helped Zurich improve user experience and optimise operations, while at the same time reducing IT development costs.

Low-code/no-code technologies are becoming an integral part of insurers’ digital strategy. Industry analysts predict strong growth in this area – for example, the global market for low-code applications is estimated to be around \$26.9 billion in 2023, an increase of 20% compared to 2022.<sup>524</sup> These projections confirm that low-code technologies are gaining importance.

## **Challenges and risks of applying low-code/no-code platforms in insurance**

Although low-code/no-code platforms bring significant advantages, their application in the insurance sector also carries certain risks that companies must carefully manage. Safety and regulation are one of the key challenges. By enabling application development outside of the IT sector, low-code/no-code tools can lead to oversight problems, creating so-called shadow IT, i.e. systems developed without formal IT control.<sup>525</sup> These systems often do not undergo rigorous security checks, increasing the risk of data leaks and non-compliance with regulatory standards. In the insurance industry, where data protection and regulatory compliance are crucial, any security breach can lead to major problems and loss of customer trust.

In order to reduce these risks, insurance companies must establish low-code/no-code development management frameworks. Most leading insurance companies already implement an approach in which the IT department retains control over

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<sup>522</sup> <https://binariks.com/blog/low-code-no-code-for-insurance/>

<sup>523</sup> Ibid.

<sup>524</sup> <https://www.infosysbpm.com/blogs/insurance/no-code-and-low-code-platform-in-insurance-the-future-is-multi-platform.html>

<sup>525</sup> <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/tech-forward/low-code-no-code-a-way-to-transform-shadow-it-into-a-next-gen-technology-asset>

business users who develop applications, forming teams to manage innovation and ensure security standards.<sup>526</sup>

In addition to security challenges, the technical limitations of low-code/no-code platforms can make their application in complex insurance processes difficult. Many tools are designed as general software platforms and lack specialized support for functions such as risk assessment, policy management or claims processing.<sup>527</sup> Insurers often have to make additional adjustments to these systems, which can cancel out the time and cost savings. Also, integration with outdated IT systems is a significant problem. Large insurers often use outdated IT systems that are not adapted to modern API connections, making it difficult to connect low-code applications with existing databases and computer systems.

Another challenge is the limited adaptability of low-code/no-code solutions. Although they enable rapid application creation, the flexibility of these platforms can be limited compared to traditional software development. Some specialized insurance applications may require advanced algorithms or specific requirements that low-code tools do not support. In addition, insurers that rely on one software vendor may face a vendor lock-in situation, where it is difficult to switch to another solution due to technical or contractual limitations.<sup>528</sup>

Finally, organisational changes and employee training are key factors in successful implementation. Although low-code/no-code tools are intuitive, they still require user training in order to effectively create applications in line with business needs and security requirements. Insurers must invest in training programs and clearly define what types of applications non-technical users can develop. To sum up, although low-code/no-code tools bring greater agility, insurers must carefully manage security, technical and organisational challenges to fully exploit their benefits.

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<sup>526</sup> <https://fivem.llc/modernizing-insurance-no-code-low-code/>

<sup>527</sup> <https://binariks.com/blog/low-code-no-code-for-insurance/>

<sup>528</sup> Pendyala, V., & Srirangam, R. K. (2024). Democratizing data insights: the impact of no-code/low-code platforms on business intelligence visualization. *International Journal of Research in Computer Applications and Information Technology (IJRCAIT)*, 7(2), pp. 647-661.

### 3. APPLICATION OF ARTIFICIAL INTELLIGENCE IN INSURANCE

#### The "Renaissance period" of artificial intelligence

In the last few years, we have witnessed a very rapid development of artificial intelligence (AI), which has been labelled as the "Renaissance period" of artificial intelligence. Compared to other technologies, artificial intelligence is much more powerful. The main reason for this is that AI is not a single technology, platform or tool, but a meta-technology that has enormous transformational power over other technologies. Artificial intelligence is the creator of tools and platforms, so it has the power to generate many systems.<sup>529</sup>

The history of artificial intelligence is about seven decades old. Its course of development was not linear, but rather a series of ups and downs. The following factors contributed to the latest "Renaissance" of the development of the field of artificial intelligence (the famous trinity of artificial intelligence<sup>530</sup>):

- vast amount of data – big data,
- Graphics Processing Units (GPU) hardware, and
- AI (ML) algorithms.

One of the basic characteristics of artificial intelligence is that the techniques and tools of artificial intelligence have the ability to be upgraded, i.e. to learn from data, which other types of software do not have. Artificial intelligence technologies move in the direction of implicit programming, where computers learn by themselves, as opposed to explicit programming, where a person "tells" the computer what to do.

AI evolution has gone in the following direction:

- The appearance of the *first theories in the field of artificial intelligence* was recorded during the 1950s;
- *Machine learning algorithms* were developed during the first decade of the 21st century;
- The development of *deep learning algorithms* (Recurrent Neural Networks, Convolutional Deep Neural Networks, Deep Feed Forward, etc.) dominated during the 2010s;

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<sup>529</sup> Suleyman, M., & Bhaskar, M. (2024). *The Coming Wave: Technology, Power and Twenty-first Century's Greatest Dilemma*. Entropia.

<sup>530</sup> Kureishy, A., Meley, C., & Mackenzie, B. (2019). *Achieving Real Business Outcomes from Artificial Intelligence, Enterprise Considerations for AI Initiatives*. Newton, MA: O'Reilly Media, Inc.

- The development of *generative AI* is characteristic of the first half of the 2020s, i.e. the current period.

## The application of Generative AI in Insurance

Generative AI (GenAI) is a field of artificial intelligence "that can create original content – such as text, images, video, audio or software code – in response to a user's prompt or request".<sup>531</sup> Generative AI belongs to the field of Machine Learning, or more precisely to the field of Deep Learning algorithms.<sup>532</sup>

In the field of GenAI the rapid development of Large Language Models (LLMs) has been noted. Among these models, the most famous is the ChatGPT model, which provides real-time answers to the user's questions in a human-like manner. This program can not only answer questions, but it can also write poems, stories, essays, solve math problems, classify things, write programming codes, etc. The application of ChatGPT is promising in many industries, including the insurance industry. In general, the application of GenAI in insurance can be manifold. It can contribute to increasing efficiency, effectiveness, operational efficiency, as well as improving customer service.<sup>533</sup>

Here are the main areas in insurance where GenAI can have a significant impact:<sup>534</sup>

- **Risk assessment and management:** GenAI can improve the management process, providing a more informed decision-making process regarding the approval of the insurance policy and the amount of the insurance premium, as well as creating simulations on various possibilities regarding the coverage for the particular claims;
- **Underwriting process:** GenAI is expected to offer faster and more efficient preparation of personalised insurance policies and ensure greater customer satisfaction;

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<sup>531</sup> Stryker, C., & Scapicchio, M. (2024). What is generative AI? *IBM*, March 22, 2024, <https://www.ibm.com/think/topics/generative-ai>

<sup>532</sup> <https://communities.sas.com/t5/SAS-Communities-Library/Where-does-GenAI-fit-within-the-AI-landscape/ta-p/915000>

<sup>533</sup> Pavlović, B. (2023). Application of ChatGPT in Insurance. In: *Challenges and Insurance Market's Response to the Economic Crisis*, Kočović, J. et al. (eds.), Belgrade: University of Belgrade, Faculty of Economics and Business, Chapter 25, pp. 455-473.

<sup>534</sup> Introduction to the Role of Generative AI in Insurance, <https://aisera.com/blog/chatgpt-generative-ai-in-insurance/>

- **Insurance claims processing:** GenAI can contribute to the significant improvement of insurance claims processing, such as the automation of certain processing tasks (input, processing and analysis of data, preparation of reports, etc.). GenAI can perform a detailed analysis of data of various types, identify trends, as well as significant deviations and outliers, thus providing an opportunity to predict future trends and prevent fraud. Also, GenAI can sort requests according to urgency and complexity, group them, and summarise voluminous text into shorter reports. All of the above contribute to lowering costs and shortening the processing time of requests. A good combination of the work of GenAI and human experts can generally achieve better performance of the entire insurance process, as well as improve user satisfaction;
- **Offering personalised products and services to clients:** GenAI provides the opportunity for insurance companies to offer their users specific products and services that are aligned with their characteristics, profiles, claims history, as well as, with their preferences. For these purposes, companies can prepare special AI platforms equipped with GenAI tools for conversation and providing answers to clients on various inquiries regarding the conditions and insurance policy. As part of this initiative, GenAI can include options such as an insurance copilot, which would contribute to the automation of issuing documents and insurance policies;
- **Extraction of useful business insights:** As in many other industries, GenAI can be applied in the insurance industry as well to analyse a vast amount of data, mainly unstructured data, making summary reports and recommendations for further steps that need to be taken in the company.

## The latest trends in the field of Generative AI

Bearing in mind that GenAI has become an extremely important topic in many industries, we show here further development perspectives of this type of artificial intelligence. We will recall the application of a well-known graphic display – Gartner's hype cycle, which can describe the life cycle of any new technology.<sup>535</sup> According to this presentation, the following five stages of the technology maturity can be distinguished:

- Technology Trigger,
- Peak of Inflated Expectations,
- Trough of Disillusionment,

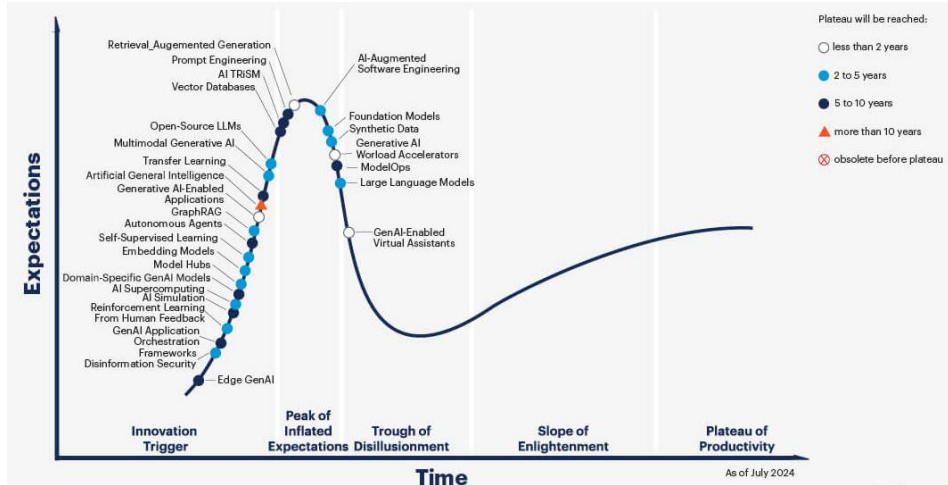
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<sup>535</sup> Linden, A., & Fenn, J. (2003). Understanding Gartner's hype cycles. *Gartner*, <https://web.archive.org/web/20230627173309/https://www.gartner.com/en/document/s/396330> (accessed 27.6.2023)

- Slope of Enlightenment, and
- Plateau of Productivity.

The GenAI has already passed the second stage of the life cycle and has entered the third stage – the Trough of Disillusionment (details can be seen on the Hype Cycle for Artificial Intelligence graph<sup>536</sup>). The development process of GenAI can be seen in Figure 1.

Figure 1. Hype Cycle for Generative AI



Source: Chandrasekaran, A. (2024). What's Driving the Hype Cycle for Generative AI. *Gartner*, November 14, 2024, <https://www.gartner.com/en/articles/hype-cycle-for-genai>

According to Gartner's review, various generative artificial intelligence technologies can be grouped into four categories: GenAI models, AI engineering tools, applications and use cases, and enablement techniques and infrastructure. The first group of GenAI models consists of the following technologies:

- **Foundation models** – Machine learning models with a large number of parameters that represent high-dimensional data, trained on a vast amount of data and can be applied in many different practical examples. Large Language Models (LLMs) are one example of these models;

<sup>536</sup> Jaffri, A. (2024). Explore Beyond GenAI on the 2024 Hype Cycle for Artificial Intelligence. *Gartner*, November 11, 2024, <https://www.gartner.com/en/articles/hype-cycle-for-artificial-intelligence>

- **Embedding models** – Algorithms used in machine learning for data encapsulation in order to facilitate work in a multi-dimensional space and translate complex data into vector embeddings;
- **Domain-specific GenAI models** – Models that are prepared to respond to the needs of specific industries. For example, domain-specific LLMs are special LL models that are prepared (trained) for a certain area or a special industry;
- **Edge GenAI** – GenAI algorithms and models that are used directly on local edge devices, such as sensors, IoT devices, cameras, microcontrollers, smartphones, PCs, laptops, or edge servers;
- **Artificial general intelligence (AGI)** – One area or type of artificial intelligence, which implies that a machine can perform any cognitive task that a human can perform.<sup>537</sup>

Another group of AI technologies consists of AI engineering tools. The main innovations in this area are: AI TRiSM – AI trust, risk and security management, Disinformation security, GenAI application orchestration frameworks and GraphRAG – techniques for improving retrieval-augmented generation (RAG) systems. From the field of AI applications and use cases, GenAI-enabled virtual assistants, autonomous agents, and the use of synthetic data obtained through simulation for training ML models stand out. In the fourth area, the emphasis is on innovations related to techniques and infrastructure, such as self-supervised learning, transfer learning, AI supercomputing, AI workload accelerators, AI simulation. Figure 1 reveals that all the mentioned technologies are in the first and second stages of maturity and implementation.

The future of Generative AI is marked by a high growth rate. According to one estimate, the growth of GenAI is expected at a compound annual growth rate of 37.3% from 2023 to 2030.<sup>538</sup> Also, it is estimated that only 5% of companies implemented GenAI applications in 2023, and predictions are that more than 80% of companies will use GenAI APIs or models in their production environment by 2026.<sup>539</sup>

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<sup>537</sup> <https://aws.amazon.com/what-is/artificial-general-intelligence/>

<sup>538</sup> Arya, N. (2023). The Future of AI: Exploring the Next Generation of Generative Models, *KD nuggets*, May 22, 2023, <https://www.kdnuggets.com/2023/05/future-ai-exploring-next-generation-generative-models.html>

<sup>539</sup> Chandrasekaran (2024), op. cit.

## 4. EMBEDDED INSURANCE – IT SUPPORT

The concept of embedded insurance refers to the integration of insurance products and services into products and services from other fields and industries. The idea of embedded insurance is not new. The recent interest for this idea has been fueled by various technological innovations. Unlike classic insurance, where the insurance process is separated from the products or services it covers, this type of insurance is included in the process of buying products and services and happens practically at the point of sale.

A classic examples of this type of insurance are: car insurance when buying and/or renting a car, travel insurance when booking a flight, electronic insurance – insurance plans for electronics and appliances, home appliances and furnishings, event ticket insurance – that covers cancellations or inability to attend the event, and so on.

Embedded insurance provides a specific experience for clients, such as:

- **Convenience:** The client can shorten the time and effort of involvement in purchasing insurance;
- **Customisation:** Instead of a uniform service for all clients, the client can be offered personalised services;
- **Accessibility:** Insurance is brought closer to the client, so even those clients who have not thought about buying insurance can relatively easily decide on it;
- **Improved coverage:** With embedded insurance clients can reach specific coverages that cannot be offered by traditional insurance;
- **Lower costs:** It is to be expected that policies are cheaper when purchased together with a product or service compared to the situation when an insurance policy is purchased separately.

In addition to the previous characteristics, embedded insurance provides a number of advantages for companies, such as: new revenue streams, increase customer retention, customer loyalty and engagement, cross-selling opportunities, open opportunities for creating new or changing existing business models, as well as opportunities to attract new investors, brand and market differentiation, etc.

In terms of technologies that support the concept of embedded insurance, the first is the application of cloud computing. The cloud-based platform *Insurance-as-a-Service* (IaaS), offering various insurance services as a software product, stands out. Other information technologies that support the idea of embedded insurance include *Application Programming Interfaces* (APIs) technology for connecting

service providers and users, while artificial intelligence and machine learning (ML) technology is used to perform data analysis that is essential for the implementation of the risk assessment process, as well as for the provision of specific personalised services and options for the customer. This type of analysis can be carried out on-premises, but there is an advantage to using cloud technology when the company stores a large amount of data in the cloud.<sup>540</sup> The processing and analysis of large amounts of data represents a significant challenge for every company, as it requires changing or redesigning the concept of business analytics according to new needs.<sup>541, 542</sup>

Obviously, the aforementioned innovations in the field of information technology create opportunities for insurance companies to relatively easily integrate personalised insurance offers using APIs and open access to their products. It is important to note that in the domain of embedded insurance, an important role is played by Insurtech companies (insurance technology companies), companies that create and develop different technological variants for the digitisation of insurance processes and services.

The concept of embedded insurance, together with the technology that supports it, can be seen as a game-changer for the insurance industry, as it provides the opportunity for insurance companies to realize in practice the well-known business slogan "provide the right services to the right person in the right place".

Table 1 shows the different models of embedded insurance and the corresponding IT support.

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<sup>540</sup> Chroneos Krasavac, B., Soldić-Aleksić, J., & Petković, G. (2016). The Big Data Phenomenon – Business and Public Impact. *Industrija*, 44(2), pp. 117-144.

<sup>541</sup> Soldić-Aleksić, J., Chroneos Krasavac, B., & Karamata, E. (2020). Business analytics: new concepts and trends. *Management: Journal of Sustainable Business and Management Solutions in Emerging Economies*, 25(2), pp. 15-29.

<sup>542</sup> Chroneos Krasavac, B., & Kaličanin, Đ. (2020). The Impact of Big Data and Business Analytics on the Competitiveness of Insurance Companies. In: *Insurance market after COVID-19*, Kočović, J. et al. (eds.), Belgrade: University of Belgrade, Faculty of Economics and Business, pp. 383-401.

Table 1. Technical requirements for different types of embedded insurance models

Embedded insurance model	Supporting information technologies
<p><b>Integration with products/services</b></p>	<p><b>API integration:</b> Seamless integration of insurance functionalities into third-party platforms.  <b>Digital platforms and core systems:</b> Support for integration and automation.  <b>User experience design:</b> Intuitive interfaces for bundled offerings.</p>
<p><b>On-demand insurance</b>  <b>Example:</b> A car-sharing app provides insurance only during vehicle use.</p>	<p><b>Automation and process optimisation:</b> Automatic policy activation and deactivation.  <b>Data analytics:</b> Real-time risk analysis for dynamic pricing.</p>
<p><b>Dynamic pricing</b>  <b>Example:</b> A car-sharing app offers insurance premium adjustments based on driving behaviour.</p>	<p><b>Data analytics:</b> Data analysis for defining pricing models.  <b>Flexible rating engine:</b> Use of real-time data for pricing adjustments.  <b>Telematics and IoT integration:</b> Connectivity with IoT devices and platforms.</p>
<p><b>Cross-selling through platforms</b></p>	<p><b>API integration:</b> Seamless integration for cross-selling.  <b>User experience Design:</b> Seamless cross-selling experience.</p>
<p><b>Subscription models</b>  <b>Example:</b> A user subscribes to a monthly car rental service that includes insurance.</p>	<p><b>Digital platforms and core systems:</b> Support for recurring billing and customer management.  <b>Automation and process optimisation:</b> Automated billing and notifications.</p>
<p><b>Contextual insurance</b>  <b>Example:</b> Short-term injury insurance tailored for high-risk activities offered during adventure sports.</p>	<p><b>API integration:</b> Real-time policy issuance during events.  <b>User experience (UX) and user interface (UI) design:</b> Seamless purchase experience during events.</p>
<p><b>Embedded in products offered by financial institutions</b>  <b>Example:</b> Credit cards with complimentary travel insurance, personal loans with built-in loan protection, and mortgage products with life insurance.</p>	<p><b>API integration:</b> Seamless integration with financial systems.  <b>Robust data management &amp; security:</b> Secure data sharing and compliance management.</p>

Source: Created according to the text: From Point of Sale to Point of Protection: The Journey of Embedded Insurance, September 2023, <https://blog.adacta-fintech.com/embedded-insurance>

Further on, we will provide some basic statistics on the prevalence of the concept of embedded insurance and on the future development of this concept.<sup>543</sup> According to research study by Drača et al. (2024), the vast majority of respondents (93%) in this research (insurance company executives and senior management from IT and business operations) believe that in the next short-term period of 5 years there will be significant or moderate growth in the field of embedded insurance. Also, 94% of respondents believe that embedded insurance will play an important or critical role in setting their business and digital strategies in the future. Nineteen per cent of companies have a complete implementation of the embedded insurance concept, while 55% of respondents have a moderate representation of embedded insurance in their business model. According to the answer of the respondents, the key reasons for considering the introduction of the concept of embedded insurance in the business models of insurance companies are as follows (listed in order of importance): enhance customer experience, increase revenue, extended market reach, access untapped market segments, defend market share from new entrants, foster innovation, and others. Key business partners for embedded insurance come from the following industries: financial institutions, health and wellness platforms/providers, automobile industry, travel industry, e-commerce platforms, electronic retailers, etc. The basic challenges in the future development and implementation of the embedded insurance concept can be grouped into three layers: the first layer relates to data privacy and regulatory compliance; the second layer includes the IT model integration, compatibility of various devices and systems, the prevention of fraud; the third layer refers to the need to the increase of consumer awareness of embedded insurance and improvement of marketing perception of this concept.

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<sup>543</sup> Drača, D., Plavec, S., Vukobrat, I., & Tomšič, A. (2024). *State of Embedded Insurance 2024, Current Adoption and Future Perspectives of Embedded Insurance across Insurance organizations, Europe*. Adacta.