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Article

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How do the barriers that prevent or hinder the applicability of artificial intelligence impact its use in an insurance company

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Abstract

Purpose – The purpose of this paper is to report on how the barriers that prevent or hinder the applicability of artificial intelligence (AI) impact its use in an insurance company.

Design/methodology/approach – Through bibliographic research, this paper maps the literature to identify the barriers to the use of AI by companies. After this, a qualitative single-case study, with descriptive characteristics, is conducted in an insurance company to verify if it is ready to adopt AI. Secondary data based on surveys of information technology consultancies were also used to provide greater consistency to the research.

Findings – This analysis showed that investments in these kinds of projects encounter organizational, financial and social barriers, such as a culture not focused on innovation, a lack of strategic IT alignment, a lack of knowledge of the potential or even the ability to carry out an adequate feasibility analysis. Based on the barriers presented by the case and AI initiatives, the researched company is using AI for automation and execution rather than using its transformative potential to be an agent of change across the organization. Most of the barriers to the adoption of AI are organizational rather than technical.

Research limitations/implications – The limitation of this study is it presents a single-case study, but this involves local cultural problems because companies are not open to supplying internal information to external researchers.

Originality/value – The value of this article lies in examining a real case in Latin America, raising the barriers to the adoption of AI, which has a different environment from Europe and the USA, presenting a company that has the freedom to choose local or international technologies.

Keywords Artificial intelligence, Alignment, Model, Applicability, Insurance

Paper type Research paper

1. Introduction

Insurance companies are investing in innovation to enhance their operational efficiency and customer relationships (Santos, Dias, & Oliveira, 2019; SINDSEG – Sindicato das Seguradoras no RS, 2020). While investing in artificial intelligence (AI) is one approach to achieving these goals, there is a lack of understanding about the value that AI can bring to businesses. A recent survey revealed that while 81% of 539 insurance company business and IT executives recognize technology's integral role in human experience, many companies are

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limiting its use to AI-driven automation and execution rather than leveraging its full potential to drive transformative change throughout their organization (Accenture, 2020). Furthermore, the insurance sector is heavily regulated by the state to safeguard customers and ensure that insurance policy provisions comply with the law, are reasonable and fair, and do not contain substantial gaps in coverage that could be misconstrued by consumers and leave them exposed. This has led lawmakers to debate how to facilitate the future evolution of the insurance industry, ensuring that consumers will not be vulnerable as well as propose frameworks to allow Open Insurance (EIOPA, 2021).

Following the global trends, the insurance market industry in Brazil has been preparing itself for the new challenges of the competitive environment, being aware that digital transformation is a deeper process, as it involves intensely transforming the company's culture with a focus on innovation, employee behavior, investment and returns analysis in relation to technology, in addition to the customer's view (Ferreira, 2019). To address these challenges, the Superintendence of Private Insurance (SUSEP) has declared its commitment to implementing Open Insurance. The objectives of this initiative include improving services for consumers, increasing competitiveness and reducing market concentration (SINDSEG – Sindicato das Seguradoras no RS, 2020). New services and products need to be developed using information from open data sources. This will allow insurers to gain a better understanding of their customers, and in turn, offer more suitable insurance policies at a more reasonable cost.

However, implementing these innovations poses challenges due to the need for cultural changes within the organization, strategic alignment of business and IT, employee training and technology investments (Pérez, 2019; Tavares, Pessôa, & Ciccone, 2020). Various adoption models highlight IT resources as essential assets for an organization (Maciá Pérez, Berna Martínez, & Lorenzo Fonseca, 2021), but the social relationships between business and IT leaders, knowledge sharing and dynamic capabilities can significantly impact the level of strategic alignment. Building upon this perspective, Tejada-Malaspina and Un Jan (2019) propose a model that incorporates intangible assets linked to strategic business–IT alignment and organizes them within a social network context.

Considering these problems and that IT should be a physical and intangible asset, this research aims to address the following question: how do the barriers that prevent or hinder the applicability of AI impact its use in an insurance company? To answer this question, bibliographic research was conducted in the Web of Science and Scopus databases to find out the barriers and issues that interfere with AI adoption. Based on the findings, an interview was conducted with an insurance company chosen for the single-case study. The results of this case study were complemented by secondary data obtained from surveys of information technology consultancy firms.

This article presents a case study from Latin America, which has a different environment from Europe and the United States. In this case, a company has the freedom of choice between local and international technologies.

The main contribution of the article is the survey of barriers that prevent or hinder the adoption of AI in insurance companies. The study shows that most of the barriers are organizational rather than technical. As a result, companies can invest in overcoming these barriers to increase the likelihood of successful adoption of this tool.

This paper is structured as follows: Section 2 explains the proposed methodology. Section 3 gives a brief definition of AI. Section 4 shows the challenges of AI adoption from the industry's perspective. Section 5 presents the use of AI from the insurance segment's point of view and presents the information collected during the interview. Section 6 analyzes the results, and Section 7 concludes the present paper.

2. Method

This section will explain the method used to achieve the aims of the present study.

This study can be classified as a qualitative single-case study, with descriptive characteristics (Yin, 2003). This single-case study can be classified as descriptive because a phenomenon (the “case”) is described in its real-world context and because the authors are trying to understand how AI is spreading or how useful it is in the insurance domain.

First, to methodologically analyze and synthesize high-quality literature. Second, to provide a solid basis for the research question and selection methodology, and finally, to demonstrate that the objectives of the study contribute something new to the knowledge of the fields (Levy & Ellis, 2006), bibliographic research was carried out in indexed databases, such as Web of Science and Scopus, to shed light on what barriers prevent or hinder the applicability of AI.

Second, an interview was conducted in an insurance company based on the main fields of AI application in this market (Eling, Nuessle, & Staubli, 2021) and the extended and deepened framework for AI adoption proposed by Pumplun, Tauchert, and Heidt (2020).

Third, research on secondary data extracted from technical reports provided by companies such as IBM (a survey conducted with a sample of 7,502 senior business decision-makers distributed in Europe, plus 1,000 respondents in Latin America region), KPMG, Capgemini (954 companies from diverse industries across 11 countries were surveyed for their ongoing AI initiatives and their annual revenues for the last financial year, with a minimum of \$1 billion reported. Examples of such companies include Zurich UK), Gartner, Deloitte, Ernst & Young (500 respondents, all US-based, aged 21 and above, who are employed by businesses with annual revenue of at least \$25 million) and McKinsey & Company were analyzed to compare with primary data collected on the case study. By choosing this type of literature, we can cover a wide range of sectors and enterprises from all over the world. The use of secondary data can address research questions that are challenging or impossible to answer through primary data collection. Furthermore, when researchers conduct a case study of a particular organization, it is essential to examine relevant documents from commercial providers to compare the results (Goode, Crego, Cary, Thornlow, & Merwin, 2016; Emerald Publishing, n.d.).

Finally, with the results of the first, second and third steps, the authors conducted an analysis to understand how insurance companies are adopting AI techniques and whether the barriers identified in the literature were found in the companies interviewed.

3. Artificial intelligence

The High-Level Expert Group on Artificial Intelligence (HLEG), an independent group of experts set up by the European Commission, offers the following comprehensive definition of AI:

“AI systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge or processing the information, derived from these data, and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behavior by analyzing how the environment is affected by their previous actions” (Ala-Pietilä *et al.*, 2019).

Eling *et al.* (2021) analyzed the impact of AI along the insurance value chain, identifying the use of expert systems and machine learning algorithms to capture, identify, understand and categorize structured and unstructured text, audio and image data. In this study, the authors used this approach to examine the use of AI applications such as voice and speech recognition and synthesis, facial recognition, sentiment detection, pattern and anomaly detection in data, and automated decision-making.

For Krogstie, Jaccheri, Rana, and Mikalef (2021) AI can bring the following added value to the business:

Points on governance, measurement, organizational structure and business models:

- (1) Emphasize the importance of governance to ensure the ethical and effective use of AI.
- (2) Discuss the need for appropriate metrics to assess the value generated by AI.
- (3) Explore how organizational structure influences the implementation and value generated by AI applications.
- (4) Highlight the importance of transparency in AI-based decision-making.
- (5) Analyze the different business models that can be developed around AI applications and how companies can profit from them.
- (6) Consider the role of various stakeholders in generating value from AI.

These points are crucial to understanding how AI can be a valuable strategic asset for organizations, positively influencing their performance and competitiveness. Each set addresses different yet complementary aspects of AI implementation and effective utilization to generate business value.

This chapter provides a broad definition of AI as human-created systems that operate in the physical or digital domain to achieve complex goals through data acquisition, interpretation, reasoning and decision-making. [Eling *et al.* \(2021\)](#) examine the impact of AI on the insurance value chain, with a particular focus on expert systems and machine learning algorithms for data processing. [Krogstie *et al.* \(2021\)](#) emphasize the value added by AI in business, focusing on data attributes, AI utilization, governance, measurement, organizational structure and business models. These aspects underscore the importance of AI as a strategic asset for organizations. When implemented and leveraged effectively, AI can help drive performance and competitive advantage.

4. Challenges to AI adoption from the industry's perspective

This section is a discussion of the challenges of AI adoption from an industry perspective.

Although AI encompasses a set of useful tools and techniques used to create value for the business, support the decision-making process and promote the development of sustainable business models ([di Vaio, Palladino, Hassan, & Escobar, 2020](#)), the challenges to its adoption have been studied for at least fifteen years. These challenges are categorized as technical, organizational and environmental, as shown in [Table 1](#):

The summary [Table 1](#) highlights a number of interrelated and complex challenges related to the implementation of AI in different sectors. The focus is on ethical, technical, organizational, privacy and regulatory issues. The quotes highlight concerns about the presence of bias in the data used to train AI models, the lack of transparency in AI models and the inherent limitations of AI-based solutions. Issues such as the need for experts in deep neural networks, corporate resistance to adopting AI, lack of resources and the importance of governance and transparency in the collection and use of data are also addressed. The complexity of the ethical, legal and technical issues involved in implementing AI highlights the need for a comprehensive and balanced approach to ensure the responsible and effective use of this innovative technology.

5. The case study

This section discusses the challenges of using AI from an insurance perspective and presents the case study.

Health insurance providers can use AI to improve the customer experience and back-office efficiency; reduce costs, fraud and risk; optimize premiums and create new business opportunities. However, like other segments, they are facing challenges such as ethical and regulatory ones, a lack of talent, poor data quality and issues related to the accuracy, bias and

Table 1. Challenges are categorized as: technical, organizational and environmental

	Authors
<i>Technical challenges</i>	
(1) Difficulty labeling training data, which is often done manually	Chui <i>et al.</i> (2018)
(2) Large data sets and the difficulty of explaining, in human terms, the results of complex models with large volumes of data	
(3) Transfer learning, in which an AI model is trained to perform a specific task and then quickly applies the learning to a similar but different activity	
(4) Risk of bias in data and algorithms, where AI models risk perpetuating existing social and cultural biases	
(5) Digitization and data processing: Slow progress in data processing and digitization can hinder the effective implementation of AI.	Toledo and Mendonça (2023)
(6) Technological infrastructure: Lack of adequate technological infrastructure can be an obstacle to implementing AI in public administration	
(8) Lack of usable and high-quality data	Cubric (2020) and Morgenstern <i>et al.</i> (2021)
(9) Applicability restrictions for some classes of domains	
(7) Non-reusability of the models	
(8) Lack of security, where devices applied to collect data might suffer cyberattacks	Hagendorff and Wezel (2020)
(9) <i>Outdated infrastructure</i> : The need to update existing technological infrastructure is cited as a challenge for the effective implementation of AI in Zimbabwe's insurance industry	Moyo, Watyoka, and Chari (2022)
(10) <i>Algorithmic discrimination</i> : Ensuring algorithms are not programmed to discriminate based on characteristics like gender, race, language, religion, social status etc.	Anshari, Almunawar, Masri, and Hrdy (2021)
(11) <i>Possibility of biases in data</i> : The presence of biases in the data used to train AI models can result in discriminatory and unfair decisions, amplifying or perpetuating discriminatory treatments in healthcare	Lima (2022)
(12) <i>Lack of transparency in models</i> : The low transparency of some AI models can hinder understanding of how decisions are made, which can generate distrust and impede acceptance of the technology	
(13) <i>Typical limitations of AI-based solutions</i> : It is important to recognize the inherent limitations of AI-based solutions, as well as to adopt a broad approach that takes into account the context in which the system is developed	
<i>Organizational challenges</i>	
1) Deploying specialized hardware in the corporate data center to meet regulatory or security mandates. This can result in huge capital expenditures	Chui <i>et al.</i> (2018)
(2) Need to establish strong data maintenance and governance processes	
(3) Lack of deep neural network specialists	
(4) Build an AI implementation strategy aligned with the organization's objectives	Singh, Hom, Abramoff, Campbell, and Chiang (2020), Henriques, De Vasconcelos, Pestana, and Rocha (2019), Rajam (2020)

(continued)

	Authors
(5) Need for business staff and managers skilled in algorithms and machine learning as well as technicians with business knowledge	Moldoveanu (2019), Nair (2019), Pumplun <i>et al.</i> (2020)
(6) Ensure that the potential of AI is explored when the methods and evidence are available, and the benefits are clear	Pumplun <i>et al.</i> (2020)
(7) <i>Financial constraints</i> : Quantitative and qualitative results indicate that financial constraints have a significant negative relationship with AI adoption	Moyo <i>et al.</i> (2022)
(8) <i>Lack of expertise</i> : The lack of knowledge and skills required to successfully implement AI is identified as a significant obstacle	
(9) <i>Resource shortages</i> : The lack of resources is highlighted as a challenge, including a shortage of expertise and high costs of AI-compliant products	
(10) <i>Transparency and consent</i> : Maintaining transparency in data collection and usage to build customer trust	Anshari <i>et al.</i> (2021)
(11) <i>Corporate resistance and lack of institutional capabilities</i> : Public servants may resist AI adoption due to fear of job loss and lack of trust in machines	Toledo and Mendonça (2023)
(12) <i>Need for training of public agents</i> : One of the biggest challenges is the need to train public servants to deal with new technologies	
(13) <i>Governance and transparency</i> : Issues related to governance and transparency can also hinder the adoption of AI in the Brazilian public sector	
<i>Environmental challenges</i>	
(1) Increased dependence on machines	Cubric (2020)
(2) Fear of job losses	
(3) Absence of knowledge and understanding about potential benefits	
(4) Safety issues	
(5) Lack of trust	
(6) Obstacles in embracing multiple stakeholder perspectives	
(7) Use and handling of sensitive personal information	Chui <i>et al.</i> (2018)
(8) The use of massively complex algorithms can raise issues of fairness and equity, bias in results, and questions of transparency and accountability	
(9) <i>Information privacy</i> : Addressing concerns about data privacy when utilizing AI in FinTech, and the need for regulations and principles to protect user privacy in the digital age	Anshari <i>et al.</i> (2021)
(10) <i>Consumer protection law</i> : The use of AI in financial services impacts consumer protection laws	Nizioł (2021)
(11) <i>Regulation of electronic persons</i> : The status of electronic persons and consumers in relation to AI systems is a current issue in EU law. Legislative actions are being taken to address civil law provisions on robotics, emphasizing the importance of privacy and security in AI development	

Table 1.

(continued)

Authors

(12) *Complexity of financial services*: Financial services, especially in the FinTech sector, are becoming more complex with the integration of AI technologies. Consumers may struggle to understand these hybrid services, leading to potential risks and challenges in consumer protection

(13) *Privacy and cybersecurity*: The growth of AI in financial transactions raises concerns about consumer privacy and cybersecurity

(14) *Education of consumers*: As AI's role in financial services expands, there is a need to educate consumers about these technologies

(15) *Moral dilemmas in adverse situations*: Ethical issues arise when programming autonomous vehicles to make decisions in emergency situations, such as choosing between saving the life of a pedestrian or that of the vehicle's passenger in case of an accident [Ravagnani \(2023\)](#)

(16) *Civil liability*: Defining responsibility in accidents involving autonomous cars is a legal and ethical challenge, as it raises questions about who is accountable in case of system failure

(17) *Ethical decision-making*: The algorithms used in autonomous vehicles must be programmed ethically, taking into account human values and ethical principles to ensure the safety and well-being of all involved

(18) *Trust and public acceptance*: Public trust in autonomous vehicle technology is essential for its widespread adoption

(19) *Complexity of damages*: Damages caused by AI can be complex and difficult to predict, making it challenging to determine the extent of coverage required by mandatory insurance [Silvestre \(2023\)](#)

(20) *Insurability of risks*: The unpredictable nature of damages caused by AI raises questions about the insurability of these risks and how insurers can manage them through actuarial techniques

(21) *Identification of responsible parties*: Assigning liability for damages caused by intelligent systems can be complicated, as it involves not only manufacturers and users but also those who have benefited from the technology

(22) *Need to encourage technological improvement*: It is essential to ensure that AI providers and operators are compensated for losses resulting from system failures to encourage technological improvement and prevent innovation stagnation

(23) *Regulation and oversight*: Establishing adequate regulation and effective oversight mechanisms are crucial to ensuring the effectiveness of mandatory insurance and protecting the fundamental rights of affected individuals

(24) *Ethical impacts*: It is essential to consider the potential ethical impacts of adopting AI solutions in healthcare, developing proportional governance models to ensure trust in the technology and mitigate possible negative consequences [Lima \(2022\)](#)

Source(s): Authors' own work

relevance of models, along with incorporating AI systems into the decision-making process and managing them (Dutt, 2020; Thesmar *et al.*, 2019). Particular attention should be paid to the relationship with the consumer, which is based on mutual trust. When customers realize they are interacting with an application, this trust can be compromised (Zarifis, Kawalek, & Azadegan, 2021).

For insurance companies in general, challenges include the need to retrofit legacy systems that cannot be integrated with new technologies, and many paper-based processes that result in a lack of digital quality (Kruse, Wunderlich, & Beck, 2019).

Damage caused by AI is an important issue that requires attention because it can have complex and unpredictable consequences, making it difficult to estimate the necessary insurance coverage. The unpredictable nature of AI-related damages raises concerns about insurers' ability to insure and effectively manage such risks. Liability for these harms is difficult to determine because it involves not just producers and users but also technological beneficiaries. Compensating for losses caused by system failures is critical for promoting technological growth and preventing innovation stagnation (Silvestre, 2023).

According to Eling *et al.* (2021), the main fields of application in the insurance market are language or text translation (voice/speech recognition, natural language generation and text analysis); recognition of patterns, trends and preferences (pattern and anomaly detection, predictive analytics and recommendation engines); computer visualization and content-based graphical information processing (image and video analysis, facial recognition and biometrics); and decision-making based on data (automatic decision-making). Moreover, the authors state that there is still a field to be explored with the use of AI to create new products, and new markets focused on customers.

Despite the digital transformation already underway in the insurance market, it is not occurring at the same pace. While some companies have taken this initiative by investing significantly in financial and human resources, others are still starting this process. This transformation is driven by operational efficiencies in underwriting, claims monitoring and risk diversification. The emergence of insurtechs, which have the characteristics of flexibility, intensive use of technologies and do not have the heavy structure of large companies, is an example of the digital transformation that is taking place (Pérez, 2019).

From this small selection of examples, it is clear that there is a need for innovation in the insurance sector. The solution to innovation depends on several factors and has therefore been implemented in different ways in the sector.

Regardless of the above threats, AI is being used to drive operational efficiencies in underwriting, claims monitoring and risk diversification. However, it is important to analyze the readiness of insurance companies to adopt AI. After discussing the challenges of using AI from an insurance perspective, the case study is described below.

The case study was conducted at a large insurance company that operates in several segments and is a benchmark for good service standards in Latin America. The interview was conducted with a Healthcare Chief Operating Officer to find out if the barriers previously described were also present in this insurance company.

The interview was divided into two parts. In the first part, the main fields of AI application in the insurance industry identified by Eling *et al.* (2021) were discussed. In the second part, a questionnaire based on the challenges categorized as technical, organizational and environmental was conducted.

The following paragraphs depict what was discussed in the first part.

Regarding *voice/speech recognition and natural language generation*, text analytics and natural language processing, the interviewee said that they could be used to help doctors complete patient records. In addition to this possible use, the company already uses OCR (optical character recognition) to read the invoices to provide reimbursements. The main challenge reported by the interviewee to implement this technology was the choice of the right partner to provide the best balance between investment and return. The respondent also judges that this technology is still immature to read unstructured data.

Concerning *sentiment detection*, the respondent said that it could be used in telemedicine to perform a patient triage. Here tests have been done, but the client's perception of additional steps before the doctor's appointment, without measurable benefits, has prevented its application. In addition, the lack of national enterprises with the necessary skills to perform this task has led to the need to hire foreign companies. In this case, two problems that prevent adoption are the high expense of translating the foreign language to Portuguese, and the rate of devaluation of the Brazilian currency against the United States dollar.

Concerning *pattern and anomaly detection* in data sets (text and/or images), the interlocutor reported that the company had been used for fraud detection in medical expense reimbursement. Regarding predictive analytics, the interviewee mentioned that it had been used for insurance premium forecasting.

With respect to a *recommendation engine*, the interviewee reported that they are using a third-party solution for issuing insurance policies and authorizing complex medical procedures. Integration with legacy systems was pointed out as a challenge that makes the adoption of this application difficult.

Concerning *facial recognition and biometrics*, the respondent mentioned that they are carrying out a study to adopt this technology to recognize the patient before the medical appointment. But, due to other priorities, it is not being used.

Regarding *automatic decision-making*, the interlocutor said that they are connecting it with the recommendation engine and intend to expand its use in the next years. The company is connecting the previously mentioned OCR to feed both the recommendation engine and automatic decision-making.

Concerning *image and video analysis*, the respondent mentioned neither its use nor any barriers.

The following paragraphs reproduce what was discussed in the second part.

From the *technical point of view*, the use of AI in insurance premium payments allowed the company to raise the amount of data used in decision-making, identify standard behaviors, inhibit fraud, and boost the adoption of good practices. However, there is no dissemination of the application of AI in the company, only in middle management.

Although the process implemented in the company is aligned with the AI application, they are making efforts to obtain a well-structured and integrated database to make the analytical process more organized. Regarding this, the respondent said that the relationship with third-party data analytics firms is difficult because some of them wish to become partners of the insurance company.

The AI implementation in the company has been based on the formulation of a concrete business case and following strategic planning, although the initiatives have been born at the team level. To achieve the objective of incorporating AI techniques in its business, the company has opted to accelerate startups, which are proving capable of turning ideas into action.

In terms of *organizational aspects*, there is top management support for AI adoption as well as change in the company culture. Some examples provided by the respondent are: training people on agile methods and concepts of startups and innovation; creating sponsors to help startups; applying the appropriate allocation of resources to the AI projects, even when there are doubts about the investment returns; bringing in third-party workers (60% of the workforce) to work together with the company's employees (40%); improving the level of data security; and developing AI projects along with universities. Although new solutions are already being developed in connection with AI techniques, the main problem mentioned is the difficulty of integrating them with legacy systems.

Regarding *environmental factors*, the company has areas that check whether all projects comply with the government regulations on customers' and collaborators' data privacy, in addition to monitoring how competitors are using AI. The interviewee pointed out that requirements from the insurance industry encourage AI adoption. In addition, the company uses insurance brokers to help customers to adopt new technologies.

6. Results analysis

Based on the question “How do the barriers that prevent or hinder the applicability of AI impact its use in an insurance company?”, this section will discuss the relationship between challenges found in the literature and the case study.

Secondary data from surveys by major IT firms were researched. These data are related to barriers in AI applications in insurance and other large companies, as described in the Methodology chapter.

The barriers that prevent or hinder the applicability of AI have a profound impact on its use within an insurance company, as highlighted by the interviewee in the case study. The challenges identified, such as ethical dilemmas in making decisions about autonomous vehicles, lack of talent to implement AI, poor data quality, high implementation costs and the need to spread the use of AI across the organization, directly affect the company’s AI initiatives.

The ethical concerns surrounding the programming of autonomous vehicles, as discussed by [Ravagnani \(2023\)](#) and [Lima \(2022\)](#), can create uncertainty about liability and insurability in accident scenarios, affecting risk assessment and claims handling. The lack of talent in AI implementation, highlighted by [Chui et al. \(2018\)](#) and [Cubric \(2020\)](#), hinders the company’s ability to use AI for tasks such as underwriting and fraud detection.

Moreover, issues related to poor data quality, as mentioned by [Cubric \(2020\)](#) and [Morgenstern et al. \(2021\)](#), can compromise the accuracy of AI algorithms used in insurance operations, affecting the decision-making process. In addition, the high cost of implementing AI solutions, as highlighted by [di Vaio et al. \(2020\)](#) and [Moyo et al. \(2022\)](#), poses financial challenges that can limit the scalability and effectiveness of AI initiatives within the company.

Furthermore, the widespread adoption and understanding of AI technologies within different departments may be hindered by the need to disseminate the use of AI across the company and a lack of transparency, as highlighted by [Cubric \(2020\)](#), [Lima \(2022\)](#) and [Toledo and Mendonça \(2023\)](#). This lack of transparency can lead to resistance and limited engagement with AI solutions, affecting their successful integration and use.

In summary, the barriers that prevent or hinder the applicability of AI have a significant impact on its use in an insurance company, as evidenced by the challenges faced by the respondents in the case study. Addressing these barriers through strategic planning, talent development, data quality improvements, cost-effective solutions, and improved transparency and dissemination of AI knowledge is critical to maximizing the benefits of AI in the insurance sector and overcoming the barriers identified by the interviewee.

Although the purpose of this paper is to find the barriers that prevent or hinder the applicability of AI in the insurance market, the respondent mentioned how his company is addressing some kinds of problems and solutions, as shown in [Table 2 \(Section 6.2\)](#).

Lastly, no technical problem found in the literature was mentioned by the interviewee. In addition, only the social problem of the use and handling of sensitive personal information was observed by the respondents.

Overall, based on the barriers presented by the case and AI initiatives, the researched company is using AI for automation and execution rather than using its transformative potential to be an agent of change across the organization ([Accenture, 2020](#)).

6.1 Secondary data

To further support the case, secondary data was collected on barriers to the adoption of AI. Publications were collected from major IT research and consulting firms such as Gartner, IBM, EY, Deloitte, KPMG, Capgemini and McKinsey&Company.

6.2 Consolidated results

A consolidated ranking of the citations for each of the barriers raised is provided in [Table 2](#) below. The [appendix](#) details the literature citations, case comments and secondary data for each of the barriers identified.

Table 2. Consolidated ranking of citations

The problems and their respective references in the literature, case and secondary data (*)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
<ul style="list-style-type: none"> • <i>Problem:</i> Moral dilemmas in adverse situations: Ethical, Civil liability and Regulatory issues arise when programming autonomous vehicles to make decisions in emergency situations, such as choosing between saving the life of a pedestrian or that of the vehicle's passenger in case of an accident (Ravagnani, 2023; Lima, 2022; Anshari et al., 2021; Nizioł, 2021; Ala-Pietilä et al., 2019) 	14+case + solution
<ul style="list-style-type: none"> • <i>Problem:</i> The need to disseminate the use of AI across the company/Lack of transparency (Cubric, 2020; Lima, 2022; Anshari et al., 2021; Toledo & Mendonça, 2023). <i>Mentioned by the interviewee:</i> There is no dissemination of the application of AI in the company, only in middle management 	13+case
<ul style="list-style-type: none"> • <i>Problem:</i> A lack of talent (Chui et al., 2018; Cubric, 2020; Nair, 2019; Moyo et al., 2022). <i>Mentioned by the interviewee:</i> The lack of national enterprises with the necessary skills to implement sentiment detection led to the need to hire foreign companies 	9+case + Solution
<ul style="list-style-type: none"> • <i>Problem:</i> Being sure to explore the potential of AI when methods and evidence are available and the advantage is clearly shown (Pumplun et al., 2020). <i>Mentioned by the interviewee:</i> Making the right choice concerning the partner that will provide the best balance between investment and return. Several benefits of AI did not bring the due economic return, leading to the decision not to adopt the technologies 	6+case
<ul style="list-style-type: none"> • <i>Problem:</i> Poor quality data (Cubric, 2020; Morgenstern et al., 2021). <i>Mentioned by the interviewee:</i> The use of OCR to read the invoices to provide reimbursements is still problematic when reading unstructured data 	5+case
<ul style="list-style-type: none"> • <i>Problem:</i> The need to redesign legacy systems (Kruse et al., 2019). <i>Mentioned by the interviewee:</i> Although the new solutions are being developed in connection with AI techniques, the difficulty of integrating them with legacy systems is being noted 	4+case
<ul style="list-style-type: none"> • <i>Problem:</i> The relationship with the consumer/ Consumer protection and Education (Dutt, 2020; Thesmar et al., 2019; Nizioł, 2021; Silvestre, 2023). <i>Mentioned by the interviewee:</i> The client's perception is that additional steps before the medical appointment could generate discomfort, with no measurable benefits in the use of sentiment detection. In addition, this solution would be very expensive and not worth the investment 	4+case
<ul style="list-style-type: none"> • <i>Problem:</i> Cost of the solution (di Vaio et al., 2020; Moyo et al., 2022). <i>Mentioned by the interviewee:</i> The lack of national enterprises with the necessary skills to implement sentiment detection led to the 	3+case

(continued)

The problems and their respective references in the literature, case and secondary data (*)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
<p>need to hire foreign companies. In this case, two problems that prevent the adoption are the high expense of translating the foreign language to Portuguese and the unfavorable exchange rate</p>	
<ul style="list-style-type: none"> • <i>Problem: Paper-based processes</i> (Cubric, 2020; Morgenstern et al., 2021). <i>Mentioned by the interviewee:</i> The use of OCR to read the invoices to provide reimbursements is still problematic when reading unstructured data 	2+case
<ul style="list-style-type: none"> • <i>Problem: Outdated Infrastructure:</i> The need to update existing technological infrastructure is cited as a challenge for the effective implementation of AI in Zimbabwe’s insurance industry (Moyo et al., 2022; Toledo & Mendonça, 2023) 	2
<ul style="list-style-type: none"> • <i>Problem: Complexity of Damages:</i> Damages caused by AI can be complex and difficult to predict, making it challenging to determine the extent of coverage required by mandatory insurance (Silvestre, 2023) 	1
<ul style="list-style-type: none"> • <i>Problem: Digitization and data processing:</i> Slow progress in data processing and digitization can hinder the effective implementation of AI (Toledo & Mendonça, 2023) 	1
<ul style="list-style-type: none"> • <i>Problem: Algorithmic discrimination:</i> Ensuring algorithms are not programmed to discriminate based on characteristics like gender, race, language, religion, social status, etc. (Anshari et al., 2021) 	1
<ul style="list-style-type: none"> • <i>Problem: Possibility of biases in data:</i> The presence of biases in the data used to train AI models can result in discriminatory and unfair decisions, amplifying or perpetuating discriminatory treatments in healthcare (Lima, 2022) 	1
<ul style="list-style-type: none"> • <i>Problem: Typical limitations of AI-based solutions:</i> It is important to recognize the inherent limitations of AI-based solutions, as well as to adopt a broad approach that takes into account the context in which the system is developed (Lima, 2022) 	1
<ul style="list-style-type: none"> • <i>Problem: Financial Constraints:</i> Quantitative and qualitative results indicate that financial constraints have a significant negative relationship with AI adoption (Moyo et al., 2022) 	1
<ul style="list-style-type: none"> • <i>Problem: Corporate resistance and lack of institutional capabilities:</i> Public servants may resist AI adoption due to fear of job loss and lack of trust in machines (Toledo & Mendonça, 2023) 	1
<ul style="list-style-type: none"> • <i>Problem: Need for training of public agents:</i> One of the biggest challenges is the need to train public servants to deal with new technologies (Toledo & Mendonça, 2023) 	1

Table 2.

(continued)

The problems and their respective references in the literature, case and secondary data (*)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
<ul style="list-style-type: none"> • <i>Problem:</i> Trust and public acceptance: Public trust in autonomous vehicle technology is essential for its widespread adoption (Ravagnani, 2023) 	1
<ul style="list-style-type: none"> • <i>Problem:</i> Insurability of Risks: The unpredictable nature of damages caused by AI raises questions about the insurability of these risks and how insurers can manage them through actuarial techniques (Silvestre, 2023) 	1
<ul style="list-style-type: none"> • <i>Problem:</i> Identification of Responsible Parties: Assigning liability for damages caused by intelligent systems can be complicated, as it involves not only manufacturers and users but also those who have benefited from the technology (Silvestre, 2023) 	1
The following is only a citation of secondary data that does not have a counterpart in the study	
<ul style="list-style-type: none"> • <i>Problem:</i> The difficulty in relationships with third-party firms/Providers (Singh et al., 2020; Silvestre, 2023). <i>Mentioned by the interviewee:</i> The relationship with third-party data analytics firms is difficult because some of them wish to become partners of the insurance company 	2+case
<ul style="list-style-type: none"> • <i>Problem:</i> Potential impact on jobs: Generative AI solutions have the potential to automate many tasks that are currently performed by humans. (KPMG, 2023), (Mahto & Miller, 2022), (Citations of secondary data that has no counterpart in the previous study) 	2
<ul style="list-style-type: none"> • <i>Problem:</i> The need to establish strong data maintenance and governance processes and build an AI implementation strategy aligned with the organization's objectives (Chui et al., 2018) 	1+Solution
<ul style="list-style-type: none"> • <i>Problem:</i> Replacing traditional, stable, and secure information technology systems with new, more flexible ones, using agile approaches (Kruse et al., 2019). <i>Mentioned by the interviewee:</i> The company is making efforts to obtain a well-structured and integrated database to make the analytical process more organized 	1+case + Solution
Details of the solutions proposed by the interviewee for some of the problems are already consolidated in the items above	
<ul style="list-style-type: none"> • <i>Problem:</i> The need to establish strong data maintenance and governance processes and build an AI implementation strategy aligned with the organization's objectives (Chui et al., 2018). <i>The solution mentioned by the respondent:</i> Ensure top management support for AI adoption, change the company's culture, and apply the appropriate allocation of resources to the AI projects 	
<ul style="list-style-type: none"> • <i>Problem:</i> Ethical and regulatory issues, as well as issues with the use and handling of sensitive personal data (Ala-Pietilä et al., 2019). <i>The solution mentioned by the respondent:</i> To solve this problem, the company is improving the level of data security, in addition to having areas that check whether all projects comply with the government regulations regarding customers' and collaborators' data privacy 	
<ul style="list-style-type: none"> • <i>Problem:</i> Replacing traditional, stable and secure information technology systems with new, more flexible ones, using agile approaches (Kruse et al., 2019). <i>The solution mentioned by the respondent:</i> The company is making efforts to obtain a well-structured and integrated database to make the analytical process more organized 	
<ul style="list-style-type: none"> • <i>Problem:</i> A lack of talent (Chui et al., 2018; Cubric, 2020; Nair, 2019). <i>The solution mentioned by the respondent:</i> Training people on agile methods and concepts of startups and innovation; bringing in third-party workers (60% of the workforce) to work together with the company's employees (40%) and developing AI projects along with universities 	

Source(s): Authors' own work

The surveys conducted by these companies involved hundreds of participating companies in dozens of countries on several continents, some of them with revenues of around a billion dollars. It is therefore considered that these surveys provide secondary data with a high degree of consistency. The consistency of the secondary data with the literature review and the case presented should also be mentioned. Further evidence of this consistency, as shown in the [Appendix](#), is that the ratio of barriers cited in the literature to those cited in the case matched those cited by Gartner, IBM, EY, Deloitte, KPMG, Capgemini and McKinsey&Company.

Figure 1 shows the distribution between data sources among the 25 problems found in the literature, case studies and secondary data. It can be seen that the main characteristics of the barriers to the adoption of AI are organizational rather than technical nature. Understanding these barriers is fundamental to taking steps to remove them and reaping the benefits of technology.

7. Conclusion

The objective of this work, which is to report on how the barriers that prevent or hinder the applicability of AI affect its use in an insurance company, was achieved in a single-case study and complemented with research using secondary data from surveys carried out by I.T. consulting firms.

A total of twenty-five barriers were found, eleven of which appeared in the case study research and eight of which appeared in the secondary data research.

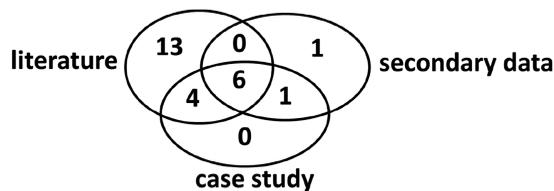
In the case study, there was no evidence of a broader strategic plan for the implementation of AI systems, although middle management does have some applications in use.

The top five most frequently cited barriers show that the majority are organizational in nature: ethical and regulatory issues, the need to spread the use of AI throughout the organization, lack of talent, many benefits of AI not providing a financial return and poor data quality.

The value of this article is that it highlights a real case in Latin America, which has a different environment from Europe and the US and presents a company that has the freedom to choose local or international technologies. Another contribution of this research is to bring solutions pointed out by the study case to remove the barriers.

The limitation of this study is that it presents a single-case study, but this involves a local cultural problem because companies are not open to providing internal information to external researchers. The use of secondary data based on consultancy firm surveys does, however, bring greater consistency to the results.

Future studies could complement this research by applying this model to other insurance companies to examine the first results of using AI. This study could be complemented with maturity models to understand the level of maturity of these companies.



Source(s): Authors' own work

Figure 1. Venn diagram of problem distributions among data sources

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Table A1. Challenges are categorized as: technical, organizational and environmental: in a detail view

In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
<ul style="list-style-type: none"> <i>Problem:</i> Moral dilemmas in adverse situations: Ethical, Civil liability and Regulatory issues arise when programming autonomous vehicles to make decisions in emergency situations, such as choosing between saving the life of a pedestrian or that of the vehicle's passenger in case of an accident (Ravagnani, 2023; Lima, 2022; Anshari et al., 2021; Niziol, 2021) 	Ethical and regulatory issues, as well as issues with the use and handling of sensitive personal data	(1) <i>Regulatory and ethical considerations:</i> AI raises a number of ethical and regulatory concerns, such as privacy, security, bias, and accountability. Organizations need to ensure that their AI systems comply with relevant laws and regulations, and that they are developed and used in an ethical and responsible manner, (Capgemini RESEARCH INSTITUTE, 2020)	(1) <i>Regulatory and ethical considerations:</i> The use of AI can raise regulatory and ethical considerations, particularly in industries such as healthcare and finance where the potential impact of AI on human lives is significant. These considerations can create a barrier to adoption, particularly in organizations that are risk-averse, (McKinsey&Company, 2018); (2) They should also invest in training and development programs to ensure that employees understand the ethical and legal implications of using generative AI, (KPMG, 2023); (3) Using AI to manipulate people's thinking and behavior: AI systems may be used to influence or manipulate people's thoughts, feelings, or actions, which can raise ethical and moral concerns (Mahto & Miller, 2022); (4) Security and data privacy concerns Security and data privacy are two important concerns about the use of AI,	14+case + solution

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
			<p>(COSTA, 2023); (5) Concerns about data privacy and security: The use of AI can raise concerns about data privacy and security, particularly in industries such as healthcare and finance w[[parms resize(1),pos(50,50),size(200,200),bgcol(156)]]re risk-averse, (McKinsey&Company, 2018); (6) Security concerns: Generative AI solutions can create new security risks, such as data breaches and cyberattacks, (KPMG, 2023); (7) Safety concerns about AI-powered systems: AI systems may pose physical or cybersecurity risks if they are not properly designed, tested, and maintained, (Mahto & Miller, 2022); (8) Inability to ensure data privacy or appropriately manage consent: AI systems may collect and process sensitive data, which can raise concerns about privacy and consent, (KPMG, 2023); (9) Use of AI for surveillance: AI systems may be used to monitor and track</p>	

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
<ul style="list-style-type: none"> <i>Problem:</i> The need to disseminate the use of AI across the company/Lack of transparency (Cubric, 2020; Lima, 2022; Anshari et al., 2021; Toledo and Mendonça, 2023). <i>Mentioned by the interviewee:</i> There is no dissemination of the application of AI in the company, only in middle management 	There is no dissemination of the application of AI in the company, only in middle management	<p>(1) <i>Explainability and transparency:</i> As AI systems become more complex and autonomous, it becomes increasingly difficult to understand how they make decisions. This can lead to issues with accountability, bias, and trust, (Capgemini RESEARCH INSTITUTE, 2020)</p>	<p>employees, which can raise concerns about privacy and autonomy (Mahto & Miller, 2022)</p> <p>(1) Many people are not convinced of the benefits of AI This is a concern that hasn't been on Costa's radar in previous surveys. By not seeing the business advantages of AI, people and organizations end up resisting its widespread adoption, (COSTA, 2023); (2) Lack of management understanding (24%) (EY, 2019). (3) Unclear applications: Many businesses struggle to understand how generative AI can be applied to their specific industry or use case, (KPMG, 2023); (4) Lack of explainability and transparency in AI-derived decisions: AI systems may make decisions that are difficult to understand or explain, which can lead to mistrust and skepticism among employees, (Mahto & Miller, 2022); (5) Lack of</p>	13+case

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
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understanding of AI and its potential benefits: Many organizations are still in the early stages of understanding what AI is and how it can be used to create value. This lack of understanding can lead to skepticism and resistance to change, (McKinsey&Company, 2018); (6) Using AI to manipulate people's thinking and behavior: AI systems may be used to influence or manipulate people's thoughts, feelings or actions, which can raise ethical and moral concerns (Mahto & Miller, 2022); (7) People prefer contact with other people: One of the factors for people giving up on using AI is the robotic behavior of the technology (COSTA, 2023); (8) Resistance to change and cultural barriers: The adoption of AI can require significant changes to existing processes and systems, which can be met with resistance from employees, (McKinsey&Company, 2018)

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
<ul style="list-style-type: none"> <i>Problem:</i> A lack of talent (Chui <i>et al.</i>, 2018; Cubric, 2020; Nair, 2019; Moyo <i>et al.</i>, 2022). Mentioned by the interviewee: The lack of national enterprises with the necessary skills to implement sentiment detection led to the need to hire foreign companies 	<p>There is a lack of talent or knowledge for the application of sentiment detection. In addition, it is believed that establishing previous steps with the client for this application would cause discomfort</p>	<p>(1) <i>Talent shortage:</i> There is a severe shortage of skilled professionals who can develop, (Capgemini RESEARCH INSTITUTE, 2020)</p>	<p>(1) <i>Lack of talent:</i> Generative AI is a complex technology that requires specialized skills and expertise, (KPMG, 2023); (2) <i>Lack of talent:</i> Generative AI is a complex technology that requires specialized skills and expertise, (COSTA, 2023); (3) <i>Limited availability of AI talent and expertise,</i> (McKinsey & Company, 2018); (4) <i>Limited AI skills, experience or knowledge</i> (17%) (IBM, 2022)</p>	<p>9+case + Solution</p>
<ul style="list-style-type: none"> <i>Problem:</i> Being sure to explore the potential of AI when methods and evidence are available and the advantage is clearly shown (Pumplun <i>et al.</i>, 2020). <i>Mentioned by the interviewee:</i> Making the right choice concerning the partner that will provide the best balance between investment and return. Several benefits of AI did not bring the due economic return, leading to the 	<p>Projects do not always present a <i>favorable result considering costs and benefits</i></p> <p>There is a lack of talent or knowledge for the application of sentiment detection. In addition, it is believed that establishing previous steps with the client for this application would cause discomfort. Moreover, this solution has a very high cost in relation</p>	<p>(1) <i>Lack of compelling return on investment</i> (27%) (EY, 2019); (2) <i>Lack of investment and a clear business case:</i> Many businesses are hesitant to invest in generative AI because they don't see a clear business case for it (KPMG, 2023); (3) <i>Reliability concerns:</i> <i>Generative AI solutions are not always reliable and can produce unexpected results,</i> (KPMG, 2023); (4) <i>Potential bias or low-quality results</i> of AI algorithms: AI systems may produce biased or inaccurate results if they are trained on biased</p>	<p>(1) <i>Lack of compelling return on investment</i> (27%) (EY, 2019); (2) <i>Lack of investment and a clear business case:</i> Many businesses are hesitant to invest in generative AI because they don't see a clear business case for it (KPMG, 2023); (3) <i>Reliability concerns:</i> <i>Generative AI solutions are not always reliable and can produce unexpected results,</i> (KPMG, 2023); (4) <i>Potential bias or low-quality results</i> of AI algorithms: AI systems may produce biased or inaccurate results if they are trained on biased</p>	<p>6+case</p>

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
decision not to adopt the technologies	to the return from implementation		or incomplete data, (Mahto & Miller, 2022); (5) Unclear business case (21%) (EY, 2019).	
<ul style="list-style-type: none"> • <i>Problem:</i> Poor quality data (Cubric, 2020; Morgenstern et al., 2021). <i>Mentioned by the interviewee:</i> The use of OCR to read the invoices to provide reimbursements is still problematic when reading unstructured data 	Low maturity level for OCR applications	(1) <i>Data quality and availability</i> (Capgemini RESEARCH INSTITUTE, 2020)	(1) <i>The problem is that some of them don't have the data ready</i> for it, (COSTA, 2023); (2) <i>Lack of quality data to train AI models;</i> (McKinsey&Company, 2018); (3) Data complexity (17%) (IBM, 2022)	5+case
<ul style="list-style-type: none"> • <i>Problem:</i> The need to redesign legacy systems (Kruse et al., 2019). <i>Mentioned by the interviewee:</i> Although new solutions are being developed in connection with AI techniques, the difficulty of integrating them with legacy systems is being noted 	There are also difficulties in integrating AI applications with current legacy systems	(1) <i>Integration with existing systems:</i> AI systems need to be integrated with existing IT infrastructure and business processes, which can be challenging due to differences in data formats, protocols, and standards, (Capgemini RESEARCH INSTITUTE, 2020)	(1) <i>Difficulty in integrating AI with existing processes and systems,</i> particularly in organizations with complex legacy systems (McKinsey&Company, 2018); (2) Complexity or difficulty in integrating and scaling AI projects (20%) (IBM, 2022)	4+case
<ul style="list-style-type: none"> • <i>Problem:</i> The relationship with the consumer/ Consumer protection and 	The relationship with third-party data analysis companies is difficult			4+case

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
<p>Education (Dutt, 2020; Thesmar <i>et al.</i>, 2019; Nizioł, 2021; Silvestre, 2023). <i>Mentioned by the interviewee:</i> The client's perception is that additional steps before the medical appointment could generate discomfort, with no measurable benefits in the use of sentiment detection. In addition, this solution would be very expensive and not worth the investment</p>	<p>because some of them want to become partners with the insurer</p>			
<ul style="list-style-type: none"> <i>Problem:</i> Cost of the solution (di Vaio <i>et al.</i>, 2020; Moyo <i>et al.</i>, 2022). <i>Mentioned by the interviewee:</i> The lack of national enterprises with the necessary skills to implement sentiment detection led to the need to hire foreign companies. In this case, two problems that prevent the adoption are the 	<p>The lack of national enterprises with the necessary skills to implement sentiment detection led to the need to hire foreign companies. In this case, two problems that prevent the adoption are the high expense of translating the foreign language to Portuguese and the unfavorable exchange rate</p>		<p>(1) <i>Cost issues: Implementing generative AI solutions can be expensive, (KPMG, 2023); (2) Research has indicated that the main barriers to AI adoption for Brazilian companies are high prices (29%), (IBM, 2022), High costs of implementing AI solutions (McKinsey&Company, 2018); (3) limited funding (20%) (EY, 2019)</i></p>	<p>3+case</p>

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
<p>high expense of translating the foreign language to Portuguese and the unfavorable exchange rate</p> <ul style="list-style-type: none"> • <i>Problem:</i> Paper-based processes (Cubric, 2020; Morgenstern et al., 2021). <i>Mentioned by the interviewee:</i> The use of OCR to read the invoices to provide reimbursements is still problematic when reading unstructured data • <i>Problem:</i> Outdated Infrastructure: The need to update existing technological infrastructure is cited as a challenge for the effective implementation of AI in Zimbabwe's insurance industry (Moyo et al., 2022; Toledo and Mendonça, 2023) • <i>Problem:</i> Complexity of Damages: Damages caused by AI can be complex and difficult to predict, making it 	<p>There is no widespread dissemination of the application of AI in the company, only in middle management</p>			2+case
				2
				1

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
challenging to determine the extent of coverage required by mandatory insurance (Silvestre, 2023)				1
<ul style="list-style-type: none"> • <i>Problem:</i> Digitization and data processing: Slow progress in data processing and digitization can hinder effective implementation of AI (Toledo and Mendonça, 2023) 				1
<ul style="list-style-type: none"> • <i>Problem:</i> Algorithmic discrimination: Ensuring algorithms are not programmed to discriminate based on characteristics like gender, race, language, religion, social status, etc. (Anshari et al., 2021) 				1
<ul style="list-style-type: none"> • <i>Problem:</i> Possibility of biases in data: The presence of biases in the data used to train AI models can result in discriminatory and unfair decisions, amplifying or perpetuating discriminatory 				

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
treatments in healthcare (Lima, 2022)				
<ul style="list-style-type: none"> • <i>Problem:</i> Typical limitations of AI-based solutions: It is important to recognize the inherent limitations of AI-based solutions, as well as to adopt a broad approach that takes into account the context in which the system is developed (Lima, 2022) 				1
<ul style="list-style-type: none"> • <i>Problem:</i> Financial Constraints: Quantitative and qualitative results indicate that financial constraints have a significant negative relationship with AI adoption (Moyo et al., 2022) 				1
<ul style="list-style-type: none"> • <i>Problem:</i> Corporate resistance and lack of institutional capabilities: Public servants may resist AI adoption due to fear of job loss and lack of trust in 				1

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
machines (Toledo and Mendonça, 2023)				
<ul style="list-style-type: none"> • <i>Problem:</i> Need for training of public agents: One of the biggest challenges is the need to train public servants to deal with new technologies (Toledo and Mendonça, 2023) 				1
<ul style="list-style-type: none"> • <i>Problem:</i> Trust and public acceptance: Public trust in autonomous vehicle technology is essential for its widespread adoption (Ravagnani, 2023) 				1
<ul style="list-style-type: none"> • <i>Problem:</i> Insurability of Risks: The unpredictable nature of damages caused by AI raises questions about the insurability of these risks and how insurers can manage them through actuarial techniques (Silvestre, 2023) 				1
<ul style="list-style-type: none"> • <i>Problem:</i> Identification of Responsible Parties: Assigning liability for 				1

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damages caused by intelligent systems can be complicated, as it involves not only manufacturers and users but also those who have benefited from the technology (Silvestre, 2023)				
<i>The following is only a citation of secondary data that does not have a counterpart in the study</i>				
<ul style="list-style-type: none"> <i>Problem:</i> The difficulty in relationships with third-party firms/Providers (Singh et al., 2020; Silvestre, 2023). <i>Mentioned by the interviewee:</i> The relationship with third-party data analytics firms is difficult because some of them wish to become partners of the insurance company 	The relationship with third-party data analytics firms is difficult because some of them wish to become partners of the insurance company			2+case
<ul style="list-style-type: none"> <i>Problem:</i> Potential impact on jobs: Generative AI solutions have the potential to automate many tasks that are currently performed by humans. (KPMG, 2023), (Mahto & Miller, 2022), 			(1) Potential impact on jobs: Generative AI solutions have the potential to automate many tasks that are currently performed by humans. This can create concerns about job displacement and unemployment, (KPMG, 2023); (2)	2

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(Citations of secondary data that has no counterpart in the previous study)			Elimination of jobs due to AI-driven automation: AI systems may automate tasks that were previously performed by humans, which can lead to job displacement and economic disruption (Mahto & Miller, 2022)	
<ul style="list-style-type: none"> <i>Problem:</i> The need to establish strong data maintenance and governance processes and build an AI implementation strategy aligned with the organization's objectives (Chui <i>et al.</i>, 2018) 				1+Solution
<ul style="list-style-type: none"> <i>Problem:</i> Replacing traditional, stable and secure information technology systems with new, more flexible ones, using agile approaches (Kruse <i>et al.</i>, 2019). <i>Mentioned by the interviewee:</i> The company is making efforts to obtain a well-structured and integrated database to make 	The company is making efforts to obtain a well-structured and integrated database to make the analytical process more organized			1+case + Solution

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
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the analytical process more organized

Solutions proposed by the interviewee for some related problems

- *Problem:* The need to establish strong data maintenance and governance processes and build an AI implementation strategy aligned with the organization’s objectives (Chui et al., 2018). *The solution mentioned by the respondent:* Ensure top management support for AI adoption, change the company’s culture, and apply the appropriate allocation of resources to the artificial intelligence projects
- *Problem:* Ethical and regulatory issues, as well as issues with the use and handling of sensitive personal data (Ala-Pietilä et al., 2019). *The solution mentioned by the*

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects	The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)	Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution
<p><i>respondent:</i> To solve this problem, the company is improving the level of data security, in addition to having areas that check whether all projects comply with the government regulations regarding customers' and collaborators' data privacy</p> <ul style="list-style-type: none"> • <i>Problem:</i> Replacing traditional, stable and secure information technology systems with new, more flexible ones, using agile approaches (Kruse <i>et al.</i>, 2019). <i>The solution mentioned by the respondent:</i> The company is making efforts to obtain a well-structured and integrated database to make the analytical process more organized • <i>Problem:</i> A lack of talent (Chui <i>et al.</i>, 2018; Cubric, 2020; Nair, 2019). <i>The</i> 				

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In summary, the interviewed executive mentioned the following barriers to implementing AI projects

The secondary data survey mentioned the following barriers to implementing AI projects. (Including insurance companies)

The secondary data survey mentioned the following obstacles to the implementation of AI projects (companies from various sectors)

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Classification by number of citations per barrier, occurrence of the barrier in the case and in the solution

solution mentioned by the respondent: Training people on agile methods and concepts of startups and innovation; bringing in third-party workers (60% of the workforce) to work together with the company's employees (40%), and developing AI projects along with universities

Source(s): Authors' own work

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