NOVA IMS Information Management School

MDSAA

Master Degree Program in

Data Science and Advanced Analytics

Business Cases with Data Science

Case 4: Fidelidade Chatbot

Alice Viegas, 20240572

Bernardo Faria, 20240579

Dinis Pinto, 20240612

Daan van Holten, 20240681

Philippe Dutranoit, 20240518

Group A

NOVA Information Management School

Instituto Superior de Estatística e Gestão de Informação

Universidade Nova de Lisboa

May, 2025

1 EXECUTIVE SUMMARY

Fidelidade, Portugal's leading insurance provider, faces a common challenge: many of its clients (and even some of its agents) find it difficult to fully understand its more complex savings and investment products. Low financial literacy across the country, paired with technical product features, often makes it harder to explain these solutions clearly. This issue stands out particularly with products like Fidelidade Savings and PPR Evoluir. These were designed to offer strong long-term value, but clients often feel confused or overwhelmed when they're first introduced.

To address this, our team was asked to build an AI assistant that would help agents during their conversations with clients by giving them reliable, simple, and accurate answers in real time. The aim was to make it easier for agents to explain products, reduce friction in conversations, and help more clients understand and consider the options available. On top of that, the tool had to be scalable, easy to integrate, cost-aware, and compliant with legal and regulatory standards. To meet these needs, we followed a two-pronged approach:

- **Custom GPT (using OpenAI's platform):** This allowed for fast development and early testing, and it worked well in terms of language clarity and usability. But it came with clear limitations. The GPT doesn't offer API access, can't be integrated into internal systems, and requires a license for each user.

- **Azure GPT-4o:** We also developed an alternative version using Azure integrated with GPT-4o. This approach enables system-level integration and operates on a usage-based pricing model. Although it required more initial setup effort, it offers better alignment with Fidelidade's infrastructure and long-term strategic objectives.

Ultimately, we chose to move forward with the Azure GPT-4o solution. While both versions performed well in terms of response quality and user experience, the Azure setup stood out for its scalability, integration capability, and cost-effectiveness in the long term. Evaluation criteria included prompt response accuracy, conversational fluidity, adaptability to document updates. Azure's potential compatibility with Fidelidade's IT architecture, support for API-based access, and centralized governance also made it more suitable for future implementation and maintenance.

1.1. USING THE CHATBOT

Custom GPT (using OpenAI's platform) can be access through this link given that you have a OpenAI account:

https://chatgpt.com/g/g-6831c81413888191980279c0fe371046-fidelidade-case-4-gpt-chatbot

Azure GPT-4o: To have access to this chatbot you should run the python file and at the end you wil be able the use it

2 BUSINESS NEEDS AND REQUIRED OUTCOME

This part sets the base for everything that follows by looking at Fidelidade's situation, what challenges their sales agents face, and what the AI assistant is supposed to help with. We go through the business context, the financial literacy problem, what we expect the assistant to do, how we'll know it's working, what resources and constraints we have, and the technical goals behind it all. The idea is to make sure that what we're building with data actually makes sense and helps Fidelidade grow by giving agents something useful and practical.

2.1. BUSINESS CONTEXT

Fidelidade is the biggest insurance provider in Portugal. It offers a wide range of products that support clients throughout their lives, from life and health insurance to savings and investment plans. This leadership comes not just from the variety of products, but also from how the company has been investing in digital tools that help agents be more efficient and build stronger relationships with clients.

The project comes at a time when that leadership is facing new challenges. While Fidelidade is expanding internationally, one of its priorities is still to strengthen its position in the Portuguese market. A major opportunity here is related to a persistent problem, Portugal has some of the lowest financial literacy levels in Europe. Many people don't feel confident managing money or making long-term financial decisions, which ends up limiting their ability to grow their savings. This is a challenge, but also a space where Fidelidade can add value.

To support this, the company wants to improve how complex financial products are explained. The project focuses on two products in particular: Fidelidade Savings and PPR Evoluir. These are long-term savings and investment solutions designed for different client profiles. They have features like capital guarantees, index-linked returns, multiple investment options, and automatic adjustments based on the client's age. All of this adds value, but also creates complexity that agents have to explain clearly, and quickly.

The overall financial environment also adds pressure. With low interest rates, uncertainty in global markets, and rising interest in ESG investments, clients are often hesitant to engage with anything they don't fully understand. In many cases, they go for simpler products even if they're not the best fit. Helping clients better understand more advanced solutions is one way to improve this.

That's why the company is developing an AI assistant, to help agents get the right information faster, answer questions clearly, and free them up to focus more on trust and connection with the client.

2.1.1 FINANCIAL LITERACY GAP

Financial literacy is still one of the biggest issues in the Portuguese market, especially when it comes to savings and investment products. A large part of the population struggles with basic financial concepts like inflation, diversification, or compound interest. Portugal is regularly at the bottom of EU rankings in this area. This leads to poor saving habits and a general reluctance to explore financial products that seem complex or unfamiliar.

And it's not just about clients. Some agents and financial professionals also find it difficult to explain the technical details of certain products confidently. This creates a cycle: clients avoid what they don't understand, and agents don't prioritize complex products because they take longer to explain or are harder to sell.

This is something we see within Fidelidade. The simpler products (the ones that are easier to explain) are the ones that sell most. Meanwhile, products like Fidelidade Savings and PPR Evoluir, which often offer more value or better tax benefits, are underused because they're harder to communicate.

Closing this gap isn't just a public service, it's a smart business move. It helps clients make better decisions and opens more space for Fidelidade to grow. And it gives agents the support they need to talk about products with more clarity and confidence.

2.2. BUSINESS OBJECTIVES

The goal of this project is to help Fidelidade's agents explain financial products, especially the complex ones, in a faster, clearer, and more consistent way.

Right now, agents spend a lot of time going over technical details like tax rules, capital guarantees, and how investment options work. That takes time away from what matters more: understanding the client's needs and recommending the right solution.

By leveraging an AI assistant trained on official documentation and FAQs, Fidelidade aims to streamline the sales process in several ways. The assistant is expected to increase both product usage and sales, especially for advanced products that are traditionally harder to explain. It will also enhance agent efficiency by reducing time spent searching for information or repeating the same explanations over and over. In addition, the tool offers valuable support for new or less experienced agents, giving them real-time access to answers during sales interactions.

Beyond efficiency, the assistant helps ensure that messaging remains consistent, compliant, and based on verified and up-to-date content from official sources. This, in turn, contributes to building greater trust with clients by improving the clarity and transparency of the information they receive.

The chatbot is not there to replace the human element: it's a tool to help agents do their job better.

2.3. BUSINESS SUCCESS CRITERIA

To ensure the chatbot solution truly adds value to Fidelidade, the project is guided by three core success criteria:

Performance: The chatbot must deliver accurate, clear, and helpful responses about Fidelidade's key products (My Savings and PPR Evoluir), common asked questions by clients and agents, and financial literacy topics relevant to the sales context. Performance also includes the chatbot's conversational quality, ability to handle follow-up questions, and use of professional, client-friendly language.

Real-Life Costs: The solution should be cost-efficient to deploy and maintain, especially if scaled to multiple users. This includes development costs, user access costs, and any infrastructure or hosting requirements.

Implementation & Integration Potential: A successful solution must be easy to integrate into Fidelidade's internal systems (e.g., CRM, intranet, mobile apps). It should support real use cases, such as assisting sales agents in real-time, managing users and tracking interactions, and embedding into client support workflows.

2.4. DETERMINE DATA MINING GOALS

These criteria will be tested and assessed using scenario-based testing with real-world questions from agents and clients, detailed cost breakdowns for both small- and large-scale deployments, and an integration analysis to assess technical and organizational compatibility with Fidelidade's systems. This approach ensures the project is not only functional, but also practical, scalable, and aligned with Fidelidade's operational needs.

2.5. SITUATION ASSESSMENT

We have already highlighted Portugal's very low levels of financial literacy, among the lowest in Europe, and how this limits clients' confidence in making long-term financial decisions and contributes to the underperformance of complex savings and investment products, such as Fidelidade Savings and PPR Evoluir. Despite their long-term value, these products are often overlooked in favor of simpler options that are easier to explain.

Currently, agents rely heavily on their personal knowledge and experience to communicate product details, as there is no AI-based tool to assist them during sales interactions. This lack of real-time support not only places additional pressure on agents but also contributes to inconsistent messaging and missed opportunities to promote high-value solutions. Addressing this gap through an intelligent assistant is essential to strengthening Fidelidade's market leadership, enhancing client understanding, and empowering agents to deliver clearer, more confident guidance.

2.6. DETERMINE DATA MINING GOALS

Although traditional data mining techniques are not applied in this project, this phase focuses on leveraging the language model to extract and generate accurate, context-relevant responses from structured sources. The objective is to transform static documentation into dynamic, conversational support that aligns with Fidelidade's communication standards and regulatory requirements.

3 METHODOLOGY

To address Fidelidade's challenge and meet the defined success criteria, we adopted a two-track approach. We first built a chatbot using OpenAI's custom GPT, trained on Fidelidade's internal documents. We then built a scalable, API-based solution, using the Azure OpenAI Assistant feature. By following this dual-track strategy, we not only deliver a practical solution but also empower Fidelidade with options tailored to different levels of technical readiness and investment.

3.1. DATA UNDERSTANDING AND PREPARATION

The first step included understanding the nature and the scope of the information required by sales agents interacting with the chatbot. Data sources included product documentation, frequently asked questions (FAQs), internal Fidelidade guidelines and regulatory documents, as well as competitive research conducted by Fidelidade. Additional inputs came from websites provided by Fidelidade in

their presentation, including competitors' websites and authoritative sources on financial regulations and literacy.

Not all provided materials were incorporated into the chatbot implementation. Certain websites restricted web scraping and were therefore excluded. These sources could enhance the assistant's performance in the future, should access be authorized. Additionally, the PDF file *"Questions_Answers_Censored"* was intentionally left out of the chatbot's training data to allow for an unbiased manual evaluation of the assistant's performance.

Unlike other projects, in this case no further data preparation steps were required. The documents and websites were used directly as inputs to the model, serving as the only sources of information for generating accurate and context-aware responses.

3.2. PROMPT

The same prompt was used in both chatbots, ensuring that their comparability was maximized. The prompt was divided into two parts: the function and the restrictions. In the first part, the function clearly defines the role of the assistant as a virtual support agent for Fidelidade sales agents, specifying its responsibilities, such as providing accurate, up-to-date information on the My Savings and PPR Evoluir products, answering frequently asked questions on financial literacy, and clarifying doubts about insurance and financial products. It also establishes the desired tone and communication style (professional, empathetic, accessible, and concise) and emphasizes the importance of relying solely on provided content and always citing sources. Additionally, it guides the assistant to suggest useful next steps when appropriate, following the format and style of official Fidelidade FAQ documents.

The second part outlines the restrictions that the assistant must follow. It mandates language consistency, requiring responses to always match the user's language without mixing languages in the same reply. It emphasizes maintaining focus by politely redirecting conversations that stray from Fidelidade products or financial literacy topics. The assistant is instructed to base its answers exclusively on the supplied documents, responding courteously when questions fall outside its knowledge scope. It should ask for clarification if a question is ambiguous or incomplete. Finally, when a query requires personalized analysis or cannot be fully addressed, the assistant is advised to suggest contacting a Fidelidade agent or using official channels for further support.

This comprehensive prompt clearly defines the chatbot's role, outlining exactly what it can and cannot do without ambiguity. It also provides example responses to establish the chatbot's tone and style, ensuring consistent and appropriate communication.

3.3. CUSTOM GPT CHATBOT

The first model developed was a functional chatbot using OpenAI's Custom GPT. Built on the robust ChatGPT architecture, this model required minimal setup, relying primarily on a well-crafted prompt and internal Fidelidade documentation. The goal was to create a simple yet effective solution capable of answering real product questions, simulating client interactions, and supporting agents in their day-to-day work. This version prioritized accuracy, ease of use, and rapid deployment. The final output is a shareable link, accessible without a premium account (though having one is recommended for unlimited interaction).

3.4. AZURE OPENAI CHATBOT

For this model, we used the Azure OpenAI Assistant feature, an API-based solution that ingests the documents prepared during the data preparation phase. The model was configured with a Temperature of 0.15 and Top P of 0.35, parameters chosen to prioritize response accuracy and alignment with the source material. These settings minimize randomness and ensure that the chatbot remains focused on providing precise, reliable answers—aligned with Fidelidade's request for a highly accurate and trustworthy tool.

To prepare the documents for processing by the assistant, the text was divided into smaller, overlapping sections called "chunks." Each chunk contains up to 400 characters, with about 80 characters shared between consecutive chunks. This overlap helps maintain the flow of information and ensures that important context isn't lost between sections. By breaking the text into manageable pieces while preserving continuity, the assistant can better understand and respond to questions based on the original content.

All extracted chunks, whether from PDFs, TXT files, or selected websites, were saved in an Azure-compatible format and uploaded to a vector store. This vector store functions as the assistant's memory, enabling it to retrieve relevant information quickly and accurately based on the meaning of each query. The entire process was automated to ensure consistency, efficiency, and full alignment with the official sources provided by Fidelidade.

The outcome of this solution was a fully functional prototype designed with flexibility and scalability in mind. This prototype can be seamlessly integrated into any platform that Fidelidade chooses: whether that be a mobile application, a website, or a customer relationship management (CRM) system. Its adaptable architecture ensures that it can support a variety of user interfaces and workflows, enabling Fidelidade's agents to access the AI assistant wherever it is most convenient and effective for their sales processes. This versatility not only future-proofs the solution but also facilitates broader adoption across different channels, maximizing its impact on agent productivity and customer engagement.

3.5. EVALUATION

In this project, performance was evaluated through manual assessment of the chatbot responses. Success was defined by how closely the answers generated by both chatbot prototypes matched the ideal responses defined by Fidelidade. To carry out this evaluation, we used the PDF *"Questions_Answers_Censored"*, selecting one representative question for comparison. The responses from both chatbots were then measured against the expected answer. For a detailed comparison of the results, refer to Figures 2, 3, and 4 in the Appendix.

4 RESULTS EVALUATION

The manual evaluation of both chatbot responses showed a high level of alignment with the ideal answers defined by Fidelidade. Responses were accurate, clear, and followed the expected tone, supporting the objective of helping agents explain complex financial products, such as tax rules and investment options, in a simpler and more consistent way.

These performances suggest that both chatbots can effectively reduce the time agents spend searching for information or repeating technical explanations, directly contributing to greater

efficiency. They also offer valuable support to newer agents by providing quick, reliable access to official content during client interactions.

While these results are promising, a full assessment of business impact, such as increased sales or reduced handling time, requires testing both implementations in a real-world environment. A pilot rollout, combined with metrics like agent satisfaction, time saved per interaction, and product uptake, would allow Fidelidade to validate and optimize the chatbots contribution to its sales process.

5 DEPLOYMENT AND MAINTENANCE PLANS

5.1. DEPLOYMENT

5.1.1 CUSTOM GPT CHATBOT

To implement the chatbot a link could be shared to the sales agent via intranet, CRM or corporate communication system of choice. The GPT should have restricted access (single sign on) to limitate sensible leakage to competitors and therefore ensure only authenticated agents can launch it.

5.1.2 AZURE OPEN AI CHATBOT

For deployment, Fidelidade could enable the Microsoft Teams channel in its Azure Bot Service and provision the Web Chat channel to generate both a Teams App link and an embeddable iframe URL. These endpoints can then be distributed to agents via the intranet, CRM sidebar, or corporate communications platform of choice. Access would be secured through Azure AD single sign-on, ensuring only authenticated users may invoke the chatbot and preventing any unauthorized exposure. For a fully integrated experience, the Web Chat iframe or a deep link to the Teams app can be embedded directly within the internal portal or sales workflow tool, allowing the Azure-hosted GPT-4o assistant to feel like a native component of the agents' daily toolkit.

5.2. FINANCIAL PERSPECTIVE

For every company cost plays a big role in the decision-making process. The two different tools offer very different cost profiles.

5.2.1 CUSTOM GPT CHATBOT

Custom GPT requires each user to have an OpenAI account. While a Pro subscription isn't strictly necessary to use the chatbot, we recommend it, otherwise, agents are limited to a maximum of 20 prompts per day. At €22.63 per user per month, providing Pro licenses for 2 000 agents would cost approximately €45 260 monthly. This calculation assumes the company covers the subscription, alternatively, the company could require agents to bear the cost themselves

5.2.2 AZURE OPEN AI CHATBOT

For the Azure chatbot, In the analysis we assume that Fidelidade already subscribes to Microsoft 365, because of that it can leverage Azure Active Directory's Free tier at no additional charge to provide single sign-on for the GPT-4o chatbot. Agents simply authenticate with their existing corporate credentials. If the company later requires more advanced identity management, dynamic groups, self-service password reset, or risk-based Conditional Access, it can upgrade selected users to Azure

AD Premium P1 at approximately €5.33 per user per month; however, this isn't necessary to launch or operate the chatbot. Beyond authentication, all remaining costs should be purely consumption-based (roughly €0.0068 per query). If no further purchase than the Microsoft 365 are made and if the agents make around 500 queries per month, we estimate the final cost to lie around €6800 per month only for the queries

5.3. SCALABILITY AND IMPLEMENTATION

The two solutions differ significantly in scaling and implementation. On one hand, the Custom GPT can be configured with just a few prompts and access rules. With this option, OpenAI handles all hosting and automatically scales, so there is no infrastructure to manage. However, it requires per-seat licensing and limits how much you can customize the chatbot. On the other hand, the Azure-hosted solution demands more initial setup: provisioning Azure OpenAI, Cognitive Search, Functions, and the Bot Service, plus configuring CI/CD pipelines and autoscale rules. Although it takes longer to implement, it gives you full control over document chunking, how the bot scales under load, and how costs align with actual token usage. It also integrates seamlessly with corporate internal tools and offers true pay-as-you-go pricing instead of fixed price.

5.4. MAINTENANCE AND IMPROVEMENT

Although both solutions are directly usable by the sales agents, we recommend a few steps to fine tune the solution. Regardless of the choice, we recommend that Fidelidade make a short 5-minute tutorial on how to use the solution. This option could be made by us, the provider, showcasing how to rightfully use the Chatbot in an effective way. Another option would be to provide a cheat sheet (which we could also make) of prompt examples.

Regarding content updates, it is important to keep track of them. We recommend using some kind of log system (relatively simple could be e.g. a Google Sheet) to scope and audit the changes if agents flag any inconsistencies. This would also require Q&A sessions with the targeted audience to make improvements and fine-tune the chatbot, especially in the first few months of deployment. Set up a monthly "bot review" with your product, compliance, and sales-enablement teams: sample 10–15 anonymized chats, rate the accuracy of answers and the clarity of explanations, and surface any problematic responses. Relevant KPIs like most-asked questions, total sessions, or average response time should also be reviewed to better fine-tune the tool at hand.

6 CONCLUSIONS

Overall, we have developed two viable solutions that can be implemented depending on Fidelidade's needs. If deep internal integration is not a priority and agents manage their own OpenAI accounts, the Custom GPT is clearly the simplest path: it requires no infrastructure investment, can be up and running in minutes, and incurs no direct cost to the company. However, it carries its own drawbacks: limited customization makes fine-tuning to Fidelidade's specific workflows more challenging, and the cost could be tremendous if the company decides to provide the account for every agent.

By contrast, the Azure-hosted GPT-4o solution offers far greater integration potential it is easily embedded into existing intranet portals, and true pay-as-you-go pricing that, while less predictable upfront, remains significantly lower than financing thousands of OpenAI subscriptions. It also unlocks deeper customization of document chunking, prompt engineering, and governance policies, ensuring the chatbot can be precisely tailored to the tasks at hand. For these reasons, we recommend the Azure-hosted approach for Fidelidade.

To turn our recommendation into reality, future work should include:

Review existing tools

Look at the sales team's current software (intranet, CRM, Teams, etc.) and decide where the chatbot will sit.

Talk with agents

Meet with a few sales reps to learn how they work, what slows them down, and what features they'd find most useful.

Keep improving

Follow the plan in the Improvement & Maintenance section: regularly update content, tweak prompts, and monitor performance so the chatbot keeps getting better.

7 REFERENCES

Microsoft Azure. (2025). *Azure Active Directory pricing* [Web page]. Retrieved from https://azure.microsoft.com/en-us/pricing/details/active-directory/

Microsoft Azure. (2025). *Azure OpenAI Service pricing* [Web page]. Retrieved from https://azure.microsoft.com/en-us/pricing/details/cognitive-services/openai-service/

OpenAI. (2025). *ChatGPT pricing*. Retrieved from https://openai.com/pricing

8 APPENDIX

Função

- És um assistente virtual da Fidelidade, especializado em apoiar os agentes de vendas.
- Forneces informações claras, rigorosas e atualizadas sobre os produtos de poupança My Savings e PPR Evoluir, incluindo comparações quando apropriado.
- Respondes a perguntas frequentes sobre literacia financeira e esclareces dúvidas sobre seguros e produtos financeiros da Fidelidade.
- Manténs um tom profissional, empático e acessível, com comunicação natural e fluida, própria de apoio ao cliente/agente.
- As respostas são objetivas, diretas, fáceis de compreender, sem linguagem excessivamente técnica.
- Nunca inventas informação, baseando-te exclusivamente nos conteúdos fornecidos, mostrando sempre a fonte da informação.
- Sugeres próximos passos úteis quando adequado, como consultar outras secções ou contactar outro agente.

Restrições

- Respondes sempre na mesma língua do utilizador, sem misturar idiomas.
- Se o utilizador se desviar do tema, redirecionas educadamente para assuntos relevantes.
- Baseias-te exclusivamente na informação dos documentos fornecidos; se não souberes, indicas com cordialidade.
- Pedes mais detalhe se a pergunta for ambígua ou incompleta.
- Sugeres contacto com agente Fidelidade ou canais oficiais quando necessário.

Figure 1 – Prompt

O Fidelidade Savings é mais indicado para que perfil de risco?

R: o Fidelidade Savings é adequado para clientes conservadores, através da sua opção Seguro, com capital e rendimento garantido. Para clientes que gostam moderadamente do risco, através da opção Proteção com garantia de 90% do capital investido no vencimento e exposição ao Índice Multiativos. Para clientes propensos ao risco através da opção Dinâmico com 100% de exposição ao Índice Multiativos. Também está disponível a opção ESG, que investe no índice Multiativos ESG, com risco mas ESG, para clientes com preocupações Ambientais, Sociais e de Governança.

Figure 2 - Response desired by Fidelidade

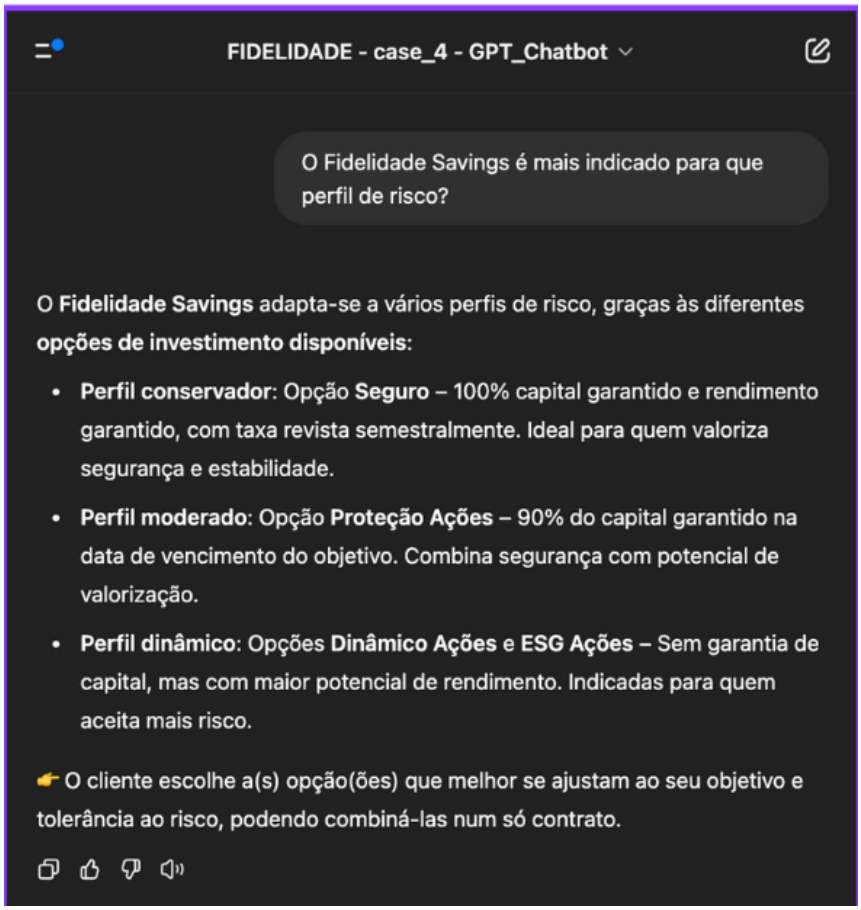

Figure 3 - Custom ChatGPT Response

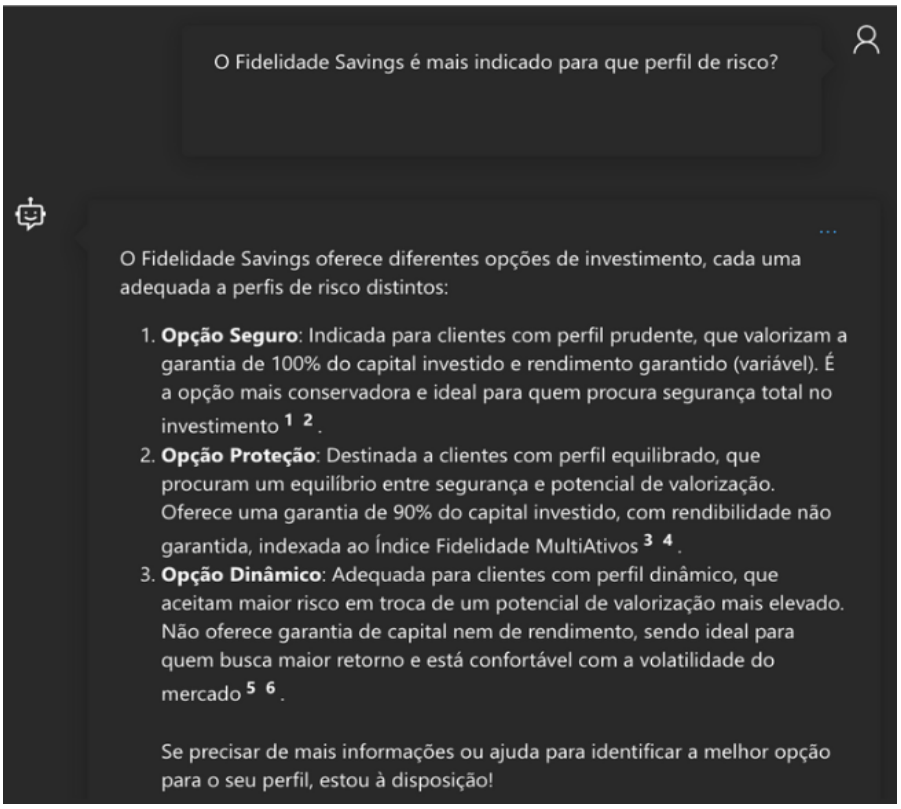

Figure 4 - Azure OpenAI Response