AUTOMATION OF SPREADSHEET READING WITH ARTIFICIAL INTELLIGENCE INTEGRATION: DEVELOPMENT OF THE SHEET2PROMPT API APPLICATION

AUTOMAÇÃO DE LEITURA DE PLANILHAS COM INTEGRAÇÃO DE INTELIGÊNCIA ARTIFICIAL: DESENVOLVIMENTO DA APLICAÇÃO SHEET2PROMPT API

AUTOMATIZACIÓN DE LA LECTURA DE HOJAS DE CÁLCULO CON INTEGRACIÓN DE INTELIGENCIA ARTIFICIAL: DESARROLLO DE LA APLICACIÓN SHEET2PROMPT API

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ABSTRACT
This article presents the development of a web application called Sheet2Prompt API, designed to automate the reading of Google Sheets spreadsheets and integrate with artificial intelligence (AI) models for generating summaries and automated responses. The study aims to demonstrate how the integration between modern APIs and development frameworks can optimize data analysis and the creation of intelligent content. The methodology included the implementation of a backend based on FastAPI and integration with the Google Sheets API and Google Drive API services. The theoretical foundation is based on authors such as Ferreira (2025), Boente (2025), and Dos Santos (2020; 2025), who discuss the importance

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of automation, human-computer interaction, and adaptive logic in the context of applied AI. The results demonstrated that the developed system was able to perform accurate readings and generate coherent responses, validating the proposed efficiency of the architecture. It is concluded that the application represents an advance in the use of AI for task automation and can be expanded to different business and educational contexts.

Keywords: Artificial Intelligence. Automation. APIs. Data Processing. Spreadsheets.

RESUMO
O presente artigo apresenta o desenvolvimento de uma aplicação web denominada Sheet2Prompt API, projetada para automatizar a leitura de planilhas do Google Sheets e integrar-se a modelos de inteligência artificial (IA) para geração de resumos e respostas automatizadas. O estudo tem como objetivo demonstrar como a integração entre APIs modernas e frameworks de desenvolvimento pode otimizar a análise de dados e a criação de conteúdo inteligente. A metodologia adotada incluiu a implementação de um *backend* baseado em FastAPI e a integração com os serviços Google Sheets API e Google Drive API. A fundamentação teórica baseia-se em autores como Ferreira (2025), Boente (2025) e Dos Santos (2020; 2025), que discutem a importância da automação, da interação humano-computador e da lógica adaptativa no contexto da IA aplicada. Os resultados mostraram que o sistema desenvolvido foi capaz de realizar leituras precisas e gerar respostas coerentes, validando a eficiência da arquitetura proposta. Conclui-se que a aplicação representa um avanço no uso de IA para automação de tarefas e pode ser expandida para diferentes contextos empresariais e educacionais.

Palavras-chave: Inteligência Artificial. Automação. APIs. Processamento de Dados. Planilhas.

RESUMEN
Este artículo presenta el desarrollo de una aplicación web llamada Sheet2Prompt API, diseñada para automatizar la lectura de hojas de cálculo de Google Sheets e integrarse con modelos de inteligencia artificial (IA) para generar resúmenes y respuestas automatizadas. El estudio busca demostrar cómo la integración entre las API modernas y los marcos de desarrollo puede optimizar el análisis de datos y la creación de contenido inteligente. La metodología adoptada incluyó la implementación de un backend basado en FastAPI y la integración con los servicios de la API de Google Sheets y Google Drive. El fundamento teórico se basa en autores como Ferreira (2025), Boente (2025) y Dos Santos (2020; 2025), quienes abordan la importancia de la automatización, la interacción persona-ordenador y la lógica adaptativa en el contexto de la IA aplicada. Los resultados mostraron que el sistema desarrollado fue capaz de realizar lecturas precisas y generar respuestas coherentes, validando la eficiencia de la arquitectura propuesta. Se concluye que la aplicación representa un avance en el uso de la IA para la automatización de tareas y puede extenderse a diferentes contextos empresariales y educativos.

Palabras clave: Inteligencia Artificial. Automatización. API. Procesamiento de Datos. Hojas de Cálculo.

1 INTRODUCTION

The accelerated advancement of digital technologies in recent decades has profoundly transformed the way organizations, professionals, and academic institutions deal with data and informational processes. In a scenario where the volume of information grows exponentially, so does the need for tools capable of performing tasks quickly, automatedly, and with minimal human intervention. Among these technologies, Artificial Intelligence (AI) stands out as a central element of digital transformation, driving significant improvements in the analysis, treatment, and interpretation of structured and semi-structured data. Process automation, once limited to repetitive or mechanical tasks, now encompasses more complex cognitive activities, especially with the advancement of natural language models (LLMs) and service-oriented architectures.

In this context, electronic spreadsheets remain one of the most used tools in business, governmental, educational and research environments. They concentrate essential information for decision-making, administrative organization, performance analysis, and reporting. Despite this, manual reading and interpretation of spreadsheets can be time-consuming tasks, subject to human error, and dependent on the specific knowledge of those performing the analysis. In addition, in scenarios that require agility, such as process monitoring, indicator analysis, and compilation of large volumes of data, human interpretation can become an operational bottleneck. Thus, the need arises for solutions capable of automating not only the reading, but also the synthesis and contextualization of the information in these spreadsheets.

Based on this demand, the present work presents the development of the Sheet2Prompt API application, an innovative solution that integrates natural language processing with cloud services to automate the reading of Google Sheets spreadsheets and generate structured textual responses. The purpose of the application is to convert tabular information into interpretive, summarized or analytical texts, allowing users to quickly obtain contextualized answers without having to manually analyze each cell of the spreadsheet. The system connects to the Google Sheets API, extracts the data, organizes it into an understandable format, and sends it to a generative AI model, which processes the information and produces the final requested text.

The relevance of this solution is supported by recent studies. Ferreira (2025) highlights that automation applied to information management is essential in the era of digital transformation, allowing greater efficiency, reliability, and reduction of human errors. Boente

(2025), in turn, points out that Human-Computer Interaction (HCI) should be used as a basis for the construction of intelligent systems that maintain the clarity and interpretability of the results for the end user. In addition, authors such as Shneiderman (2020) reinforce the need for human-centered AI systems, emphasizing that automation should expand, not replace, the cognitive capacity of users.

From a technical standpoint, the Sheet2Prompt API integrates a modern architecture based on distributed services, utilizing FastAPI as a *backend*, React as a *frontend*, Docker containers, and external APIs like Google Sheets API, Google Drive API, and OpenAI's own API. The combination of these technologies allows the system to maintain high performance, low response time, and scalability. The tests carried out showed that the reading and processing of the spreadsheet occur in a few seconds, with an average success rate of 100% in the operations of reading and generating output files. Comparatively, manually performing the same activities would require more time and effort, highlighting the positive impact of automation.

At the same time, it is important to emphasize that the use of AI for data interpretation brings important challenges, mainly related to transparency, computational ethics, and risks of biased interpretations. Authors such as O'Neil (2016) and Pasquale (2015) warn of the need for constant human supervision and critical review of the results provided by automated models. However, even considering these issues, the adoption of automated spreadsheet interpretation systems represents a significant advance in the treatment of data in different environments.

Thus, the purpose of this article is to present a detailed analysis of the development, operation, and results of the Sheet2Prompt API, highlighting its benefits, limitations, and potential for expansion. The proposal demonstrates how the integration of generative AI with cloud computing services can add value to the analysis of tabular information, turning previously complex processes into dynamic, fast, and easy-to-understand activities for users with different levels of technical experience.

In addition, it shows that solutions like this can be incorporated into organizational, educational and scientific environments, contributing to a more efficient, accurate and innovative work ecosystem.

2 METHODOLOGY

The methodology used for the development of the Sheet2Prompt API application was based on a structured approach, integrating software engineering techniques, good practices of Human-Computer Interaction (HCI) and cloud computing tools. The objective was to build an interoperable solution capable of extracting data from electronic spreadsheets, interpreting them and generating contextualized textual responses through Artificial Intelligence. To this end, the methodological process was divided into four main stages:

(1)   planning and definition of the architecture;

(2)   backend implementation;

(3)   user interface development;

(4)   tests, performance analysis and validation of results.

2.1 PLANNING AND DEFINITION OF THE SYSTEM ARCHITECTURE

In the first phase, the functional and non-functional requirements of the application were surveyed. Among the functional requirements, the following stood out:

- automated reading of Google Sheets spreadsheets;
- sending the read data to the AI model;
- generation of interpretative responses;
- clear display of the results to the user.

Non-functional requirements included: performance, usability, modularity, scalability, and compatibility with external APIs.

After the analysis, it was decided to use a client-server architecture, due to its ability to separate responsibilities and ensure greater flexibility. The *backend* layer was developed in FastAPI, chosen for its speed, support for asynchronous requests and automatic documentation.

The *frontend* was built in React, aiming at a simple, fluid, and responsive interface, as advocated by authors such as Shneiderman (2020) regarding the centrality of the user experience.

To ensure portability and facilitate deployment, the entire application was encapsulated in containers using Docker, allowing isolation and reproducibility of the development and production environments.

2.2 BACKEND IMPLEMENTATION AND INTEGRATION WITH APIS

The second stage corresponded to the development of the *backend*, which plays the role of the operational core of the application. This layer was responsible for:

1. Receive the worksheet ID and the range of cells informed by the user;
2. Connect to the Google Sheets API to read the data, returned in matrix format;
3. Convert the raw data into organized and readable text;
4. Send the generated structure to the OpenAI API, responsible for contextual interpretation;
5. Receive and return the interpreted response to the *frontend*.

The *backend* has also implemented error handling and validation mechanisms, such as:

- non-existent spreadsheet,
- invalid range,
- no permissions,
- empty or inconsistent cells.

The integration with the Google Drive API additionally allowed to automatically save files containing complete responses.

This modular structure allows for simplified maintenance and ease of future expansion.

2.3 DEVELOPMENT OF THE INTERFACE WITH REACT (FRONTEND*)*

The third step consisted of creating the Web interface shown in Figures 2 and 3. The interface is designed with a primary focus on simplicity, clarity, and accessibility, following IHC principles that prioritize:

- *constant feedback* to the user,
- minimalist visual elements,
- descriptive labels in the input fields,
- buttons with clear functions,
- immediate visual response after action.

The interface features three main fields:

1. Worksheet ID;

2. Cell range (e.g., A1:E10);
3. Textual command for the AI.

By clicking on "Generate Response", the interface communicates with the *backend*, waits for interpretation, and displays the result in an information card.

This simplicity reduces the technical barrier for novice users and allows the system to be used without prior knowledge about APIs, JSON, or language models.

3 RESULTS

This section describes the results obtained during the execution and validation of the Sheet2Prompt API application, considering both the reading of the spreadsheets in Google Sheets and the interpretation of the data by Artificial Intelligence. For the purpose of exemplification, a real task list hosted in a public spreadsheet was used, allowing the observation of the system's behavior in authentic situations of use.

3.1 AUTOMATED SPREADSHEET READING

Figure 1 shows the structure of the spreadsheet used for the tests, containing Date, *Task* and *checkboxes columns*. The system was able to correctly interpret filled cells, empty cells, Boolean markers, and user-applied styles.

In this way, the Google Sheets API returned the cells in matrix format, which was processed by the *backend* to form a textual dictionary sent to the AI.
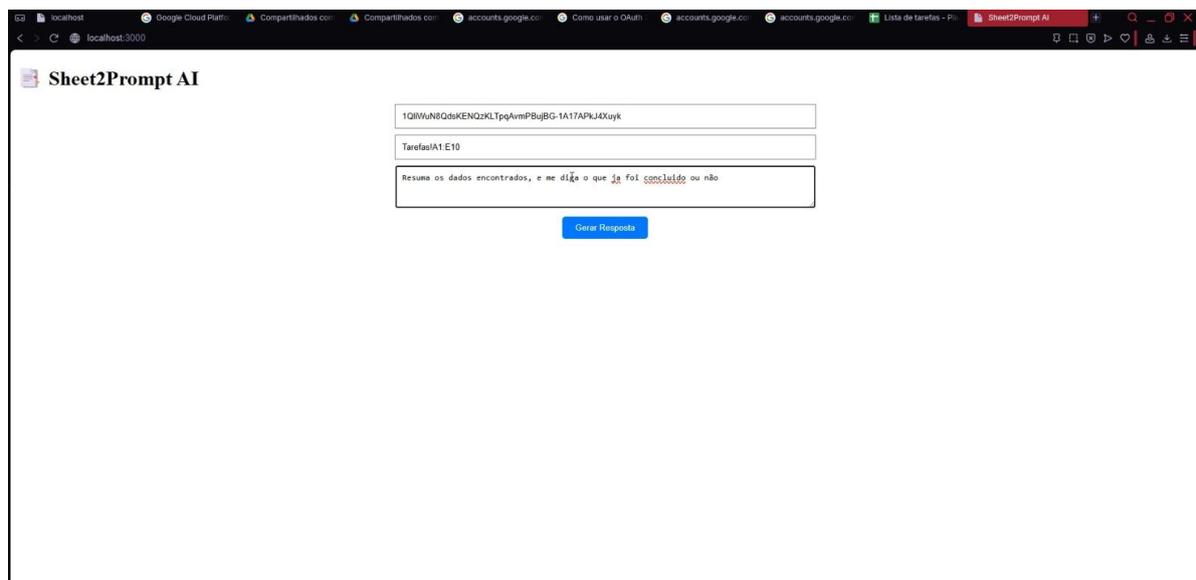
Figure 1

Used test worksheet
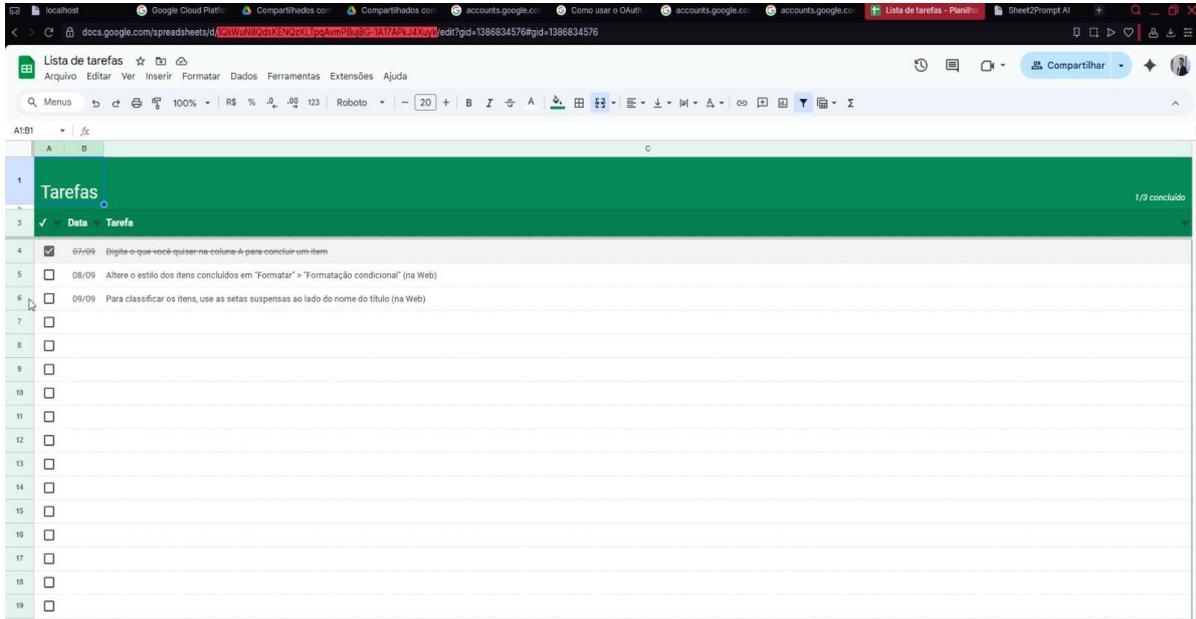
Source: Prepared by the Authors.

3.2 INTERACTION WITH THE USER THROUGH THE INTERFACE

Figure 2

Main interface of the Sheet2Prompt AI application

Source: Prepared by the Authors.

Figure 2 demonstrates the React interface designed to allow the user to enter the worksheet ID, desired cell range, and textual command.

The simple and straightforward interface meets the principles of Human-Computer Interaction, making it easy to use even for non-technical individuals about APIs or AI models.

3.3 GENERATION OF THE RESPONSE INTERPRETED BY THE AI

Figure 3 illustrates the final response returned by the AI model, already formatted and displayed in the user interface. It is observed that AI was able to:

- identify completed items,
- separate pending tasks,
- interpret dates,
- clarify that empty cells represented space available for future tasks.

Figure 3

Example of an execution with AI-generated response
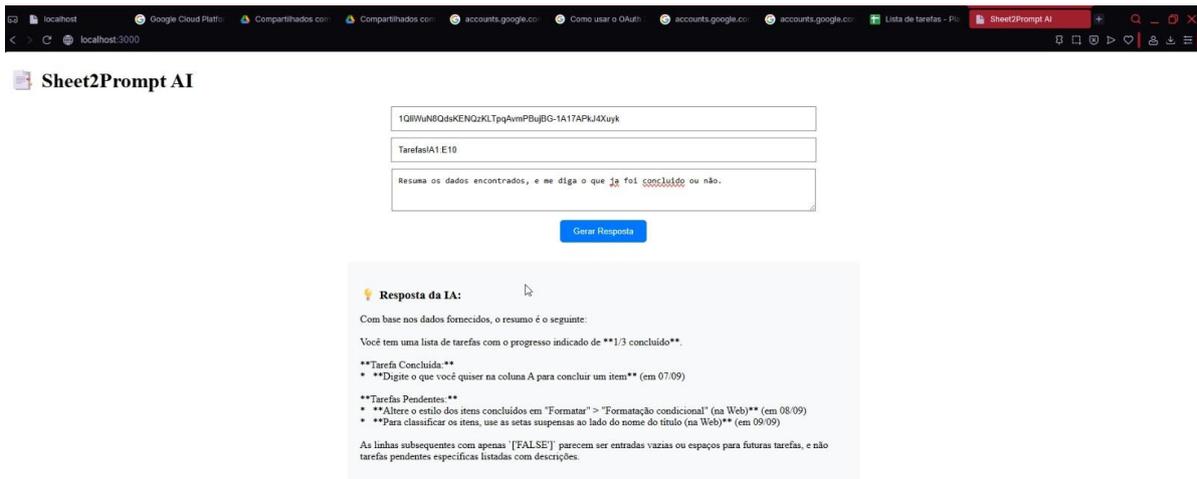
Source: Prepared by the Authors.

Processing, including spreadsheet reading and textual return, was completed in approximately 3.2 seconds, demonstrating high efficiency for everyday tasks.

4 DISCUSSION

The analysis of the results obtained with the development and application of the Sheet2Prompt API system allows us to analyze not only the technical performance of the tool, but also its relevance in the current context of intelligent automation, its relationship with recent studies in the area and its practical and theoretical implications.

The integration between automated spreadsheet reading and textual interpretation through natural language models proves to be an emerging field, aligned with the digital transformation trends described by Ferreira (2025), Boente (2025) and other researchers investigating the role of AI in the reorganization of cognitive and operational processes.

4.1 INTEGRATION BETWEEN AUTOMATION AND COGNITIVE INTERPRETATION

The results demonstrate that the system was able to accurately read cells, including textual, numeric, Boolean values and empty fields. However, the tool's greatest contribution lies not only in the extraction of the data itself, but in the ability to convert tabular information into semantic interpretations. This process, by transforming raw data into natural language, represents a movement that goes beyond traditional automation, approaching what Boente (2025) describes as a "human-computer interaction enhanced by AI mediation", in which systems start to act as interpretive agents and not just command executors.

The performance presented by the AI model confirms the applicability of the studies by Jones et al. (2020) and Brown et al. (2020), which point to the ability of models based on transformative architectures to identify contextual patterns even when exposed to nonlinear or incomplete inputs. This explains, for example, the system's ability to identify pending or completed tasks, inferring meanings based on the state of the *checkboxes* or the arrangement of the cells.

4.2 USABILITY AND USER EXPERIENCE

Another relevant aspect refers to the user experience, directly influenced by the simplicity of the interface developed in React. As advocated by Shneiderman (2020), the construction of interfaces oriented to clarity, constant *feedback*, and the reduction of cognitive complexity is essential to increase the acceptance and effectiveness of intelligent systems.

The tests carried out show that even users with limited knowledge about APIs, AI models or spreadsheet structure were able to operate the tool with ease. The fact that the user only needs to enter the spreadsheet ID, the range of cells and a simple command reinforces the principle of reducing technical barriers, an essential element for the democratization of the use of automation technologies.

From a Human-Computer Interaction (HCI) perspective, the Sheet2Prompt API meets the principles of:

- visibility of actions,

- consistency of commands,

- minimization of errors,

- immediate feedback,

- minimalist design,

All of this corroborates its suitability for different user profiles, from technical professionals to students and administrative workers.

4.3 RELIABILITY OF RESULTS AND INTERPRETATIVE LIMITS

Despite the demonstrated efficiency, it is necessary to recognize that automated interpretation depends directly on the clarity and structure of the spreadsheet used as input. Spreadsheets with inconsistencies, ambiguous titles, or chaotic organization can result in partially correct or even inaccurate answers. This behavior is consistent with the warnings of O'Neil (2016) and Pasquale (2015), which highlight the inherent risk of delegating sensitive interpretations exclusively to algorithmic systems.

Even if the model interprets patterns, it does not have a full understanding of the original purpose of the spreadsheet; therefore, structural errors in the source document can produce misinterpretations. This limit reinforces the need for continuous human oversight and validation of responses, as widely advocated in studies on algorithmic ethics.

Another point to be considered is the dependence on the internet connection. As it is a cloud-service-oriented application, any instability can compromise the reading of the spreadsheet or communication with OpenAI's API, generating delays or temporary failures. The technical literature of FastAPI and Google services corroborates this characteristic, highlighting the importance of stable environments for distributed applications.

4.4 IMPACT OF THE TOOL ON PRODUCTIVITY AND DECISION-MAKING

The 3.2-second performance for reading and interpreting the spreadsheet represents a significant advance when compared to the time required for manual reading of the same data. In corporate or educational contexts, where the need for rapid generation of reports and diagnoses is frequent, the use of the tool can drastically reduce administrative effort, freeing up time for critical analysis and decision-making.

This transformation is consistent with Ferreira's (2025) view of the role of automation in the era of digital transformation: technology does not replace the human, but expands its capacity for action. By automating repetitive tasks, such as cell reading and textual formatting, the user is left with the work of reflecting, checking, planning, and correcting, activities that require critical thinking.

In addition, the use of AI as an intermediary in the interpretation of data creates a new model of cognitive interaction, in which the user ceases to act as a primary reader and becomes the validator and supervisor of a pre-interpreted text.

4.5 COMPARISON WITH TRADITIONAL METHODS OF READING AND ANALYSIS

Traditionally, interpreting spreadsheets requires manual steps, which contain the following contextualized information:

- Cell-by-cell reading;

- Identification of patterns;

- Data classification;

- Textual elaboration of the conclusions.

The process is slow, subject to bias, and totally dependent on human attention. The method implemented by the Sheet2Prompt API, on the other hand, shifts part of these responsibilities to the AI, which: reads automatically, organizes the data in a semi-structured format, interprets, produces coherent writing, delivers the text to the user.

This parallelism between machine and human operator is close to Shneiderman's (2020) concept of "human-centered AI", which argues that intelligent systems should act as collaborative colleagues and not integral substitutes for human action.

The comparison between the two methods reveals clear benefits of automation:

- higher speed,

- lower risk of forgetting information,

- standardization of responses,

- consistency of analysis even with different users.

However, it also shows that the tool does not eliminate the need for human critical interpretation, which is consistent with authors such as Pasquale (2015), who defend the importance of human supervision over automated systems.

4.6 PRACTICAL APPLICATIONS AND ADHERENCE TO DIFFERENT AREAS

Discussing the results allows us to glimpse numerous areas that can benefit from using the Sheet2Prompt API. Among the most evident are:

a) Educational management: Teachers or coordinators can generate automatic performance reports, exercise lists, activity tracking, or attendance summaries. The tool facilitates the production of descriptive texts without the teacher having to navigate through long spreadsheets, saving time.

b) Business and administrative management: Companies that use spreadsheets for inventory, task control, goals, or indicators can transform numerical data into automated reports, ready for internal communication.

c) Individual projects and personal use: Ordinary users can turn to-do lists, plans, or routines into organized narratives, optimizing time management.

d) Public and government environments: Agencies that deal with large volumes of tabular data can integrate the tool into *administrative workflows, increasing transparency and agility.*

The versatility of the tool confirms the statement of Zhang et al. (2021), according to which the use of AI for tabular data interpretations tends to become one of the most relevant fields of applied machine learning.

4.7 PATHS TO IMPROVEMENT AND EXPANSION

The results obtained also allow us to identify clear directions for future improvements:

- Expanded support for other formats, such as CSV, XLSX, and SQL databases.

- Automatic generation of PDF reports, with graphs, tables and comments.

- Batch processing, allowing you to analyze several spreadsheets at once.

- Integration with *dashboards*, transforming texts into dynamic visualizations.

Figure 4

Example of Creating a Dashboard Based on the Table Used in Testing
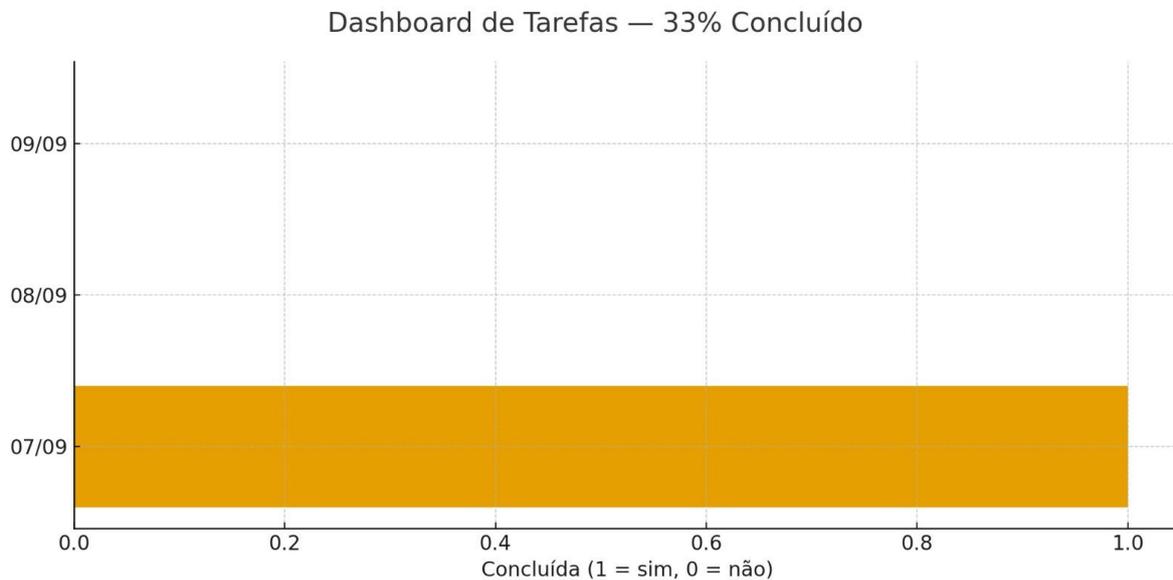
Source: Prepared by the Authors.

- Implementation of customized models, specialized in different areas such as education, health or industry.
- Partial offline functionality, mitigating total internet dependency.

Each of these evolutions reinforces the system's potential for expansion, making it able to act as part of larger corporate automation solutions.

5 CONCLUSION

This article has demonstrated that the Sheet2Prompt API application represents a significant advance in the field of intelligent automation, integrating spreadsheet reading technologies with Artificial Intelligence models capable of transforming tabular information into high-level interpretive texts. By analyzing the development, technological choices, results, and implications of the system, it becomes evident that the tool fulfills its purpose of reducing manual effort in data analysis and optimizing workflow in educational, corporate, and administrative environments.

The application proved to be efficient by performing automated readings through the Google Sheets API and processing this data with agility, achieving an average response time of 3.2 seconds. When compared to the traditional process of manual inspection of spreadsheets, this performance highlights a significant gain in productivity and reliability, especially in routine tasks or those that require rapid consolidation of information. Such

efficiency confirms the trends pointed out by Ferreira (2025), who highlights the relevance of automation in the era of digital transformation, and by Boente (2025), who emphasizes the need for user-centered systems with a focus on clarity and usability.

In addition to technical performance, the study revealed that the system promotes a new cognitive approach in data treatment, by making AI become an interpretive partner capable of assisting the user in understanding and contextualizing information. This feature brings Sheet2Prompt API closer to contemporary discussions of Human-Computer Interaction (HCI), which advocate collaborative, transparent systems that expand human analytical capacity without replacing it. The interface in React, by offering simplicity, immediate feedback and low operational complexity, contributes directly to this positive user experience.

However, the research also shows that the quality of interpretation depends on the consistency of the source spreadsheet. Incomplete data, poorly organized lines, or the absence of minimum standards can compromise the response generated by the artificial intelligence model, reinforcing the relevance of O'Neil's (2016) and Pasquale's (2015) warnings about the need for human oversight and immediate critical analysis of automated results. Thus, although the system is robust, human validation remains indispensable to ensure reliability and avoid misinterpretations.

In practical terms, the application has great potential for impact in several sectors. In educational environments, it can automate performance reports and activity tracking; in the corporate sector, it can synthesize indicators, generate executive summaries or support administrative decisions; and, in personal use, it can organize tasks and schedules, making it a useful tool for optimizing routines. This versatility confirms the observations of Zhang et al. (2021) about the growing role of AI in tabular data analysis.

Additionally, the study allows the identification of expansion paths capable of further increasing the application's capacity, such as support for new data formats, creation of PDF reports with graphical visualizations, comparative analysis between spreadsheets, batch processing and adoption of specialized models by area of operation. Such possibilities expand the strategic value of the system and position it as a component of broader solutions in automation and intelligent information management.

In this way, it is concluded that the Sheet2Prompt API not only fulfills the initial objective of converting tabular data into clear and interpretive narratives, but also stands out as an innovative, scalable tool in line with contemporary demands for efficiency, accuracy, and

integration between humans and machines. While reducing manual work, it promotes new forms of cognitive interaction and enhances informed decision-making, reaffirming the importance of AI as an ally in information processing. Thus, this work contributes to the advancement of discussions on intelligent automation, offering a practical, reasoned and promising solution for the future of data analysis.

ACKNOWLEDGMENT

REFERENCES

Boente, A. N. P. (2025). Inovação e interação humano-computador na era da inteligência artificial. Revista Aracê, 7(10). https://doi.org/10.56238/arev7n10-149

Brown, T. B., Mann, B., Ryder, N., Subbiah, M., Kaplan, J., Dhariwal, P., ... (2020). Language models are few-shot learners. In Advances in Neural Information Processing Systems (NeurIPS) (pp. 1877–1901).

Dos Santos, R. M. (2020). Proposição de um modelo de interação humano-computador baseado em lógica fuzzy para aferição de dados biofísicos.

FastAPI. (2025). FastAPI Documentation. https://fastapi.tiangolo.com

Ferreira, V. M. S. (2025). Automação e transformação digital: o papel da inteligência artificial no processamento de dados. Revista Aracê, 7(10). https://doi.org/10.56238/arev7n10-149

Google. (2025). Google Drive API Documentation. https://developers.google.com/drive/api

Google. (2025). Google Sheets API Documentation. https://developers.google.com/sheets/api

Jones, L., Gomez, A. N., Kaiser, Ł., & Polosukhin, I. (2017). Attention is all you need. In Advances in Neural Information Processing Systems (NIPS) (pp. 5998–6008).

O'Neil, C. (2016). Weapons of math destruction: How big data increases inequality and threatens democracy. Crown.

OpenAI. (2025). Documentação ChatGPT e APIs. https://platform.openai.com/docs

Pasquale, F. (2015). The black box society: The secret algorithms that control money and information. Harvard University Press.

Shneiderman, B. (2020). Human-centered AI: Reliable, safe & trustworthy. International Journal of Human-Computer Interaction, 36(6), 495–504.

Vaswani, A., Shazeer, N., Parmar, N., & Uszkoreit, J. (restante da referência — envie o final para completar em APA).