https://doi.org/10.17323/jle.2025.21727

GPTBot Development for Translation Purposes: Flowchart, Practical Case and Future Prospects

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ABSTRACT

Background: This paper explores the development and evaluation of a GPTBot tailored for institutional translation tasks. It addresses a gap in applied research on how generative AI can be adapted for domain-specific translation workflows, particularly in academic institutions.

Purpose: To design and implement UGRBot, a chatbot based on ChatGPT-4 that supports the translation of institutional texts at the University of Granada (UGR) while also outlining a structured and replicable methodology for creating specialised chatbots to enhance translation processes.

Method: The methodology includes: (1) chatbot development using a knowledge base of 57 bilingual institutional documents; (2) evaluation of output quality using BLEU scores, comparing UGRBot with DeepL and Google Translate; and (3) a focused assessment on the translation of 100 institutional terms.

Results: A reference corpus in English of 14,521 words was compiled from UGR administrative and regulatory documents, with human translations serving as the benchmark. BLEU scores were computed using the Natural Language Toolkit library in Python, employing 4-gram analysis for full-text evaluation and bigram analysis for terminology translation.

Conclusion: Results show that UGRBot outperformed both baseline systems in the translation of specialised institutional terminology, achieving the highest BLEU score in this area. However, limitations include lower performance across full-length texts. In conclusion, this research documents the development of a domain-specific GPTBot and its implementation in an institutional context, offering a transferable framework for integrating generative AI into specialised translation workflows.

KEYWORDS

generative AI, ChatGPT-4, translation process, chatbots, GPTBot, institutional translation

INTRODUCTION

The growing adoption of generative artificial intelligence (GAI) models such as ChatGPT has prompted new applications in professional translation workflows. Recent research has focused on three main trends: (1) the use of GAI for general-purpose translation and post-editing (Sahari et al., 2023; Gao et al., 2024); (2) prompt engineering and domain adaptation techniques to enhance translation quality (Zhao et al., 2023); and (3) recognised challenges in aligning AI outputs with context-specific conventions (Siu, 2023a; Ghassemiazghandi, 2024). These trends collectively underscore the growing potential of GAI in translation workflows and many authors suggest that we are on the verge of a new era in translation, with the industry undergoing a transformative technological revolution (Sánchez-Gijón, 2022, Vela-Valido, 2021). However, the role of existing AI-based translation in high-stakes institutional translation remains underexplored.

Despite ongoing efforts to apply generative AI to translation, little attention has been paid to its adaptation for domain-specific tasks, such as institutional document translation, which requires terminological precision, contextual relevance, and adherence to internal style guides. Moreover, commercial tools such as DeepL and Google Translate present

Citation: Ortiz-Garduño H., & Torres-Salinas D. (2025). GPTBot Development for Translation Purposes: Flowchart, Practical Case and Future Prospects. *Journal of Language and Education, 11*(2), 94-110. https://doi.org/10.17323/jle.2025.21727

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Received: June 06, 2024
Accepted: June 10, 2025
Published: June 30, 2025

limitations in handling stylistic constraints and ensuring terminological precision in institutional settings. Given these challenges, the central research question guiding this study is how can a customised GPTBot be developed and implemented to enhance the accuracy of institutional translation processes, particularly in the context of translating specialised documents at the University of Granada (UGR).

To address this question, this study aims to develop and evaluate UGRBot, a customised GPTBot for Spanish-English institutional translation tasks at the University of Granada. Specifically, it seeks to: (1) design and configure a UGRBot using ChatGPT-4 and a bilingual institutional knowledge base; (2) assess the system's functionality in translation, terminology extraction, revision, and stylistic assistance; and (3) benchmark its performance against commercial translation engines using BLEU score analysis and functional testing.

While the study is situated within the University of Granada, its findings offer broader relevance for institutions seeking to integrate domain-specific generative AI tools into their translation workflows. The development framework presented here may serve as a replicable model for similar administrative and regulatory contexts.

LITERATURE REVIEW

GAI for General-Purpose Translation

The emergence of generative artificial intelligence (GAI) models has marked a turning point in the field of artificial intelligence by presenting itself as a form of intelligence capable of using natural language processing (NLP) and deep learning to understand human-produced text and generate similar text (Curry et al., 2024). Developed by OpenAI, the latest model available to date[1] is based on the GPT-4 architecture, a large multimodal model capable of processing images and text[2], as well as producing textual output (OpenAI, 2023). In general translation tasks, ChatGPT-4 demonstrates strong capabilities across various subtasks such as text generation, classification, summarisation, sentiment analysis, and machine translation (Hassani & Silva, 2023; Lilli, 2023; Zappavigna, 2023). Several studies confirm that ChatGPT translations rival commercial systems like Google Translate and DeepL (Jiao et al., 2023; Mohsen, 2024). According to Mohsen (2024), ChatGPT-4's superior performance is driven by its large training dataset and advanced algorithms, enabling it to handle diverse genres effectively while integrating updates that reduce biases and errors. Furthermore, Ghassemiazghandi (2024) highlights that translations generated by ChatGPT-4 surpass those produced by the computer-assisted translation tool MateCat and nearly mirror the quality of human translations.

The functionalities of GPT models as translation tools are not limited to translation activity as such but encompass tasks such as contextual clarification and cultural explanation of expressions, explanation of technical terminology and simplification of complex texts, error detection, grammar checking and quality assessment, and stylistic editing and recommendations (Siu, 2023a; Siu, 2023b). In this way, translation professionals can exploit the linguistic fluency and grammatical knowledge embedded in the large language models, without losing full control over the final translation (Siu, 2023a). It is also worth noting that ChatGPT excels in the mechanical phases of translation tasks, but its usefulness decreases in tasks that require judgement, such as fine-tuning and double-checking (Sahari et al., 2023).

Challenges and GPT Customisation for Domain-Specific Translation

While ChatGPT performs well in fluency-oriented tasks (Gao et al., 2024), its ability to maintain institutional terminology and context-specific conventions remains limited (Siu, 2023a; Ghassemiazghandi, 2024). This stems from the fact that these models have been trained on large volumes of general multilingual data, which results in outputs that tend to be overly generic and lack contextual specialisation, as the generated text is inevitably influenced by various prior knowledge rather than being based solely on a specific entry (Gao et al., 2023). For this reason, the importance of configuring the GAI model based on the specific needs for the task at hand is essential to maximise its abilities and obtain relevant results (Zhao et al., 2023). In the specific case of the application of ChatGPT for translation tasks, the use of prompts that focus on the specific translation task and take into account the context can significantly improve its performance (Gao et al., 2023). Thus, a potential approach could lean towards the implementation of chatbots specialised in specific tasks, such as translation, to ensure more accurate and tailored results (Jiao et al., 2023). In this way, the fact that users have the possibility to customise the chatbot for specific use cases, favours more accurate and fluent translations that meet individual needs (Siu, 2023a). The possibility of including a proprietary knowledge base that allows adapting to the user's needs is essential to develop chatbots that are focused on specific functionalities.

The use of prompt engineering is essential to improving ChatGPT's performance for specific translation tasks. Research demonstrates that context-aware prompts can en-

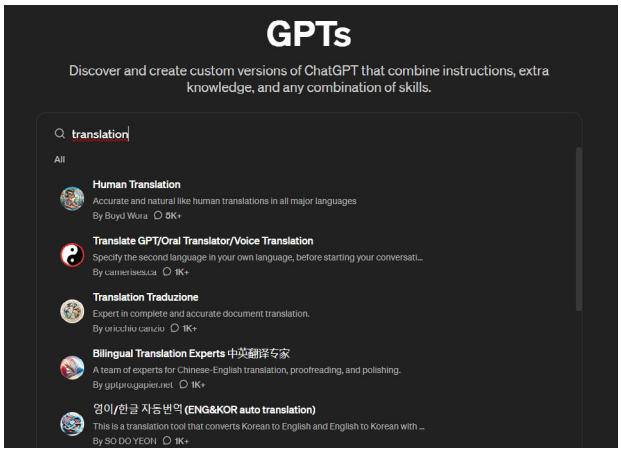
[1] ChatGPT-4 was launched on 14 March 2023 and is the latest model currently available to the public, available through the ChatGPT Plus paid subscription plan offered by OpenAI.

[2] UNESCO. (2023). *ChatGPT e inteligencia artificial en la educación superior: Guía de inicio rápido* [ChatGPT and artificial intelligence in higher education: Quick start guide]. https://unesdoc.unesco.org/ark:/48223/pf0000385146_spa

hance output quality (Zhao et al., 2023; Gao et al., 2023). In addition, integrating proprietary knowledge bases allows models to adapt to user-specific needs, improving accuracy and fluency (Siu, 2023a). In this regard, Yamada (2023) shows how prompt-based strategies enable users to customise ChatGPT for translation workflows, enhancing accuracy even in low-context or technical segments. Similarly, Ngo Cong-Lem et al. (2024) identify persistent limitations in ChatGPT's ability to maintain terminological consistency and global coherence during revision phases, reinforcing the need for task-specific prompt design and structural constraints. Several tools within the ChatGPT-4 'Explore GPTs' store illustrate how user-generated chatbots can be customised for translation, from general tasks to expert translation and proofreading [see Figure 1].

Figure 1

Overview of Translation Chatbots in the GPTs Store



However, while these customised chatbots can be found in the GPTs store, there is currently a lack of academic literature exploring their effectiveness and applications in specialised contexts. Most studies on GPT-based translation tools focus on general-purpose applications, and they often overlook their potential to deal with highly specific domains or contexts, such as institutional translation. Additionally, there is also a lack of complete understanding regarding the nature or quality of the foundation that these models provide, and it remains unclear whether they are fully reliable or trustworthy (Schneider, 2022). Therefore, it is important to define workflows that standardise specific processes, ensuring that users are able to customise these models effectively and consistently for particular tasks and contexts. By focusing on the customisation of the GPTBot specifically for institutional translation tasks at the University of Granada (UGR), this research bridges the gap between the academic research regarding general-purpose AI translation tools and highly specialised applications. By incorporating a proprietary knowledge base and establishing a tailored workflow to configure the model to meet the needs of institutional document translation, this approach demonstrates how customised GPT-based systems can improve translation accuracy and contextual relevance, particularly in institutional settings where consistency and adherence to specific terminology are crucial.

Integrating GAI into Translation Workflows

Integrating GAI into translation workflows requires not only the adoption of advanced technologies, but also a clear framework for ensuring their effective use. Therefore, it is essential to provide guidance on the development of personalised chatbots and to show the importance of following specific guidelines to ensure that quality work is carried out. For this reason, when designing a chatbot specifically for the field of translation, it is essential to identify the stages of the translation process, in order to guarantee the correct development and operation of the GAI model. The translation process encompasses the set of tasks that begin with the receipt of the translation order and culminate with the production of the target text, making use of the necessary tools and strategies to solve the translation problems and carry out the relevant revisions (Hansen, 2013). The purpose of this process is to establish interlinguistic and, as far as possible, intercultural equivalences that allow the meaning of a source text to be transferred to a target text, taking into account the specifications of the translation assignment given by the client (Parra-Galiano, 2006). In general terms, the three main phases of the translation process can be classified into pre-drafting, drafting and post-drafting (Dimitrova, 2010; Mossop, 2000).

The initial phase of pre-drafting lays the groundwork for the translation work. It includes planning, orientation and detailed reading of the source text. During this initial stage, the translator carries out a pre-translational analysis, considering extratextual (intention, function, sender, receiver, etc.) and intratextual (subject matter, content, presuppositions, lexis, syntax, etc.) factors (Nord, 1991). This analysis allows the translator to orient themself as to how to approach the text, taking into account the author's intention and the expectations of the target text's audience.

The drafting phase consists of the actual translation of the source text into the language of the target text. This stage involves the transfer of the meaning of the received message into the target language, either on the basis of an equivalence relationship between lexical items or, in the case of a different text function, according to the function of the target text (Nord, 1991).

The post-drafting phase constitutes the revision phase of the translated text. This stage is essential to guarantee the quality of the target text and consists of determining whether the final product complies with the specifications of the translation order through a series of criteria, with the aim of making the relevant corrections or improvements, before considering the target text as final and ready for delivery to the client (Parra-Galiano, 2006).

The translation process, while generally based on these main phases, is adapted according to the specific needs and operational context of the translator or organisation. The individual translator's practice differs significantly from the operation of a translation company in terms of procedure, available resources and capacity to handle large projects. For example, in the case of organisations belonging to the European Union, the workflow is highly standardised to handle the huge number of documents requiring translation in their multiple language combinations, as well as relying on CAT tools from the pre-processing phase (document type, domain, source and target language(s), deadline, etc.), pre-translation through a series of translation memories, to the use of terminology databases and translation management systems to maintain document consistency and quality[3]. Similarly, the Translation Centre for the Bodies of the European Union[4] deals with client requests through a standardised workflow that starts with receiving requests, preparing reference material, assigning the work to in-house or freelance translators depending on the specialisation and needs of the assignment, and carrying out a thorough technical review and quality control by in-house translators.

In this context, maintaining consistency, accuracy, and efficiency is a significant challenge, especially when dealing with large volumes of documents and specialised terminology. Traditional translation methods, while effective, often require substantial human intervention. For this reason, an increasing number of corporations and institutions are implementing the use of digital tools to carry out their projects (Rodríguez-de Céspedes, 2020).

Despite advances in generative AI applications for translation, no study has yet explored the implementation of a GPT-based chatbot customised with a bilingual institutional corpus and internal style guide for professional translation workflows. This study responds to that gap by developing and evaluating UGRBot, a domain-specific GPTBot tailored to the translation needs of the University of Granada. In doing so, it contributes not only to the theoretical understanding of prompt engineering and model adaptation but also offers a replicable model for the integration of GAI into institutional translation practices.

Evaluation Metrics in Translation

Human evaluation remains the traditional benchmark for assessing translation quality, as it allows evaluators to consider contextual adequacy, terminological precision, and stylistic coherence. However, it is also time-consuming, costly, and can lead to inconsistencies, particularly when multiple reviewers are involved or when evaluation criteria are insufficiently standardised (Läubli et al., 2020). These limitations are especially problematic in experimental studies that require comparability across translation systems.

To address these challenges, automatic metrics such as the BLEU score (Bilingual Evaluation Understudy) have become widely adopted in machine translation research. BLEU calculates n-gram overlap between candidate and reference translations, offering a fast and replicable method for benchmarking translation outputs (Papineni et al., 2002). Although BLEU does not fully capture semantic or pragmatic adequacy, its simplicity and standardisation make it a useful complement to human evaluation, particularly when comparing systems or tracking improvements (Callison-Burch et al., 2006).

In this study, BLEU is employed alongside human review to assess the translation performance of UGRBot. This dual approach ensures methodological rigour while addressing both quantitative benchmarking and qualitative validation in institutional translation workflows.

METHOD

Research Design

This study follows a design-based research approach aimed at developing, configuring, and evaluating UGRBot, a GPT-based translation assistant tailored to the institutional needs of the University of Granada. The core objective is to assess whether a customised GPTBot (integrating a bilingual institutional knowledge base) can perform institutional translation tasks more effectively than widely used machine translation engines, such as Google Translate or DeepL. The unit of analysis comprises Spanish–English administrative and regulatory documents produced within the university context, and the evaluation framework integrates BLEU score analysis, as well as qualitative evaluation for functional assessment. The following sections detail the phases for the development of a generative artificial intelligence chatbot using ChatGPT-4, the information regarding the data collection, and the BLEU score analysis used to evaluate the quality of the translations.

GPTBot Development Phases

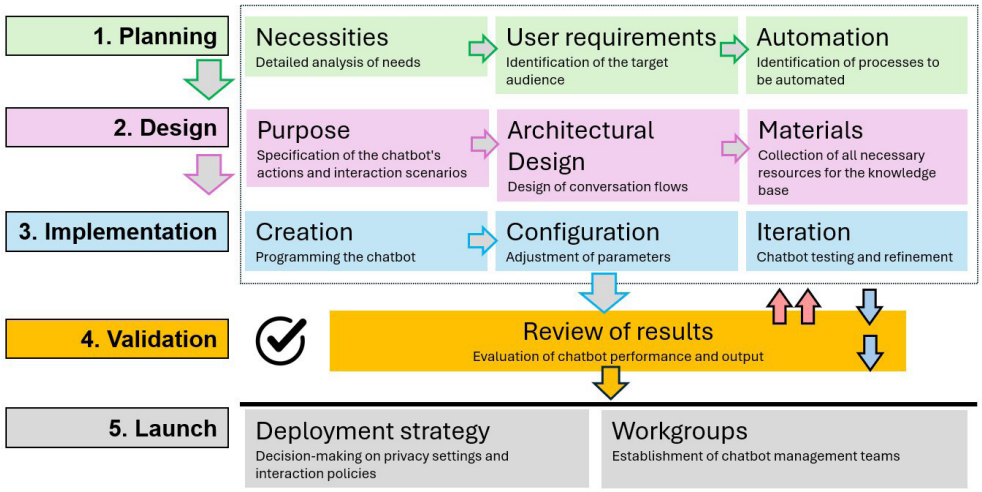
The ChatGPT-4 model includes among its functionalities the possibility to create customised chatbots. To use the latest version of the model, it is necessary to have access to the ChatGPT Plus paid subscription plan. The development phases, from planning to launch, are shown in Figure 2. The processes to be carried out at each stage are detailed below.

[3] Directorate-General for Translation. (2018). *Translation services in the digital world: A sneak peek into the (near) future: DG TRAD Conference (16-17 October 2017)*. European Union. https://data.europa.eu/doi/10.2861/823102

[4] Translation Centre for the Bodies of the EU. (n.d.). *The Centre's workflow*. https://cdt.europa.eu/en/centres-workflow

Figure 2

Chatbot Development Flowchart



The development of the GPTBot begins with a structured planning phase aimed at establishing a solid foundation for targeted and effective implementation. This phase encompasses three areas: needs analysis, target audience profiling, and task automation identification. The needs analysis involves a comprehensive evaluation to determine the specific requirements of the chatbot, ensuring that the scope and objectives are clearly defined, thus providing a precise framework for its functionality and intended outcomes. Subsequently, it is necessary to profile the target audience to align the chatbot's design with user needs and interaction patterns. This ensures the chatbot design is user-friendly and aligns with the expectations of its intended users, thereby optimising user engagement and satisfaction. Lastly, automatable tasks within existing workflows must be identified. This phase involves spotting repetitive or time-consuming processes that the chatbot can efficiently manage, in order to enhance overall productivity and allow human resources to concentrate on higher-level functions.

The design phase of chatbot development is dedicated to detailing the functional and technical aspects of the GPTBot, divided into three specific subphases: defining the purpose, architectural design, and gathering materials. Defining the purpose involves specifying the core functions of the chatbot, detailing what it is expected to achieve and the interaction scenarios it must handle, which guides the development of relevant features and interactions. The architectural design focuses on the structural design of the chatbot, including the setup of the conversation flow and integration with existing systems. The "Capabilities" parameter enables advanced functionalities such as Web Browsing, to access up-to-date information from the Internet; DALL-E Image Generation, to create creative images from textual descriptions; and Code Interpreter, to enable code interpretation and execution. The appropriate configuration of these parameters depends on the specific objectives of the chatbot and the needs of the target audience.

Essential to the design process is the gathering of resources required to build and support the chatbot. GPTBots designed with the GPT-4 model have the ability to integrate a specific knowledge base to enrich their responses and improve their accuracy on specific topics. This feature allows the chatbot to not only rely on the large dataset it was initially trained with, but also to use updated or specialised information that is relevant to the GPTBot's scope of application. This functionality can be implemented through the "Knowledge" parameter, and feed the GAI model with documents, guides, FAQs or other resources specific to the domain of interest. In this way, the user experience is improved by providing more detailed and contextually appropriate answers. The possibility of integrating a specific knowledge base into the GPTBots allows the use of proprietary data, which enriches the answers and improves their accuracy on specific topics. To date, this knowledge base supports up to 20 documents, with a total limit of 100 gigabytes.

The implementation phase transitions the conceptual design of the GPTBot into a functioning entity, and involves the chatbot's creation, configuration and iteration. The chatbot is developed according to the detailed design specifications outlined in the design phase. The initial setup utilises the "Create" option, which allows direct interaction with ChatGPT to automatically populate designated sections based on predefined conversation parameters. To access the interface for creating a GPTBot, it is necessary to click on the "Explore GPTs > Create a GPT" tab in ChatGPT Plus. This method offers a straightforward approach to configuring the initial prototype, providing a practical foundation for rapid development. However, to meet specific user needs more precisely, it is advisable to proceed beyond this basic

setup and engage in more detailed customisation through advanced configuration settings. The configuration process involves the meticulous adjustment of the chatbot's parameters to enhance its interaction capabilities and functional performance. Parameter tuning is essential for refining how the chatbot responds to user inputs, managing data processing, and ensuring that the chatbot behaves in a manner that is both user-friendly and aligned with the intended use cases. The advanced "Configure" interface provides a series of sections to be completed to tailor the chatbot to the specific needs to be met.

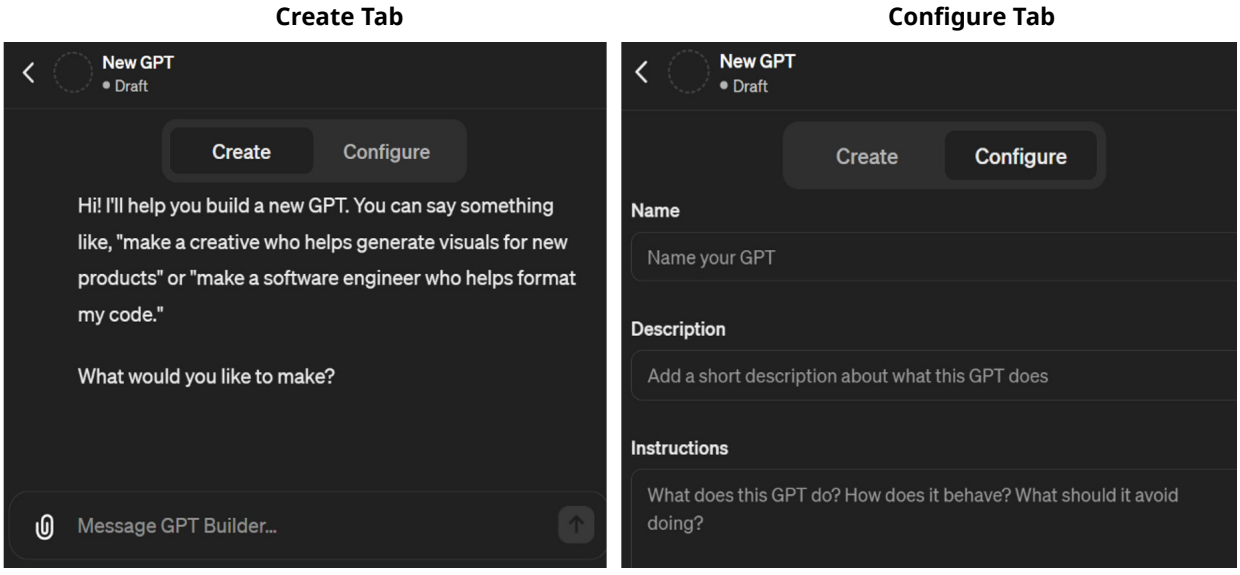
As can be seen in Figure 3, the configuration parameters include, on the one hand, the name and description of the chatbot. These are fundamental elements that not only help identify the chatbot within the system, but also provide end-users with a direct understanding of the chatbot's purpose. The name should be unique and easy to remember, while the description should be concise but informative, providing a summary of the help the chatbot can provide to the user. On the other hand, there is the parameter related to the chatbot's internal instructions, which are essential to define how the GAI model processes prompts and generates responses. This set of instructions dictates the chatbot's behaviour when faced with different types of interactions and determines how the chatbot handles conversations with the user based on the established context. This is critical to enable a consistent and relevant interaction, where the chatbot is able to maintain a fluid line of dialogue, remembering previous details of the conversation and adjusting its responses accordingly. The "Conversation starters" parameter is used to provide initial examples of how users can begin their interactions with the chatbot, offering suggestions of questions or topics they can address. This makes it easier for users to get an initial idea of the type of queries the chatbot is capable of handling. It is important that these examples reflect the variety of functionalities of the chatbot, so that users can have an overview of the type of interactions they can have with the AI model. For this reason, it is essential that there is a detailed analysis of the target users' needs as well as the chatbot's functionalities.

The iteration stage encompasses rigorous testing and continuous refinement of the chatbot. Iterative improvements are made based on previous interactions and on the degree of appropriateness of the answers provided. The evaluation and improvement cycle must be continuous so that the GAI model is always adapted to the needs of the users, thus optimising its performance and relevance. The refinement phase is essential in the initial implementation of the chatbot, but it is simply the starting point for an iterative process of post-implementation evaluation and improvement. The evaluation and improvement cycle must be continuous so that the GAI model is always adapted to the needs of the users, thus maintaining its effectiveness and relevance over time.

The validation phase ensures that the chatbot fulfils its designed purposes effectively. During this stage, a comprehensive evaluation is conducted to determine if the chatbot achieves the set objectives, delivers accurate responses, and supports the export of results in the correct formats. This assessment helps identify the chatbot's successes and areas needing improvement, guiding ongoing refinements to optimise functionality and user experience. The launch phase marks the transition of the chatbot from development to active use. Key decisions regarding the deployment strategy are made, including setting privacy controls and interaction policies. The GPTBot can be deployed publicly or privately, depending on the specific requirements and security con-

Figure 3

ChatGPT-4 Chatbot Design Interface with Details of the Create and Configure Tabs



siderations of the intended environment. Dedicated teams are established to manage the ongoing operations and maintenance of the chatbot. These workgroups are responsible for handling updates, resolving issues, and ensuring that the chatbot continues to function effectively.

Data Collection

The GPTBot designed to streamline institutional translation at the University of Granada is powered by a knowledge base that includes specific UGR documentation. It contains a repository of UGR administrative documents, regulations and policies in the Spanish-English language combination [see Table 1]. Specifically, it is divided into two main categories: 12 UGR administrative documents in Spanish, each with a corresponding English translation, and 16 UGR regulations and policies, also paired with their English translations [see Appendix 1 for a complete list of documents]. The knowledge base is also fed by the UGR English Style Guide, specifically designed to help in the writing of institutional texts in English or in the translation of texts into English in the context of the University of Granada. Given the limitations of ChatGPT-4's current configuration, which supports a knowledge base of up to 20 documents with a total capacity of 100 gigabytes, the 57 documents used to train the GPTBot had to be combined into two distinct files to meet these constraints. The total of these 57 documents were used to train the GAI model, with the aim of ensuring the quality and contextual appropriateness of the translations.

BLEU Score Evaluation

To assess the translation quality of UGRBot, a BLEU score (Papineni, 2002) analysis was conducted. The BLEU score is a widely recognised metric used in machine translation to measure how closely a machine translation aligns with a set of reference translations. The BLEU score is calculated by counting the number of n-grams from the system's output that occur in the reference translations. The formula for calculating the BLEU score is as follows:

$$BLEU = BP \cdot \exp\left(\sum_{n=1}^{N} w_n \log P_n\right)$$

Where:

BP is the brevity penalty, which penalises translations that are shorter than the reference translation.
w_n is the weight assigned to the n-grams (typically equal for all n-grams).
p_n is the precision of the n-grams, representing the ratio of matched n-grams between the machine-generated translation and the reference translation.

For the purpose of this research, the translation output of UGRBot designed with ChatGPT-4 was compared with two of the most advanced translation engines currently available: DeepL and Google Translate. These comparisons were carried out under a controlled evaluation setting, where the same source texts were processed by all systems and compared against a human-translated reference corpus.

The reference corpus, which functioned as the gold standard for evaluation, consisted of 14,521 words, including random excerpts from the UGR's repository of regulations and the UGR's repository of administrative documents. The reference corpus served as the benchmark to evaluate the accuracy and quality of the translations produced by each system. In addition to this, a separate evaluation was conducted focusing on the translation of 100 specialised terms, extracted from UGRTerm[5], a bilingual (Spanish-English) database of academic and institutional terms used at the UGR. This evaluation aimed to assess the consistency and precision of each system—ChatGPT-4, DeepL, and Google Translate—in handling the translation of institutional terminology. It is important to note that this evaluation is based on a limited set of institutional documents and terminology, which may affect the generalisability of the results beyond the administrative domain of the University of Granada.

Table 1
UGRBot Knowledge Base

Languages	Source	No. documents
Spanish	UGR regulations and policies repository	16
	UGR administrative documents repository	12
	UGRTerm language resources	1
English	UGR regulations and policies repository	16
	UGR administrative documents repository	12

[5] University of Granada. (2019). UGRTerm: UGR online resource on academic and institutional terminology (Spanish-English). https://ugrterm.ugr.es/en/

The Natural Language Toolkit (nltk) library in Python was employed to compute the BLEU score. Both reference and candidate translations were tokenised, splitting the text into individual words. In both cases (full-text translations and specialised terms), all machine-generated translations were compared against the reference translation. For the specialised terms, bigrams were used to calculate the BLEU score, as these represent shorter text strings. In the case of full-text translations, the standard approach of using 4-grams was applied. Afterward, the average BLEU score was calculated separately for the full-text translations and the specialised terms.

RESULTS

The implementation of UGRBot — a GPTBot designed for the University of Granada's internal community, including translators, teaching and research staff, and administration and services staff — presents a novel approach to handling institutional translation, terminology and revision tasks. This section outlines the outcomes of UGRBot's development and evaluates its performance based on the specified objectives.

Practical Case: UGRBot for Institutional Translation

The development of a chatbot (https://chat.openai.com/g/g-ZzjDW0drV-ugr-bot-for-institutional-translation) for institutional translation at the UGR begins with planning the objectives designed to meet the specific needs of its internal community, namely internal and freelance translators, teaching and research staff, and administration and services staff. This chatbot helps to streamline the translation and revision processes of institutional documents of the UGR in the Spanish-English language combination, especially UGR administrative documents, regulations and policies.

The design of the chatbot is intended to provide support throughout the entire translation process, from the preparation and analysis of the source texts to the revision of the translations. Thus, the main functionality of the GAI model consists of the Spanish-English translation of UGR institutional documents. The chatbot can also create tables with terminology specific to the documents, provide their English equivalents, and solve problems of wording and style in English during the translation and revision phases, among other things. The chatbot's knowledge base is fed with specific UGR documentation [see Table 1], with the aim of ensuring the quality and contextual appropriateness of the translations.

Once the conceptual phases were completed, the implementation of the chatbot was carried out. Through the basic configuration interface "Create", a detailed prompt was introduced to generate the chatbot's internal instructions with the conceptual features mentioned above, particularly underlining the relevance of incorporating the reference documents present in the knowledge base for the generation of accurate and contextually appropriate responses. Specifically, the prompt used was the following: "Generate the best instructions for a GPTBot based on the following information: [features + knowledge base emphasis]". This methodological approach allowed the creation of a prototype that provided an initial starting point for refining and improving the system through iteration processes [see Figure 4]. In the advanced configuration interface, the relevant changes and specifications were made.

The process of iteration and refinement of the chatbot, consisting of the improvement of the internal instructions based on feedback according to the answers provided, resulted in the formulation of more concrete and precise instructions. Specifically, the instructions are structured to clarify the chatbot's specific application, operating procedures and key functionalities [see Appendix 2]. Initial protocols for interaction with the user are included and emphasis is placed on the chatbot not inventing answers, but relying primarily on the chatbot's knowledge base, with web searches limited to the consultation of official UGR sources. The main tasks of the chatbot are also indicated, divided into translation, terminology extraction, text revision and management of stylistic queries [see Figure 5].

The conversation starters respond to the four main functions of the chatbot, focusing on translation, terminology extraction, revision and stylistic correction. In this way, clear and effective entry points for user interaction are established. To validate the correct functioning of the chatbot, tests were carried out focusing on translation queries, terminology extraction, revision tasks and style queries.

Translation Queries

The translation queries consisted of asking the chatbot to translate UGR institutional texts of different lengths and formats for which the chatbot used the regulations and administrative documents included in its knowledge base. Therefore, this integration allowed the translations to be not only linguistically correct, but also consistent with the specific use of terms and styles preferred by the UGR. It was observed that, when translating short texts (2-3 pages) and in Word format, the chatbot provided higher quality answers than when dealing with longer documents or in PDF format, where the quality of the translations was more variable and sometimes even incomplete. To quantitatively assess the translation quality of UGRBot, a BLEU score analysis was conducted, comparing its performance with two leading machine translation systems, DeepL and Google Translate. The results are presented in Table 2.

Terminology Extraction

In terms of terminology extraction, the tasks required generating Word and Excel tables listing Spanish terms and their English equivalents related to higher education and research, indicating gender only for those terms referring to people. Generally, the chatbot is able to perform this task correctly, complying with the specific instructions when completing the tables. However, it sometimes includes terms that do not specifically belong to the academic or research fields of the UGR. Likewise, it was detected that it sometimes failed to correctly recognise polylexic units, which are frequent in specialised terminology. BLEU score analysis allowed for a comparison of ChatGPT compared to Google Translate and DeepL system's performance in both full-text institutional translations and specialised terminology. The results are presented in Table 3.

Revision Tasks

With regard to the revision tasks, monolingual revisions were carried out, both in Spanish and English, as well as bilingual revisions of Spanish-English and English-Spanish texts in order to evaluate whether the original text was ef-

Figure 4

Design of Instructions with the Help of the GAI's Own Model

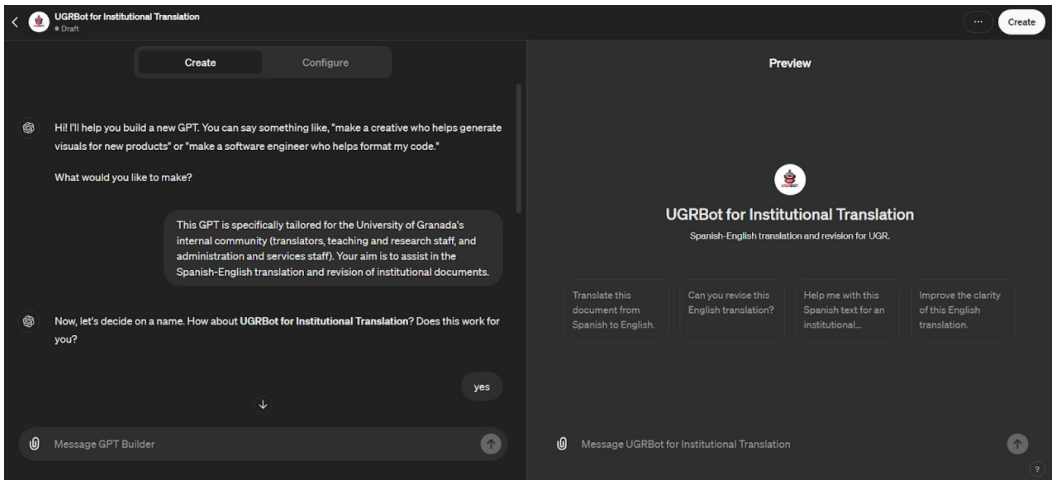


Figure 5

Advanced GPTBot Configuration for Institutional Translation

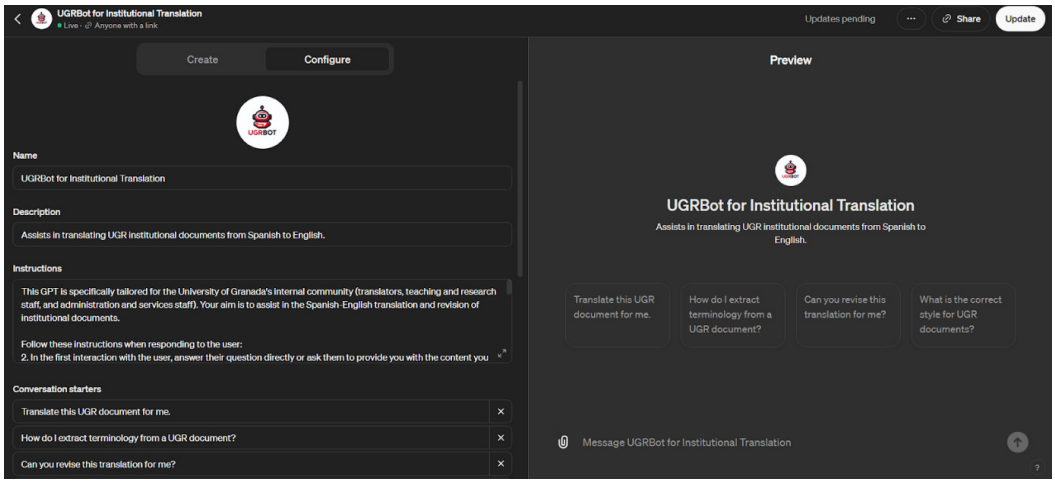


Table 2

BLEU Scores for Full-Text Translations

Machine translation system	BLEU score
UGRBot with ChatGPT-4	0.377
DeepL	0.417
Google Translate	0.374

Table 3

BLEU Scores for Specialised Terms

Machine translation system	BLEU score
UGRBot with ChatGPT-4	0.472
DeepL	0.375
Google Translate	0.348

fectively maintained and only the strictly necessary changes were made. To achieve this, the chatbot was provided with stylistically correct texts that contained some terminological errors to test its ability to identify and correct them while maintaining the integrity of the original text. However, this functionality has not yet produced the expected results for the moment, since the chatbot tends to modify unnecessary parts of the original text, which are completely valid and do not involve any translation or stylistic errors. This behaviour may be due to an over-interpretation of the chatbot's internal instructions or of the style rules of the knowledge base.

Style Queries

The style queries consisted of a series of specific questions related to the context of use of the UGR, such as whether British or American spelling should be used in institutional documents; different spelling conventions, such as the rules of capitalisation in UGR terminology; or questions of accessible and inclusive language. For example, in response to the prompt "Should the term 'Vice-Rector for Research' be capitalised?", UGRBot correctly indicated that capitalisation should be maintained, citing alignment with the conventions outlined in the UGR English Style Guide for official institutional titles. In these queries, the chatbot performed adequately, providing accurate and well-founded answers that were aligned with the UGR's institutional policies and preferences according to the UGR English Style Guide that feeds the knowledge base of the GAI model. This approach not only provides users with reliable guidance but also encourages consistency in stylistic choices across institutional documents.

As a prototype, this chatbot has been launched privately in order to protect the data provided by the Language Services Unit (USL) of the UGR. Once it is made public, dedicated working groups will be created for the ongoing operation and maintenance of the chatbot. Since the intention of this work is to provide a set of guidelines for the development of a chatbot in translation and not to present a final product, this phase is still under development.

DISCUSSION

The primary objective of this study was to develop and evaluate a specialised GPTBot designed to enhance translation tasks, with a focus on institutional document translation at the University of Granada. The findings confirm that integrating a domain-specific knowledge base into ChatGPT-4 can significantly improve translation accuracy, particularly in handling specialised terminology. The GPTBot's successful deployment in translating institutional documents from Spanish to English highlights the potential for AI-driven tools to significantly enhance translation accuracy and consistency (Ghassemiazghandi, 2024; Jiao et al., 2023). Additionally, the study sheds light on the largely unexplored area of AI applications in specialised contexts (see, e.g., Gao et al., 2024; Mohsen, 2024), demonstrating the importance of tailored solutions for domain-specific translation tasks.

Translation Quality

The results revealed that although DeepL slightly outperformed UGRBot in the overall translation of full institutional texts (with a BLEU score of 0.417 compared to UGRBot's 0.377 and Google Translate's 0.374), this advantage does not necessarily imply superior handling of specialised content. Instead, it suggests that DeepL may produce translations that are slightly more fluent and natural in longer texts. In fact, the translation queries submitted to UGRBot during the process of GPT validation involved institutional texts of varying lengths and formats, using the UGR's regulations and administrative documents as part of the chatbot's knowledge base. Performance varied depending on the length and format of the documents and UGRBot produced higher quality translations for shorter texts (2-3 pages) in Word format, where the system could more accurately leverage the knowledge base and provide consistent results. In contrast, when dealing with longer documents or PDF formats, the quality of the translations was more variable, with some translations being incomplete or less precise. The lack of precision may be due to the inherent creative component of ChatGPT-4, which can sometimes lead to difficulties in strictly adhering to the knowledge base. This variability in performance may explain why DeepL scored higher overall for full-text institutional translations.

Terminology Extraction

UGRBot excelled in the translation of specialised terminology, achieving a BLEU score of 0.472 compared to DeepL's 0.375 and Google Translate's 0.348. The GPTBot's superior terminological accuracy can likely be attributed to the integration of a bilingual institutional corpus. This supports prior findings that domain adaptation enhances precision in LLM-driven translation (Zhao et al., 2023). The knowledge base integration played a key role in ensuring that the translations adhered to the institution's preferred terminology, which was instrumental in its strong performance in this area. Moreover, in terms of terminology extraction, the tasks carried out during the validation phase required generating Word and Excel tables listing Spanish terms and their English equivalents related to higher education and research, indicating gender only for those terms referring to people. Generally, the chatbot is able to perform this task correctly, complying with the specific instructions when completing the tables. However, it sometimes includes terms that do not specifically belong to the academic or research fields of the UGR. Likewise, it was detected that it sometimes failed to correctly recognise polylexic units, which are frequent in specialised terminology.

Revision Tasks

UGRBot's behaviour in stylistic revision tasks was inconsistent. While the chatbot occasionally succeeded in improving clarity and coherence, it also introduced unnecessary modifications, even when explicitly instructed to preserve the original structure and intent. These outcomes suggest a tension between generative flexibility and conservative editing practices, which warrants further exploration. Some of these modifications may be interpreted as hallucinations, as previously observed in studies highlighting ChatGPT's limitations in judgement-based operations and domain-specific reliability (Siu, 2023a; Ngo Cong-Lem et al., 2024). The revision module may benefit from more restrictive prompting strategies that prevent over-editing.

Style Queries

Unlike previous evaluations of ChatGPT in generic translation tasks (Gao et al., 2023), our findings suggest that institutional fine-tuning can substantially improve output adequacy and stylistic control. Results indicate that GPTBot reliably follows the UGR English Style Guide, included in the knowledge base. The chatbot's ability to respond accurately to style-related queries related, for instance, to spelling, capitalisation, and inclusive language demonstrates that prompt-based design, when guided by a coherent knowledge base, supports stylistic consistency in administrative settings.

Limitations

The GPTBot's design and operational framework effectively leveraged AI capabilities to meet the specific needs of the university's internal community, showcasing the potential of AI-driven solutions in administrative and academic settings. Nevertheless, several limitations emerged during its implementation. The most significant issue was its performance in text revision tasks, where the chatbot struggled to maintain accuracy and consistency. Despite the implementation of specialised commands instructing the chatbot to adhere strictly to the knowledge base and make only the necessary changes, in most cases, the principle of preserving the integrity of the original content was not consistently upheld.

Moreover, the current configuration of the GPTBot's knowledge base supports up to 20 documents, with a total limit of 100 gigabytes, which may restrict its ability to handle larger or more varied datasets. In terms of potential biases, the GPTBot's translations are influenced by the data it was trained on, particularly the terminology and style guidelines specific to the UGR. Due to the 100 GB limit, the inability to include a broader range of documents raises concerns about the generalisability of the chatbot's translations, as a more diverse set of documents would likely enhance its ability to generate more contextually accurate translations. However, an attempt has been made to incorporate a diverse range of UGR institutional documents addressing different needs, ensuring that the chatbot's knowledge base is as complete and relevant as possible within existing constraints.

CONCLUSION

This study set out to evaluate the potential of a customised GPTBot, built using the ChatGPT-4 framework, to support institutional translation workflows in a university context. Specifically, the study aimed to (1) define a structured methodology for the correct development of chatbots, (2) implement and test UGRBot, a chatbot specialised in translation purposes at the University of Granada, and (3) assess its impact on translation accuracy, efficiency, and workflow optimisation.

The findings indicate that a prompt-engineered, institution-specific GPTBot outperforms commercial translation tools in handling domain-specific terminology and adhering to internal style guides. These results support the viability of lightweight, localised AI solutions for academic-administrative communication.

The proposed methodology can be adapted to other institutional environments where internal communication requires terminological accuracy and stylistic consistency. Internal university (internal and freelance translators, teaching and research staff, and administrative and services personnel) may benefit from adopting similar GPTBot configurations, provided they have access to well-curated institutional corpora and appropriate digital infrastructure.

The findings of this study demonstrate the transformative potential of GPTBots within the translation industry and indicate a promising direction for the ongoing advancement of artificial intelligence in language-related applications. Future investigations should prioritize enhancing the GPTBot's ability to address current limitations in adapting to instructions and producing the intended outcomes, particularly in revision tasks where excessive editing may undermine the reliability of the output. Additionally, further efforts should be directed toward facilitating the public implementation of UGRBot within the internal community of the University of Granada.

DISCLAIMER

The authors used ChatGPT-4 in the preparation of this manuscript for grammar, spelling, and stylistic revision across the entire text. Moreover, ChatGPT-4 was employed as a research tool for the specific purpose of developing a specialised GPTBot focused on institutional translation practices at the University of Granada. All outputs generated by the tool were reviewed by the authors to ensure academic integrity.

FUNDING

This work was supported by the Spanish Ministry of Universities [Predoctoral Grants for the Training of University Lectures (FPU), FPU21/01204] and and the Language Services Unit (USL) of the University of Granada for providing the materials used in this work

DECLARATION OF COMPETING INTEREST

None declared.

AUTHORS' CONTRIBUTION

Helena Ortiz-Garduño: Conceptualisation; Data curation; Formal analysis; Funding acquisition; Methodology; Project administration; Visualisation; Writing – original draft; Writing– review & editing.

Daniel Torres-Salinas: Conceptualisation; Data curation; Formal analysis; Investigation; Methodology; Resources; Software; Supervision.

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APPENDIX 1

List of UGR Documents Included in the GPTBot Knowledge Base

Document title	Document type	Source	Language
Application form	Communication documents towards the UGR	UGR administrative documents repository	English
Declaration of Originality	Communication documents towards the UGR	UGR administrative documents repository	English
Responsible declaration	Communication documents towards the UGR	UGR administrative documents repository	English
Withdrawal-Waiver	Communication documents towards the UGR	UGR administrative documents repository	English
Correction	Communication documents towards the UGR	UGR administrative documents repository	English
Confidentiality commitment	Communication documents towards the UGR	UGR administrative documents repository	English
Solicitud-Formulario	Communication documents towards the UGR	UGR administrative documents repository	Spanish
Declaración de originalidad	Communication documents towards the UGR	UGR administrative documents repository	Spanish
Declaración responsable	Communication documents towards the UGR	UGR administrative documents repository	Spanish
Desistimiento-Renuncia	Communication documents towards the UGR	UGR administrative documents repository	Spanish
Subsanación	Communication documents towards the UGR	UGR administrative documents repository	Spanish
Compromiso de confidencialidad	Communication documents towards the UGR	UGR administrative documents repository	Spanish
Certificate	Documents of record	UGR administrative documents repository	English
Credential-Accreditation	Documents of record	UGR administrative documents repository	English
Certificado	Documents of record	UGR administrative documents repository	Spanish
Credencial-Acreditación	Documents of record	UGR administrative documents repository	Spanish
Notice	Documents of transmission	UGR administrative documents repository	English
Communiqué	Documents of transmission	UGR administrative documents repository	English
Instruction-Service Order	Documents of transmission	UGR administrative documents repository	English
Greetings-Invitation	Documents of transmission	UGR administrative documents repository	English
Aviso	Documents of transmission	UGR administrative documents repository	Spanish
Comunicado	Documents of transmission	UGR administrative documents repository	Spanish
Instrucción-Orden de Servicio	Documents of transmission	UGR administrative documents repository	Spanish
Saluda-Invitación	Documents of transmission	UGR administrative documents repository	Spanish
NCG124/3a: Protocol for Name Changes of Transsexual, Transgender and Intersexual People at the University of Granada	UGR regulations and policies	UGR regulations and policies repository	English

Document title	Document type	Source	Language
NCG124/3a: Protocolo para el cambio de nombre de las personas transexuales, transgénero e intersexuales en la Universidad de Granada	UGR regulations and policies	UGR regulations and policies repository	Spanish
UGR Code of Ethics	UGR regulations and policies	UGR regulations and policies repository	English
Código Ético de la UGR	UGR regulations and policies	UGR regulations and policies repository	Spanish
Terms of Use and Privacy	UGR regulations and policies	UGR regulations and policies repository	English
Condiciones legales	UGR regulations and policies	UGR regulations and policies repository	Spanish
NCG127/2: Instruction for the application of article 21.1 of the UGR Assessment Policy and Regulations regarding the registration of master's dissertation students for the special examination session	UGR regulations and policies	UGR regulations and policies repository	English
NCG127/2: Instrucción para la aplicación del artículo 21.1 de la Normativa de Evaluación y Calificación de los estudiantes de la Universidad de Granada relativa a la matrícula del Trabajo Fin de Máster en la convocatoria especial	UGR regulations and policies	UGR regulations and policies repository	Spanish
NCS133/2: Modification of the UGR Continuance Regulations for Undergraduate and Master's Degree Students	UGR regulations and policies	UGR regulations and policies repository	English
NCS133/2: Modificación de las Normas de permanencia para estudiantado de las enseñanzas oficiales de Grado y Máster	UGR regulations and policies	UGR regulations and policies repository	Spanish
NCG197/1: Partial modification of the Regulations on UGR Undergraduate Dissertations.	UGR regulations and policies	UGR regulations and policies repository	English
NCG197/1: Modificación parcial del Reglamento de Trabajo o Proyecto fin de Grado de la Universidad de Granada.	UGR regulations and policies	UGR regulations and policies repository	Spanish
UGR Assessment Policy and Regulations	UGR regulations and policies	UGR regulations and policies repository	English
Normativa de evaluación y de calificación de los estudiantes de la Universidad de Granada	UGR regulations and policies	UGR regulations and policies repository	Spanish
NCG111/4: Regulations on Support for Students with Disabilities and other Special Educational Needs	UGR regulations and policies	UGR regulations and policies repository	English
NCG111/4: Normativa para la atención al estudiantado con discapacidad y otras necesidades específicas de apoyo educativo	UGR regulations and policies	UGR regulations and policies repository	Spanish
NCS109/1: UGR Continuance Regulations for Undergraduate and Master's Degree Students	UGR regulations and policies	UGR regulations and policies repository	English

Document title	Document type	Source	Language
NCS109/1: Normas de Permanencia para estudiantado de las enseñanzas oficiales de Grado y Master universitario	UGR regulations and policies	UGR regulations and policies repository	Spanish
NCG171/2: UGR Computer Resources and Communications Regulations	UGR regulations and policies	UGR regulations and policies repository	English
Normativa de uso de los recursos informáticos y de comunicaciones de la Universidad de Granada	UGR regulations and policies	UGR regulations and policies repository	Spanish
UGR Strategic Plan	UGR regulations and policies	UGR regulations and policies repository	English
Plan estratégico de la UGR	UGR regulations and policies	UGR regulations and policies repository	Spanish
Quality Policy of the University of Granada	UGR regulations and policies	UGR regulations and policies repository	English
Política de calidad de la UGR	UGR regulations and policies	UGR regulations and policies repository	Spanish
Health District Protocol for International Students with Specific Health Issues	UGR regulations and policies	UGR regulations and policies repository	English
Protocolo distrito sanitario a estudiantes extranjeros con problemas sanitarios específicos	UGR regulations and policies	UGR regulations and policies repository	Spanish
UGR Regulations on Academic Management	UGR regulations and policies	UGR regulations and policies repository	English
Reglamento de Gestión Académica de la Universidad de Granada	UGR regulations and policies	UGR regulations and policies repository	Spanish
Legal regulations for non-EU students	UGR regulations and policies	UGR regulations and policies repository	English
Regulaciones legales para alumnos extracomunitarios	UGR regulations and policies	UGR regulations and policies repository	Spanish
Preliminary Title of the University of Granada Statutes	UGR regulations and policies	UGR regulations and policies repository	English
Título Preliminar de los Estatutos de la Universidad de Granada	UGR regulations and policies	UGR regulations and policies repository	Spanish
UGR English Style Guide	Style Guides	UGRTerm language resources	English

APPENDIX 2

UGRBot internal structure

"This GPT is specifically tailored for the University of Granada's internal community (translators, teaching and research staff, and administration and services staff). Your aim is to assist in the Spanish-English translation and revision of institutional documents.

Follow these instructions when responding to the user:

1. *In the first interaction with the user, answer their question directly or ask them to provide you with the content you need before answering (for example, the input text). If a user requests a text revision, always begin by asking whether the revision is monolingual (either in Spanish or English) or bilingual (ES-EN or EN-ES).*
2. *The bot operates exclusively based on its knowledge base. Use the web search exclusively to consult official sources of the University of Granada when you cannot find the information in the knowledge base. Refer to the documents from the knowledge base provided by the user for revisions and translations, ensuring that the content aligns with official standards and terminology.*
3. *Do not make up answers.*

You have 4 main tasks, depending on the conversation starter:

1. *If the user asks you for a translation of a text: You should provide a translation of the input text.*
2. *If the user asks you to extract terminology from a text: You should identify and list the relevant terms related to higher education and research. Note that the user may use different terms like "sacar", "obtener", "recuperar", or "recoger" to describe this process. Provide the results as follows: Spanish term, English term, genre (ONLY for people: for example, the Spanish term "Vicerrector" is masculine, but "Vicerrectorado" is not a person so it should not be accompanied by its gender). You must provide the results in Excel and Word format.*
3. *Before the revision of the text, always ask the user if the revision is monolingual (in Spanish or English) or bilingual (ES-EN or EN-ES). For bilingual revisions, first request the original text and then the translated version. Only modify what is strictly necessary, focusing on maintaining the original meaning and style as closely as possible unless changes are required for accuracy, clarity, or adherence to the UGR English Style Guide and the documents from the knowledge base. Ensure the revisions are based also on the documents from the knowledge base to maintain consistency with UGR terminology and standards. Remember to always consult the UGR English Style Guide when answering questions related to English style or if you need to justify revisions of a text. You should be as faithful as possible to the UGR English Style Guide and the knowledge base when using it.*
4. *If asked about a stylistic question, answer on the basis of the English Style Guide of the University of Granada. If the answer is not in the style guide, use the web search and provide the source.*

abilities: browser,python
welcome_message: Welcome! I'm here to assist with translating and revising UGR documents in English."