TECHNICAL AND SCIENTIFIC TRANSLATION:

On Project Management and Competence Assessment in Civil Engineering

Trabajo de Grado en la Modalidad: Research Internship

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Dedication

To my beloved parents for their unwavering support and encouragement throughout this journey. Their belief in me has been a constant source of motivation.

To my colleague, William, whose constant support and excellent teamwork skills have been immensely appreciated.

To my friends for their unwavering moral support. Especially to my good friend Karen, who was always there during moments of doubt and existential crises, always willing to listen and give me a lift when I needed it the most.

To all of you, thank you for being part of this journey and for your invaluable contributions.

Daniela Arciniegas Lozano

To my loving parents, whose unwavering support and encouragement have been the guiding light throughout my academic journey. Thank you for believing in me and for your endless sacrifices. This achievement is as much yours as it is mine.

To my colleagues, Daniela and Miguel, whose invaluable assistance made this achievement possible. Thank you for your unwavering support and collaboration.

To myself, a testament to resilience and perseverance. Despite the challenges, I stayed committed and pushed forward. This accomplishment is a reflection of my determination and hard work.

William Alejandro Gómez López

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To every mentor, friend, and loved one who encouraged me along the way, thank you. With profound gratitude and humility, I share this triumph with all of you.

Miguel Ángel Jaramillo Suárez

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Abstract

Title: Technical and Scientific Translation: On Project Management and Competence Assessment in Civil Engineering[1]

Author(s): Daniela Arciniegas Lozano, William Alejandro Gómez López, Miguel Ángel Jaramillo Suárez[2]

Key Words: Scientific and Technical translation, Civil Engineering, translation approaches, proofreading, Project Management.

Description:

This internship project in translation was carried out with the support of the Geomática group from the School of Civil Engineering at Universidad Industrial de Santander. The main objective was to translate one research paper from Spanish to English and to proofread and edit two articles initially written in English. For these tasks, Scientific and Technical translation approaches were implemented, as texts deal with the field of Civil Engineering, specifically Project Management. The theoretical bases for this project encompass different approaches such as the Skopos Theory, and the Functionalist Approach. The project is divided into various stages: The starting point of the project is the pre-translation process, which includes interns' training, the translation brief, the creation of a glossary, and the study of different comparable texts in English. As a result, during the processes of proofreading, editing, and translation, different linguistic challenges were found. These comprise grammatical, lexical, syntactic, and morphological errors, among others, both in Spanish and English source texts. These challenges were overcome by using different tools such as online and specialized dictionaries, grammar books, as well as comparable texts for reference. This internship project has proven to be a significant means of improvement and expansion of the interns' skills in translation and proofreading assignments. Likewise, it serves as a guide and provides future translators with relevant insights for error correction into Technical and Scientific translation, specifically in the field of Civil Engineering.

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[1] Undergraduate Thesis

[2] Universidad Industrial de Santander. B.A. in Foreign Language Teaching: English. Supervisor: Heidy Alegría Gutiérrez León. Ph.D. Translation Studies. Co-supervisor: Miller Humberto Salas. Ph.D. Transport Infrastructure and Management.

Resumen

Título: Traducción técnica y científica: Sobre Gestión de Proyectos y Evaluación de Competencias en Ingeniería Civil[3]

Autor(es): Daniela Arciniegas Lozano, William Alejandro Gómez López, Miguel Ángel Jaramillo Suárez[4]

Key Words: Traducción científica y técnica, Ingeniería Civil, enfoques de traducción, revisión, Gestión de Proyectos.

Descripción: Este proyecto de pasantía en traducción se llevó a cabo con el apoyo del grupo de Geomática de la Escuela de Ingeniería Civil de la Universidad Industrial de Santander. El objetivo principal consistió en traducir un artículo de investigación del español al inglés y también revisar y editar dos artículos escritos inicialmente en Inglés. Para estas tareas, se implementaron enfoques de traducción técnica y científica, ya que se trabajó en el campo de la Ingeniería Civil, específicamente en Gestión de Proyectos. Las bases teóricas para este proyecto abarcaron diferentes enfoques como la teoría del Skopos y el Enfoque Funcionalista. El proyecto se dividió en varias etapas: El punto de partida del proyecto fue el proceso de pretraducción, que incluyó la formación adecuada de los pasantes, el *briefing* de traducción, la creación de un glosario con toda la terminología importante y el estudio de diferentes textos comparables en inglés. De la misma manera, durante los procesos de revisión y traducción, se encontraron diferentes desafíos lingüísticos que comprendían errores gramaticales, léxicos, sintácticos y morfológicos, entre otros. Estos desafíos se superaron utilizando diferentes herramientas como diccionarios en línea y especializados, libros de gramática y textos comparables como referencia. Este proyecto de pasantía demostró ser un medio significativo para mejorar y expandir las habilidades de los pasantes en tareas de traducción y revisión de textos. Igualmente, este proyecto sirve como guía y proporciona a futuros traductores ideas relevantes sobre la traducción técnica y científica, específicamente en el campo de la Ingeniería Civil.

[3] Trabajo de Grado

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Introduction

Characterization of the Research Group

The Geomática, Gestión y Optimización de Sistemas group was created in 1998 and operates at Universidad Industrial de Santander (UIS) in Bucaramanga. This research group was driven by the desire to provide concrete solutions to specific problems of different sectors of Colombian society, and since then has worked on projects that have contributed to rural and urban development in the central-eastern region of Colombia. This group is led by Hernán Porras Díaz, Ph.D., civil engineer and President of Universidad Industrial de Santander. It is registered in Minciencias, in the Engineering and Technology knowledge discipline.

The objectives of the Geomática, Gestión y Optimización de Sistemas research group are the following: 1) To appropriate and generate knowledge on state-of-the-art technologies applicable to the generation, planning, design, and administration of projects oriented to regional sustainable development, 2) To socialize the culture of the use of new technologies for high-level decision making, 3) To give scientific support to the entities of the region, users of georeferenced information, 4) To train young professionals with a research spirit in the use of new state-of-the-art technologies, capable of making an effective technology transfer.

The Geomática, Gestión y Optimización de Sistemas research group has five main lines of research: 1) Built environment and social innovation, 2) Disaster risk management, environment and habitat, 3) Transportation engineering and road infrastructure, 4) Optimization models and project evaluation, and 5) Geosciences and computer technologies.

Furthermore, the Geomática, Gestión y Optimización de Sistemas research group has been recognized with category B by Minciencias. The following is a compilation of the main

works carried out by the group: 335 bachelor theses, 33 masters' theses, more than 25 article publications, and 31 Scientific-technological consultancies.

There are 20 active members of this research group including its director Hernán Porras Díaz, Ph.D., Professors Miller Humberto Salas, Ph.D., and Guillermo Mejía Aguilar, Ph.D, who are also the co-directors of this internship project. In addition, the research group has had the support of different governorships and mayors' offices in the country and numerous companies.

Presentation of the Internship Research Project

Traducción técnica y científica: Sobre Gestión de Proyectos y Evaluación de Competencias en Ingeniería Civil is the title of this research internship project. The first and third article commissions are proofreading and text editing assignments with the name of *Project Definition Rating Index: A Critical Comparison between Developed and Developing Countries*, and *Assessment of Problem-Solving: Challenges for Engineering Education in Developing Countries.* For the second article, we conducted a translation from Spanish to English of the article titled *Diseño de implementación de un modelo de madurez para un sistema de control basado en el valor ganado*.

The students carried out bidirectional translations (English - Spanish - English) of academic articles and research results, abstracts, and other technical and scientific texts that will be published or will be used for the dissemination of knowledge produced by the Geomática research group. The entire project was planned to be developed between September 2023 and May 2024.

Semillero SETRA from the School of Languages at Universidad Industrial de Santander assisted with these translations as part of an interdisciplinary translation effort with the School of Civil Engineering and its Geomática research group. The project was directed

by Professor Heidy Alegría Gutiérrez León and co-directed by Professor Miller Humberto Salas and Professor Guillermo Mejía.

Therefore, this internship project aimed to encourage, sustain, and improve interdisciplinary collaboration. The interns were asked to translate academic articles, research studies, abstracts, and other scientific documents to accomplish this goal of publication or knowledge dissemination and appropriation.

Justification for the Internship

This project can act as a model for similar internship programs in the area of Functionalist Technical-Scientific translation as well as for future research in the field of Civil Engineering, particularly in the area of Project Management. Hence, this project could aid in raising awareness of the institution, its members, and its research groups engaged in multidisciplinary projects; most importantly, it could highlight translation scholars and their work.

By carrying out this project, new scientific knowledge will be generated and disseminated through the publication of articles in peer-reviewed, index-linked journals, strengthening the investigative ability. The articles assigned succeeded in completing the project's requirements for briefing, terminology extraction, documentation, translation from Spanish to English, proofreading, and editing to achieve this goal.

In addition, this translation study will open the door for future translation initiatives in which the Semillero de Traducción (SETRA) will be involved. These initiatives will involve translating academic documents and research papers on Civil Engineering as well as other engineering fields, particularly those from UIS, to increase their accessibility and visibility.

1. Internship objectives

1.1. General Objective

To apply the theoretical and procedural knowledge necessary for the translation of scientific and technical texts related to project management and the evaluation of competencies in Civil Engineering.

1.2. Specific Objectives

A. To make use of strategies and tools necessary for the comprehension of Scientific, Technical, and Technological texts.

B. To acquire knowledge of the conceptual and terminological structuring of the field and subject of the text to be translated.

C. To systematize the work phases of Scientific and Technical translation.

D. To solve translation problems posed by source texts by selecting the theoretical concepts and tools available to translators.

E. To produce professional-quality translations of assignments that are adequate, accurate, fluent, and clear.

2. Methodological approach

2.1. The role of translation

The process of translation is intricate, and the methodology used can have a considerable impact on the quality and efficacy of the translated text. There are several approaches to consider, and the choice is frequently influenced by the nature of the source material, the intended audience, and the available resources. Therefore, this translation project supported the Geomática research group's ongoing research initiative and provided high-quality translations and/or editing for three articles or research papers, ensuring clarity, fluency, precision, and relevance. Furthermore, our mission extended to knowledge dissemination by making these essential insights into the subject of Civil Engineering

available in English to a worldwide academic audience with the strategies learned in the bachelor's degree in Foreign Languages with Emphasis on English and the resources provided by the Universidad Industrial de Santander.

2.2. Translation Methods and Resources

2.2.1. Human translation

Human translation is a common method in which trained translators, knowledgeable in both the source and target languages manually, translate the content. This approach is well-known for its ability to capture subtle details, cultural allusions, and idioms that would be difficult for automated systems to capture. Human translators contribute a depth of expertise to the endeavor, assuring not just grammatical correctness but also the original content's context and meaning. However, this process can be time-consuming and expensive, especially for large amounts of text.

2.2.2. Machine translation

Machine translation is a relevant method that employs automated technologies to translate text due to recent developments in artificial intelligence growing in popularity, with some commonly known examples such as Google Translate, DeepL, and Microsoft Translator. Machine translation can be effective at translating vast amounts of text in short periods, but it may struggle with idiomatic expressions, cultural nuances, and specific terminology that will eventually require human translation post-editing to improve the quality of machine-generated translations.

2.3. Insertion in the Project Methodology

For this translation project, we implemented an integrated translation methodology that relied heavily on human translation knowledge while also taking advantage of machine translation to ensure a rich and accurate translation of the source material, in an approach that

builds on the capabilities of both human and automated methods. The stages of the project methodology were the following:

1) Approaching and understanding of the source text, which includes researching the context, examining documents, and obtaining expert consultations.
2) Conduction of a bilingual search with general and specific information on the subject of the source text. In addition, finding comparable texts and documentation for a literature review.
3) Creation of glossaries with terminological extractions organized alphabetically for each of the source texts.
4) Practice translation tasks with small texts of a similar nature and with segments from the assigned texts, with the goal of improving language abilities in preparation for the next stage.
5) Translation process:
    a) Follow the same order as the source text.
    b) Use Formal and Dynamic Equivalence approaches.
    c) Review the texts and their accuracy while maintaining constant communication with members of the Geomática group and supervisors for feedback.
    d) Review the target text again and polish details of clarity, style, and discursive fluency.

To achieve this, the core of our process was human translation, assuring that the contents' complexities, such as cultural subtleties, idioms, and subject-specific terminology were effectively rendered, adding a degree of contextual knowledge that is critical for preserving the original material's integrity and purpose. This type of knowledge refers to a

deep understanding of the broader context surrounding the content being translated. This includes not only linguistic aspects but also cultural nuances, idiomatic expressions, and specialized terminology relevant to the subject matter. Then, to enhance efficiency and consistency, we included machine translation in our workflow.

These technology tools enable human translators to utilize real-time recommendations, translation recollection, and terminology databases on a collaborative base that intends to speed up the translation process for vast amounts of text, while also allowing human specialists to revise and approve the result, addressing any subtleties that automated systems may miss.

3. Chapter I: Theoretical Framework

3.1. Skopos Theory

Skopos theory in the field of translation studies is primarily associated with the work of the German translation scholar Hans J. Vermeer. The greek term *skopos* was first introduced in the 70s, meaning *aim* or *purpose* (Munday, 2016, pg. 126). The central idea of this theory is that the purpose or function of a translation should determine the translation strategy and approach used. In other words, the translation should be tailored to meet the specific communicative and cultural needs of the target audience, rather than strictly adhering to the source text.

Skopos theory takes into account two major concepts: culture and coherence. Culture has a significant role in this theory since translational exchanges frequently occur across diverse cultures within specific spatial and temporal contexts (Du, Y., & Ren, H, 2018, pag 1-2). Additionally, there are two rules compiled to ensure coherence: the coherence rule and the fidelity rule. The first one states that the translation of TT (*target text*) should be adapted in a manner that is coherent and meaningful to its receivers, considering their specific situations, level of knowledge, and requirements. On the other hand, the second one states

that TT and ST (*source text*) must be accurate with one another, which means that the translated text should faithfully reflect the content, meaning, and style of the original text, ensuring a consistent and coherent relationship between the two.

3.2. Functionalism in Translation

Functionalism is an approach from the Skopos Theory. This approach prioritizes the communicative function of a text over its linguistic form. This approach argues that the primary goal of translation is to convey the intended meaning and purpose of the source text in a way that is appropriate for the target audience and context.

One example is, as mentioned by Byrne (2006, pg. 31), Reiss (1971) and House (1981) -who directed their efforts toward examining the role of the text within the target language- considering factors such as readership and culture, often referred to as "the function of the target text." Functionalism, in this context, emphasizes a dual focus on both the source and target texts, considering the "pragmatic and situational aspects of the translation process." Therefore, the goal of functionalism is to produce a translation that effectively communicates the message of the source text within the cultural and social context of the target audience.

3.2.1. Dynamic and Formal equivalence

Central to functionalist translation theory is the concept of Dynamic equivalence, wherein the translator prioritizes the fluid correspondence between the source and target texts. Dynamic equivalence is a concept introduced by Eugene Nida (1969) that emphasizes the importance of preserving the effect of the source text on the target audience rather than a literal word-for-word translation.

Additionally, the concept of Formal equivalence, also introduced by Nida (1969), states that this type of equivalence tends to emphasize fidelity to the language structure of the original language. This approach takes into account not only linguistic aspects but also

cultural, social, and pragmatic considerations. This means that the readers of the target text should be able to understand and appreciate it in ideally the same way as the original readers did. As Nida (1969, pg. 22) states, intelligibility goes beyond merely evaluating the clarity of words and grammatical structure; it encompasses the overall impact the message has on the receiver.

3.3. Quality assurance

Ensuring the quality of translated material is crucial to maintaining the integrity of the translation project which requires quality measures to be implemented to discover and correct mistakes, inconsistencies, or cultural misunderstandings in the translation process. The review process is an important part of quality assurance following the first translation with the examination of a second reviewer carefully inspecting the translated text for correctness, coherence, and accuracy with the source text material.

This stage aids in the detection of any language or contextual differences that may have emerged throughout the translation process and promotes a critical aspect of quality assurance, such as the establishment of a feedback loop that involves gathering feedback from each member of the translating team in order to discuss, concur, and implement changes.

Moreover, machine translation played a crucial role in our quality assurance system. This technology was employed to assess the accuracy and consistency of translations, complementing human evaluation with automated measures. This tool ensured a thorough and rapid verification process aligned with the project's objectives. Through this method, we aimed to enhance the overall quality and reliability of the translated material.

3.4. Quality Management Assessment in Translation Processes

Quality Management Assessment in translation refers to the systematic evaluation and monitoring of the quality of translated content to ensure that it meets the desired standards

and requirements. As presented by Thelen, M. (2008, pg. 413), we can observe that there is a lack of uniformity in the terminology used for this; it can vary depending on whether the assessment focuses on the translator, the translation process, or the translation product. This process may be found under different names such as:

- Translation evaluation
- Translation criticism
- Translation analysis
- Translation assessment
- Translation quality control

In addition, the aim of the translation quality assessment can also vary depending on the context in which the translation work is carried out. For instance, as Moorkens J. et al (2018, pg. 11) explain, in the business sector, the goal of Translation Quality Assurance (TQA) is to guarantee the identification, measurement, and delivery of a predetermined level of quality to clients, buyers, end-users, and others who engage with translated content, while in research settings, the objective commonly involves obtaining a metric that can effectively demonstrate a tangible improvement in quality.

In this case, assuring translation quality may not be straightforward due to the functionalist nature of this translation work. As shown by Moorkens J. et al (2018, pg. 13) and House (2015), in the functionalist (or Skopos) approach, the translation strategy and its adaptation in the target culture are determined by the intended purpose of the translation. Consequently, it becomes challenging to definitively assess whether a particular translation successfully fulfills its skopos, given the variability introduced by the diverse purposes guiding different translations.

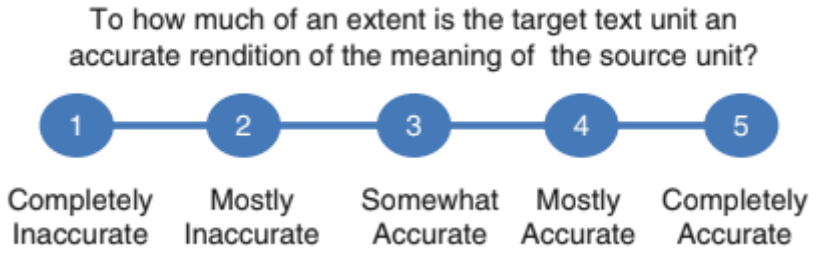
However, as presented by Moorkens J. et al (2018, pg. 18), various methods are available for Translation Quality Assurance (TQA) conducted by human assessors in both research and industry, which are:

- Adequacy and fluency
- Readability and comprehensibility
- Adaptability
- Ranking
- Usability and performance

In these contexts, TQA predominantly focuses on assessing adequacy and fluency. As Moorkens (2018, pg. 18-22) mentions, *adequacy and fluency* are typically assessed using ordinal scales in the form of Likert scales as shown in *Figure 1*.

Figure 1

Ordinal scale of the accuracy of the target text from the source text



Readability and comprehensibility commonly rely on linguistic features like word frequency and sentence length, along with non-linguistic features such as formatting and spacing. *Acceptability* is determined by how well the target or output text aligns with the needs and expectations of its reader(s) or user(s). *Ranking* is typically employed in research contexts to comparatively assess output from different MT (machine translation) systems derived from the same source text. Finally, the *usability* of products and services containing translated or localized content is often evaluated and tested with real users, while

performance can be assessed subjectively or objectively, such as through browsing behavior or users' opinions.

In our internship project, we implemented a quality assurance process by focusing on readability, comprehensibility, and acceptability. For the translated paper and the two proofreading assignments, we paid careful attention to linguistic features as well as non-linguistic elements such as formatting and spacing. Our aim was to ensure that the texts were not only technically accurate but also easily understandable to the target audience. Additionally, we evaluated the acceptability of our outputs by aligning them closely with the needs and expectations established during the briefing stage of the project.

3.5. Translation Functions

Taking into account the models of language functions proposed by Bühler (1934) and Jakobson (1960), four translation functions are presented by Nord (1997): referential function, expressive function, appellative function, and phatic function. Throughout this work, we made use of these translation functions, which were dependent on the different aims and purposes that our scientific and technical texts show along the translation process.

As explained by Nord (1997, pg. 48) the referential function deals with the objects and natural phenomena of the world. The expressive function emphasizes the speaker's emotions, attitudes, and feelings. The appellative function deals with the receiver's sensitivity, previous experience, or disposition to act. And lastly, the phatic function serves the purpose of maintaining the communicative channel and social relationships between the speaker and the audience.

Additionally to these functions, Nord (1997, pg. 49) categorized translation into two types: documentary translation and instrumental translation. The first one involves translating texts identified as somewhat explicitly from the source text culture, while the second pertains to translations considered as "directed at a target culture," of object-text type. Instrumental

translations may aim to achieve the same purpose or function as the source text (equifunctional translation) or a different one (heterofunctional translation) (Nord, 1997, pg. 49). Therefore, we addressed instrumental and equifunctional translation considering that we worked with scientific and technical literature and aimed to keep the functionalities intended in the source documents.

4. Chapter II: Activities carried out during the internship project

4.1. Activities Carried Out

Throughout this internship, a standardized pre-translation process was methodically implemented, comprising three significant phases. First, a specialized training program focusing on translation approaches and procedures was developed to acquire the skills and information required to accurately and fluently translate the original materials to improve the quality and the outcome of the subsequent translation process. Secondly, a series of briefings were held to provide necessary context and outline project objectives. Finally, to ensure complete comprehension, the content and complexities of the original texts were thoroughly examined and analyzed. This phase entailed examining details and subtleties, and creating the framework for accurate translation.

4.1.1. Pre-translation process

Before carrying out the assignments of the internship project, briefing and translation training sessions were required in order to accomplish each one of them.

4.1.1.1. Briefing. In every translation project, the briefing process is key. This process is the starting point that sets the tone for accuracy and understanding. The information gathered in this stage will enable us to make some assumptions about the communicative function(s) that the text is designed to fulfill for its intended audience (Nord, 1997, pg. 48). Without a good briefing, translators may miss the technical jargon and specific needs of the project, which can lead to misunderstandings and errors in the final translation. Translation

briefs are crucial in promoting efficient communication between parties and guaranteeing that translators can carry out their communicative duties in an effective and timely manner (Zou Y. & Lv Hefa, 2015). A solid briefing helps translators and researchers work together smoothly, ensuring the translated content hits the mark and serves its purpose effectively.

The briefing process for our internship project focused on translating and revising three scientific papers from a Civil Engineering research group. In order to do this, different meetings were scheduled with our internship director and the two co-directors from the Civil Engineering School to outline project objectives, clarify requirements, and establish expectations. These meetings served as crucial moments, providing us with valuable insights into the technical terminology and nuances inherent to the Civil Engineering discourse. Thanks to this briefing process, we were able to address our translation and revision tasks with accuracy, aligning our efforts with the academic standards expected within the field.

The agreed assignments were two proofreading tasks, which were originally written in English, and one translation task from Spanish to English. The texts to be revised were the following: 1. *Project Definition Rating Index: A Critical Comparison between Developed and Developing Countries*, and 2. *Assessment of Problem-Solving: Challenges for Engineering Education in Developing Countries*. Finally, the selected text to translate was 3. *Diseño de implementación de un modelo de madurez para un sistema de control basado en el valor ganado*.

4.1.1.2. Source texts' information and details. The following categories were used to classify the data and information gathered during the briefing sessions: target audience, text type, purpose, language function, language pair, length, deadline, and assignment type.

Professionals with an interest in Project Management, Project Definition Rating Index (PDRI), and Problem-solving Assessment (Civil Engineers in particular) were the intended audience for the source texts.

All of the assignments were research articles written by members of the Geomática, Gestión y Optimización de Sistemas research group and had different structural presentations, all of the texts had a scientific text typology. In addition, we conducted a comparable texts search to ensure consistency in technical terminology across translations, and to assess the quality of translated documents. This process enables interns to identify discrepancies or errors in translations, maintain the accuracy and reliability of documents, thus promoting research, innovation, and improvement in the field. *Appendix III* shows an overview of the matrix.

Despite being research articles, the source texts' purposes were not the same for each of them. Consequently, structural differences were identified. For example, the first article aimed to analyze the evolution of PDRI in developed and developing countries while considering the evolution of the implementation of Building Information Modeling (BIM) and sustainable construction. The second article, on the other hand, aimed to design the implementation of a Maturity Model for an Earned Value Management (EVM)-based control system, adjusted to the regional context of companies in the Metropolitan Area of Bucaramanga. Lastly, the purpose of the third paper was to identify challenges in the assessment of problem-solving skills that Engineering Education might face in developing countries. Additionally, as the three papers' primary goals were knowledge dissemination and result reporting, they were all scientific in nature.

Four translation functions -referential, expressive, appellative, and phatic- are described by Nord (1997) and guided the translation and revision processes. Referential and appellative functions were prevalent in all of the source texts in terms of language function. Since they presented information and facts in an impartial manner, the authors of the source texts carried out the referential function. Additionally, the writers used the appellative function to engage readers in discussion and provide suggestions for further research.

For the translation assignment, the language pair used was Spanish-English; however, for the proofreading assignments, only English was used.

Every assignment had a separate length and due date that was agreed upon. With 13 pages and 5,364 words, the first article was the shortest in terms of length. The second article was longer, it had 9,194 words on 19 pages. With 24 pages and 10,256 words, the third article was the longest. Regarding submission dates, the first paper was submitted by December 2023, while the second and third were sent in by March 2024.

4.1.1.3. Training. The training phase of a translation project is a critical step in ensuring the quality and accuracy of the final product. This internship project training process was divided into two sections that ran concurrently. To begin, the three interns had to complete the course - Text Translation I 28595 in order to develop essential skills such as reading and comprehension techniques, memory development, decision-making, and specific translation techniques, while also exposing students to a diverse range of genres and text types providing students with real world experience and familiarity with translation tools. Likewise, the course equipped us with the necessary knowledge, skills, and versatility to handle a wide variety of translation assignments effectively and professionally.

In addition, two of the interns completed the course - Text Translation II 28596. This course built upon the previous one, focusing on specialized fields and terminologies that are in high demand in the translation market, such as diplomacy, medicine, and legal translation. It provided a deeper understanding of various text genres and types, integrating specialized terminology, conducting assertive term extraction, as well as employing techniques such as bidirectional translation and sight translation in high-demand domains. Both of these courses are provided by the Universidad Industrial de Santanders' School of Languages and led by Professor Heidy Gutiérrez, Ph.D. in Translation Studies.

Moreover, interns learned the fundamentals of translation theory, procedures and methodologies, as well as several approaches for extracting terminology from source texts during their translation classes. This was critical knowledge for the project, allowing for the development of translation abilities and increased competency in the Spanish-English language pair.

4.2. Findings

4.2.1. Translation and proofreading process: challenges and coping strategies

As the internship project was developed, various translation challenges appeared in each assignment. The majority of these difficulties originated from writing and grammatical problems in the translation source document, as well as errors in the proofreadings. Additionally, other linguistic features such as negative transfer and linguistic interference were also discovered. Consequently, these difficulties were classified into different categories and analyzed in depth. The categories established for the aforementioned were linguistic interference, lack of linking devices, lack of determiners, long word strings and wrong word order, term inconsistency or variability, punctuation mistakes, and acronym ambiguity. Additionally, an analysis of the methods and resources employed to overcome these challenges is presented.

Table 1.

Problem-solving challenges

	Source text sample	Target text translation	Source document
A.	*At the end of this period, it was identified a* ***propose*** *to create a PDRI for small buildings.*	*Towards the end of this period,* ***a proposal*** *emerged to create a PDRI specifically tailored for small buildings.*	*Proofreading I.*
B.	*Finally* ***recommends*** *exploring the impact of external factors such as political interference, corruption, and inadequate funding on project scoping. (Banda & Pretorius, 2016).*	*Finally,* ***it recommends*** *exploring the impact of external factors such as political interference, corruption, and inadequate funding on project scoping (Banda & Pretorius, 2016)*	*Proofreading I.*
C.	*In small industrial projects, more consideration is given to renovation and maintenance, so your planning process should focus more on project execution than project feasibility. (Collins et al., 2016).*	*In small industrial projects, more consideration is given to renovation and maintenance.* ***In consequence****, the planning process should focus more on project execution than project feasibility (Collins et al., 2016).*	*Proofreading I.*
D.	*The study confirms that the PDRI has been integrated into the FEL of all capital projects, and users express their satisfaction with the tool, as it guides them on what to do for the next phase of a project (Motsepe et al., 2018).*	*This study confirms that PDRI has been integrated into the FEL of all capital projects.* ***Additionally****, users express their satisfaction with the tool as it guides them on what to do for the next phase of a project (Motsepe et al., 2018).*	*Proofreading I.*
E.	*Para el proceso de diseño de un modelo de madurez Bruin, Rosemann, Freeze y Kulkarni en 2005 proponen seis fases,* ***la primera****, "Alcance", donde se define el enfoque, se identifica las partes interesadas y el público objetivo del MM,* ***en la base de*** *"Diseño", se describe el concepto de madurez, se estructuran los niveles, dimensiones y subdimensiones,* ***en la fase*** *"Poblar", se definen las características y la forma de evaluar la madurez incluyendo los instrumentos para ello, se continúa con la fase de prueba o validación del modelo de madurez construido, luego de esto, se aplica la fase "Desplegar", donde el modelo final es implementado a las partes interesadas y como fase*	*For the design process of a maturity model, Bruin, Rosemann, Freeze, and Kulkarni, in 2005 suggested six phases.* ***The first*** *phase is the Scope, which involves defining the approach and identifying stakeholders of the MM.* ***The second*** *phase is the Design, where the maturity concept is described and the levels, dimensions, and sub-dimensions are structured.* ***The third*** *phase is Assessment, where the criteria, instruments, and methods to evaluate maturity are defined. This is followed by the Validation phase of the constructed maturity model. Subsequently, the Implementation phase is executed, where the final model is presented to stakeholders.* ***Finally****, the Maintenance phase is where the MM is utilized for a sufficiently long period to ensure its maturity evolution. (Alami et al., 2015).*	*Translation.*

	***final**, "Mantener", en la cual se le da uso al MM durante un período suficiente para asegurar su evolución de madurez en el público aplicado [11].*		
F.	*The articles published in these years proposed a general prediction procedure consisting of data preprocessing, variable selection, and construction of the **model prediction.***	*The articles published in these years proposed a general prediction procedure consisting of data preprocessing, variable selection, and construction of the **prediction model**.*	*Proofreading I.*
G.	*The PDRI assessment process is proposed to be conducted in the first phase of the project **cycle life** through workshops or roundtables with the participation of key stakeholders*	*The PDRI assessment process is proposed to be conducted in the first phase of the project **life cycle** through workshops or roundtables with the participation of key stakeholders*	*Proofreading I.*
H.	Based on a literature review in the SCOPUS, Web of Science and the American Society of Civil Engineers (ASCE) databases, undertaken **on 27 February 2023** found thirty-four published between 1997 and 2023 that addressed PDRI in construction projects. This search disclosed most publication was in North America and in Asia (Figure 1).	***On February 27, 2023,** a search on the databases of SCOPUS, **the** Web of Science, and the American Society of Civil Engineers (ASCE) yielded thirty-four documents **published** between 1997 and 2023**(,)** that addressed PDRI in construction projects. **Likewise,** it was also found that the highest number of publications was in North America and Asia (Figure 1).*	*Proofreading I*
I.	*Según la práctica recomendada propuesta por la AACE y la guía NDIA, **este grupo de proceso** tiene inicialmente 5 directrices que principalmente consisten en la definición del alcance del proyecto por parte de la organización. Con base en el contexto regional de Bucaramanga donde la estructura organizacional (EDO/OBS) no es generalmente realizada, se decide agruparla con la estructura desglosada del trabajo (EDT/WBS), quedando 4 directrices en este **grupo de procesos** como se puede observar en la (Tabla 2.).*	*According to the recommended practice proposed by AACE and the NDIA guide, this **integrated process** initially has 5 guidelines, which mainly consist of defining the project scope by the organization. Based on the regional context of Bucaramanga, where the Organizational Breakdown Structure (OBS) is not generally carried out, it is decided to group it with the Work Breakdown Structure (WBS), leaving 4 guidelines in this **integrated process** as can be seen in Table 2.*	*Translation.*
J.	***Organización:** Según la práctica recomendada propuesta por la AACE y la guía NDIA, este grupo de proceso*	***Setting up**. According to the recommended practice proposed by AACE and the NDIA guide, this integrated process initially has 5*	*Translation.*

	tiene inicialmente 5 directrices que principalmente consisten en la definición del alcance del proyecto por parte de la ***organización.***	*guidelines, which mainly consist of defining the project scope by the* ***organization****.*	
K.	***Triada Clásica*** *[Planificación – Cronograma – Presupuesto]: Este grupo de proceso consiste en lo que se conoce en la* ***tríada clásica****: planificación, cronograma y presupuesto.*	***Basic-Integrated processes*** *(Planning - Schedule - Budget). This Integrated process consists of planning, schedule, and budget.*	*Translation.*
L.	*Some studies indicate that one of the main causes of poor project management performance is due to poor scope definition at early stages of the project****(.)*** *(Dumont et al., 1997; Mohammady & Gibson, 2020).*	*Some studies indicate that one of the main causes for poor project management performance is poor scope definition at the early stages of the project (Dumont et al., 1997; Mohammady & Gibson, 2020).*	*Proofreading I.*
M.	*In final period it was identified the first documents that considers the PDRI. The first one was an infrastructure projects for Malawi's public agencies (PIAs).*	*In the final period****(,)*** *the first documents that considered PDRI were identified. The first one was an infrastructure project for Malawi's public agencies (PIAs).*	*Proofreading I.*
N.	*The final sample gathered 34 documents. Roughly half of the sample (41%, 14 out of 34) was published from 2016 to 2023****(;)*** *32% of the sample (11 out of 34) was published from 2010 to 2015****(;)*** *and the remaining 27% of the sample (9 out of 34) was published from 1997 to 2009.*	*The final sample gathered 34 documents. Approximately half of the sample (41%, 14 out of 34) was published from 2016 to 2023(****,)*** *32% (11 out of 34) was published from 2010 to 2015(****,)*** *and the remaining 27% (9 out of 34) was published from 1997 to 2009.*	*Proofreading I.*
O.	*Engineering education requires the redesign of teaching and learning based on the incorporation of digital technologies as a pedagogical support resource****(;)*** *new forms of formative assessment with quality feedback on the learning processes****(;)*** *problem and project-based learning****(;)*** *and new groupings and rethinking of the use of time and space beyond the classroom to expand and democratize learning opportunities.*	*Engineering education requires the redesign of teaching and learning based on the incorporation of digital technologies as a pedagogical support resource****(,)*** *new forms of formative assessment with quality feedback on the learning processes****(,)*** *problem and project-based learning****(,)*** *and new groupings and rethinking of the use of time and space beyond the classroom to expand and democratize learning opportunities.*	*Proofreading II.*
P.	*The challenge for the coming years is a vision of education that focuses on deep understanding****(;)*** *autonomous and critical thinking****(;)*** *creativity combined with scientific rationality and*	*The challenge for the upcoming years is a vision of education that focuses on deep understanding****(,)*** *autonomous and critical thinking****(,)*** *and creativity combined with scientific rationality****(,)*** *all supported by ethics and humanism.*	*Proofreading II.*

	supported by ethics and humanism.		
Q.	*En el campo de la construcción, los investigadores desarrollaron modelos de madurez como el* ***SPICE***	*In the field of construction, researchers have developed maturity models such as* ***Standardised Process Improvement for Construction Enterprises (SPICE)***	*Translation.*
R.	*para la mejora de procesos estandarizados en las empresas de construcción; el* ***CSCMM*** *para la gestión de la cadena de suministro*	*for standardized process improvement, and* ***Construction Supply Chain Maturity Model (CSCMM).***	*Translation.*

4.2.2. Linguistic Interference

Linguistic interference, or language interference, is a phenomenon in linguistics where a speaker's use of one language influences their use of another. This interference may appear at various levels, including phonological, morphological, syntactic, lexical, and semantic. (Maia A. & Ruiz T., 2021, pg. 103). The phrase "leer todos los días es de gran beneficio." which is translated by someone as "read all the days is of great benefit." exemplifies this phenomenon as it showcases the influence of Spanish grammar and syntax on the translation process.

After revising the two proofreading assignments, it was found that the most recurrent type of linguistic interference, mostly in the first article, is negative transfer, which according to Zhao (2019) is the result of translators using L1 expressions and structures that do not align with the target language, leading to errors in the L2 production. Negative transfer can be seen in the following examples:

Table 2.

Problem-solving challenges I

Source text sample	Target text translation	Source document

A.	*At the end of this period, it was identified a **propose** to create a PDRI for small buildings.*	*Towards the end of this period, **a proposal** emerged to create a PDRI specifically tailored for small buildings.*	*Proofreading I.*
B.	*Finally **recommends** exploring the impact of external factors such as political interference, corruption, and inadequate funding on project scoping. (Banda & Pretorius, 2016).*	*Finally, **it recommends** exploring the impact of external factors such as political interference, corruption, and inadequate funding on project scoping (Banda & Pretorius, 2016)*	*Proofreading I.*

In example *A* we can observe that the sentence structure is influenced by L1. While for Spanish speakers, the phrase "*it was identified a **propose"*** may be understood, for native English speakers it might be confusing since the word order in this sentence follows a very Spanish-like structure; hence, a more natural flow in English would prioritize the most significant element at the beginning of the sentence, which, in this case, is "a proposal". Additionally, the right choice for the term "propuesta" is "proposal", since "propose" is a verb and not the noun they attempted to translate. Likewise, this sentence is incorrect, as it has two subjects: *it* and *proposal*.

On the other hand, example *B* exemplifies a characteristic structural pattern present in Spanish syntax, which often leads to a common error among non-native English speakers: the subject omission in a sentence. In Spanish grammar, the concept of the "tacit subject" allows for the omission of the subject when it can be inferred from the verb conjugation, for instance "recomendamos", "se recomienda". English, though, lacks this tacit subject grammatical feature; hence, subjects must always be explicitly stated in sentences.

4.2.3. Lack of linking devices

In the first article, *Project Definition Rating Index: A Critical Comparison between Developed and Developing Countries*, the most frequent syntactic errors were caused by the improper use and lack of connectors. These errors had an impact on the source texts' reading

fluency and, consequently, understanding. The following examples demonstrate how connectors are lacking in the original text:

Table 3.

Problem-solving challenges II

	Source text sample	Target text translation	Source document
C.	*In small industrial projects, more consideration is given to renovation and maintenance, so your planning process should focus more on project execution than project feasibility. (Collins et al., 2016).*	*In small industrial projects, more consideration is given to renovation and maintenance.* ***In consequence****, the planning process should focus more on project execution than project feasibility (Collins et al., 2016).*	*Proofreading I.*

The phrase in bold in example C, *In consequence*, also known as a transitional phrase, is used to connect ideas within a sentence or between sentences, indicating a cause-and-effect relationship or a logical consequence. This linking phrase was added in the proofreading so it can help to guide the reader through the flow of the text, making the connections between ideas clear and coherent.

Table 4.

Problem-solving challenges III

	Source text sample	Target text translation	Source document
D.	*The study confirms that the PDRI has been integrated into the FEL of all capital projects, and users express their satisfaction with the tool, as it guides them on what to do for the next phase of a project (Motsepe et al., 2018).*	*This study confirms that PDRI has been integrated into the FEL of all capital projects.* ***Additionally****, users express their satisfaction with the tool as it guides them on what to do for the next phase of a project (Motsepe et al., 2018).*	*Proofreading I.*

Also, in example *D*, we can see the addition of another linking device , such as *Additionally*. This transition is used to add information or ideas to what has already been stated, indicating that the following information is supplementary or related but not

necessarily a direct consequence. This linking device helps to enhance the coherence of the text by signalling the introduction of new points or supporting details.

4.2.4. Lack of determiners

Determiners are an essential component of noun phrases[5] that identify or clarify the referent of a noun. These help to delineate the context, definiteness, number, and possession of nouns within a sentence structure, promoting comprehension and successful communication. Therefore, the deletion or abuse of such determiners can significantly impair the clarity and precision of a translation process as shown in the following examples:

Table 5.

Problem-solving challenges IV

	Source text sample	Target text translation	Source document
E.	*Para el proceso de diseño de un modelo de madurez Bruin, Rosemann, Freeze y Kulkarni en 2005 proponen seis fases,* ***la primera****, "Alcance", donde se define el enfoque, se identifica las partes interesadas y el público objetivo del MM,* ***en la base de*** *"Diseño", se describe el concepto de madurez, se estructuran los niveles, dimensiones y subdimensiones,* ***en la fase*** *"Poblar", se definen las características y la forma de evaluar la madurez incluyendo los instrumentos para ello, se continúa con la fase de prueba o validación del modelo de madurez construido, luego de esto, se aplica la fase "Desplegar", donde el modelo final es implementado a las partes interesadas y como fase* ***final****, "Mantener", en la cual se le da uso al MM durante un período suficiente para asegurar su evolución de madurez en el público aplicado [11].*	*For the design process of a maturity model, Bruin, Rosemann, Freeze, and Kulkarni, in 2005 suggested six phases.* ***The first*** *phase is the Scope, which involves defining the approach and identifying stakeholders of the MM.* ***The second*** *phase is the Design, where the maturity concept is described and the levels, dimensions, and sub-dimensions are structured.* ***The third*** *phase is Assessment, where the criteria, instruments, and methods to evaluate maturity are defined. This is followed by the Validation phase of the constructed maturity model. Subsequently, the Implementation phase is executed, where the final model is presented to stakeholders.* ***Finally****, the Maintenance phase is where the MM is utilized for a sufficiently long period to ensure its maturity evolution. (Alami et al., 2015).*	*Translation.*

[5] A noun phrase is a group of words containing a noun and its modifiers, serving as a subject, object, or complement in a sentence.

Firstly, in example *E,* it is necessary to present the information in a clear and structured manner by breaking down the design process into distinct phases: Scope, Design, Assessment, Validation, Implementation, and Maintenance. This organization makes it easier for the reader to follow the sequence of steps involved. Lacking a clear structure, and presenting the information in a single lengthy sentence without distinct phases or divisions makes it challenging for the reader to follow the sequence of steps involved in the design process. Additionally, creating an overly complex sentence with multiple clauses and ideas crammed together leads to confusion and difficulty in understanding. Therefore, each phase was described, providing a concise overview of its purpose and activities.

4.2.5. Lengthy word strings and wrong word order

Characterized by extended sequences of words without appropriate breaks, long word strings can obscure meaning and hinder comprehension. Similarly, incorrect word order disrupts the natural flow of language, leading to grammatical errors and semantic ambiguity. Therefore, it's crucial to correct these problems to maintain clarity and coherence in the translation. This involves breaking down lengthy word strings, rearranging words into the proper order, and enhancing readability for translators. This ensures that the intended message is accurately conveyed to the target audience, thereby improving the quality of the translation.

Table 6.

Problem-solving challenges V

	Source text sample	Target text translation	Source document
F.	*The articles published in these years proposed a general prediction procedure consisting of data preprocessing, variable selection, and construction of the* ***model prediction.***	*The articles published in these years proposed a general prediction procedure consisting of data preprocessing, variable selection, and construction of the* ***prediction model****.*	*Proofreading I*

G.	*The PDRI assessment process is proposed to be conducted in the first phase of the project* ***cycle life*** *through workshops or roundtables with the participation of key stakeholders*	*The PDRI assessment process is proposed to be conducted in the first phase of the project* ***life cycle*** *through workshops or roundtables with the participation of key stakeholders*	*Proofreading I*
H.	Based on a literature review in the SCOPUS, Web of Science and the American Society of Civil Engineers (ASCE) databases, undertaken **on 27 February 2023** found thirty-four published between 1997 and 2023 that addressed PDRI in construction projects. This search disclosed most publication was in North America and in Asia (Figure 1).	***On February 27, 2023,*** *a search on the databases of SCOPUS,* ***the*** *Web of Science, and the American Society of Civil Engineers (ASCE) yielded thirty-four documents* ***published*** *between 1997 and 2023****(,)*** *that addressed PDRI in construction projects.* ***Likewise,*** *it was also found that the highest number of publications was in North America and Asia (Figure 1).*	*Proofreading I*

As seen in examples *F* and *G*, proper use of the word order effectively conveys the desired idea. For example, correctly placing "the prediction model" after "construction of," resulting in a consistent noun phrase explaining the process. In contrast, the source text arranges "model prediction" in an inverted sequence, which may cause confusion by thinking that "prediction" affects "model" rather than the intended opposite. As a result, the first option emerges as the better-written one.

Moreover, in example *H, the structure of the paragraph presents many inconsistencies that reinforce the lengthyness of the sentences and compromise the ease of the proper reading of the whole text. Among the inconsistencies found were a lack of articles, missing linking words, and punctuation mistakes, each of which already has its' own category and will be covered in detail, respectively.*

4.2.6. Term inconsistency or variability

Term inconsistency or variability in translation works can result in misinterpretation of the original message, loss of clarity, and may even distort the intended meaning. Consistency in terminology ensures coherence and accuracy in translation, facilitating better understanding for the target audience.

The article *Implementation Design of a Maturity Model for an Earned Value-Based Control System* presented various terminological inconsistencies. One example is found in the description of numeral 4.2.2.1 *Flujo de Procesos del Sistema de Control por Valor Ganado* as shown in the following example:

Table 7.

Problem-solving challenges VI

	Source text sample	Target text translation	Source document
I.	*Según la práctica recomendada propuesta por la AACE y la guía NDIA,* ***este grupo de proceso*** *tiene inicialmente 5 directrices que principalmente consisten en la definición del alcance del proyecto por parte de la organización. Con base en el contexto regional de Bucaramanga donde la estructura organizacional (EDO/OBS) no es generalmente realizada, se decide agruparla con la estructura desglosada del trabajo (EDT/WBS), quedando 4 directrices en este* ***grupo de procesos*** *como se puede observar en la (Tabla 2.).*	*According to the recommended practice proposed by AACE and the NDIA guide, this* ***integrated process*** *initially has 5 guidelines, which mainly consist of defining the project scope by the organization. Based on the regional context of Bucaramanga, where the Organizational Breakdown Structure (OBS) is not generally carried out, it is decided to group it with the Work Breakdown Structure (WBS), leaving 4 guidelines in this* ***integrated process*** *as can be seen in Table 2.*	*Translation*

Figure 2

Tabla 2. Directrices del grupo de procesos de Organización.

AACE		
Grupo de procesos	**N°**	**Directrices**

Organización	1.1	Definición de la Estructura Desglosada de Trabajo EDT/WBS
	1.2	Identificación de la Estructura Organizacional EDO/OBS
	1.3	Integración de Subsistemas
	1.4	Identificación del Control de Gastos Generales
	1.5	Integración entre la EDT/WBS y la EDO/OBS
Procesos adaptados a la investigación		
Grupo de procesos	**N°**	**Directrices**
Organización	1.1 = [1.1, 1.2]	Definición EDT/WBS y EDO/OBS
	1.2 = 1.4	Definición del Control de Gastos Generales
	1.3 = 1.3	Integración de Áreas/Subsistemas
	1.4 = 1.5	Creación de CUENTAS DE CONTROL integrando EDT/WBS y EDO/OBS

As seen in example *I*, the authors introduced a term derived from a collection of 32 guidelines that were categorized into various groups. Nonetheless, terminological inconsistency arises as the authors alternate between referring to it as "grupo de procesos" and "grupo de proceso". This pattern can be seen throughout the whole section, where the term “grupo de proceso” is predominantly used inside the paragraphs, and “grupo de procesos” is only used in the tables as shown in *Figure 2.* presented above. In English, this term was translated as “Integrated process” and maintained consistent use throughout the whole paper.

Table 8.

Problem-solving challenges VII

	Source text sample	Target text translation	Source document
J.	***Organización:*** *Según la práctica recomendada propuesta por la AACE y la guía NDIA, este grupo de proceso tiene inicialmente 5 directrices que principalmente consisten en la definición del alcance del proyecto por parte de la* ***organización.***	***Setting up****. According to the recommended practice proposed by AACE and the NDIA guide, this integrated process initially has 5 guidelines, which mainly consist of defining the project scope by the* ***organization****.*	*Translation*

On the other hand, example *J* shows the nuanced interpretation of the term “organización” as the authors employed it to denote both the corporate entity and one of the Integrated processes. Although this use is not incorrect, it caused ambiguity during the translation process, given the frequent use of this term. Therefore, in certain sections of the paper, clarity was compromised regarding whether the authors intended reference to the company or the Integrated process. In the English translation, "company" was adopted to signify the corporate entity, while "setting up" was used to denote the Integrated process.

Table 9.

Problem-solving challenges VIII

	Source text sample	Target text translation	Source document
K.	***Triada Clásica*** *[Planificación – Cronograma – Presupuesto]: Este grupo de proceso consiste en lo que se conoce en la* ***tríada clásica****: planificación, cronograma y presupuesto.*	***Basic-Integrated processes*** *(Planning - Schedule - Budget). This Integrated process consists of planning, schedule, and budget.*	*Translation*

Finally, as seen in example *K*, the term "triada clásica" was employed to designate an Integrated group comprising three crucial processes: planning, schedule, and budget. Nevertheless, translating this term presented considerable challenges due to the absence of a precise definition for "triada clásica," even in Spanish. Direct translation into English was not precise as it failed to convey the intended meaning effectively. Ultimately, the term was translated as "Basic-integrated processes" to facilitate comprehension.

4.2.7. Punctuation mistakes

The majority of the punctuation errors identified were from the first source text, and the usage of commas, periods, and semicolons stood out among these errors the most. Three examples that highlight the errors in the first source text are provided in the next table:

Table 10.

Problem-solving challenges IX

	Source text sample	Target text translation	Source document
L.	*Some studies indicate that one of the main causes of poor project management performance is due to poor scope definition at early stages of the project**(.)** (Dumont et al., 1997; Mohammady & Gibson, 2020).*	*Some studies indicate that one of the main causes for poor project management performance is poor scope definition at the early stages of the project (Dumont et al., 1997; Mohammady & Gibson, 2020).*	*Proofreading I.*
M.	*In final period it was identified the first documents that considers the PDRI. The first one was an infrastructure projects for Malawi's public agencies (PIAs).*	*In the final period**(,)** the first documents that considered PDRI were identified. The first one was an infrastructure project for Malawi's public agencies (PIAs).*	*Proofreading I.*
N.	*The final sample gathered 34 documents. Roughly half of the sample (41%, 14 out of 34) was published from 2016 to 2023**(;)** 32% of the sample (11 out of 34) was published from 2010 to 2015**(;)** and the remaining 27% of the sample (9 out of 34) was published from 1997 to 2009.*	*The final sample gathered 34 documents. Approximately half of the sample (41%, 14 out of 34) was published from 2016 to 2023(**,)** 32% (11 out of 34) was published from 2010 to 2015(**,)** and the remaining 27% (9 out of 34) was published from 1997 to 2009.*	*Proofreading I.*

Also, in the next two examples from the third source text, we can evidence other punctuation errors, especially related to the semicolon:

Table 11.

Problem-solving challenges X

	Source text sample	Target text translation	Source document
O.	*Engineering education requires the redesign of teaching and learning based on the incorporation of digital technologies as a pedagogical support resource**(;)** new forms of formative assessment with quality feedback on the learning processes**(;)** problem and project-based learning**(;)** and new groupings and rethinking of the use of time and space beyond the classroom to expand*	*Engineering education requires the redesign of teaching and learning based on the incorporation of digital technologies as a pedagogical support resource**(,)** new forms of formative assessment with quality feedback on the learning processes**(,)** problem and project-based learning**(,)** and new groupings and rethinking of the use of time and space beyond the classroom to expand and democratize learning opportunities.*	*Proofreading II*

	and democratize learning opportunities.		
P.	*The challenge for the coming years is a vision of education that focuses on deep understanding**(;)** autonomous and critical thinking**(;)** creativity combined with scientific rationality and supported by ethics and humanism.*	*The challenge for the upcoming years is a vision of education that focuses on deep understanding**(,)** autonomous and critical thinking**(,)** and creativity combined with scientific rationality**(,)** all supported by ethics and humanism.*	*Proofreading II*

In example *L*, we can see improper placement of punctuation within the citation. In academic writing in English, when incorporating citations into the text, a period should be positioned after the citation within parentheses. There should not be an additional period before the parentheses, as the period after the parentheses suffices to conclude the sentence appropriately.

In example *M*, the comma is missing after “In final period”. The comma is necessary because it introduces an introductory phrase, which are often adverbial phrases, normally followed by a comma, no matter their place in the statement. In English grammar, introductory phrases at the beginning of a sentence are typically followed by a comma to separate them from the main clause. This comma helps to clarify the structure of the sentence and makes it easier for the reader to understand the intended meaning.

In the examples *N*, *O*, and *P* we can identify a misuse of semicolons in the English language. Semicolons are used to separate independent clauses that are closely related or to separate items in a list when those items contain commas themselves (Merriam-Webster, 2024). In this case, the phrases are not independent clauses, and commas are sufficient to separate the items in the list. Therefore, commas should be used instead of semicolons to separate the publication date ranges.

4.2.8. Acronym ambiguity

Identifying "acronym ambiguity" throughout the translation process is critical for the target text's intelligibility. This relates to employing acronyms without explanation, which can be confusing for readers. Accordingly, translators must be careful when identifying ambiguous acronyms since misunderstandings can have a significant impact on translation accuracy, and avoiding acronym ambiguity is critical to ensuring clear communication with the intended audience. Therefore, acronyms must be defined when they are first used in the text to ensure readability and translation effectiveness.

Table 12.

Problem-solving challenges XI

	Source text sample	Target text translation	Source document
Q.	*En el campo de la construcción, los investigadores desarrollaron modelos de madurez como el* ***SPICE***	*In the field of construction, researchers have developed maturity models such as* ***Standardised Process Improvement for Construction Enterprises (SPICE)***	*Translation*
R.	*para la mejora de procesos estandarizados en las empresas de construcción; el* ***CSCMM*** *para la gestión de la cadena de suministro*	*for standardized process improvement, and* ***Construction Supply Chain Maturity Model (CSCMM).***	*Translation*

In the examples *Q* and *R* the challenges of acronym ambiguity in translation are illustrated. In the original text, acronyms such as "SPICE" and "CSCMM" are used without prior explanation or definition. Even if the reader may infer their meanings within the context of construction and supply chain management, this assumption introduces ambiguity. In the absence of a precise definition, readers who are not familiar with these acronyms might find it difficult to understand their exact meaning, which could result in misunderstandings or confusion. This issue is resolved in the revised translation by giving more thorough explanations for each acronym, improving readability, and guaranteeing that all readers will

grasp the intended meaning. This emphasizes how crucial it is to define acronyms when they are used for the first time in a text in order to reduce ambiguity and improve cross-language comprehension.

4.3. Problem-solving and translation tools applied

Since our goal as interns is to preserve the functionality of the source texts so that high-quality translations can be produced, functionalism was the translation approach useful to address the various translation challenges discussed above. Furthermore, literal translation of utterances was performed using the Formal Equivalence approach, while Dynamic Equivalence was used to create new terms for the translation of some titles and phrases (see Methodological approach). Likewise, the syntactic and lexical difficulties found in the source texts were taken into consideration when translating the target materials.

Additionally, online dictionaries and concordancers like Linguee.com, Dictionary.cambridge.org, and Reverso.com were used as well as revisions of two technical and scientific libraries: American Society of Civil Engineers (ASCE) Library, and Biblioteca Virtual UIS. Moreover, we searched for comparable texts and made our own glossaries containing specific terminology.

After examining the errors identified, it is evident that the initial proofreading assignment was notably more challenging than the second assignment. The first task presented a range of difficulties, including punctuation mistakes, linguistic interference, lack of linking devices, lengthy word strings, and incorrect word order. In contrast, the second proofreading assignment primarily involved minor punctuation errors. Additionally, the translation assignment presented its own distinct challenges, such as a lack of determiners, inconsistencies in terminology, and ambiguity with acronyms. Consequently, the most demanding tasks were the first proofreading and the translation assignment. The examples from the previous section are shown below in *Tables XIII*, *XIV* and *XV* along with the target

text translations with problem solving decisions. Examples shown here have already been classified and explained in a more detailed manner in section *4.2 Findings.* This division shows the challenges and corrections classified by assignment:

Table 13.

Problem-solving in proofreading I.

Source text samples	Target text translation
A). *At the end of this period, it was identified a* ***propose*** *to create a PDRI for small buildings.*	*Towards the end of this period,* ***a proposal*** *emerged to create a PDRI specifically tailored for small buildings.*
B). *Finally* ***recommends*** *exploring the impact of external factors such as political interference, corruption, and inadequate funding on project scoping. (Banda & Pretorius, 2016).*	*Finally,* ***it recommends*** *exploring the impact of external factors such as political interference, corruption, and inadequate funding on project scoping (Banda & Pretorius, 2016).*
C). *In small industrial projects, more consideration is given to renovation and maintenance, so your planning process should focus more on project execution than project feasibility. (Collins et al., 2016).*	*In small industrial projects, more consideration is given to renovation and maintenance.* ***In consequence****, the planning process should focus more on project execution than project feasibility (Collins et al., 2016).*
D). *The study confirms that the PDRI has been integrated into the FEL of all capital projects, and users express their satisfaction with the tool, as it guides them on what to do for the next phase of a project (Motsepe et al., 2018).*	*This study confirms that PDRI has been integrated into the FEL of all capital projects.* ***Additionally****, users express their satisfaction with the tool as it guides them on what to do for the next phase of a project (Motsepe et al., 2018).*
F). *The articles published in these years proposed a general prediction procedure consisting of data preprocessing, variable selection, and construction of the* ***model prediction.***	*The articles published in these years proposed a general prediction procedure consisting of data preprocessing, variable selection, and construction of the* ***prediction model****.*
G). *The PDRI assessment process is proposed to be conducted in the first phase of the project* ***cycle life*** *through workshops or roundtables with the participation of key stakeholders*	*The PDRI assessment process is proposed to be conducted in the first phase of the project* ***life cycle*** *through workshops or roundtables with the participation of key stakeholders*
H). Based on a literature review in the SCOPUS, Web of Science and the American Society of Civil Engineers (ASCE) databases, undertaken **on 27 February 2023** found thirty-four published between 1997 and 2023 that addressed PDRI in construction projects. This search disclosed most publication was in North America and in Asia (Figure 1).	***On February 27, 2023,*** *a search on the databases of SCOPUS,* ***the*** *Web of Science, and the American Society of Civil Engineers (ASCE) yielded thirty-four documents* ***published*** *between 1997 and 2023****(,)*** *that addressed PDRI in construction projects.* ***Likewise,*** *it was also found that the highest number of publications was in North America and Asia (Figure 1).*
L). *Some studies indicate that one of the main causes of poor project management performance is due to poor scope definition at early stages of the project****(.)*** *(Dumont et al., 1997; Mohammady & Gibson, 2020).*	*Some studies indicate that one of the main causes for poor project management performance is poor scope definition at the early stages of the project (Dumont et al., 1997; Mohammady & Gibson, 2020).*
M). *In final period it was identified the first documents that considers the PDRI. The first one was an infrastructure projects for Malawi's public agencies (PIAs).*	*In the final period****(,)*** *the first documents that considered PDRI were identified. The first one was an infrastructure project for Malawi's public agencies (PIAs).*

N). *The final sample gathered 34 documents. Roughly half of the sample (41%, 14 out of 34) was published from 2016 to 2023**(;)** 32% of the sample (11 out of 34) was published from 2010 to 2015**(;)** and the remaining 27% of the sample (9 out of 34) was published from 1997 to 2009.*	*The final sample gathered 34 documents. Approximately half of the sample (41%, 14 out of 34) was published from 2016 to 2023**(,)** 32% (11 out of 34) was published from 2010 to 2015**(,)** and the remaining 27% (9 out of 34) was published from 1997 to 2009.*

Table 14.

Problem-solving in translation I.

Source text samples	**Target text translation**
E). *Para el proceso de diseño de un modelo de madurez Bruin, Rosemann, Freeze y Kulkarni en 2005 proponen seis fases, **la primera**, "Alcance", donde se define el enfoque, se identifica las partes interesadas y el público objetivo del MM, **en la base de** "Diseño", se describe el concepto de madurez, se estructuran los niveles, dimensiones y subdimensiones, **en la fase** "Poblar", se definen las características y la forma de evaluar la madurez incluyendo los instrumentos para ello, se continúa con la fase de prueba o validación del modelo de madurez construido, luego de esto, se aplica la fase "Desplegar", donde el modelo final es implementado a las partes interesadas y como fase **final**, "Mantener", en la cual se le da uso al MM durante un período suficiente para asegurar su evolución de madurez en el público aplicado [11].*	*For the design process of a maturity model, Bruin, Rosemann, Freeze, and Kulkarni, in 2005 suggested six phases. **The first** phase is the Scope, which involves defining the approach and identifying stakeholders of the MM. **The second** phase is the Design, where the maturity concept is described and the levels, dimensions, and sub-dimensions are structured. **The third** phase is Assessment, where the criteria, instruments, and methods to evaluate maturity are defined. This is followed by the Validation phase of the constructed maturity model. Subsequently, the Implementation phase is executed, where the final model is presented to stakeholders. **Finally**, the Maintenance phase is where the MM is utilized for a sufficiently long period to ensure its maturity evolution. (Alami et al., 2015).*
I). *Según la práctica recomendada propuesta por la AACE y la guía NDIA, **este grupo de proceso** tiene inicialmente 5 directrices que principalmente consisten en la definición del alcance del proyecto por parte de la organización. Con base en el contexto regional de Bucaramanga donde la estructura organizacional (EDO/OBS) no es generalmente realizada, se decide agruparla con la estructura desglosada del trabajo (EDT/WBS), quedando 4 directrices en este **grupo de procesos** como se puede observar en la (Tabla 2.).*	*According to the recommended practice proposed by AACE and the NDIA guide, this **integrated process** initially has 5 guidelines, which mainly consist of defining the project scope by the organization. Based on the regional context of Bucaramanga, where the Organizational Breakdown Structure (OBS) is not generally carried out, it is decided to group it with the Work Breakdown Structure (WBS), leaving 4 guidelines in this **integrated process** as can be seen in Table 2.*
J). Organización:** Según la práctica recomendada propuesta por la AACE y la guía NDIA, este grupo de proceso tiene inicialmente 5 directrices que principalmente consisten en la definición del alcance del proyecto por parte de la **organización.	***Setting up**. According to the recommended practice proposed by AACE and the NDIA guide, this integrated process initially has 5 guidelines, which mainly consist of defining the project scope by the **organization**.*
***K). Triada Clásica** [Planificación – Cronograma – Presupuesto]: Este grupo de proceso consiste en lo que se conoce en la **triada clásica**: planificación, cronograma y presupuesto.*	***Basic-Integrated processes** (Planning - Schedule - Budget). This Integrated process consists of planning, schedule, and budget.*

Q). *En el campo de la construcción, los investigadores desarrollaron modelos de madurez como el* ***SPICE***	*In the field of construction, researchers have developed maturity models such as* ***Standardised Process Improvement for Construction Enterprises (SPICE)***
R). *para la mejora de procesos estandarizados en las empresas de construcción; el* ***CSCMM*** *para la gestión de la cadena de suministro*	*for standardized process improvement, and* ***Construction Supply Chain Maturity Model (CSCMM).***

Table 15.

Problem-solving in proofreading II.

Source text samples	Target text translation
O). *Engineering education requires the redesign of teaching and learning based on the incorporation of digital technologies as a pedagogical support resource****(;)*** *new forms of formative assessment with quality feedback on the learning processes****(;)*** *problem and project-based learning****(;)*** *and new groupings and rethinking of the use of time and space beyond the classroom to expand and democratize learning opportunities.*	*Engineering education requires the redesign of teaching and learning based on the incorporation of digital technologies as a pedagogical support resource****(,)*** *new forms of formative assessment with quality feedback on the learning processes****(,)*** *problem and project-based learning****(,)*** *and new groupings and rethinking of the use of time and space beyond the classroom to expand and democratize learning opportunities.*
P). *The challenge for the coming years is a vision of education that focuses on deep understanding****(;)*** *autonomous and critical thinking****(;)*** *creativity combined with scientific rationality and supported by ethics and humanism.*	*The challenge for the upcoming years is a vision of education that focuses on deep understanding****(,)*** *autonomous and critical thinking****(,)*** *and creativity combined with scientific rationality****(,)*** *all supported by ethics and humanism.*

5. Chapter III: Conclusions and Project Evaluation

This internship project offered us considerable experience and insights into scientific translation, especially within the field of Civil Engineering. Close involvement with the articles revised and thorough research into their subject matter made a significant expansion and improvement of our skills in translation and proofreading assignments.

During the course of this internship project, tasks encompassing translation and proofreading were undertaken. Specifically, two proofreading and editing assignments were conducted for the articles titled *Project Definition Rating Index: A Critical Comparison between Developed and Developing Countries* and *Assessment of Problem-Solving: Challenges for Engineering Education in Developing Countries.* Furthermore, translation

(Spa-Eng) was performed for the article *Diseño de implementación de un modelo de madurez para un sistema de control basado en el valor ganado*.

The translation task presented notable challenges, as evidenced by the variety of difficulties encountered during their execution across this internship project. Foremost among these challenges was the encounter with unfamiliar terminologies and the evident knowledge barrier, both of which significantly hindered our progress in the translation task in its early stages. However, by looking into the subject matters by means of research, conducting cooperative work, and putting in the effort to improve our language skills and subject knowledge, we managed to overcome these difficulties. This ongoing process not only helped us grasp the finer details of the texts but also made us improve our expertise in the field of translation.

This project was carried out through a series of well-defined steps and stages, which facilitated its comprehensive development. Pre, during, and post-translation procedures were followed to optimize the outcome of the internship project. The initial objectives were effectively met by adhering to these procedures, which involved acquiring the required knowledge, identifying relevant terminology, and applying a set of strategies, tactics, and tools to generate a project of outstanding quality.

Each article, whether translated or edited, posed its own set of challenges. However, among them, the article designated for translation appeared as the most demanding. This was primarily due to the precise terminology employed throughout the entire document, its length, and the significant number of linguistic inconsistencies it presented. Whereas the proofreading and editing tasks also presented challenges, but they were comparatively simpler, resulting in less complex work process.

Moreover, by documenting the challenges encountered and the problem-solving strategies employed throughout this project, future translators in training process may gain

valuable insights into the complexities of translating technical and scientific texts. In the same vein, by sharing the experiences and methodologies of this internship project, we expect to contribute to the ongoing development and refinement of translation practices in the domain of Civil Engineering.

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