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GLOBAL TREND OF PROJECT MANAGEMENT METHODOLOGIES
TENDENCIA MUNDIAL DE LAS METODOLOGÍAS DE GESTIÓN DE PROYECTOS

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ABSTRACT

This study addresses the evolution and trends in project management methodologies globally, emphasizing the increasing importance of project management across various industries due to the need for adaptability and efficiency in the business world. The research was based on an analysis of 1,085 documents to provide a comprehensive overview of emerging practices and techniques in this field, focusing on agile, hybrid, and traditional methodologies.
The research methodology employed is non-experimental, documentary, and cross-sectional, using secondary data analysis and both theoretical and empirical research techniques to break down, analyze, and synthesize information. An integrated approach was used that combines theoretical analysis with empirical techniques such as documentary analysis, employing tools like Atlas.ti for data coding and analysis. The results showed that agile and hybrid methodologies are highly effective and popular, particularly in contexts that require high flexibility and rapid adaptation to changes. Traditional methodologies such as Six Sigma and Waterfall were found to be less flexible and with limited applicability to specific contexts. The study concludes by emphasizing the importance of selecting project management methodologies that align with the specific needs of the project and the organization, highlighting the trend toward more flexible and adaptive practices in modern project management.

Palabras clave:
gestión de proyectos, metodologías ágiles, metodologías híbridas, metodologías tradicionales

RESUMEN

El presente estudio aborda la evolución y tendencias en las metodologías de gestión de proyectos a nivel global, destacando la importancia creciente de la gestión de proyectos en diversas industrias debido a la necesidad de adaptabilidad y eficiencia en el mundo empresarial. La investigación se basó en un análisis de 1805 documentos para ofrecer una visión integral de las prácticas y técnicas emergentes en este campo, enfocándose en metodologías ágiles, híbridas y tradicionales. La metodología de investigación

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empleada es no experimental, documental y transversal, utilizando análisis de datos secundarios y técnicas de investigación teóricas y empíricas para descomponer, analizar y sintetizar información. Se utilizó un enfoque integrado que combina el análisis teórico con técnicas empíricas como el análisis documental, empleando herramientas como Atlas.ti para la codificación y análisis de datos. Los resultados mostraron que las metodologías ágiles e híbridas son altamente efectivas y populares, particularmente en contextos que demandan alta flexibilidad y adaptación rápida a cambios. Metodologías tradicionales como Six Sigma y Waterfall se encontraron menos flexibles y con aplicabilidad limitada a contextos específicos. El estudio concluye subrayando la importancia de seleccionar metodologías de gestión de proyectos que se alineen con las necesidades específicas del proyecto y la organización, resaltando la tendencia hacia prácticas más flexibles y adaptativas en la gestión de proyectos moderna.

Introduction

In an ever-changing business world, project management has emerged as an essential discipline in a wide range of industries, where adaptability and efficiency are critical to project success. This study delves into the most current trends in project management methodologies, highlighting how innovations in the field are reshaping the way organizations approach project planning and execution globally. By comprehensively analyzing 1085 documents, it aims to provide a comprehensive overview of the most effective practices and emerging techniques in project management.

As we move into the information and technology age, project management methodologies are challenged to keep up with rapid technological changes and the increasing demands of organizations and their customers for flexibility and efficiency. This article examines how agile, hybrid and traditional techniques are adapting and transforming in response to the needs of the global environment, and what implications they have for the future of project management in sectors as varied as engineering and construction.

The research is supported by an in-depth review of academic literature, analysis of recent survey data, and detailed case studies. Through these elements, it seeks to provide a detailed understanding of how project management methodologies are evolving to meet the challenges of the 21st century, including both theoretical and empirical considerations. Methods such as analytical-synthetic and inductive-deductive are used, together with documentary analysis techniques, to decompose, analyze and synthesize the information, thus allowing a deeper understanding of the interrelationships and internal dynamics of the phenomena studied.

The study also includes the codification and analysis of secondary data obtained from various sources, with the support of tools such as Atlas.ti and Mendeley to organize and analyze the documents, which facilitates the identification of patterns, contextualizations and deductions about the variables and goals proposed. With an integrated approach, the research ensures a rigorous assessment of the current and future situation of project management, providing effective solutions and clear guidance for the engineering and construction field.

Method, Techniques and Analysis

The research presented was non-experimental, documentary and cross-sectional, focused on addressing practical problems and proposing the implementation of new knowledge in organizations that manage projects. The methodology included the analysis of secondary data obtained from various sources such as books and surveys, relying on techniques such as data collection, coding and analysis.

The research methods were divided into two main categories: theoretical and empirical. At the theoretical level, analytical-synthetic, inductive-deductive, historical-logical and systemic-structural-functional methods were used. These methods made it possible to decompose, analyze and synthesize the information to formulate a solid theoretical and methodological basis, facilitating the understanding of the interrelationships and internal dynamics of the phenomena studied (Rodríguez Jiménez and Pérez Jacinto, 2017; Torres-Miranda, 2020).

At the empirical level, techniques such as documentary analysis were used. This included the modification of documents to facilitate their access and subsequent analysis (Falcón and Serpa, 2021).

This integrated methodological approach allowed for a deep and multifaceted understanding of project management at a global level, specifically addressing the practices and dynamics of communication in this field. The combination of theoretical and empirical analysis facilitated a rigorous and detailed assessment, essential for developing effective solutions tailored to the engineering and construction field.

The methodological framework applied included the exhaustive review of existing literature, the analysis of recent surveys, and the evaluation of case studies, all selected to reflect both the global reality and the particularities of diverse international contexts. This strategy allowed us to identify international best practices in project management, focusing on the unique needs and challenges faced in diverse markets.

In addition, the methodology incorporated a systematic analysis of the communication tools used in engineering and construction projects, evaluating their effectiveness in different cultural and organizational contexts. It analyzed how cultural differences affect communication and collaboration practices within project teams, and how these practices could be improved to increase efficiency and effectiveness in project management.

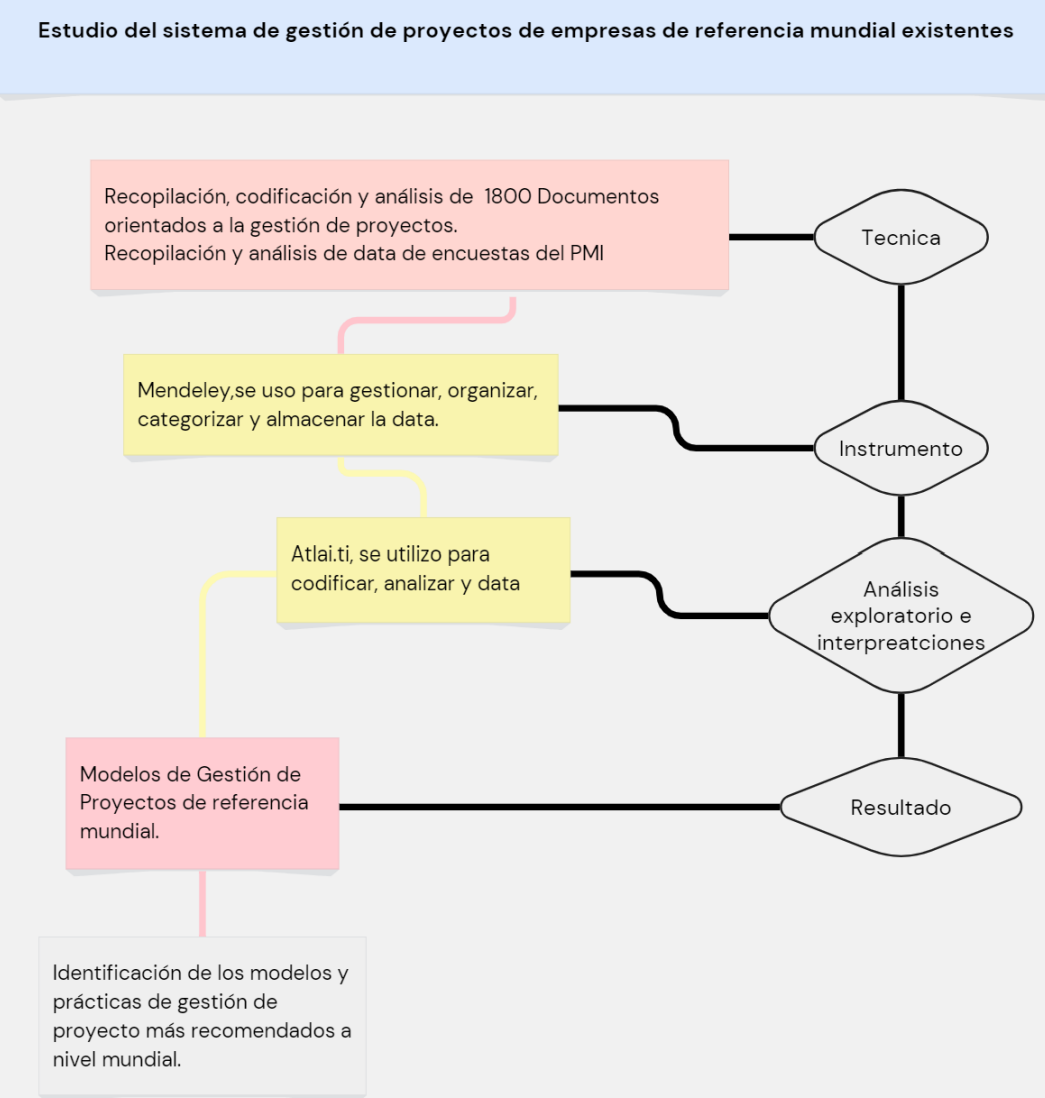
The implementation of advanced data coding and analysis techniques, using software such as Atlas.ti and Mendeley, allowed for a meticulous organization and synthesis of the information, facilitating the identification of trends, patterns and gaps in current practices.

Overall, this methodological approach not only deepened the understanding of global project management dynamics, but also established a robust framework for proposing and implementing changes that effectively respond to the challenges and opportunities of the engineering and construction sector in international contexts.

The research was conducted through the review, analysis, comparison and deduction of existing documents, data, surveys and records in order to establish patterns, contextualizations and deductions of the variables and goals proposed. An important part of this phase was carried out through the codification of 1805 documents, with the help of the Atlas.ti and Mendeley tools. Figure 1 outlines the methodology used.

Figure 1

Methodological outline for the study of the project management system of world reference companies.



Document Selection

It was decided to use Mendeley as the main tool for reference management in this research, given its ability to organize and facilitate access to a large number of academic documents. Mendeley is a bibliographic reference management software that allows to store, organize and categorize research in an efficient way, which was essential in this project given the magnitude of the review.

In this case, 1,805 documents related to project management were stored in a Mendeley database. These documents included studies, articles, books and other academic materials. The software allowed documents to be categorized according to a number of key attributes, such as:

- Title: Each document was labeled with its full title, which facilitated its identification.
- Author: Authors' names were recorded to allow quick and proper reference in the research.

- Editorial and Source: These data made it possible to trace the origin of each publication and the level of credibility of each source.
- Date: Sorting the papers by date helped to identify the most recent papers, ensuring that the research included the most current findings.

The criteria for selecting the documents that were incorporated into Mendeley focused on specific topics relevant to project management. The main inclusion criteria were:

- Project management methodologies: Studies that analyzed different approaches and methodologies (such as Agile, Prince2, Six Sigma, among others).
- Standards and practices in project management: Documents discussing standards and best practices applied in project management, such as PMBoK or ISO.
- Project management models and approaches: Studies on different models used to manage projects in various industries.
- Statistics on project efficiency and success: Research presenting quantitative data on project performance and efficiency under different methodologies.

The use of Mendeley not only facilitated the efficient organization of a large number of documents, but also helped to discover recent research in the field of project management. Mendeley has features to suggest relevant articles based on the stored readings, which increased access to new sources of information that could be useful for the research.

Mendeley served as a central tool in the reference management process, ensuring that the 1,805 documents were logically organized and accessible to the research team. This not only facilitated the quick and efficient retrieval of information, but also allowed the tracking of the most recent and relevant literature on project management methodologies and practices.

Import of Documents

The documents collected in the Mendeley platform were transferred to Atlas.ti for further qualitative analysis. This process included the import of 1805 documents related to project management methodologies, which had previously been organized and stored in Mendeley. At this stage, each document was tagged with specific metadata, which allowed a precise structuring of the information within Atlas.ti, optimizing both the organization and the search for relevant documents during the analysis.

The use of this metadata greatly facilitated the organization of documents in Atlas.ti, allowing researchers to efficiently navigate through a large amount of information. Instead of performing extensive manual searches, researchers could quickly filter documents using the assigned tags, which significantly accelerated the analysis process. In addition, labeling provided the ability to identify patterns or relationships between studies of the same author, a specific time period, or with a particular focus on a methodology.

Thanks to the metadata-based organization, the search for documents during the thematic analysis was more agile and accurate. This allowed the researchers to directly access the most relevant studies for each phase of the analysis or for each aspect of the project management methodologies. For example, if at one point in the analysis, recent studies on the adoption of agile methodologies were needed, documents labeled by "date" and "type of methodology" could be easily located and analyzed in depth.

Detailed metadata tagging in Atlas.ti not only allowed efficient organization and access to documents, but also optimized the analysis process by facilitating the search for accurate information. This was key to handling a large number of documents in a systematic way and ensuring that maximum value was extracted from the available information, providing a solid basis for a detailed qualitative analysis of project management methodologies.

Data Coding

Coding in this study was conducted using a mixed approach, meaning that it combined both deductive coding and inductive coding to capture the complexity of the project management systems used by the companies. This approach allows both the application of predefined codes and the discovery of new topics as documents are examined.

Deductive Coding: In deductive coding, codes were created before starting the analysis, based on concepts already known from the project management literature. These predefined codes represented the parameters already expected to be found in the analysis, such as high performance, profit, efficiency, success, and productivity. For example, if existing studies indicated that an agile approach favors high performance, a code for "high performance" would be created and applied to text segments that mention or discuss this idea.

Inductive Coding: In parallel, as the documents were reviewed, new themes or patterns emerged that had not been anticipated. This is the process of inductive coding, in which new codes are created to capture these unexpected findings. For example, if an emerging theme emerged during the document review, such as the influence of organizational culture on the choice of methodology, a new code was created to reflect that theme. This inductive approach made it possible to enrich the analysis by better reflecting the specific reality of the companies' project management systems.

Coding is a central process in the analysis of qualitative data, and in this case, Atlas.ti software was used to perform the analysis in a structured and efficient manner. The coding process is explained in detail below:

- Text Encoding: The first step was the selection of text segments within the documents that discussed key parameters such as high performance, profit or efficiency. For example, if a document described how a particular methodology increased the efficiency of a project, that segment of text was identified as relevant to the analysis.
- Creation of Codes: Each key parameter was represented by a code. These codes may have been previously defined (deductive) or created during the analysis (inductive). For concepts that were repeatedly mentioned in the literature (such as "profit" or "productivity"), codes were created to organize and group all the fragments related to these topics.
- Code Assignment: Once the codes were created, they were applied to the relevant text segments. This means that every time a document referred to one of the parameters, that text fragment was "tagged" with the corresponding code. For example, if a section talked about how a methodology contributed to the success of the project, the code "success" was assigned to that text segment.

The ultimate goal of this coding process was to organize the qualitative analysis in a way that would allow for the identification of key patterns and themes in the documents reviewed. This facilitated the analysis of the relationships between the different parameters (such as high performance or profit) and the project management

methodologies used. In addition, coding made it possible to compare the use and effectiveness of different methodologies quantitatively, based on the frequency with which certain themes or parameters are mentioned and how they correlate with each other.

The parameters of the study of global project management trends were established as shown in Table 1, while the codes used are reported in Table 2.

Table 1
Parameters used in Atlas.ti

Parameter	Description
High Performance	It measures the ability of the methodology to achieve superior results in terms of effectiveness and compliance with objectives. It is focused on evaluating the overall effectiveness of an approach to achieving outstanding performance, including the ability to exceed expectations and industry benchmarks.
Benefit	Evaluates the direct and indirect impact of the methodology on the generation of economic gains or competitive advantages for the organization. This parameter focuses on both tangible and intangible financial returns and benefits.
Efficient	Measures the optimization in the use of resources within a project, minimizing waste and maximizing productivity. This parameter considers how the methodology facilitates more efficient use of time, money, and human resources.
Successful	Evaluates the degree to which the methodology facilitates the satisfactory achievement of project objectives. It considers the effectiveness of the approach in achieving the established goals, both in terms of final results and in terms of meeting deadlines and budgets.
Productivity	Refers to the improvement in quantity and quality of the work produced under the application of the methodology. Analyzes the ability of equipment to do more work in less time, increasing efficiency without compromising the quality of the end result.
Negative	Measures the adverse effects or disadvantages that could arise from adopting a specific methodology. This parameter evaluates potential risks or contraindications in certain contexts or projects, helping to identify potential drawbacks before implementing an approach.
Practice	Evaluates the actual and practical implementation of the methodologies in concrete real-world situations. It examines the applicability and effective execution of an approach, considering how it adapts to different circumstances and how viable it is in various operating environments.
Approach	Analyzes the underlying philosophy or approach of the methodology to project management. It includes the evaluation of how projects are planned, executed and evaluated under this approach, highlighting

	the coherence and alignment with the organization's objectives and values.
Project	Measures the structure and management of specific projects implemented under the methodology. It focuses on the methodology's ability to organize and carry out projects effectively, ensuring cohesion and coordination between the different stages of the project.
Management	Evaluates the effectiveness of the methodology in overall project management. It covers aspects such as decision making, resource management and progress monitoring, assessing how these elements contribute to the overall success of the project.
PMI	Investigates the adoption and application of Project Management Institute (PMI) standards in actual practice. It includes the evaluation of how best practices and management techniques aligned with PMI certifications are integrated into projects.
PMBoK	It focuses on the implementation of the Project Management Body of Knowledge (PMBoK) guide and its congruence with the standards recommended by the PMI. Evaluates the ability to adapt these practices to specific projects and contexts, ensuring their effectiveness and relevance in different situations.

Table 2
Table of codes used in Atlas.ti

Codes	**Codes**	**Codes**
○ Agile	○ Kanban	○ Project Management
○ Approach	○ Improve	○ Project
○ Benefit	○ Methodology	○ Performance
○ Wellness	○ Negative	○ Scrum
○ Efficiency	○ PMBoK	○ Six Sigma
○ Success	○ PMI	○ Waterfall
○ Management	○ Positive	○ Communications
○ Good	○ Practice	○ Spain

○ Hybrid	○ Prince2	○ Software
○ IPMA	○ Productivity	

Data Analysis

The analysis of the documents in the study was performed using Atlas.ti, a qualitative data analysis software. The analysis tools provided by Atlas.ti were instrumental in identifying patterns and relationships among the key concepts extracted from the 1805 documents reviewed. Two key techniques were used for this analysis: Cooccurrence Analysis and Semantic Networks.

Cooccurrence Analysis is a technique that made it possible to identify which codes (themes or concepts) appear together frequently in the documents. By tagging text segments with codes such as "high performance," "efficiency," "profit," and "productivity," this analysis allowed us to see which themes tend to be associated with each other. For example, if "high performance" and "efficiency" frequently appear together, this suggests that in the documents studied there is a relationship or dependence between the two concepts.

This analysis was instrumental in uncovering relationships between different aspects of project management, showing how certain factors (such as the use of a particular methodology) are linked to specific outcomes, such as productivity or success. It also made it possible to identify connections that were not obvious on the surface, providing a deeper insight into how the different components within a project are interrelated.

In addition to the cooccurrence analysis, semantic networks were generated to visualize the relationships between the different codes. These networks allow to graphically visualize the connections between codes, showing how concepts are related in the context of project management. Each code is represented as a node in the network, and the links between nodes show the frequency or strength of the connections.

The semantic networks provided a clear view of patterns and structures in the data, helping to identify which themes were most central or interrelated. For example, if "productivity" is directly connected to many other concepts such as "high performance" or "profit", this indicates that productivity is a central theme in project management.

The combined use of co-occurrence analysis and semantic networks allowed not only to quantify the presence of certain concepts in the documents, but also to understand how these concepts are interconnected within the practice of project management. This holistic view facilitated the identification of patterns that would not be evident through superficial analysis, providing a deeper framework for understanding the dynamics at play in project management and helping to identify key areas for improving efficiency and performance in business projects.

Data Visualization

Atlas.ti, as an advanced qualitative analysis tool, was used not only to manage and analyze large volumes of data, but also to visualize the findings in a way that made them easily understandable and accessible. Two of the main visualization functionalities used in the analysis were Word Clouds and Code Maps, each with distinct but complementary purposes.

Word Clouds are visual representations that highlight the most frequent terms in a set of documents. In this case, Atlas.ti generated word clouds to highlight the themes and concepts that appeared most frequently in the project management documents. The most

common words were displayed with greater size and prominence, while less frequent terms were represented in smaller sizes.

- Purpose: The use of word clouds helped the researchers to quickly identify the key terms that predominated in the analyzed documents. This provided an immediate overview of the most recurring themes in the project management literature, such as "efficiency", "profit", "productivity" or "agile methodologies". This functionality is particularly useful for detecting initial patterns without the need to perform an in-depth analysis from the beginning.
- Advantage: The word clouds not only facilitated the identification of dominant themes, but also helped to visualize how concepts were organized within the content, which gave clues as to which topics were most relevant or were being discussed with greater emphasis.

Code Maps, another key feature of Atlas.ti, were used to graphically show how specific topics (or codes) were distributed throughout the document set. These maps are visual representations that show the relationship and connections between different themes coded in the analysis. Each code or topic is presented as a node, and the links between nodes indicate the co-occurrence or strength of the relationship between those topics.

- Purpose: The code maps were essential to understand the interconnections between the different themes present in the documents. For example, in an analysis of project management methodologies, a code map might show how "efficiency" connects to other codes such as "high performance" or "profit". This made it possible to clearly and directly visualize how the different aspects of project management interact and are distributed in the documents.
- Advantage: This tool helped identify deeper and more complex patterns that word clouds alone could not show. The code maps revealed relationships between themes and helped researchers understand not only which themes were prevalent, but how they were related to each other within the contexts discussed in the literature.

The combination of word clouds and code maps in Atlas.ti made it possible to present the findings in a visually intuitive and understandable way. While word clouds facilitated the detection of the most recurrent themes, code maps provided a more detailed view of the relationships and connections between those themes. Together, these visualizations helped the researchers interpret the data more fully, identifying both the central themes and underlying structures in the project management documents

Results

Using the "concept" and "cloud" functionalities in Atlas.ti, a preliminary view of the predominant terms in the 1805 documents analyzed was generated, as illustrated in Figure 2. This word cloud visualization reveals key terms such as management, projects, culture and approach (including mentions such as agile approach and agile methodologies), as well as other important terms such as success and enterprise.

The word cloud highlights the most frequently discussed topics in the papers, providing a quick and clear view of the predominant concepts in the project management literature. Terms such as "management" and "projects" underline the centrality of these

themes in the studies analyzed, while concepts such as "culture" and "approach" reflect how agile methodologies are being adapted and adopted in different organizational environments. This suggests a trend towards aligning management methodologies with local practices or industry-specific characteristics.

Terms such as "success" and "enterprise" also appear frequently, indicating a strong correlation between the implementation of certain methodologies and the achievement of positive project results, in addition to their impact on the overall performance of organizations. This frequency highlights the perceived value of project management methodologies as key tools for improving operational efficiency and achieving organizational success.

Figure 2

Visualization of word clouds obtained from the analysis of 1805 documents

Based on this visualization, a more detailed coding of the documents was carried out. Specific codes were used to represent the key concepts that emerged from the analysis, allowing a systematic categorization of the data. Codes such as High Performance, Profit, Efficiency, Success, and Productivity were applied to relevant passages within the documents. In addition, additional codes were created for specific methodologies such as "Agile", "Scrum", "PMBoK" and "Six Sigma", which facilitated the analysis of the differences between them.

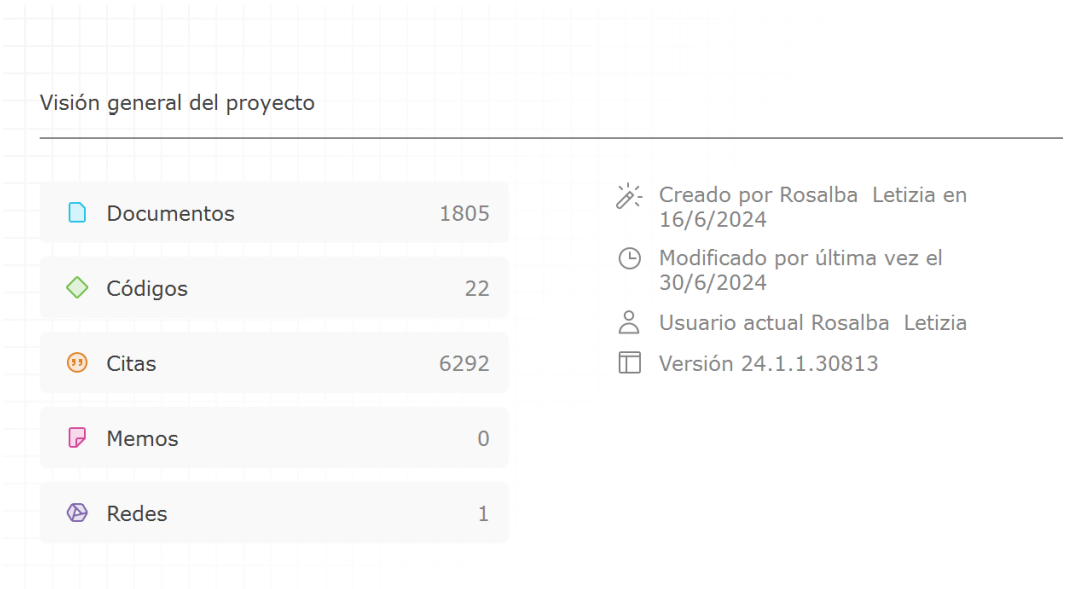
The citation generation process allowed the extraction of text segments that were labeled with the relevant codes, which facilitated the analysis of frequencies and patterns. These citations not only provided references for the key concepts, but also offered concrete evidence on how the methodologies are discussed and applied in different contexts.

Figure 3 provides a visual representation of these codes and citations through a network of codes, which shows how the topics are connected to each other in the documents. This network helps to identify the most prominent relationships and

connections between concepts, providing a clear view of how themes are distributed throughout the analysis.

Figure 3

General display of the project from the analysis of 1805 documents



Tables 3 and 4 present the results of the code co-occurrence analysis, where the interactions between different codes are examined to better understand how the methodologies and key parameters are related. For example, the co-occurrence between High Performance and PMBoK indicates a significant correlation in the literature, suggesting that the practices recommended by PMBoK are closely linked to the achievement of outstanding project performance.

In contrast, the low frequency of co-occurrence between High Performance and Six Sigma suggests that this methodology is not perceived as particularly effective in achieving outstanding performance, highlighting the limitations of Six Sigma in certain contexts.

The use of Atlas.ti allowed not only to organize and analyze the data efficiently, but also to quickly identify the most relevant issues and their interrelationships. This provided a solid basis for assessing the strengths and weaknesses of each methodology and offering guidance on selecting the most appropriate approach for the specific needs of projects and organizations.

Table 3

Code co-occurrence analysis of the 1805 document analysis (part 1)

Parameter	High Performance Citations=622	Benefit Appointments=745	Efficient Appointments=125	Successful Appointments=1407	Citation Productivity=53	Negative Citations=86
Agil+Scrum+Kanban+Hibrido Citas=283+62+22+65	3	128	26	128	8	2

Parameter	High Performance Citations=622	Benefit Appointments=745	Efficient Appointments=125	Successful Appointments=1407	Citation Productivity=53	Negative Citations=86
Agil Citas=283	2	85	18	85	5	1
Scrum Quotes=62	1	16	5	9	1	0
Kanban Quotes=22	0	5	2	4	0	0
Hybrid Appointments=65	0	22	1	30	2	1
Prince2 Citations=543	0	143	14	117	4	6
Six Sigma Quotes=10	0	6	0	3	0	0
Waterfall Appointments=43	0	10	2	16	0	0
IPMA Citations=11	0	4	0	3	0	0
PMBoK Citations=85	1	28	3	30	4	1
PMI Citations=70	1	24	2	30	3	0

Table 4

Code co-occurrence analysis of the 1805 document analysis (part 2)

Parameter	Methodology Citations=1399	Practical Appointments=414	Approximation Appointments=946	Project Appointments=3472	Appointment Management=4104	PMBoK Citations=85	PMI Citations=70
Agil+Scrum+Kanban+Hibrido Citas=283+62+22+65	270	102	199	429	425	34	26

Agil Citas=283	159	70	123	280	279	20	16
Scrum Quotes=62	51	15	28	62	60	5	3
Kanban Quotes=22	20	2	8	22	22	0	0
Hybrid Appointments =65	40	15	40	65	64	9	7
Prince2 Citations=543	497	62	65	543	515	10	11
Six Sigma Quotes=10	2	1	2	10	5	1	1
Waterfall Appointments =43	33	15	23	43	43	5	1
IPMA Citations=11	2	3	2	11	10	1	4
PMBoK Citations=85	38	23	28	85	84	0	28
PMI Citations=70	32	16	22	70	70	28	0

Discussion and Conclusions

The analysis of 1805 documents on project management methodologies provides valuable information on the preferences and effectiveness of different approaches according to sector and project characteristics. Through the use of qualitative analysis tools such as Atlas.ti, significant patterns in the adoption of these methodologies were identified, providing a deeper understanding of their applicability in specific contexts.

Agile methodologies, which include Agile, Scrum, Kanban and their hybrid combinations, stand out for their flexibility and adaptability. With 128 quotes on the parameters of high performance and profit, these methodologies are particularly useful in sectors that undergo rapid change and require an agile response to market fluctuations. This is the case in financial services and information technology (IT), where the ability to adjust project approaches in real time is essential to remain competitive. Agile methodologies enable continuous iteration, facilitating frequent delivery of value and rapid adaptation to changes in customer requirements or market conditions.

This agile approach is highly valued for its ability to maintain operational efficiency while navigating uncertain environments, making it a preferred choice in volatile industries where flexibility is crucial to success.

In contrast, Prince2 is a highly valued methodology in projects that require structure and rigorous control. With 143 citations in profit and 117 in high performance, this methodology excels in sectors such as construction and manufacturing, where the management of complex, large-scale projects requires detailed planning and tight control of risks and resources. Prince2 is distinguished by its ability to divide a project into clear and manageable phases, which facilitates better resource management and ensures that each phase meets its objectives before moving on to the next.

This methodology is particularly appreciated in regulated environments, where it is mandatory to follow a well-defined process to ensure that all regulations and quality standards are met. Prince2 provides a systematic approach that minimizes risk and helps organizations achieve clear, measurable results.

Although PMBoK and PMI do not reach the same level of popularity as agile methodologies in terms of performance and benefit, their structure and standardization are highly valued in environments that demand consistency and alignment with international standards. With 30 citations in high performance and profit, PMBoK and PMI are frequently used on projects where predictability and compliance with global standards are critical.

These approaches provide a solid foundation for managing projects that require a meticulous approach aligned with industry best practices, making them ideal for large-scale projects that need to meet strict standards and have a high degree of control.

Traditional methodologies such as Six Sigma and Waterfall show less flexibility compared to agile methodologies, but are still useful in projects where a sequential and predictable approach is preferable. Six Sigma, with 6 quotes on profit and efficiency, focuses on process optimization and defect reduction, being particularly relevant in sectors such as manufacturing, where quality and continuous improvement are essential.

Waterfall, with 10 quotes in profit and 16 in high performance, is appreciated in projects with clear requirements from the beginning, such as in construction or traditional software development. However, its lack of flexibility and less ability to adapt to changes make it less suitable for more dynamic environments, where project needs may evolve over time.

The analysis also reveals how the adoption of methodologies varies considerably by sector and region. In sectors such as IT and financial services, agile methodologies are the most prevalent due to their ability to adapt quickly to change. On the other hand, in sectors such as construction and manufacturing, traditional methodologies such as Waterfall and Six Sigma are still relevant, although less popular than Prince2 and PMBoK due to their structured and predictive approach.

The choice of project management methodology should be based on a thorough assessment of project needs and operating conditions. Agile methodologies are ideal for projects that require adaptability and rapid response to change, while Prince2 and PMBoK offer structured and predictable solutions, suitable for contexts that demand rigor and control.

Traditional methodologies, although less flexible, continue to play an important role in industries where sequentiality and predictability are essential for success. This analysis provides project managers and organizations with the information needed to make informed decisions, maximizing operational efficiency and ensuring success in a competitive environment.

In addition, understanding the differences in the adoption of methodologies by industry and region allows organizations to adapt their management practices to improve project effectiveness and increase job satisfaction in a variety of industry contexts.

To continue advancing in the analysis of project management methodologies, it is suggested that a series of complementary research studies be carried out to delve deeper into key aspects not covered in this initial analysis. These are some proposals for continuity:

- Comparative Analysis of Hybrid Methodologies: Given the increase in the adoption of hybrid methodologies in Europe and other regions, it would be interesting to carry out a more in-depth comparative analysis between pure agile and hybrid methodologies. This study could explore how organizations are customizing their project management practices, combining the flexibility of Agile with the structure of Prince2 or PMBoK, and how these variations impact project efficiency and success in different industries.

- Impact of Methodologies on Team Satisfaction and Sustainability: A future line of research could examine how different project management methodologies influence team satisfaction and job well-being. In addition, it would be interesting to study how agile, Prince2, or PMBoK approaches contribute to operational sustainability within organizations, both in terms of human resources and the use of material and technological resources.
- Detailed Sector Research: Although the current analysis reveals differences in the adoption of methodologies between sectors such as IT, financial services, construction, and manufacturing, more specific research exploring the peculiarities of each sector could help identify what factors determine the choice of a particular methodology. This could include regulatory aspects, size of companies, types of clients, and project complexities.
- Adoption of New Technologies in Project Management: In the era of digital transformation, it is important to analyze how new technologies such as artificial intelligence (AI), machine learning, and blockchain are influencing project management methodologies. A study investigating the integration of these technologies into traditional or agile methodologies could provide valuable insights into how project management will evolve in the coming years.
- Performance of Methodologies in SMEs versus Large Corporations: It would be useful to compare how small and medium-sized enterprises (SMEs) and large corporations adopt and use different project management methodologies. This analysis could identify which methodologies are most effective depending on the size of the organization and what adaptations are required for them to be successful in different types of companies.
- Evaluation of the Cost-Benefit of the Implementation of Methodologies: Finally, it would be relevant to conduct an exhaustive cost-benefit analysis associated with the implementation of different project management methodologies. This would include the costs of training, implementation, and maintenance of the methodologies, in contrast to the benefits generated in terms of efficiency, quality, and customer satisfaction.

These proposed studies would not only advance knowledge of the effectiveness and applicability of project management methodologies in different contexts, but would also provide organizations with more precise tools to choose the methodology that best suits their needs. In addition, they could contribute to the continuous improvement of existing methodologies or to the development of new approaches that integrate the flexibility and structure needed to meet today's project management challenges.

References

Falcón, A. L., & Serpa, G. R. (2021). Acerca de los métodos teóricos y empíricos de investigación: significación para la investigación educativa. *Conrado*, *17*(S3), 22–31. https://conrado.ucf.edu.cu/index.php/conrado/article/view/2133

González, R., & Salazar, F. (2018). *Aspectos básicos del estudio de muestra y población para la elaboración de los proyectos de investigación*. Universidad de Oriente.

Rodríguez Jiménez, A., & Pérez Jacinto, A. O. (2017). Métodos científicos de indagación y de construcción del conocimiento. *Revista Escuela de Administracion de Negocios*, *82*, 175–195. https://doi.org/10.21158/01208160.n82.2017.1647

Torres-Miranda, T. (2020). Defending the Historical-Logical Method on the Basis of Logic as a Science. *Revista Cubana de Educación Superior*, *39*(2).