

Exploring Interconnections and Social Media Dynamics Within PMI Latin America Chapters

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Abstract: This paper investigates the PMI LATAM Chapters' use of social media to foster project management practices. Employing Social Listening and Social Media Mining, we extracted insights from web conversations, enabling strategic planning and community engagement. Advanced platforms captured data referenced in user interactions, underpinning our exploratory analysis. Social Network Analysis revealed a strong internal community structure with pivotal nodes leading discussions on PMI-related themes. The study highlights the dynamism of PMI LATAM Chapters in adapting global standards to local realities and underscores their role in professional development and networking. The findings suggest that effective social media use can enhance the PMI's mission across Latin America, with implications for member engagement and operational strategy optimization.

Keywords: project management; PMI; LATAM; SNA; LDA; social listening

Exploración de Interconexiones y Dinámicas de Redes Sociales en los Capítulos de PMI Latinoamérica.

Resumen: Este estudio examina cómo los capítulos de PMI LATAM utilizan las redes sociales para promover prácticas de gestión de proyectos. Mediante la escucha social y la minería de redes, se extrajeron perspectivas valiosas de las conversaciones en línea, facilitando la planificación estratégica y el compromiso comunitario. Plataformas avanzadas recopilaban datos de interacciones de usuarios, fundamentando nuestro análisis exploratorio. El Análisis de Redes Sociales reveló una fuerte estructura comunitaria interna con nodos clave liderando debates sobre temas relacionados con el PMI. El estudio resalta el dinamismo de los capítulos de PMI LATAM en la adaptación de estándares globales a realidades locales y subraya su rol en el desarrollo profesional y la creación de redes. Los hallazgos sugieren que el uso efectivo de las redes sociales puede potenciar la misión del PMI en toda América Latina, con implicaciones para el compromiso de los miembros y la optimización de estrategias operativas.

Palabras clave: gestión de proyectos; PMI; LATAM; SNA; LDA; social listening



Introduction

Social Listening and social media mining are the art of extracting valuable insights from large volumes of semi-structured and unstructured data on the web [1]. This process facilitates informed and astute decision-making. Digital platforms are treasure troves of information that, when leveraged, can serve potent business intelligence purposes. These insights enable understanding social media users' opinions about our brand or enterprise, providing audience demographic and location data, and identifying key communities and the most influential social media users [2] [3].

Project Management Institute (PMI) chapters are pivotal in fostering an active community of project management professionals by providing resources, networking opportunities, and professional development programs. Each PMI chapter serves as a local hub where members can share knowledge, meet industry experts, and gain access to PMI publications and standards [4].

In Latin America, the PMI chapters are especially dynamic, reflecting the region's growing emphasis on professionalizing project management practices. These chapters, empowered by their adaptability and resourcefulness, are integral in adapting PMI's global standards to local needs, including navigating the unique business landscapes and cultural aspects of Latin American countries. The 22 PMI LATAM chapters mentioned in this study cover a wide geographic area, each facilitating events, workshops, and seminars tailored to enhance the competencies and careers of project management professionals within their locale.

The role of PMI LATAM chapters extends into the digital realm, particularly on social media platforms like Twitter. These chapters utilize social media not only to disseminate information about events and initiatives but also to engage in discussions about project management trends and best practices. By maintaining an active and inclusive presence on these platforms, PMI LATAM chapters are able to reach a broader audience, engage with members, and provide a platform for networking and professional exchange [5].

The active engagement of PMI LATAM chapters on social media also serves as a barometer for the health and vibrancy of the project management community in the region. As employed in this study, social network analysis (SNA) allows us to visualize the interconnections among chapter members and identify influential nodes within the network [6]. This analysis provides insights into how information flows within the community, highlights active participants, and reveals the collaborative structures that underpin the chapters' activities. Such insights are invaluable for chapters aiming to optimize their outreach and impact within the project management community, ensuring they remain at the forefront of industry developments and continue to attract and retain members.

This research is vital because it provides strategic insights into the social dynamics and community interconnections within PMI Latin America, which are critical for enhancing engagement and understanding the regional influence of the chapters. LATAM PMI chapters can better strategize their communication and member engagement by mapping the relationships and influence patterns among the members and their communities to foster a more connected and effective network. The findings benefit the chapters in optimizing their operational strategies and enriching the broader knowledge of professional community management and social media dynamics. These insights could support PMI's overarching professional development goals and community engagement across Latin America.

Methodology

Data Collection

We employed advanced social listening platforms, Mention and Brandwatch, to capture a broad spectrum of social media data. Our initial selection included a sample of 6,503 posts between June 2022 to September 2023, curated to reference specific names and hashtags pertinent to the chapters summarized in Table 1. This approach enabled us to tap into real-time discussions and sentiments, providing a rich dataset for analysis. By harnessing these insights, we aim to deepen our understanding of public perception and interaction with the topics covered in this research.

Table 1. PMI LATAM Local Chapters

Country	PMI Local Chapters	Country	PMI Local Chapters
Bolivia	Santa Cruz, Bolivia Chapter	Honduras	Honduras Chapter
Brazil	Amazônia, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Minas Gerais, Paraíba, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, São Paulo, Santa Catarina, Sergipe	México	Bajío, Jalisco, México, Nuevo León, Puebla
Chile	Antofagasta, Santiago	Nicaragua:	Nicaragua Chapter
Colombia	Antioquia, Bogotá, Caribe, Pacífico	Panamá:	Panamá Chapter
Costa Rica	Costa Rica Chapter	Paraguay:	Asunción
Dominican Republic	Dominican Republic Chapter	Perú	Lima, Norte, Southern Region
Ecuador	Andes Pacífico, Guayas	Puerto Rico	Puerto Rico Chapter
El Salvador	El Salvador Chapter	Uruguay:	Montevideo
Guatemala	Guatemala Chapter	Venezuela	Venezuela Chapter

Exploratory Analysis

We launched an exploratory data analysis of the collected social media posts using data mining techniques and topic detection facilitated by Latent Dirichlet Allocation (LDA). Data mining [7] allows for extracting patterns from large datasets, employing methods at the intersection of machine learning, statistics, and database systems to transform raw data into valuable insights. This process involves algorithms designed to identify correlations or patterns among numerous fields within large relational databases, enabling a comprehensive understanding of the data gathered.

Further refining our analysis, we utilized Latent Dirichlet Allocation (LDA) [8], a probabilistic model designed explicitly for topic discovery and modeling within text collections. LDA operates under the assumption that documents are composed of a mixture of topics, where a topic is defined as a probability distribution over a set of words. This model assigns topics to documents to best capture the words observed in the texts based on the probability distributions of topics and words. By applying LDA, we can effectively classify documents, summarize content, and perform other text analyses to derive deeper insights from the social media interactions related to the chapters outlined.

Community Detection

To analyze the PMI LATAM chapters' social media engagement, we constructed a graph where tweet authors and interacting users formed interconnected nodes, with interactions like mentions, likes, or comments creating

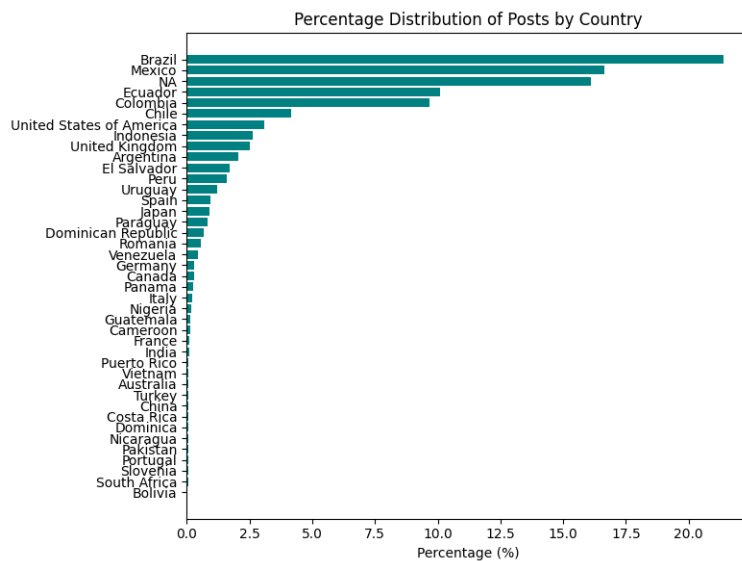
links. We weighted these links based on interaction frequency to quantify relationship strengths. The Force Atlas [9] algorithm then graphically depicted this network, its simplicity enabling us to swiftly interpret community structures and identify characteristics such as community size and connectivity. To refine this view, we applied the Louvain Method to enhance the network modularity, distinguishing tightly knit clusters from less connected nodes. Additionally, the Spin-glass algorithm helped categorize users into groups, and centrality measures, such as eigenvector centrality, pinpointed critical influencers within the network, revealing the most prominent channels for information flow.

Results

Exploratory Analysis

Figure No. 1 illustrates the percentage distribution of social media posts by country. Most social media conversations originate from chapters and users in Brazil and Mexico, followed by Ecuador, Colombia, Chile, and the United States. This data suggests an elevated level of engagement from these countries in online discussions, reflecting their active participation in the digital space.

Figure 1 Percentage Distribution of Posts by Country



Text Mining and Topic Modeling

First, we conducted a text-mining exercise to refine the extensive discussions and content shared across the social media platforms of the PMI LATAM chapters. This endeavor aimed to identify the most salient topics and terminologies within the online project management LATAM communities. The resulting word cloud shown in Figure 2 is not just a collection of terms; it's a visual culmination of this deep analytical work crafted to understand and highlight the critical areas of focus, concerns, and interests that resonate within and across the PMI chapters in the Latin American region.

Figure 2 Word cloud from PMI LATAM chapters



The word cloud centers on project management themes, prominently featuring "direction" and "projects," which strongly emphasizes leadership and project execution. References to "PMI" and its specific Latin American chapters like "pmistgochile," "pmicapitolomex," "pmicaribe" and "pmicolombia" indicate a geographical and organizational focus within the professional community. Additionally, terms such as "minister," "trade," and "team" imply discussions that might intertwine governmental roles with commercial aspects in project management. The presence of "agile" highlights the adoption of modern project methodologies, signifying a progressive approach to managing and directing projects in the region.

After selecting publications in Spanish and Portuguese languages, for pre-processing and cleaning, we implemented a topic modeling model, specifically the LDA Model, to analyze them. The findings, presented in Table 2, outline the results of employing Social Network Analysis (SNA) to discussions across ten topics. These results reflect key themes and patterns in community engagement, collaboration, and professional development. Each entry highlights how specific PMI chapters address challenges and opportunities in project management. The summarized data aids in understanding the impact of various initiatives and strategies. This analysis offers a structured overview of community dynamics and their contributions to the field.

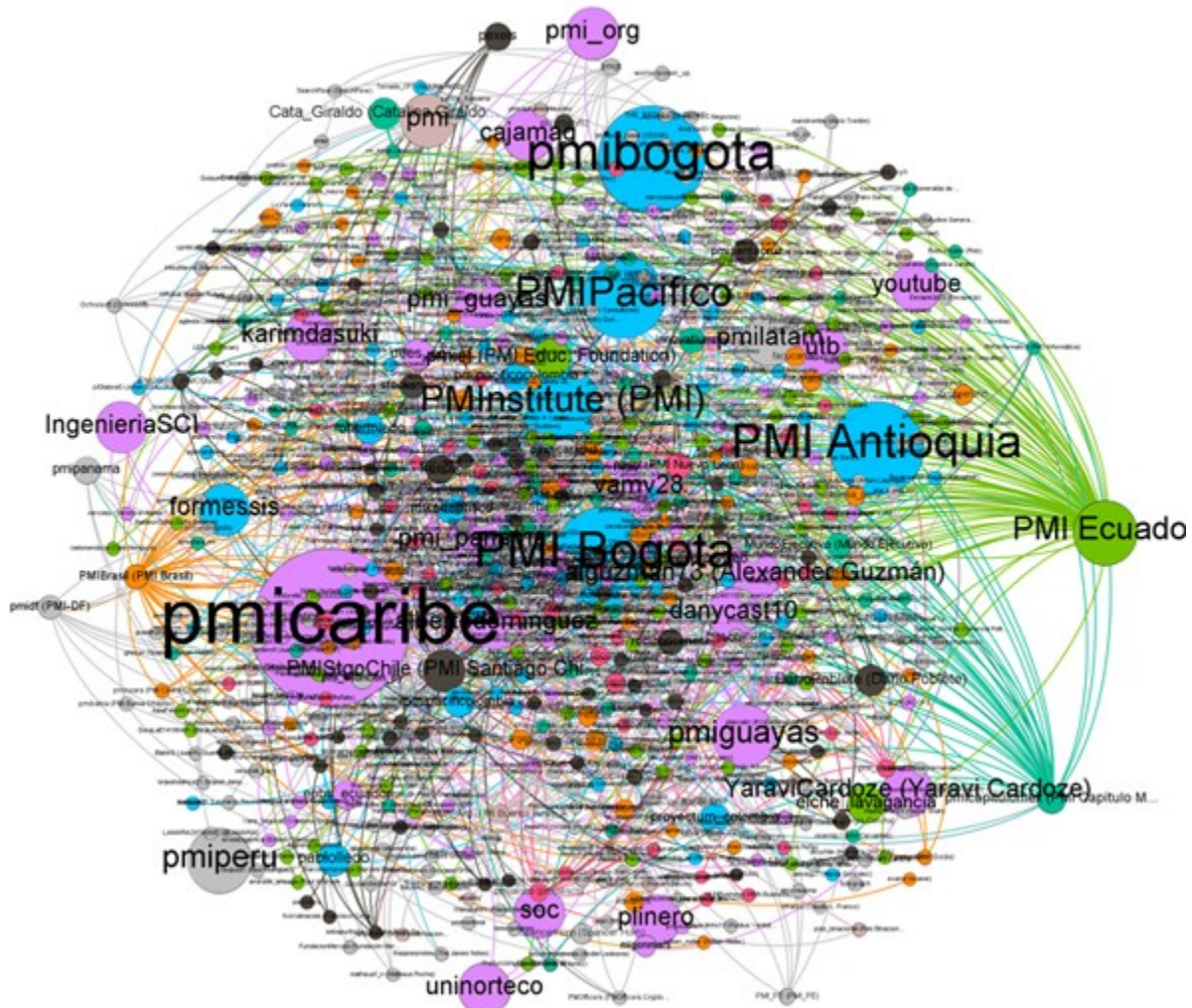
Table 2. More relevant topics from PMI LATAM Chapters publications

Topic ID	PMI Local Chapters	Topic Description
1	PMI Ecuador	Prominence at the congress with a commitment to project management excellence.
3	Digital Leadership in Project Management	Highlighting key themes of digital leadership within the project management domain.
3	PMI Colombia Workshops	Enhancing the project management landscape through educational workshops.
4	PMI Capitulomex Events	Organizing notable events that provide value to project management professionals.
5	PMI RD Direction and Management	Focusing on practical and strategic aspects of project direction and management.
6	PMI Caribe Corporate Engagement	Engaging with corporate entities, active community role, and member recognition.
7	PMI Guayas Educational Commitments	Commitment to education with a focus on PMP certification sessions for member development.
8	Industry and Robotics	Leading discussions on current topics such as industry and robotics, and technology advancements.

Community Detection

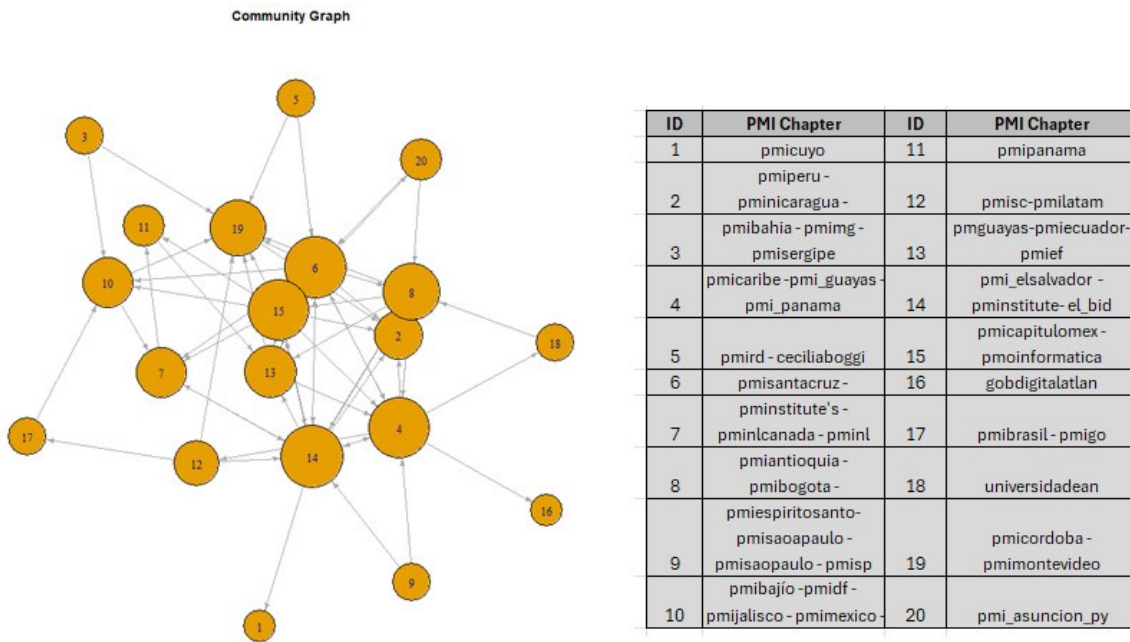
In analyzing the PMI LATAM Chapters' collaboration networks, our Social Network Analysis (SNA) revealed a complex structure of 901 nodes with a high modularity score of 0.826, as shown in Figure 3. This score underscores the internal solid cohesion of the most populous user groups within their communities and a lesser degree of outward linkage to other groups. We applied a contraction algorithm to simplify and interpret the intricate web of connections, consolidating multiple nodes into single vertices. The algorithm transformed the original graph into a streamlined model where each vertex represents a cluster of the initial nodes, offering a more precise depiction of the information flow within and between these integrated communities. Figure 4 shows a graph of collaboration communities

Figure 3. Graph of PMI LATAM chapters accounts



This analysis identified specific communities as particularly central, indicated by their eigenvector centrality measures. Accounts like pmicolombia (Bogota), pmicaribe, pmiantioquia, pmipacifico, pmiiinstitute, pmiperu, pmiecuador, pmiguayas, and the general PMI account, command significant influence. Their high eigenvector centrality scores reflect active interactions and strategic engagement with other pivotal nodes. These accounts form the network's backbone, crucial for the propagation of information and ideas, highlighting their indispensable role in shaping the PMI community's communication landscape across Latin America.

Figure 4. Graph of PMI LATAM Chapters communities.



As can be seen in Figure 4, corresponding to the community collaboration graph, the communities belong to the PMI Chapters of Antioquia, Bogotá, Caribe, and Pacífico (Community 8), along with El Salvador (ID 14), Santa Cruz, and Santiago de Chile (Community 6), Córdoba and Montevideo (Community 19), and Guayas and Ecuador (Community 13), standing out for their collaboration initiatives. These communities have been instrumental in organizing various events, including project management topic workshops and online study sessions tailored to PMP and PMI-ACP certifications, thus enriching the project management educational landscape. This constructive collaboration transcends geographic boundaries and cements a culture of shared knowledge and mutual support within PMI's global network.

Conclusions

This study offers a comprehensive view of the communication and collaboration network within the PMI chapters in Latin America, emphasizing the strategic use of social media to enhance project management practices. Through social listening and data mining techniques, key patterns and influential nodes have been identified within the communities, reflecting a highly active and engaged digital environment. The effective adaptation of PMI's global standards to the local context highlights the responsiveness and

dynamism of the region's chapters. Social Network Analysis has uncovered substantial internal cohesion within the LATAM PMI chapters. Significant modularity indicates solid connections among members within communities and fewer outward connections. This highlights the need to foster more integrated networks to maximize collaboration and knowledge exchange. Digital platforms emerge as vital tools for reaching and retaining members and keeping chapters at the cutting edge of professional development.

In conclusion, the research underscores the importance of understanding social interactions and network dynamics to enhance community management and operational strategy within PMI Latin America. PMI chapters can leverage these insights to design their communication initiatives and member engagement better, thereby promoting a more connected and effective network. These findings provide a solid foundation for ongoing professional development and community engagement across the region, with the potential to significantly enhance the effectiveness of PMI chapters in Latin America.

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