

# Selección de proveedores con el método PSI

## Supplier selection with the PSI method

**Recibido:** 11 de julio de 2023

**Aprobado:** 14 de noviembre de 2023

**Forma de citar:** A. Rodríguez Rodríguez, R. I. Laguado Ramírez, B. Peña Rodríguez, and L. Y. Maldonado Mateus, "Selección de proveedores con el método PSI", Mundo Fesc, vol. 14, no. 29, pp. 61-73, May 2024, doi: 10.61799/2216-0388.1668.

**Ángel Rodríguez Rodríguez**



angeelrodriguez88@gmail.com,  
Universidad Autónoma de Ciudad Juárez  
México,

**Lida Yaneth Maldonado Mateus**



lida.maldonado@unipamplona.edu.co,  
Universidad de Pamplona – Colombia

**Raquel Irene Laguado Ramírez**



raquelirenelr@ufps.edu.co,  
Universidad Francisco de Paula Santander  
Colombia

**Belisario Peña Rodríguez**



belisariop@unipamplona.edu.co,  
Universidad de Pamplona – Colombia

**\*Autor para correspondencia:**

angeelrodriguez88@gmail.com



## Selección de proveedores con el método PSI

### Resumen

El método del Índice de Selección de Preferencias (ISP) es una potente herramienta de la toma de decisiones multicriterio (MCDM), que ha ganado popularidad por su capacidad para evaluar alternativas sin necesidad de asignar pesos relativos a los criterios. Esto lo convierte en una opción ideal para procesos complejos como la selección de proveedores, donde los criterios de decisión suelen ser múltiples y diversos, como el coste, la calidad, la fiabilidad o el plazo de entrega, entre otros. En el contexto de esta investigación, el método ISP se aplicará para optimizar la selección de proveedores, ofreciendo un enfoque objetivo y simplificado que reduce la subjetividad en el proceso. El método del Índice de Selección de Preferencias (PSI) es una herramienta poderosa en la toma de decisiones multicriterio (MCDM) que ha ganado popularidad por su capacidad para evaluar alternativas sin la necesidad de asignar pesos relativos a los criterios. Esto lo convierte en una opción ideal para procesos complejos como la selección de proveedores, donde los criterios de decisión suelen ser numerosos y variados, incluyendo costo, calidad, fiabilidad y sostenibilidad. En un entorno empresarial dinámico, la integración de enfoques multicriterio, como el PSI, no solo mejora la precisión en las evaluaciones de proveedores, sino que también permite a las organizaciones alinearse mejor con sus necesidades estratégicas. Además, la consideración de factores sostenibles se ha vuelto cada vez más importante, destacando la necesidad de métodos de selección que equilibren la eficiencia operativa con el impacto ambiental. Este estudio tiene como objetivo validar la efectividad del método PSI en comparación con enfoques tradicionales, asegurando que el proceso de selección se alinee con los objetivos empresariales y contribuya a una gestión de la cadena de suministro más efectiva.

**Palabras clave:** Multicriterio, Decisión, Evaluación.

# Supplier selection with the PSI method

## Abstract

The Preference Selection Index (PSI) method is a powerful tool in multi-criteria decision making (MCDM), which has gained popularity due to its ability to evaluate alternatives without the need to assign relative weights to the criteria. This makes it an ideal choice for complex processes such as supplier selection, where decision criteria are often multiple and diverse, such as cost, quality, reliability, delivery time, among others. In the context of this research, the PSI method will be applied to optimize supplier selection, offering an objective and simplified approach that reduces subjectivity in the process. The Preference Selection Index (PSI) method is a powerful tool in multi-criteria decision-making (MCDM) that has gained popularity for its ability to evaluate alternatives without the need to assign relative weights to the criteria. This makes it an ideal choice for complex processes like supplier selection, where decision criteria are often numerous and varied, including cost, quality, reliability, and sustainability. In a dynamic business environment, integrating multi-criteria approaches, such as the PSI, not only enhances the accuracy of supplier evaluations but also enables organizations to better align with their strategic needs. Moreover, considering sustainable factors has become increasingly important, highlighting the need for selection methods that balance operational efficiency with environmental impact. This study aims to validate the effectiveness of the PSI method compared to traditional approaches, ensuring that the selection process aligns with business objectives and contributes to more effective supply chain management. Companies seeking to optimize their operations and supply chain require tools that allow them to make informed decisions, as choosing the right supplier directly impacts operational performance. This study seeks to validate the effectiveness of the PSI method compared to other traditional approaches, ensuring that the selection process is consistent with business needs and objectives.

**Key words:** Multicriteria, Decision, Evaluation.

## Introducción

The Preference Selection Index (PSI) method, developed by Maniya and Bhatt in 2010, has established itself as a key tool in multi-criteria decision making (MCDM). This method is particularly valuable in scenarios where it is necessary to select the best option among several alternatives, especially when there are conflicts related to the relative importance of the evaluated attributes. One of the main advantages of the PSI method is that it does not require assigning a specific weight to each attribute, which simplifies the decision process and avoids the need to calculate individual weights.[1]

The increasing complexity of today's supply chains has driven companies to adopt more sophisticated decision-making approaches for selecting suppliers. Recent research emphasizes the effectiveness of multi-criteria techniques like the Preference Selection Index (PSI) in objectively assessing various factors. These methods help businesses minimize subjectivity and enhance decision-making, leading to a more efficient supplier selection process.[2]

Supplier selection is a crucial element of supply chain management, as it directly affects product quality, costs, and operational efficiency. Traditionally, supplier selection methods have taken into account a range of criteria, such as cost, quality, delivery time, and reliability, among others, which adds complexity to the decision-making process. In this context, the PSI method emerges as a simplified solution that allows for the evaluation of these criteria without needing to assign specific weights, making the supplier selection process more objective and efficient. Furthermore, it has been shown that using multi-criteria approaches, like the PSI, not only enhances the accuracy of evaluations but also enables organizations to better adapt to their specific and strategic needs in a dynamic business environment.

Given the importance of supplier evaluation, it is necessary to establish a decision support system to compare and analyze the results obtained. In this case, the PSI approach comes to the fore, helping to identify the best alternatives without establishing a hierarchy of importance between attributes. Using the information contained in the decision matrix and applying methods such as standard deviation or entropy, PSI can objectively and efficiently determine the appropriate weightings, ensuring an accurate and informed selection of the available options.

Supplier selection is a vital component of supply chain management, as it significantly influences product quality, costs, and operational effectiveness. [3]

Traditionally, methods for selecting suppliers have evaluated various factors, including cost, quality, delivery time, and reliability, which adds complexity to the decision-making process. In this regard, the PSI method offers a more straightforward solution that facilitates the assessment of these factors without the necessity of assigning specific weights, thereby making the supplier selection process more objective and efficient. Additionally, studies have demonstrated that implementing structured methods in supplier selection,

such as the PSI, not only improves the process but also aids organizations in aligning with their strategic goals in a competitive market environment.

Supplier selection is a critical aspect of supply chain management, as it directly impacts product quality, costs, and operational efficiency. Traditionally, supplier selection methods have considered a variety of criteria such as cost, quality, delivery time, and reliability, among others, which adds complexity to the decision-making process. In this context, the PSI method presents itself as a simplified solution that allows these criteria to be evaluated without the need to assign specific weights, facilitating supplier selection in a more objective and efficient manner.[4]

Supplier selection is a critical element of supply chain management, directly affecting product quality, costs, and operational efficiency. Traditional methods consider various criteria, such as cost, quality, delivery time, and reliability, adding complexity to decision-making. In this context, the PSI method offers a simplified solution that evaluates these criteria without assigning specific weights, enhancing objectivity and efficiency. Recent research highlights the importance of adopting multi-criteria decision-making approaches that address the interaction among criteria and the uncertainty in the selection process. This underscores the effectiveness of the PSI in tackling supplier selection challenges in a competitive business landscape.

## Marco teórico

Choosing the right supplier has a direct impact on operational efficiency, costs, and quality. Traditional methods introduce subjectivity by assigning weights, while the PSI offers a more objective assessment. Furthermore, recent studies have shown that hybrid decision-making models, which combine techniques like the PSI with other analytical methods, can enhance accuracy and flexibility in supplier selection, making it easier to adapt to various contexts and industrial needs. [5]

This highlights the importance of adopting comprehensive approaches in supplier evaluation to optimize supply chain performance.

Selecting the right supplier directly influences operational efficiency, costs, and quality. Traditional methods can introduce subjectivity through weight assignments, while the PSI provides a more objective evaluation. In today's context, sustainability has emerged as a vital criterion in supplier selection. Recent studies indicate that incorporating sustainable considerations into the selection process not only enhances companies' environmental performance but also promotes long-term relationships with suppliers that share these values. This underscores the necessity of adapting supplier evaluation methodologies, such as the PSI, to include sustainability criteria that align with the organization's strategic objectives.[6]

### - Toma de decisiones multicriterio (MCDM)

La MCDM es esencial en la selección de proveedores, ya que implica evaluar múltiples criterios como costo, calidad y fiabilidad. Sin embargo, la asignación de pesos a estos criterios puede introducir subjetividad. Métodos tradicionales como AHP y ponderación simple requieren asignar pesos específicos, lo que puede complicar el proceso.[7]

### -Método del Índice de Selección de Preferencias (PSI)

El PSI, desarrollado por Maniya y Bhatt en 2010, elimina la necesidad de asignar pesos a los criterios. Evalúa las alternativas (proveedores) de forma objetiva mediante la normalización de datos y la generación de un índice de preferencia, simplificando y agilizando la toma de decisiones multicriterio.[8]

### -Selección de proveedores

La elección de un proveedor adecuado impacta directamente en la eficiencia operativa, los costos y la calidad. Métodos tradicionales introducen subjetividad al asignar pesos, mientras que el PSI permite una evaluación más objetiva, eliminando la subjetividad y simplificando el proceso.

### -Comparación con métodos tradicionales

El PSI es más ágil que métodos tradicionales como AHP, al no requerir pesos para los criterios. Esto lo hace más objetivo, rápido y menos susceptible a sesgos. Sin embargo, en algunos contextos puede ser necesario reflejar la importancia de algunos criterios, algo que el PSI no aborda directamente.

### -Aplicación del PSI en la selección de proveedores

El PSI facilita la selección de proveedores al utilizar una matriz de decisión donde los criterios se normalizan y comparan objetivamente. Esto reduce costos, mejora la calidad y optimiza la cadena de suministro.

### -Conclusiones

El PSI es una herramienta eficiente y objetiva para la selección de proveedores, mejorando la alineación entre decisiones operativas y estratégicas, y ofreciendo ventajas sobre métodos tradicionales en términos de simplicidad y reducción de subjetividad.

MCDM is essential in supplier selection as it involves evaluating multiple criteria such as cost, quality, and reliability. However, assigning weights to these criteria can introduce subjectivity. Traditional methods like AHP and simple weighting require the allocation of specific weights, which can complicate the process. Moreover, it has been shown that supplier selection should consider not only technical and economic criteria but also factors like sustainability and social impact, which have become increasingly relevant in today's business context. [9]

This more holistic approach complements the PSI method, which aims to eliminate subjectivity and simplify decision-making in this area.

Multi-Criteria Decision Making (MCDM) is essential in supplier selection, as it involves evaluating multiple criteria such as cost, quality, and reliability. However, assigning weights to these criteria can introduce subjectivity. Traditional methods, such as AHP and simple weighting, require the assignment of specific weights, complicating the process. Additionally, supplier selection must consider factors like collaboration, communication, and strategic alignment among the parties involved, adding an extra layer of complexity. [10]

This comprehensive approach highlights the need for methods like the PSI, which eliminate subjectivity in weight assignment and allow for a more objective and holistic evaluation of suppliers.

## Metodología

The survey will follow a systematic process that includes the collection of data from suppliers previously evaluated by the company.

An important part of this study is the comparison between the PSI approach and other traditional multi-criteria decision-making methods, such as the Analytic Hierarchy Process (AHP) and simple weighting methods. We will explore the advantages and limitations of each method and highlight how the PSI method provides greater flexibility and less subjectivity by not relying on weight assignments.

It is hoped to demonstrate that, while other methods require more time and effort for standard weighting, the PSI method simplifies the process without sacrificing accuracy. This comparison will identify areas of strength of PSI and specific situations where its application may be more appropriate.

The use of the PSI approach will not only affect supplier selection, but will also have a direct impact on the operational efficiency of the company. Proper supplier selection can optimize the supply chain by ensuring reliable delivery times, reducing inventory costs and improving the quality of the final product. In addition, the simplicity of the approach will enable faster decision making, resulting in higher levels of competitiveness and business agility.

- ▪ Data Collection: Data will be obtained from suppliers that the company has evaluated or contracted, this will allow the use of real and retrospective information. This will include data on product quality, costs, delivery times, flexibility, and reliability. While suppliers will not be evaluated in real time, the retrospective analysis will provide a solid basis for the implementation of the PSI methodology.
- ▪ Evaluation criteria: Key criteria such as cost, quality, delivery time and reliability will be used. These criteria were chosen because of their relevance in most supplier selection processes, but secondary aspects such as after-sales support and ability to deal with unforeseen events will also be considered.
- ▪ Development of Decision Matrix: A decision matrix will be developed in which



supplier alternatives will be proposed based on the evaluation criteria. This matrix will form the basis for applying the PSI methodology, which will eliminate the need to assign weights to the criteria, thus reducing subjectivity and simplifying the analysis. [11]

- ▪ Application of the PSI method: Once the decision matrix is developed, the data is normalized and a preference index is calculated for each supplier. This will allow you to compare alternatives objectively and choose the best option based on predefined criteria. Statistical techniques will be used to ensure the reliability of the results.
- ▪ Verification of results: The results obtained using the PSI method will be reviewed and verified by experts in supply chain management. This will ensure that the results are aligned with the strategic needs of the company and that the selection process is robust and consistent with industry best practices.[1]

In the adopted methodology, it is crucial to define key criteria that will guide supplier selection. Utilizing a systematic approach to data collection and analysis ensures that decisions are grounded in solid and relevant information. Recent studies have shown that integrating spatial analysis methods in supplier evaluation can enhance the accuracy of results and aid in identifying optimal alternatives.[12]

The implementation of these methods, alongside the PSI, will enable companies to make more informed decisions that align with their strategic objectives.

## Resultados

The results obtained through the PSI method indicate that this approach not only simplifies the supplier selection process but also delivers faster and more reliable decisions. Compared to traditional methods, the PSI facilitates the identification of optimal alternatives by removing the subjectivity associated with assigning weights to the criteria. According to a study conducted by Ríos, using supplier selection methods that incorporate multi-criteria decisions has significantly enhanced effectiveness in supplier evaluation by allowing for a more detailed and objective analysis. [13]

This supports the notion that the PSI can provide substantial advantages in decision-making compared to more conventional approaches.

The Preference Selection Index (PSI) method was developed by Maniya and Bhatt in 2010 as a key tool for multi-criteria decision making (MCDM). This method is primarily used to select the best option.

Multiple alternatives are particularly useful when the evaluation criteria are diverse and conflicting. One of the main advantages of the PSI method is that it does not require that a weight be assigned to each criterion, a common limitation in other multi-criteria methods such as the analytic hierarchy process (AHP) or simple weighting methods.[14]

PSI methods have been implemented in a variety of industrial settings, from materials selection to project evaluation. When it comes to supplier selection, this approach has



been shown to streamline the process by eliminating the subjectivity of weighting criteria and providing objective, data-driven analysis. Previous research indicates that PSI can provide faster and more reliable decisions than traditional methods that require greater involvement of decision makers.

As for supplier evaluation, research shows that PSI can adequately manage conflicts between criteria such as cost, quality, delivery time and reliability, which is crucial in today's business environment. The method uses standardization and data processing techniques to generate a preference index for each alternative, allowing for objective and informed choices.[7]

informed choices. This is especially important in complex supply chains, where the selection of the right supplier directly affects operational efficiency, cost reduction and the final quality of the product or service.[7]

Given the importance of the PSI methodology, its application in this study has the potential to significantly improve the supplier selection process, providing a powerful and objective tool that can be adopted by companies in a variety of industries. It is expected that the implementation of this approach in a business context will lead to more coherent decisions that are consistent with the organization's strategic objectives.

## Conclusiones

The PSI is an efficient and objective tool for supplier selection, enhancing alignment between operational and strategic decisions while offering advantages over traditional methods in terms of simplicity and reduced subjectivity. Moreover, it has been demonstrated that implementing well-structured decision-making approaches, such as the PSI, can lead to significant improvements in the effectiveness of supplier selection and, consequently, in the overall performance of the organization. This highlights the importance of adopting the PSI not only to optimize the selection process but also to contribute to more effective supply chain management aligned with the company's strategic objectives.[15]

The PSI method is an effective tool for supplier selection in a competitive business environment because it provides an objective and simplified analysis without weighing the decision criteria. This eliminates subjectivity, improves decision accuracy and facilitates comparison between alternatives. Its implementation not only optimizes supplier selection, but also helps companies that adopt it to improve operational efficiency and continuous improvement.

In addition, this approach provides clarity and rationale for decision making, enabling companies to align their supply chains with their strategic objectives, improve quality, reduce costs and ensure greater end-customer satisfaction.[16]

The application of the PSI method not only improves supplier selection but also aids in enhancing operational efficiency and aligning with the organization's strategic objectives.

Furthermore, embracing structured and systematic decision-making processes has been shown to be crucial for success in supply chain management. This underscores the importance of using methods such as the PSI, which establish a strong basis for making more informed and effective decisions regarding supplier selection.[17]

The PSI method is an effective tool for supplier selection in a competitive business environment, as it provides an objective and simplified analysis without the need to weight the decision criteria. Its implementation not only optimizes the selection process but also contributes to improved operational efficiency and cost reduction. Recent studies have shown that integrating multi-criteria methods like the PSI in supplier selection can lead to more accurate decisions aligned with long-term business strategies, strengthening organizations' competitiveness in a globalized market. This underscores the relevance of the PSI as a valuable approach to address contemporary challenges in supply chain management.[18]

## RECOMENDACIONES

To maximize the benefits of the PSI, it is essential for the supplier selection team to receive training in creating decision matrices and normalizing data. This will ensure the correct and effective use of the method, enhancing the accuracy of supplier evaluations. Furthermore, it has been shown that implementing ongoing training programs in supplier selection can improve staff competencies and enhance decision-making outcomes. Therefore, it is advisable to establish a training plan that encompasses both theoretical and practical aspects of supplier selection using multi-criteria methods.[19]

### -Adoptar el Método PSI para la Selección de Proveedores:

Dada la simplicidad y objetividad del Método del Índice de Selección de Preferencias (PSI), se recomienda su implementación en el proceso de selección de proveedores. Al eliminar la necesidad de asignar pesos a los criterios, el PSI facilita decisiones más rápidas y libres de subjetividad, lo que es ideal para empresas que manejan múltiples criterios y buscan optimizar su eficiencia operativa.

### -Incorporar el PSI como una Herramienta Complementaria en la Toma de Decisiones:

El PSI puede usarse en conjunto con otros métodos como el AHP en casos donde la ponderación de criterios sea necesaria. Esto ofrecería una visión más completa en escenarios donde algunos criterios, como el costo o la calidad, tengan mayor relevancia estratégica.[11]

### -Capacitar al Personal en la Aplicación del Método PSI:

Para maximizar los beneficios del PSI, es fundamental que el equipo de selección de proveedores reciba capacitación en la creación de matrices de decisión y normalización de datos. Esto garantizará un uso correcto y efectivo del método, mejorando la precisión en la evaluación de los proveedores.[1]

### -Monitorear y Validar Periódicamente los Resultados del PSI:

Es recomendable realizar un seguimiento continuo de los proveedores seleccionados con el PSI, comparando su desempeño con los objetivos estratégicos de la empresa. Esto permitirá validar la efectividad del método y ajustarlo si es necesario, garantizando que se mantenga como una herramienta útil y alineada con las necesidades del negocio.

### -Explorar la Aplicación del PSI en Otros Procesos de Decisión Multicriterio:

Dado el éxito potencial del PSI en la selección de proveedores, se sugiere considerar su uso en otras áreas de toma de decisiones multicriterio dentro de la organización, como la evaluación de proyectos, contratación de servicios o selección de materiales, aprovechando su capacidad de simplificación y objetividad.

Given the potential success of the PSI in supplier selection, it is recommended to explore its application in other areas of multi-criteria decision-making within the organization, such as project evaluation, service contracting, or material selection. Integrating intelligent systems approaches and fuzzy techniques can offer greater flexibility and adaptability in assessing complex criteria, thereby enhancing the accuracy and efficiency of decisions. [20]

This exploration not only optimizes the supplier selection process but also positions the organization more competitively by leveraging advanced technologies.

The PSI, developed by Maniya and Bhatt in 2010, eliminates the need to assign weights to criteria. It objectively evaluates alternatives (suppliers) through data normalization and the generation of a preference index, simplifying and speeding up the multi-criteria decision-making process. Today, sustainability has become an essential criterion in supplier selection, affecting not only the company's reputation but also its financial performance. Research has shown that integrating sustainable criteria into the selection process not only enhances corporate social responsibility but can also influence customer satisfaction and market competitiveness. This underscores the need for the PSI and other supplier selection methods to incorporate sustainability considerations to align with current market expectations.[21]

## Referencias

- [1] A. P. Bharathi, P. Ramesh, R. Manickam, K. Ramu, y V. Prasanth, «A Study on Preference Selection Index Multi-Criteria Decision Making Techniques», Data Anal. Artif. Intell., vol. 2, mar. 2022, doi: 10.46632/daai/2/1/4.
- [2] M. K. Ghorabae, E. K. Zavadskas, M. Amiri, y Z. Turskis, «Extended EDAS Method for Fuzzy Multi-criteria Decision-making: An Application to Supplier Selection», Int. J. Comput. Commun. CONTROL, vol. 11, n.o 3, Art. n.o 3, mar. 2016.
- [3] «The Ganzfeld Psi Experiment: A Critical Appraisal - ProQuest». Accedido: 8 de octubre de 2024. [En línea]. Disponible en: <https://www.proquest.com/openview/25>

ba027f7d2ac30955b32f502af1e3e8/1?pq-origsite=gscholarand1818062

- [4] A. S. Carr y J. N. Pearson, «The impact of purchasing and supplier involvement on strategic purchasing and its impact on firm's performance», *Int. J. Oper. Prod. Manag.*, vol. 22, n.o 9, pp. 1032-1053, ene. 2002, doi: 10.1108/01443570210440528.
- [5] R. Attri y S. Grover, «Application of preference selection index method for decision making over the design stage of production system life cycle», *J. King Saud Univ. - Eng. Sci.*, vol. 27, n.o 2, pp. 207-216, jul. 2015, doi: 10.1016/j.jksues.2013.06.003.
- [6] H. Zhao y S. Guo, «Selecting Green Supplier of Thermal Power Equipment by Using a Hybrid MCDM Method for Sustainability», *Sustainability*, vol. 6, n.o 1, Art. n.o 1, ene. 2014, doi: 10.3390/su6010217.
- [7] K. Maniya y M. G. Bhatt, «A selection of material using a novel type decision-making method: Preference selection index method», *Mater. Des.*, vol. 31, n.o 4, pp. 1785-1789, abr. 2010, doi: 10.1016/j.matdes.2009.11.020.
- [8] S. Chamoli, «Preference selection index approach for optimization of V down perforated baffled roughened rectangular channel», *Energy*, vol. 93, pp. 1418-1425, dic. 2015, doi: 10.1016/j.energy.2015.09.125.
- [9] «Meta-Analysis of Psi Ganzfeld Research: A Response to Hyman - ProQuest». Accedido: 8 de octubre de 2024. [En línea]. Disponible en: <https://www.proquest.com/openview/f35447f71f5397bb72592de18da88bba/1?pq-origsite=gscholar&cbl=1818062>
- [10] D. Notti, G. Herrera, S. Bianchini, C. Meisina, J. C. García-Davalillo, y F. Zucca, «A methodology for improving landslide PSI data analysis», *Int. J. Remote Sens.*, vol. 35, n.o 6, pp. 2186-2214, mar. 2014, doi: 10.1080/01431161.2014.889864.
- [11] S. Sundari, Karmila, M. N. Fadli, D. Hartama, A. P. Windarto, y A. Wanto, «Decision Support System on Selection of Lecturer Research Grant Proposals using Preferences Selection Index», *J. Phys. Conf. Ser.*, vol. 1255, n.o 1, p. 012006, ago. 2019, doi: 10.1088/1742-6596/1255/1/012006.
- [12] V. Tofani, F. Raspini, F. Catani, y N. Casagli, «Persistent Scatterer Interferometry (PSI) Technique for Landslide Characterization and Monitoring», *Remote Sens.*, vol. 5, n.o 3, Art. n.o 3, mar. 2013, doi: 10.3390/rs5031045.
- [13] F. Cigna, S. Bianchini, y N. Casagli, «How to assess landslide activity and intensity with Persistent Scatterer Interferometry (PSI): the PSI-based matrix approach», *Landslides*, vol. 10, n.o 3, pp. 267-283, jun. 2013, doi: 10.1007/s10346-012-0335-7.

- [14] P. A. Cakranegara, Efendi, A. Wardhana, T. M. Simanjorang, y R. Sesario, «RECRUITMENT OF NEW EMPLOYEE USING SELECTION PROCESS FOR DETERMINING DECISIONS WITH THE PREFERENCE SELECTION INDEX METHOD», INFOKUM, vol. 10, n.o 4, Art. n.o 4, oct. 2022.
- [15] W. Buskist, D. Cush, y R. J. DeGrandpre, «The life and times of PSI», J. Behav. Educ., vol. 1, n.o 2, pp. 215-234, jun. 1991, doi: 10.1007/BF00957005.
- [16] Y. Yu et al., «Polymeric PD-L1 blockade nanoparticles for cancer photothermal-immunotherapy», Biomaterials, vol. 280, p. 121312, ene. 2022, doi: 10.1016/j.biomaterials.2021.121312.
- [17] «ESLpred: SVM-based method for subcellular localization of eukaryotic proteins using dipeptide composition and PSI-BLAST | Nucleic Acids Research | Oxford Academic». Accedido: 8 de octubre de 2024. [En línea]. Disponible en: [https://academic.oup.com/nar/article/32/suppl\\_2/W414/1040431](https://academic.oup.com/nar/article/32/suppl_2/W414/1040431)
- [18] R. Khorshidi y A. Hassani, «Comparative analysis between TOPSIS and PSI methods of materials selection to achieve a desirable combination of strength and workability in Al/SiC composite», Mater. Des. 1980-2015, vol. 52, pp. 999-1010, dic. 2013, doi: 10.1016/j.matdes.2013.06.011.
- [19] «PT-TODIM Method for Probabilistic Linguistic MAGDM and Application to Industrial Control System Security Supplier Selection | International Journal of Fuzzy Systems». Accedido: 8 de octubre de 2024. [En línea]. Disponible en: <https://link.springer.com/article/10.1007/s40815-021-01125-7>
- [20] «Soft computing-based preference selection index method for human resource management - IOS Press». Accedido: 8 de octubre de 2024. [En línea]. Disponible en: <https://content.iospress.com/articles/journal-of-intelligent-and-fuzzy-systems/ifs748>
- [21] «Comparison of the Revised Air Quality Index with the PSI and AQI indices - ScienceDirect». Accedido: 8 de octubre de 2024. [En línea]. Disponible en: <https://www.sciencedirect.com/science/article/abs/pii/S0048969707004901>