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Neutrosophic Interpretation of Legal Texts and Contracts

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Abstract. The purpose of this research is to demonstrate the usefulness of using neutrosophic logic in determining ambiguities in legal texts. To do this, the aim is to carry out an analysis of a legal text through the use of neutrosophic operators to determine the existence of indeterminacies or ambiguities that may be the subject of deficiencies in the legal field. The use of neutrosophic correlation operators made it possible to identify a set of highly relevant elements that, according to the assessment of experts, must be subjected to mandatory evaluation in the process of analysis and interpretation of legal documents. The incorporation of neutrosophic numbers was particularly significant when examining in detail the language contained in legal clauses and provisions in order to detect vague, ambiguous, or general terms. This study has provided solid evidence of the effectiveness and versatility of the method when applied in the legal field.

Keywords: neutrosophic logic, interpretation, legal documents, neutrosophic correlation coefficients.

1 Introduction

The proper interpretation of legal documents and contracts holds significant importance in the legal and contractual field. Precise comprehension and execution of legal and contractual provisions are vital to maintain the stability and efficacy of the legal and contractual framework. The precise interpretation of these documents is a complex process that requires deciphering a dense and technical language, where each word and phrase can have substantial effects on one's rights, responsibilities, and duties.

However, the existence of indeterminacies or ambiguities in legal texts is a recurring concern in the legal field and can have significant consequences. These indeterminacies refer to situations in which legal provisions do not clearly specify how they should be applied in particular circumstances, giving rise to divergent interpretations. On the other hand, ambiguities arise when a word, phrase, or clause in a legal text may have multiple meanings or is not precise enough for application in a specific context.[1], [2]

These erroneous or ambiguous interpretations of legal texts and contracts can lead to conflicts, litigation, and legal disputes that can be costly both in financial and time terms. Furthermore, lack of clarity in interpretation can undermine confidence in the legal system and in the enforcement of contractual agreements, which in turn can negatively affect the stability of business relationships and the protection of individual rights.

Neutrosophic logic can be a valuable tool in these cases [3]. Neutrosophic logic is a branch of logic that was developed to deal with ambiguity, uncertainty, and vagueness in decision-making and knowledge representation. It was proposed by the mathematician and philosopher Florentin Smarandache in the 1990s [4]. This theory is based on the idea that truth and falsehood may not be the only truth values in complex or uncertain situations. It introduces a third truth value, called "indeterminate," which represents the uncertainty or ambiguity inherent in a statement.[5]

In neutrosophic logic, neutrosophic sets are used to express and manipulate uncertain or ambiguous information. A neutrosophic set is a set in which each element is assigned three values: true, false, and indeterminate [6]. These values allow to represent the ambiguity of a statement or the uncertainty about its truth or falsity. Commonly, neutrosophic logic is applied through neutrosophic logical operators that act on neutrosophic sets [7]. These operators include neutrosophic negation, neutrosophic conjunction, and neutrosophic disjunction, among others. These operators allow logical operations to be performed with indeterminate truth values.[8]

An important aspect of neutrosophic logic is its ability to handle situations in which truth values are not binary, that is, not limited to true or false. This is especially useful in fields where ambiguity and uncertainty are common, such as artificial intelligence [9], decision-making in uncertain environments [10], and natural language interpretation.[11]

Consequently, neutrosophic set theory can be useful in expressing and managing uncertainty in the interpretation of legal texts. By assigning neutrosophic truth values, ambiguity, and indeterminacy in legal clauses and provisions could be quantified. This would facilitate a more accurate understanding of the uncertainty inherent in legal language and could allow interpreters to address it more transparently and fairly.[8], [12], [13]

The purpose of this work is to demonstrate the benefits of using neutrosophic logic in determining ambiguities in legal texts. In this sense, correlation coefficients are a very important tool for judging the relationship between two objects. These coefficients have been widely applied to data analysis and classification, decision-making, pattern recognition, etc. [14]. The present carries out an analysis of a legal text through the use of neutrosophic operators to determine the existence of indeterminacies or ambiguities that may be the subject of deficiencies in the legal field.

In this article, the preliminary aspects of neutrosophic logic and SVNS are first discussed, as well as the formulas for the analysis of correlation coefficients defined in the domain of single-valued neutrosophic sets. Subsequently, the bases on which the analysis is carried out are established, the results achieved are presented and the conclusions derived from the study are produced.

2 Preliminaries

Definition 1. [15] Let X be a space of points (objects), with a generic element in X denoted by x. A neutrosophic set A in X is characterized by a truth-membership function TA(x), an indeterminacy-membership function IA(x), and a falsehood-membership function FA(x). The functions TA(x), IA(x) and FA(x) are real standard or nonstandard subsets of] −0, 1+ [, i.e., TA(x): X →] −0,1+ [, IA(x): X →] −0, 1+ [, and FA(x): X →] −0, 1+ [. There is no restriction on the sum of TA(x), IA(x), and FA(x), so there is −0 ≤ sup TA(x) + sup IA(x) + sup FA(x) ≤ 3+.

It is difficult to apply the neutrosophic set to practical problems. Therefore, in [16-20] Wang introduced the concept of a single-valued neutrosophic set (SVNS), which is an instance of a neutrosophic set, to be used in real scientific and engineering applications. Below is the definition of an SVNS.

Definition 2. Let X be a space of points (objects) with generic elements in X denoted by x. An SVNS A in X is characterized by a truth-membership function $T_A(x)$, an indeterminacy-membership function $I_A(x)$, and a falsity-membership function $F_A(x)$ for each point x in X, $T_A(x)$, $I_A(x)$, $F_A(x) \in [0, 1]$. Thus, A SVNS A can be expressed as

$A = \{x, T_A(x), I_A(x), F_A(x) | x \in X\}$

Then, the sum of $T_A(x)$, $I_A(x)$, and $F_A(x)$ satisfies the condition $0 \leq T_A(x) + I_A(x) + F_A(x) \leq 3$.

Definition 3. [16] The complement of an SVNS A is denoted by A^c and is defined as

$Ac = \{x, FA(x), 1 - IA(x), TA(x) | x \in X\}$

Definition 4. [16] A SVNS A is contained in the other SVNS B, $A \subseteq B$ if and only if $T_A(x) \leq T_B(x)$, $I_A(x) \geq I_B(x)$, and $F_A(x) \geq F_B(x)$ for every x in X.

Definition 5. [16] Two SVNSs A and B are equal, written as A = B, if and only if $A \subseteq B$ and $B \subseteq A$

2.1 Correlation coefficient of SVNSs

Definition 6. [17] For any two SVNSs A and B in the universe of discourse X = {x1, x2, . . . , xn}, the correlation coefficient between two SVNSs A and B is defined as follows:

$$M(A,B) = \frac{1}{3n}\sum_{i=1}^{n}[\phi_i(1-\Delta T_i) + \varphi_i(1-\Delta I_i) + \psi_i(1-\Delta F_i)] \quad (1)$$

Where

$$\phi_i = \frac{3-\Delta T_i - \Delta T_{max}}{3-\Delta T_{min} - \Delta T_{max}},$$

$$\varphi_i = \frac{3-\Delta I_i - \Delta I_{max}}{3-\Delta I_{min} - \Delta I_{max}},$$

$$\psi_i = \frac{3-\Delta F_i - \Delta F_{max}}{3-\Delta F_{min} - \Delta F_{max}},$$

$$\Delta T_i = |T_A(x_i) - T_B(x_i)|,$$

$$\Delta I_i = |I_A(x_i) - I_B(x_i)|,$$

$$\Delta T_i = |T_A(x_i) - T_B(x_i)|,$$

$$\Delta T_{min} = min_i|T_A(x_i) - T_B(x_i)|,$$

$\Delta I_{min} = min_i|I_A(x_i) - I_B(x_i)|$,

$\Delta F_{min} = min_i|F_A(x_i) - F_B(x_i)|$,

$\Delta T_{max} = max_i|T_A(x_i) - T_B(x_i)|$,

$\Delta I_{max} = max_i|I_A(x_i) - I_B(x_i)|$,

$\Delta F_{max} = max_i|F_A(x_i) - F_B(x_i)|$,

for any xi∈ X and i = 1, 2, . . ., n

However, the differences of importance are considered in the elements in the universe. Therefore, it is necessary to take into account the weight of the element *xi* (*i*= 1, 2,..., *n*). In the following, we introduce a weighted correlation coefficient between SVNSs.

Definition 7. [17] Let *wi* be the weight for each element *xi* (*i*= 1, 2, . . . , *n*), *wi* ∈[0, 1], and $\sum_{i=1}^{n} w_i = 1$, then we have the following weighted correlation coefficient between the SVNSs *A* and *B*:

$$M_w(A,B) = \frac{1}{3}\sum_{i=1}^{n} w_i[\phi_i(1-\Delta T_i) + \varphi_i(1-\Delta I_i) + \psi_i(1-\Delta F_i)] \quad (2)$$

2.2 Decision-making method using the correlation coefficient of SVNSs.

In the multiple attribute decision-making problem with single-valued neutrosophic information, the characteristic of an alternative Ai (i = 1, 2, ..., m) on an attribute Cj (j = 1, 2,..., n) is represented by the following SVNS:

$$Ai = \{Cj, TAi\,(Cj), IAi\,(Cj), FAi\,(Cj) | Cj \in C, j = 1,2,\ldots,n\}$$

where $TAi\,(Cj), IAi\,(Cj), FAi\,(Cj) \in [0,1]$ and $0 \leq TAi\,(Cj) + IAi\,(Cj) + FAi\,(Cj) \leq 3\; for\; Cj \in C, j = 1,2,..,$ n, and i = 1, 2, . . ., m

For convenience, the values of the three functions T_{Ai} (C_j), I_{Ai} (C_j), F_{Ai} (C_j) are denoted by a single-valued neutrosophic value (SVNV) d_{ij} = <t_{ij}, i_{ij}, f_{ij}> (i = 1, 2, . . ., m; j = 1, 2, . . ., n), which is usually derived from the evaluation of an alternative A_i with respect to a criterion C_j by the expert or decision maker. Thus, it is possible to elicit a single-valued neutrosophic decision matrix D = $(d_{ij})_{m\times n}$.

In multiple attribute decision-making problems, the concept of an ideal point has been used to help identify the best alternative in the decision set. Although the ideal alternative does not exist in the real world, it does provide a useful theoretical construct against which to evaluate alternatives.[18-21-22-23-24]

In the decision-making method, an ideal SVNV can be defined by d_j^* =<t_j^*, i_j^*, f_j^*>=< 1, 0, 0 > (j = 1, 2, . . . , n) in the ideal alternative A*. Hence, by applying Equation (2) the weighted correlation coefficient between an alternative A_i (i =1, 2, . . ., m) and the ideal alternative A* is given by

$$M_w(A_i, A^*) = \frac{1}{3}\sum_{j=1}^{n} w_j\left[\phi_{ij}\left(1-\Delta t_{ij}\right) + \varphi_{ij}\left(1-\Delta i_{ij}\right) + \psi_{ij}\left(1-\Delta f_{ij}\right)\right] \quad (3)$$

Where

$$\phi_{ij} = \frac{3 - \Delta t_{ij} - \Delta t_{i\,max}}{3 - \Delta t_{i\,min} - \Delta t_{i\,max}},$$

$$\varphi_i = \frac{3 - \Delta i_{ij} - \Delta i_{i\,max}}{3 - \Delta i_{i\,min} - \Delta i_{i\,max}},$$

$$\psi_i = \frac{3 - \Delta f_{ij} - \Delta f_{i\,max}}{3 - \Delta f_{i\,min} - \Delta f_{i\,max}},$$

$\Delta t_{ij} = \left|t_{ij} - t_j^*\right)\!\left|,\right.$

$\Delta i_{ij} = \left|i_{ij} - i_j^*\right)\!\left|,\right.$

$\Delta f_{ij} = \left|f_{ij} - f_j^*\right)\!\left|,\right.$

$\Delta t_{i\,min} = min_j\left|t_{ij} - t_j^*\right|$,

$\Delta i_{i\,min} = min_j\left|i_{ij} - i_j^*\right|$,

$\Delta f_{i\,min} = min_j\left|f_{ij} - f_j^*\right|$,

$\Delta t_{i\,max} = max_j\left|t_{ij} - t_j^*\right|$,

$$\Delta i_{i\,max} = max_j \left| i_{ij} - i_j^* \right| ,$$

$$\Delta f_{i\,max} = max_j \left| f_{ij} - f_j^* \right| ,$$

for i = 1, 2, . . ., m and j = 1, 2, . . ., n. By the correlation coefficient M_w (A_i, A*) (i =1, 2, . . ., m), it is possible to obtain the ranking order of all alternatives and determine which are the best one(s).

4 Results

In order to conduct a study, it is imperative to carry out a meticulous selection of the elements to be subjected to analytical scrutiny within the realm of legal documents. Through a process of brainstorming and group discussion, the experts devise a list of six criteria for analysis that are of vital relevance to the purposes of the research in question. This criteria selection procedure is crucial in the stage of defining the variables of the study, allowing the subsequent evaluation and quantification of the key factors that affect the quality and clarity of the legal documents under analysis. In this sense, the elements defined by the experts include:

1. Cross References and Definitions: Analyze whether the legal text includes clear cross-references to other sections and precise definitions of key terms. The lack of these references may contribute to ambiguity.
2. Clarity of Language: Clarity of language is essential. Evaluates whether the legal text is written in a way that is understandable to the parties involved, without the need for specialized legal knowledge. Clear language helps reduce ambiguity.
3. Presence of Vague or Ambiguous Terms: Identifies terms or phrases that may have multiple interpretations or whose meanings are not clearly defined in the context of the contract. Vague or ambiguous terms may lead to disputes.
4. Lack of Specificity in Certain Provisions: Examines whether the legal text lacks specific details in certain clauses or provisions. Lack of specificity can lead to uncertainty about the parties' obligations and rights.
5. Possibility of Diverse Interpretations: Consider how different parties involved may interpret the legal text in different ways. If there are multiple possible interpretations, it is an indication of ambiguity.
6. Inconsistencies and Contradictions: Look for inconsistencies or contradictions within the legal text. If there are parts of the contract that appear to conflict with each other, this can lead to ambiguity and indeterminacy.

To carry out the analysis of the selected elements and determine which of them exerts a more significant influence, three specific evaluation criteria were chosen. First, the criterion of "*impact on the level of ambiguity/indeterminacy*" (C1) was selected. This criterion is designed to assess the extent to which each alternative contributes to the ambiguity or indeterminacy observed in the legal text. Ambiguity and indeterminacy are critical factors that can affect the quality and effectiveness of the legal document, and it is necessary to understand their origin and extent.

The second criterion, called "*degree of influence on understanding*" (C2), focuses on analyzing the level at which each element influences the general understanding of the legal text by the parties involved. Effectively understanding the content of a contract or legal document is essential to avoid misunderstandings and future disputes, so this criterion examines the ability of the elements to facilitate or hinder such understanding.

Finally, the third criterion, titled "*potential for negative legal consequences*" (C3), focuses on evaluating the potential of each of the alternatives to give rise to adverse legal consequences. This includes the possibility of triggering litigation, disputes, or breaches of contract. Alternatives that have the greatest potential to generate legal problems are identified as priorities since their rectification or clarification can help prevent costly disputes and protect the interests of the parties involved.

To evaluate the elements based on the selected criteria; it has been arranged that the experts complete a short form in order to obtain precise evaluations. In addition, they have been asked to weigh the importance of each of the criteria in relation to the others. This weighting is of vital importance since it allows quantifying the relevance of each criterion in the evaluation process.

In this sense, experts have been required to specify the extent to which they consider that a specific alternative, denoted as "Ai", does or does not fit a particular criterion, represented as "Cj". The options provided for evaluations are "good" (Tx), "bad" (Fx), or "unsafe" (Ix). The choice of one of these options provides a clear indication of the expert's perception of the suitability of the alternative for the criterion in question.

It is important to highlight that equal weight (wj=0.33) has been attributed to all the evaluated criteria, which guarantees equitable consideration of each of them in the evaluation process. This methodology provides a solid foundation for data collection and analysis. In this way, it is expected to facilitate informed decision-making in relation to the prioritization and improvement of elements in legal texts.

In the outlined analysis process, the calculation of the arithmetic mean is applied to the evaluations provided by the experts. This involves the aggregation of the ratings given by each expert in relation to the criteria and alternatives under consideration. The results of these collective evaluations yield a decision matrix called "D", which is generated as a consequence of this process and is presented below.

$$D = \begin{bmatrix} \langle 0.3;\ 0.2;\ 0.3\rangle & \langle 0.3;\ 0.2;\ 0.3\rangle & \langle 0.1;\ 0.2;\ 0.5\rangle \\ \langle 0.4;\ 0.2;\ 0.2\rangle & \langle 0.7;\ 0.1;\ 0.2\rangle & \langle 0.6;\ 0.2;\ 0.3\rangle \\ \langle 0.4;\ 0.3;\ 0.2\rangle & \langle 0.5;\ 0.2;\ 0.3\rangle & \langle 0.6;\ 0.1;\ 0.2\rangle \\ \langle 0.3;\ 0.2;\ 0.3\rangle & \langle 0.1;\ 0.2;\ 0.5\rangle & \langle 0.4;\ 0.2;\ 0.2\rangle \\ \langle 0.2;\ 0.3;\ 0.5\rangle & \langle 0.3;\ 0.2;\ 0.3\rangle & \langle 0.3;\ 0.2;\ 0.3\rangle \\ \langle 0.4;\ 0.2;\ 0.2\rangle & \langle 0.4;\ 0.2;\ 0.2\rangle & \langle 0.6;\ 0.1;\ 0.2\rangle \end{bmatrix}$$

In accordance with what is described for the development of the method and obtaining the results, the values of the operators φ, μ, and ψ are determined to obtain the correlation coefficients, as defined by the method. Tables 1 and 2 show the results of such operations.

Table 1: Minimum and maximum values of variation in the membership functions of truth, falsity, and indeterminacy. Source: own elaboration.

	A1	A2	A3	A4	TO 5	A6
ΔTmin	0.7	0.3	0.4	0.6	0.7	0.4
ΔImin	0.3	0.2	0.2	0.2	0.3	0.2
ΔFmin	0.2	0.1	0.1	0.2	0.2	0.1
ΔTmax	0.9	0.6	0.6	0.9	0.8	0.6
ΔImax	0.5	0.3	0.3	0.5	0.5	0.2
ΔFmax	0.2	0.2	0.3	0.2	0.3	0.2

Table 2: Values of φ, μ, and ψ for each selection alternative. Source: own elaboration

Crimes	**φ1**	**φ2**	**φ3**	**μ1**	**μ2**	**μ3**	**ψ1**	**ψ2**	**ψ3**
Cross References and Definitions	1.00	1.00	0.86	1.00	1.00	0.91	1.00	1.00	1.05
Language Clarity	0.86	1.00	0.95	1.00	1.00	0.96	0.96	1.00	1.00
Presence of Vague or Ambiguous Terms	0.90	0.95	1.00	1.00	0.96	1.00	0.92	0.96	1.04
Lack of Specificity in Certain Provisions	0.93	0.80	1.00	0.96	0.87	1.00	1.00	1.00	1.00
Possibility of Diverse Interpretations	0.93	1.00	1.00	0.91	1.00	1.00	0.96	1.00	1.00
Inconsistencies and Contradictions	0.90	0.90	1.00	1.00	1.00	1.00	0.96	0.96	1.04

Thus, through the application of equation (3), the values corresponding to the correlation coefficients $M_w(A_i, A^*)$ are derived. Table 4 shows these calculated values and presents a ranking based on the scores obtained.

The use of equation (3) allows an accurate measurement of the correlation between the evaluated alternatives and the reference alternative, which provides a quantitative basis for the comparison and classification of the alternatives. These correlation coefficients are valuable decision-making tools as they highlight the relative relationships of each alternative to the reference alternative, contributing to objective evaluation and selection of the best options.

Table 3: Weighted correlation coefficients. Source: own elaboration

Analyzed elements	**M coefficient**
Cross References and Definitions	0.55
Language Clarity	0.71

Analyzed elements	M coefficient
Presence of Vague or Ambiguous Terms	0.67
Lack of Specificity in Certain Provisions	0.56
Possibility of Diverse Interpretations	0.55
Inconsistencies and Contradictions	0.69

In this case, it can be observed that the element "*Language Clarity*" obtains the highest weighted correlation coefficient, with a value of 0.71, which indicates a strong positive correlation with the quality and clarity of the legal text. This suggests that language clarity is a critical factor in improving document quality. On the other hand, elements such as "*Presence of Vague or Ambiguous Terms*" and "*Inconsistencies and Contradictions*" also present significant correlation coefficients (0.67 and 0.69, respectively), which positions them as important elements to consider in the improvement process.

Clarity of Language, *Inconsistencies and Contradictions*, and *Presence of Vague or Ambiguous Terms* were the three elements that stand out as having the greatest influence on the quality and clarity of legal texts. These results support the need to address these three elements with priority in the process of reviewing and improving legal texts. By doing so, the quality, clarity, and effectiveness of legal documents can be improved, reducing ambiguity and mitigating potential adverse legal consequences.

4.1 Illustrative example

As part of the analytical methodology employed, a practical case study was conducted with a plastics industry firm situated in the city of Puyo. Four legal specialists with expertise in contract regulations regarding this particular industry sector participated in the study to analyze the company's compliance with applicable legal provisions.

As part of this practical study, experts examined and evaluated a particular employment contract. They were asked to provide their evaluations through a form in which the adequacy of the document in question had to be considered.

Table 4 shows the results obtained after the evaluation of one of the experts using the linguistic criteria described in [19]. To carry out this evaluation, the evaluation elements obtained previously were taken as reference.

Table 4: Neutrosophic evaluation of employment contract carried out by an expert *k*

	Language Clarity	Presence of Vague or Ambiguous Terms	Inconsistencies and Contradictions
Description of tasks	(0.90, 0.10, 0.10)	(0.60, 0.35, 0.40)	(0.90, 0.10, 0.10)
Working hours	(0.90, 0.10, 0.10)	(0.50, 0.50, 0.50)	(0.50, 0.50, 0.50)
Salary policy	(0.70, 0.25, 0.30)	(0.90, 0.10, 0.10)	(0.70, 0.25, 0.30)
Trial period	(0.90, 0.10, 0.10)	(0.50, 0.50, 0.50)	(0.70, 0.25, 0.30)
Benefits and advantages	(0.70, 0.25, 0.30)	(0.70, 0.25, 0.30)	(0.80, 0.15, 0.20)
Termination Policy	(0.80, 0.15, 0.20)	(0.80, 0.15, 0.20)	(0.90, 0.10, 0.10)
Confidentiality policy	(0.60, 0.35, 0.40)	(0.80, 0.15, 0.20)	(0.60, 0.35, 0.40)

It is important to highlight that, in this specific case, the criteria previously identified in the initial analysis were used. However, it is crucial to recognize that each legal document may have particularities and distinctive characteristics that make certain criteria and elements acquire differentiated importance in the analysis process. In other words, the suitability of the criteria identified in this practical study may vary depending on the particularities of each contract, highlighting the need to consider and adapt the analysis approach according to the specific characteristics of each legal document.

The evaluation table used neutrosophic numbers to evaluate the elements of an employment contract in consideration of the selected criteria. Each entry in the table comprises three values that represent the expert's perception in terms of affirmation, indifference, and denial, respectively. The results derived from this analysis allow the researchers to determine that, according to the expert, both the "*Description of Tasks*" and the "*Work Schedule*" exhibit adequate levels of clarity in the contract. However, there is some uncertainty or areas for improvement regarding the clarity of the terms related to the "*Salary Policy*", "*Benefits and advantages*", and "*Confidentiality Policy*".

On the other hand, concerning the presence of vague or ambiguous terms, the expert shows a particularly critical attitude in relation to the "*Working Schedule*" and the "*Trial Period"*, assigning low affirmation values. This implies that the expert identifies aspects that are confusing or ambiguous in these elements of the contract. Finally, regarding inconsistencies and contradictions, the expert tends to point out areas for improvement, mainly in relation to the "*Working Schedule*" and the "*Confidentiality Policy*". This suggests that the expert perceives the existence of certain areas where these elements of the contract could present inconsistencies or contradictions.

In summary, according to the expert's neutrosophic evaluation, some elements, such as "*Description of Tasks*" and "*Work Schedule*", stand out for their clarity of language. However, there are significant concerns regarding the presence of vague or ambiguous terms and potential inconsistencies in various elements of the contract, suggesting areas that may require review and improvement to ensure a clearer and more coherent employment contract.

4 Discussion

The results obtained confirm that neutrosophic logic appears to be an invaluable tool in the interpretation and evaluation of legal documents. Its importance lies in its ability to deal with the uncertainty and ambiguity inherent in legal language, allowing for more accurate and detailed analysis of the terms and conditions in legal documents.

In the context of contract interpretation, neutrosophy offers a structured way of handling situations where a term or clause can be interpreted in multiple ways. The use of neutrosophic numbers allows interpreters to express their level of conviction or belief in a particular interpretation. This is especially relevant in the analysis of contracts, commercial agreements, or court rulings, where nuances and subtleties are critical. In these settings, it is possible to observe that neutrosophy helps address semantic ambiguity by allowing evaluators to express how confident they are in a given interpretation, which can be crucial for making informed decisions.

Ultimately, neutrosophy provides an analytical framework that promotes a more accurate and systematic interpretation of these documents, which in turn helps reduce the risk of conflicts and litigation arising from misunderstandings or ambiguities. Clarity in the interpretation and evaluation of legal documents is essential to ensure compliance with laws and the protection of the rights of the parties involved, which highlights the significant usefulness of neutrosophy in the field of law and jurisprudence.

Conclusion

In the field of legal sciences, it is common to face vagueness and indeterminacy when analyzing legal documents. In such situations, the level of scrutiny by jurists and other stakeholders takes on a critical role. This study has highlighted the usefulness of neutrosophic logic for the identification of evaluation criteria for legal documents and their subsequent interpretation. The use of neutrosophic correlation operators has made it possible to identify a set of highly relevant elements that, according to the assessment of experts, must be subjected to mandatory evaluation in the process of analysis and interpretation of legal documents.

This study has provided solid evidence of the effectiveness and versatility of the applied method in the legal field. The use of single-valued neutrosophic numbers to carry out the analysis has practically validated the applicability of neutrosophic set logic. It is recommended to explore and adopt other multi-criteria methods related to the multiple dimensions of neutrosophic logic, in order to delve deeper into the study area and its applicability to real problems.

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