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The Enduring Power of Giving and Caring from Cavemen to Kind Hearts: A Neutrosophic Multi-Criteria Decision Making Approach

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Abstract

Giving and caring are not just warm and fuzzy feelings; they are the bedrock of a healthy society. By understanding the neuroscience and sociology behind these behaviors, we can cultivate a world that prioritizes cooperation, compassion, and the well-being of all its members. We used the single valued neutrosophic sets (SVNSs) with the multi-criteria decision making (MCDM) method for evaluating the giving and caring impacts. We used TreeSoft to divide the problems as a tree. The SVNSs were used to overcome uncertain information in the evaluation process. The SVNSs were integrated with the DEMATEL method to compute the relationships between criteria. This study used nine criteria. The results show the criterion 5 has the highest impacts and criterion 1 has the lowest criterion.

Keywords: Generosity, Non-Diophantine, Synergy of Giving, Tree of life, Stewardship Ethics.

1 | Introduction

The importance of giving and caring in society might seem self-evident, but science sheds light on why these behaviors are not just niceties, but cornerstones of a thriving civilization. From the dawn of humanity, our brains and social structures have been wired for cooperation and empathy.

Neuroscience reveals the pleasure centers in our brains light up when we give to others. Studies have shown that acts of generosity trigger the release of dopamine, a neurotransmitter associated with reward and motivation. In essence, helping others makes us feel good! This positive reinforcement loop encourages prosocial behaviors, strengthening the bonds within a community.

Sociology adds another layer to the story. From the earliest hunter-gatherer bands, survival depended on collective action. Sharing food, caring for the sick and injured, and working together to secure resources were essential for group success. Societies that fostered cooperation and compassion thrived, while those prioritizing individual gain struggled.

Here's a breakdown of the enduring power of giving and caring:

- Evolutionary Advantage: Cooperation offered a clear survival benefit in our prehistoric past. Groups that looked after one another were more likely to raise healthy children, defend against threats, and innovate. This ingrained tendency to care for others continues to shape our social interactions.

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- Stronger Communities: Giving and caring foster trust and reciprocity. When people feel supported and valued, they are more likely to cooperate, leading to a more stable and resilient society.
- Individual Well-being: Studies suggest that acts of generosity not only benefit the recipient but also the giver. Giving back can reduce stress, increase happiness, and even improve physical health.

The emphasis on giving and caring isn't limited to prehistoric times. Modern societies still rely on these fundamental human instincts. From charitable organizations to acts of everyday kindness, these behaviors create a ripple effect, strengthening the social fabric and fostering a sense of well-being for all.

1.1 | The Generosity Equation: Beyond Give and Take with Adam Grant

Adam Grant's seminal work, "Give and Take," sheds light on the power of giving in social dynamics. He classifies individuals into three categories: givers, takers, and matchers. Givers prioritize helping others, often at their own expense. Takers prioritize their own gain, sometimes exploiting others. Matchers seek a balance, reciprocating what they receive.

Grant's research demonstrates that givers, though sometimes taken advantage of, often rise to leadership positions due to the trust and loyalty they inspire. However, the concept of giving extends beyond the simple "give and take" model.

1.2 | The Non-Diophantine Arithmetic of Giving

Imagine giving not as a subtractive process, where you lose something by helping others, but as a process governed by non-Diophantine arithmetic [1, 2]. In traditional arithmetic, $1 - 1 = 0$. In non-Diophantine arithmetic, however, the equation can yield a surprising outcome.

When we give, it creates a ripple effect. Our act of generosity inspires others to give back, creating a chain reaction of positive behavior. This synergy multiplies the impact of our initial gift, producing more than the sum of its parts.

1.3 | The Synergy of Giving

Think about open-source software projects. Developers contribute their time and expertise for free, creating a powerful resource that benefits everyone. This exemplifies the synergy of giving. The collective effort produces something far greater than what any individual could achieve alone.

Here's how the synergy of giving plays out:

- Inspiration: When we see others give, it motivates us to do the same. This domino effect creates a more generous society.
- Collaboration: Giving fosters a spirit of collaboration, where people share resources and ideas to achieve a common goal.
- Innovation: When people are free to give and share ideas, it sparks innovation and leads to new solutions and progress.

1.4 | Tree of life ethics since the era of Eden

According to the story of Eden in the Book of Genesis, stewardship ethics and tree of life ethics were both initiated by God himself, and they lay the foundation for a true City of God, which is a utopia envisioned by many religions.

- Stewardship Ethics: God placed humanity in the Garden of Eden as stewards, entrusting them with care for creation. This implies responsibility, not just dominion, requiring us to give back and nurture the environment.

- Tree of Life Ethics: The Tree of Life symbolizes flourishing life, attainable only through obedience to God's will. This will likely involve aspects of giving and caring, for true life thrives in a community that shares and supports its members.

These ethics, initiated by God, suggest that a City of God prioritizes the well-being of all its inhabitants. Giving and caring are not optional but essential for fulfilling God's purpose and creating a flourishing community.

2. | What is tree of life ethics and how does it function in today's society?

The concept of the Tree of Life, a source of immortality and flourishing, appears in various cultures and religions. But beyond its literal interpretation, the Tree of Life also represents a specific ethical framework with profound implications for building a better society. Let's explore what Tree of Life ethics are and how they function in the modern world.

2.1 | The Essence of Tree of Life Ethics

At its core, Tree of Life ethics emphasize creating conditions for a life that truly flourishes. This goes beyond mere survival; it encompasses well-being, fulfillment, and a sense of purpose for all members of a community.

Here are some key principles of this framework:

- Interdependence: Humans are interconnected, and the well-being of one is linked to the well-being of all.
- Compassion: Caring for others, especially those in need, is essential for a flourishing community.
- Sustainability: Living in harmony with nature and ensuring resources for future generations is crucial.
- Justice: Creating a fair and equitable society where everyone has the opportunity to thrive.

2.2 | Tree of Life Ethics in Action

While the story of Eden may be symbolic, the principles of Tree of Life ethics resonate with various social movements and initiatives today:

- Environmentalism: The growing focus on sustainability and environmental protection reflects the concern for preserving the foundation of all life.
- Social Justice: Movements advocating for equality and opportunity for all align with the concept of a just and flourishing society.
- Community Building: Initiatives fostering strong, supportive communities where individuals can contribute and reach their full potential embody the essence of interdependence.

2.3 | Challenges and Opportunities

Modern society faces numerous challenges: social inequality, environmental degradation, and political polarization. These issues highlight the need for a shift towards Tree of Life ethics.

3. | Evaluating the criteria of Giving and caring

This section presents the single valued neutrosophic sets with Tree soft [3, 4] to evaluate the criteria of giving and caring (GC). The single valued neutrosophic sets (SVNSs) are used to deal with uncertainty in the evaluation process.

Multi-attribute decision-making (MADM) situations are those that, in real life, typically include many schemes and numerous characteristics. The secret to solving this issue is figuring out how to rank and choose the options given the circumstances. Commonly, alternatives are assessed using precise values in conventional

MADM techniques. However, since people are vulnerable to subjectivity and because objective objects are complicated, MADM problems frequently involve uncertainty, which means that the decision information provided could be more transparent and precise.

Zadeh [5, 6] performed an in-depth study and developed the idea of the fuzzy set (FS) to define fuzzy notions. A tool for expressing fuzzy information is FS. Based on this, Atanassov added the non-membership degree as a parameter to specify the intuitionistic fuzzy set. Intuitionistic fuzzy sets consider both membership and non-membership degrees. Despite its widespread development and popularity, FS theory cannot address all forms of uncertainty that arise in everyday life, such as inconsistent and ambiguous information.

Smarandache [7–9] thus put out the idea of a neutrosophic set. The intuitionistic fuzzy set has three membership functions: truth, indeterminacy, and falsity. The neutrosophic set is an extension of this fuzzy set. Subsequently, several academics put out single-valued neutrosophic sets (SVNSs) [10, 11].

The SVNSs were integrated with the DEMATEL method to compute the relationships between criteria. The DEMATEL method is a MADM method used to analysis the criteria. Tree soft used to divide the problem into a tree to simply computation and calculation [12]. This study has two levels. In the first level the goal from this study. In the second level, the evaluation of the criteria by the SVN- DEMATEL method [13, 14]. The following are the steps of the SVN- DEMATEL method.

Step 1. Build the direct relation matrix between criteria. This study used three experts to evaluate the criteria. The three experts are used the linguistic terms of SVNSs to build the direct relation matrix.

Step 2. Convert the single valued neutrosophic numbers into a crisp value by using the score function.

Step 3. Combined the direct relation matrix into one matrix.

Step 4. Normalize the direct relation matrix.

$$N = k.x \quad (1)$$

$$k = \frac{1}{\max\limits_{1 \le i \le n} \sum_{j=1}^{n} x_{ij}} \quad ; i, j = 1,2,3, \dots, n \quad (2)$$

Step 5. Compute the total relation matrix

$$T = N(I - N)^{-1} \quad (3)$$

Step 6. Obtain the casual diagram between criteria.

3.1 | Results of Evaluation Giving and Caring

This section introduces the relationships between criteria. This study introduces 9 criteria to be evaluated as society, cooperation, empathy, positive reinforcement, prosocial behaviors, secure resources, Evolutionary, advantage, stronger communities, individual well-being.

Step 1. Three experts evaluated the criteria to build the direct relation matrix as shown in Table 1.

Step 2. Then single valued neutrosophic numbers are converted into a crisp value by using the score function.

Step 3. Then combined the direct relation matrix into one matrix.

Step 4. Then normalize the direct relation matrix as shown in Table 2 using Eqs. (1) and (2).

Step 5. Then compute the total relation matrix as shown in Table 3 using Eq. (3).

Step 6. Obtain the casual diagram between criteria as shown in Figure 1. Criterion 5 has the highest impact and criterion 1 has the lowest impact.

Table 1. Direct relation matrix.

	GC_1	GC_2	GC_3	GC_4	GC_5	GC_6	GC_7	GC_8	GC_9
GC_1	1	(0.9,0.1,0.2)	(0.8,0.2,0.3)	(0.6,0.4,0.5)	(0.5,0.5,0.5)	(0.4,0.6,0.7)	(0.2,0.7,0.8)	(0.1,0.8,0.9)	(0.9,0.1,0.2)
GC_2	1/(0.9,0.1,0.2)	1	(0.1,0.8,0.9)	(0.4,0.6,0.7)	(0.5,0.5,0.5)	(0.6,0.4,0.5)	(0.8,0.2,0.3)	(0.9,0.1,0.2)	(0.8,0.2,0.3)
GC_3	1/(0.8,0.2,0.3)	1/(0.1,0.8,0.9)	1	(0.9,0.1,0.2)	(0.8,0.2,0.3)	(0.6,0.4,0.5)	(0.5,0.5,0.5)	(0.1,0.8,0.9)	(0.6,0.4,0.5)
GC_4	1/(0.6,0.4,0.5)	1/(0.4,0.6,0.7)	1/(0.9,0.1,0.2)	1	(0.6,0.4,0.5)	(0.8,0.2,0.3)	(0.4,0.6,0.7)	(0.2,0.7,0.8)	(0.5,0.5,0.5)
GC_5	1/(0.5,0.5,0.5)	1/(0.5,0.5,0.5)	1/(0.8,0.2,0.3)	1/(0.6,0.4,0.5)	1	(0.9,0.1,0.2)	(0.2,0.7,0.8)	(0.4,0.6,0.7)	(0.4,0.6,0.7)
GC_6	1/(0.4,0.6,0.7)	1/(0.6,0.4,0.5)	1/(0.6,0.4,0.5)	1/(0.8,0.2,0.3)	1/(0.9,0.1,0.2)	1	(0.1,0.8,0.9)	(0.5,0.5,0.5)	(0.1,0.8,0.9)
GC_7	1/(0.2,0.7,0.8)	1/(0.8,0.2,0.3)	1/(0.5,0.5,0.5)	1/(0.4,0.6,0.7)	1/(0.2,0.7,0.8)	1/(0.1,0.8,0.9)	1	(0.6,0.4,0.5)	(0.9,0.1,0.2)
GC_8	1/(0.1,0.8,0.9)	1/(0.9,0.1,0.2)	1/(0.1,0.8,0.9)	1/(0.2,0.7,0.8)	1/(0.4,0.6,0.7)	1/(0.5,0.5,0.5)	1/(0.6,0.4,0.5)	1	(0.8,0.2,0.3)
GC_9	1/(0.9,0.1,0.2)	1/(0.8,0.2,0.3)	1/(0.6,0.4,0.5)	1/(0.5,0.5,0.5)	1/(0.4,0.6,0.7)	1/(0.1,0.8,0.9)	1/(0.9,0.1,0.2)	1/(0.8,0.2,0.3)	1
	GC_1	**GC_2**	**GC_3**	**GC_4**	**GC_5**	**GC_6**	**GC_7**	**GC_8**	**GC_9**
GC_1	1	(0.5,0.5,0.5)	(0.4,0.6,0.7)	(0.2,0.7,0.8)	(0.1,0.8,0.9)	(0.9,0.1,0.2)	(0.8,0.2,0.3)	(0.6,0.4,0.5)	(0.5,0.5,0.5)
GC_2	1/(0.5,0.5,0.5)	1	(0.4,0.6,0.7)	(0.5,0.5,0.5)	(0.6,0.4,0.5)	(0.8,0.2,0.3)	(0.9,0.1,0.2)	(0.8,0.2,0.3)	(0.4,0.6,0.7)
GC_3	1/(0.4,0.6,0.7)	1/(0.4,0.6,0.7)	1	(0.1,0.8,0.9)	(0.9,0.1,0.2)	(0.8,0.2,0.3)	(0.6,0.4,0.5)	(0.5,0.5,0.5)	(0.2,0.7,0.8)
GC_4	1/(0.2,0.7,0.8)	1/(0.5,0.5,0.5)	1/(0.1,0.8,0.9)	1	(0.6,0.4,0.5)	(0.8,0.2,0.3)	(0.4,0.6,0.7)	(0.4,0.6,0.7)	(0.9,0.1,0.2)
GC_5	1/(0.1,0.8,0.9)	1/(0.6,0.4,0.5)	1/(0.9,0.1,0.2)	1/(0.6,0.4,0.5)	1	(0.9,0.1,0.2)	(0.5,0.5,0.5)	(0.1,0.8,0.9)	(0.8,0.2,0.3)
GC_6	1/(0.9,0.1,0.2)	1/(0.8,0.2,0.3)	1/(0.8,0.2,0.3)	1/(0.8,0.2,0.3)	1/(0.9,0.1,0.2)	1	(0.6,0.4,0.5)	(0.4,0.6,0.7)	(0.6,0.4,0.5)
GC_7	1/(0.8,0.2,0.3)	1/(0.9,0.1,0.2)	1/(0.6,0.4,0.5)	1/(0.4,0.6,0.7)	1/(0.5,0.5,0.5)	1/(0.6,0.4,0.5)	1	(0.8,0.2,0.3)	(0.5,0.5,0.5)
GC_8	1/(0.6,0.4,0.5)	1/(0.8,0.2,0.3)	1/(0.5,0.5,0.5)	1/(0.4,0.6,0.7)	1/(0.1,0.8,0.9)	1/(0.4,0.6,0.7)	1/(0.8,0.2,0.3)	1	(0.4,0.6,0.7)
GC_9	1/(0.5,0.5,0.5)	1/(0.4,0.6,0.7)	1/(0.2,0.7,0.8)	1/(0.9,0.1,0.2)	1/(0.8,0.2,0.3)	1/(0.6,0.4,0.5)	1/(0.5,0.5,0.5)	1/(0.4,0.6,0.7)	1
	GC_1	**GC_2**	**GC_3**	**GC_4**	**GC_5**	**GC_6**	**GC_7**	**GC_8**	**GC_9**
GC_1	1	(0.4,0.6,0.7)	(0.2,0.7,0.8)	(0.1,0.8,0.9)	(0.5,0.5,0.5)	(0.2,0.7,0.8)	(0.9,0.1,0.2)	(0.8,0.2,0.3)	(0.5,0.5,0.5)
GC_2	1/(0.4,0.6,0.7)	1	(0.5,0.5,0.5)	(0.4,0.6,0.7)	(0.4,0.6,0.7)	(0.5,0.5,0.5)	(0.6,0.4,0.5)	(0.9,0.1,0.2)	(0.6,0.4,0.5)
GC_3	1/(0.2,0.7,0.8)	1/(0.5,0.5,0.5)	1	(0.2,0.7,0.8)	(0.4,0.6,0.7)	(0.5,0.5,0.5)	(0.1,0.8,0.9)	(0.2,0.7,0.8)	(0.4,0.6,0.7)
GC_4	1/(0.1,0.8,0.9)	1/(0.4,0.6,0.7)	1/(0.2,0.7,0.8)	1	(0.6,0.4,0.5)	(0.8,0.2,0.3)	(0.2,0.7,0.8)	(0.2,0.7,0.8)	(0.2,0.7,0.8)
GC_5	1/(0.5,0.5,0.5)	1/(0.4,0.6,0.7)	1/(0.4,0.6,0.7)	1/(0.6,0.4,0.5)	1	(0.9,0.1,0.2)	(0.4,0.6,0.7)	(0.2,0.7,0.8)	(0.1,0.8,0.9)
GC_6	1/(0.2,0.7,0.8)	1/(0.5,0.5,0.5)	1/(0.5,0.5,0.5)	1/(0.8,0.2,0.3)	1/(0.9,0.1,0.2)	1	(0.5,0.5,0.5)	(0.5,0.5,0.5)	(0.9,0.1,0.2)
GC_7	1/(0.9,0.1,0.2)	1/(0.6,0.4,0.5)	1/(0.1,0.8,0.9)	1/(0.2,0.7,0.8)	1/(0.4,0.6,0.7)	1/(0.5,0.5,0.5)	1	(0.4,0.6,0.7)	(0.8,0.2,0.3)
GC_8	1/(0.8,0.2,0.3)	1/(0.9,0.1,0.2)	1/(0.2,0.7,0.8)	1/(0.2,0.7,0.8)	1/(0.2,0.7,0.8)	1/(0.5,0.5,0.5)	1/(0.4,0.6,0.7)	1	(0.6,0.4,0.5)
GC_9	1/(0.5,0.5,0.5)	1/(0.6,0.4,0.5)	1/(0.4,0.6,0.7)	1/(0.2,0.7,0.8)	1/(0.1,0.8,0.9)	1/(0.9,0.1,0.2)	1/(0.8,0.2,0.3)	1/(0.6,0.4,0.5)	1

Table 2. Normalized direct relation matrix.

	GC_1	GC_2	GC_3	GC_4	GC_5	GC_6	GC_7	GC_8	GC_9
GC_1	0.206711	0.119433	0.094169	0.06431	0.078091	0.101059	0.12862	0.101059	0.12862
GC_2	0.405231	0.206711	0.068904	0.084981	0.098762	0.126324	0.151588	0.17226	0.117136
GC_3	0.573096	0.842506	0.206711	0.084981	0.137808	0.126324	0.082685	0.059717	0.080388
GC_4	0.933675	0.513647	0.891585	0.206711	0.117136	0.158479	0.066607	0.05742	0.110246
GC_5	0.792394	0.447322	0.357298	0.364785	0.206711	0.17915	0.075794	0.050529	0.087278
GC_6	0.562726	0.349277	0.349277	0.269624	0.238513	0.206711	0.082685	0.094169	0.107949
GC_7	0.464681	0.290974	0.776181	0.671141	0.621029	0.776181	0.206711	0.117136	0.146995
GC_8	0.728248	0.248883	0.949888	0.778523	1	0.463535	0.399389	0.206711	0.117136
GC_9	0.35512	0.399389	0.604816	0.512614	0.794573	0.717878	0.307187	0.399389	0.206711

Table 3. Total direct relation matrix.

	GC_1	GC_2	GC_3	GC_4	GC_5	GC_6	GC_7	GC_8	GC_9
GC_1	-0.35799	-0.29738	-0.20362	-0.11337	-0.09752	-0.07639	-0.01533	-0.02587	-0.00399
GC_2	-0.33583	-0.38281	-0.31848	-0.1453	-0.13246	-0.12059	-0.02417	0.005	-0.0505
GC_3	-0.26861	0.139515	-0.41522	-0.26066	-0.19965	-0.18273	-0.07195	-0.05839	-0.0687
GC_4	-0.16108	-0.10678	0.003397	-0.36278	-0.39548	-0.30584	-0.15893	-0.12565	-0.08611
GC_5	-0.09673	-0.19988	-0.2763	-0.10323	-0.26643	-0.2347	-0.14317	-0.12872	-0.08431
GC_6	-0.27861	-0.25557	-0.24439	-0.14184	-0.18126	-0.18449	-0.14023	-0.09343	-0.07614
GC_7	-0.87975	-0.59506	-0.25981	-0.12784	-0.26995	-0.0161	-0.29486	-0.29558	-0.21948
GC_8	-0.92186	-0.84694	-0.28579	-0.15358	-0.08971	-0.48051	-0.21266	-0.33974	-0.342
GC_9	-1.34435	-0.87332	-0.54584	-0.26945	-0.09709	-0.1771	-0.2809	-0.13029	-0.28518

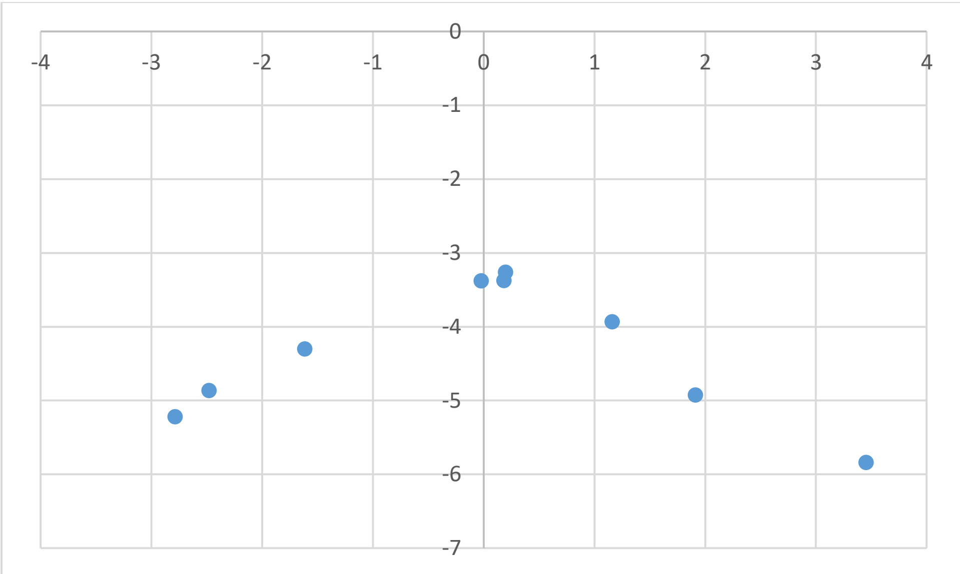

Figure 1. The relationships between criteria.

3.2 | Here's How We Can Embrace these Principles

- Individual Actions: Practicing compassion, making sustainable choices, and advocating for justice are all ways individuals can contribute.
- Community Initiatives: Supporting organizations that promote social good, environmental protection, and community development.
- Policy and Governance: Enacting policies that ensure equal opportunity, promote sustainability, and foster a sense of shared responsibility.

3.3 | Building a City of Life

Tree of Life ethics are not a utopian ideal, but a framework for building a better society, a "City of Life" where everyone has the opportunity to flourish. By practicing these principles on individual and collective levels, we can create a world that is more just, sustainable, and ultimately, a place where life truly thrives.

4 | Concluding Remark

In conclusion, giving and caring are not just warm and fuzzy feelings; they are the bedrock of a healthy society. By understanding the neuroscience and sociology behind these behaviors, we can cultivate a world that prioritizes cooperation, compassion, and the well-being of all its members.

Grant's "give and take" framework provides a valuable starting point, but the concept of giving goes beyond a tit-for-tat exchange. By embracing the non-Diophantine nature of giving and harnessing the synergy it creates, we can cultivate a world built on generosity, collaboration, and progress.

This study used the SVNSs with the MCDM method, and TreeSoft set. The SVNSs were used to overcome the uncertainty of the information. The SVNS has three memberships: tree, indeterminacy, and falsity. The SVNS was integrated with the DEMATEL method. The DEMATEL method is an MCDM method used to compute the relationships between criteria. The direct relation matrix was created by using the opinions of experts. Then, the single-valued neutrosophic numbers are used to build a direct relation matrix. Then, the score function is used to obtain the crisp values. Then, we combined these matrices into one matrix. Then, we applied the steps of the DEMATEL method. We used nine criteria. The results show that criterion 5 has the highest impact, and criterion 1 has the lowest impact.

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Author Contribution

All authors contributed equally to this work.

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Data Availability

The datasets generated during and/or analyzed during the current study are not publicly available due to the privacy-preserving nature of the data but are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that there is no conflict of interest in the research.

Ethical Approval

This article does not contain any studies with human participants or animals performed by any of the authors.

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