ACTUALIZING DISTRIBUTIVE JUSTICE IN DIACONAL MINISTRY THROUGH A DIGITAL THEOLOGY APPROACH USING FUZZY MADM (SAW MODEL)

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ABSTRACT

Diaconal ministry is a mandate for the church to manifest God's love to the vulnerable. However, in practice, aid distribution is often hindered by assessor subjectivity (elders/deacons), nepotism, and data inaccuracy, leading to the kind of injustice seen in the early church (Acts 6:1). This study proposes an interdisciplinary "Digital Theology" approach by implementing the Fuzzy Multi-Attribute Decision Making (Fuzzy MADM) algorithm as a tool for a Decision Support System (DSS). Unlike rigid binary logic, Fuzzy logic is capable of accommodating the uncertainty of the congregation's economic conditions, which are often vague or ambiguous. By utilizing the SAW (Simple Additive Weighting) method, this study simulates a priority ranking of aid recipients based on measurable pastoral criteria. The results demonstrate that integrating technology into ecclesiastical management can minimize human bias, enhance transparency, and ensure more precise distributive justice in accordance with biblical principles.

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INTRODUCTION

The church is called to be a "sharing community" amidst an unequal world. One concrete manifestation of this calling is the diaconal ministry.(Keller, 2015) However, since the early church era, the distribution of social assistance has never been devoid of problems.(Candra, 2025) Acts 6:1-6 records the first internal crisis in the history of the church, which was caused not by doctrinal debates, but by a managerial issue: "A complaint by the Hellenists arose against the Hebrews because their widows were being neglected in the daily distribution."

This text reveals an often-overlooked theological fact: good intentions (providing assistance) without a just system will breed division. In the context of the contemporary church, this challenge becomes increasingly complex. The Board of Elders or Deacons is frequently faced with limited funds on one hand, and an abundance of requests for assistance on the other. The decision of "who receives help" and "who is put on hold" is often made based on intuition, emotional closeness (nepotism), or invalid data. Consequently, a distortion of justice occurs: the vocal but less needy congregants receive assistance, while the truly impoverished but passive congregants are neglected.

Amidst the rapid digitalization of ministry, the church has the opportunity to utilize technology as a partner in stewardship, navigating how automated decision logic interacts with ecclesiastical ethics.(Candra et al., 2026)(Sari & Candra, n.d.) One relevant technology is the Decision Support System (DSS) based on Fuzzy Multi-Attribute Decision Making (Fuzzy MADM).(Turban et al., 2011) While conventional computer logic is binary (Black/White, Rich/Poor), Fuzzy Logic mimics the human way of thinking that is capable of processing uncertainty and gradations (e.g., "Slightly Poor," "Quite Vulnerable," "In Dire Need").(Zadeh et al., 1996)

The application of Fuzzy mathematical logic in church governance should be viewed through the lens of 'Common Grace.' Just as the Israelites utilized Egyptian gold to build the Tabernacle, the modern church is theologically justified in 'plundering the Egyptians' by adopting this secular technological advancement for the glory of God. Algorithms are not entities that rival the leading of the Holy Spirit; rather, they are created means sanctified to support the cognitive limitations of God's servants in manifesting distributive justice, ensuring that digital frameworks intentionally embody unconditional care.(Candra, 2025)(Sari & Candra, 2025)

Computational approaches in the realm of theology are not a taboo. Previously, an assessment model based on weight calculation has also been proposed in the transformation of theological education to achieve assessment objectivity.(Arendra & Candra, 2022) This study aims to bridge the gap between Theology and Informatics. The author argues that the use of algorithms in diaconal ministry is not an attempt to replace the role of the Holy Spirit or eliminate the human side of ministry, but rather an effort of "digital asceticism" to discipline fallen human subjectivity in order to achieve the objectivity of justice desired by God.(Candra & Sari, 2022)

RESEARCH METHODOLOGY

To bridge the gap between theological dogma and mathematical logic, this study implements a sequential exploratory mixed-methods design. This approach allows qualitative biblical principles to be translated into measurable computational simulations. This hybrid approach was chosen to bridge the epistemological gap between "revelatory truth" (theology) and "logical truth" (mathematics). The main objective is to address two challenges simultaneously: the formulation of an ethical foundation (why must we be fair?) and the design of technical instruments (how to be measurably fair?). Operationally, this research was carried out through the following three systematic stages:

Exegesis and Variable Construction

The first stage focuses on textual analysis using the grammatical-historical hermeneutical method. The author conducted an in-depth study of the text of Acts 6:1-7 to understand the sociological context of the Hellenistic widows' complaints, as well as reviewed the Old Testament legal principles regarding justice (mishpat) for the marginalized (Deuteronomy 15). The output of this stage is not merely a doctrinal understanding, but the extraction of biblical indicators. Theological concepts such as "poor," "widow," "dependents," and "sick" are reconstructed into measurable variables that will serve as the basis for criteria in the decision system.

Fuzzy MADM Algorithm Architecture

The second stage is the translation of theological variables into computational language. The author utilizes Fuzzy Multi-Attribute Decision Making (Fuzzy MADM) logic. Unlike crisp

logic which is strictly binary (0 or 1), fuzzy logic is used due to its ability to map the uncertainty of human data into degrees of membership (interval values from 0 to 1). The chosen resolution method is SAW (Simple Additive Weighting). This method is often referred to as the weighted sum method. The basic concept is to find the weighted sum of the performance ratings for each alternative across all attributes. The SAW algorithm was selected because of its efficiency in providing precise ranking values in cases involving multiple criteria. The mathematical formulation steps of SAW used in this research are:

- Determining Criteria and Weights: Establishing criteria (C_j) and preference weights (W_j) based on pastoral urgency.
- Matrix Normalization (R): This stage aims to equalize the scale of each criterion. Theoretically, the SAW method has two standard normalization formulas based on the type of attribute:
- If the attribute is a Benefit (e.g., Dependents, Sickness), then:

$$r_{ij} = \frac{x_{ij}}{\max(x_{ij})}$$

- If the attribute is a Cost (e.g., Income, Assets), then:

$$r_{ij} = \frac{\min(x_{ij})}{x_{ij}}$$

where r_{ij} is the normalized performance rating value.

- Calculating the Preference Value (V): The final step is to calculate the final value (V_i) for ranking purposes using the weighted sum formula:

$$V_i = \sum_{j=1}^{n} w_j r_{ij}$$

A larger V_i value indicates that the alternative (congregant) has a higher priority to receive diaconal assistance.(Kusumadewi & Purnomo, 2010)

- Implementation in Research: Considering that in the Fuzzification stage (point a) the author has applied an inverse logic to the Cost criteria (converting a small currency value into a large priority weight/1.0), technically all input data has been converted into the Benefit principle. Therefore, the entire normalization calculation process in this system is executed using the Benefit formula to maintain the consistency of priority values.

Simulation and Pastoral Verification

The third stage is model validation. The designed model was tested using simulation data of congregants (dummy data) to maintain privacy, but with characteristics that represent real conditions in the field. The system output, in the form of a priority ranking list, was then re-analyzed using a pastoral perspective (human verification). This aims to ensure that the algorithm's recommendations are not only mathematically correct but also in harmony with human values and ecclesiastical justice.

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Broadly speaking, the workflow of this decision support system—starting from congregant data input, the fuzzification process, matrix normalization, to the output of priority recommendations—is depicted in detail through the flowchart in Figure 1.

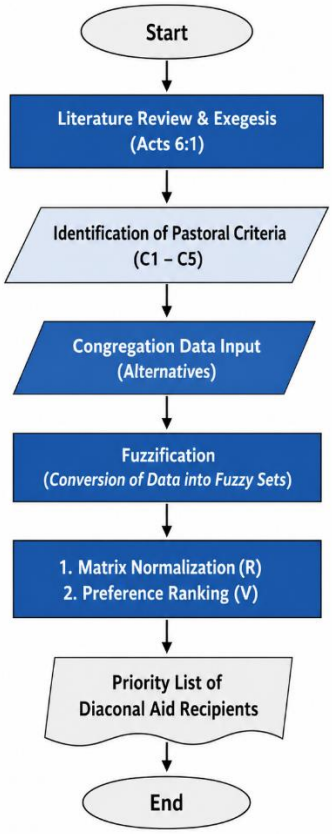

Figure 1. Flowchart

RESULTS AND DISCUSSION

The systematic discussion begins by laying a biblical foundation through the exegesis of Acts 6, which then becomes the axiological basis for the system's design. Furthermore, these theological principles are operationalized into a Fuzzy logic simulation to produce a decision-making model that is measurable yet retains a pastoral dimension.

The Ethics of Algorithms

The application of technology in the church raises a serious ethical question: Can machines act fairly? From the perspective of digital ethics, the use of algorithms must be strictly guarded to prevent the church from falling into a condition where moral authority and ethical decision-making are unwittingly surrendered entirely to the sovereignty of technology.(Postman, 1993) There is a risk that the use of algorithms will reduce humans (congregants) to mere statistical numbers (dehumanization). However, from the perspective of Reformed Theology, technology is viewed as part of the Cultural Mandate—a neutral tool that needs to be redeemed. The greatest danger lies not in the algorithm itself, but in the bias of its creator (Algorithmic Bias). As explained in previous research, bias in machine learning is often a digital manifestation of structural sin (hamartiology) hidden within the data,(Candra et al., 2026) requiring continuous ethical oversight to prevent social discrimination.(Candra, 2026)

In the SAW method, this bias can infiltrate during the determination of Preference Weights (W). If the church assigns too high a weight to the "Worship Participation" criterion (e.g., 50%) and a low weight to "Income" (10%), then the algorithm will become a "Pharisaic Algorithm"—one that only rewards those who diligently attend services, while neglecting the poor, sick widow at home. Therefore, the process of determining weights in the Fuzzy MADM method must be conducted through serious theological struggle. Setting the weights at 30% for "Income" and 25% for "Dependents" in this study is a form of theological alignment (preferential option for the poor) translated into programming language. Herein lies the role of the theologian: not merely as an application user, but as an "ethics architect" who ensures that the logic of the system aligns with the logic of the Kingdom of God.

Comparative Analysis of The Conventional Model vs. The Computational Model

To observe the effectiveness of the proposed system, the following is a comparative analysis between the conventional decision-making method (manual board meetings) and the Fuzzy MADM-based method:

Table 1. Comparison of Diaconal Decision-Making Models

Aspect of Comparison	Conventional Model (Manual)	Digital Theology Model (Fuzzy MADM)
Basis of Decision	Intuition, feelings, and memory of the board.	Measurable data and logical criteria.
Risk of Bias	High (Proximity bias/nepotism, recency bias).	Low (The algorithm consistently treats all data).
Transparency	Difficult to audit (reasons for decisions are often abstract).	Open (Weight values and final scores can be tracked/audited).
Processing Time	Slow (Lengthy debates in meetings).	Fast (Automatic calculations in a matter of seconds).
Nature of Justice	Tends towards Equality (Equal distribution).	Tends towards Equity (Distributed according to the level of vulnerability).

The table above shows that although the digital model excels in aspects of efficiency and objectivity, it has a weakness in the aspect of "personal touch." Therefore, this Fuzzy MADM model is positioned as a Decision Support System (DSS), not a Decision-Making System. The final authority remains with the church board (or elders/deacons), with this system functioning as a "data compass" so that the direction of the decision does not go astray.

Reconstructing The Theology of Diaconia

Diaconia is often misunderstood merely as a charitable activity (distributing basic food commodities to those who ask). However, the root word diakonein implies a service that restores dignity. In the Old Testament tradition, justice (mishpat) is always oriented towards the protection of vulnerable groups: widows, orphans, and foreigners. God does not only command His people to "give," but to give "justly."

A biblical review of Acts 6:1-7 affirms that diaconia is a structural issue of justice (mishpat). The crisis that occurred in the early church was not due to a lack of funds or a lack of prayer, but rather due to a failure in the distribution system that caused the Hellenistic Jewish widows to be neglected.(Cook, 2009) The Apostles realized that the distribution problem required a managerial solution. They did not say, "Let us just pray so that the widows will not go hungry,"

but rather said, "Pick out from among you seven men... whom we will appoint to this duty" (Acts 6:3). There was a selection process, management, and accountability.

The term 'wisdom' (sophia) in Acts 6:3 does not merely refer to personal piety alone, but also encompasses practical competence in governance (administration). In the context of digital theology, this Decision Support System (DSS) can be understood as an attempt at the 'codification of collective wisdom'—a supporting tool that manifests the biblical principle of prudence into measurable logical procedures, in order to minimize the bias of human subjectivity and cultural hesitations (ewuh pakewuh) which are prone to administrative unfairness.(Sari & Theo Pilus Candra, 2022)

In the context of the modern church, this challenge of injustice is often repeated in the form of cognitive bias. The board or deacons, as finite human beings, subconsciously tend to give priority assistance to congregants they know personally (proximity bias) or congregants who are vocal in expressing their complaints. As a result, the "silent poor" group often slips off the ministry's radar.

The use of a computer algorithm-based "management system" in this regard is not an attempt to replace the role of the Holy Spirit or to eliminate the aspect of love, but rather a manifestation of stewardship responsibility to minimize such subjectivity. The goal is to ensure that every penny of God's money is channeled transparently to those who need it most (the poorest of the poor), in accordance with the spirit of Deuteronomy 15:7-11.(Sider, 1997)

Fuzzy Logic As a "Hermeneutic of Poverty"

In conventional computer science, the logic used is binary logic (Crisp Logic): 0 or 1, Yes or No. If applied to poverty, this logic becomes inhumane. For example, if the poverty line threshold is set at Rp 1.000.000, then someone earning Rp 1.001.000 will be considered "Not Poor" and the system will refuse to help them. Yet, the difference of Rp 1.000 does not change the reality of their suffering.

This is where Fuzzy Logic plays a role as a hermeneutical bridge. Fuzzy Logic mimics the way God and humans view a reality that is not black-and-white. It accommodates uncertainty and gradations. Through fuzzy membership curves, the economic condition of the congregants is not assessed rigidly, but in degrees of membership (values from 0 to 1). Someone could be in a "Slightly Vulnerable" (0.4) or "Highly Critical" (0.9) condition. This approach allows the church to "mathematize empathy," capturing the nuances of the complex burdens of the congregants' lives that often escape standard statistical data collection.

Why use Fuzzy Logic? Because poverty is a multidimensional phenomenon that cannot be measured with rigid numbers (Crisp). A case example:

- Congregant A: Salary of Rp 1.500.000, Single.
- Congregant B: Salary of Rp 1.800.000, Supporting 3 school-aged children and a sick wife.

If using standard mathematical logic (e.g., Poverty Line < Rp 2.000.000), both fall equally into the "Poor" category. However, pastorally, Congregant B is clearly struggling much more than Congregant A. Fuzzy Logic allows us to map the "membership function" where Congregant B has a higher vulnerability value approaching 1 (High Priority) compared to Congregant A. Fuzzy Logic works by mapping linguistic variables (human language) into fuzzy sets. This is a

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form of "mathematizing empathy," where the church attempts to understand the complexity of the congregants' life burdens with precision.

Implementation of The Fuzzy MADM Algorithm In Diaconal Cases

To test the effectiveness of this model, the research established five pastoral criteria derived from biblical principles, which were then converted into variables for the Simple Additive Weighting (SAW) algorithm.

Assessment Criteria and Weighting

The criteria were structured based on the priority of pastoral urgency. The criteria are divided into two attributes: Cost (the smaller the value, the higher the priority) and Benefit (the larger the value, the higher the priority). To visualize how these vague economic conditions are mapped into mathematical numbers, the author uses a triangular fuzzy number membership function, as illustrated in Figure 2.

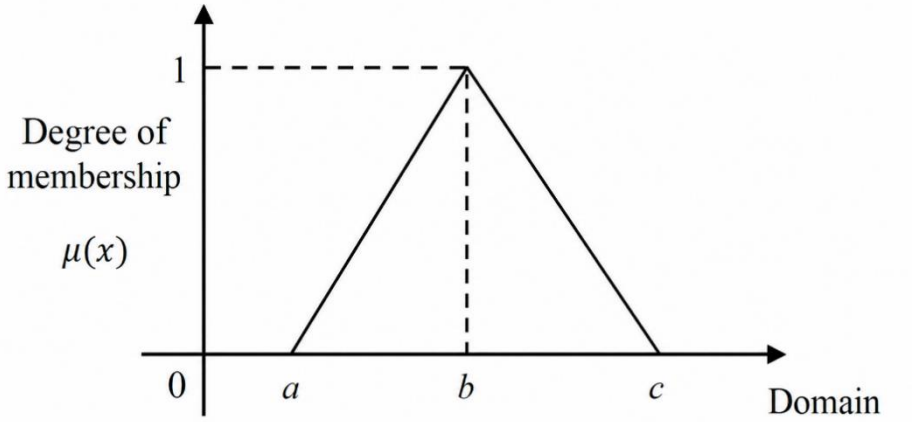

Figure 2. Representation of Triangular Fuzzy Number

Description: This graph shows how economic conditions are not assessed in a binary manner (0 or 1), but rather have a degree of membership (μ) between 0 and 1. The intersection points between the triangles represent "gray" or vague areas.

Detailed Fuzzification Procedures and Membership Functions

Raw congregational data were converted into fuzzy set membership degrees ($\mu(x) \in [0,1]$) using Triangular Fuzzy Numbers (TFNs) according to predefined operational domain limits:

1. Monthly Income (C_1 - Cost converted to Priority Scale):
   - Very Low ($< 1{,}000{,}000$ IDR) → $\mu = 1.0$ (Critical Priority)
   - Low ($1{,}000{,}000 - 2{,}000{,}000$ IDR) → $\mu = 0.75$
   - Moderate ($2{,}000{,}000 - 3{,}500{,}000$ IDR) → $\mu = 0.50$
   - High ($> 3{,}500{,}000$ IDR) → $\mu = 0.20$ or 0.0

2. Dependents (C_2 - Benefit):
   - 1 person → $\mu = 0.20$; 2 persons → $\mu = 0.40$; $3 - 4$ persons → $\mu = 0.80$; ≥ 5 persons → $\mu = 1.00$.

3. Housing Status (C_3 - Cost converted to Priority Scale):
   - Rent/Freeloading with critical vulnerability → $\mu = 0.75 - 1.00$; Privately Owned → $\mu = 0.25$.

4. Health Condition (C_4 - Benefit):
   - Healthy → $\mu = 0.25$; Mild Illness → $\mu = 0.50$; Chronic/Terminal Illness → $\mu = 1.00$.

5. Activity/Obedience (C_5 - Benefit):
   - Less Active → $\mu = 0.40$; Quite Active → $\mu = 0.60$; Active → $\mu = 0.80$; Very Active → $\mu = 1.00$.

The selection of criteria and the assignment of preference weights (W_j) were established through a expert consensus approach using a two-round Delphi Method. A panel consisting of senior pastors, diaconal board members, and theological ethicists evaluated the relative urgency of each parameter against biblical imperatives of distributive justice (mishpat). The weight assigned to Monthly Income ($C_1 = 30\%$) reflects the primary economic vulnerability highlighted in Leviticus 25:35. Dependents ($C_2 = 25\%$) and Housing Status ($C_3 = 20\%$) were prioritized based on family sustainability imperatives (1 Tim. 5:8). Health Condition ($C_4 = 15\%$) addresses medical crisis vulnerabilities (Matt. 25:36), while Activity/Obedience ($C_5 = 10\%$) was deliberately given the lowest weight to prevent diaconal aid from being misconstrued as a spiritual reward, preserving the unconditional nature of diaconia.

Table 2. Pastoral Criteria and Algorithm Variables

Code	Criteria	Attribute	Weight (%)	Biblical Basis
C1	Monthly Income	Cost (The smaller, the higher the priority)	30%	Lev 25:35 (Your brother who becomes poor)
C2	Number of Dependents	Benefit (The more, the higher the priority)	25%	1 Tim 5:8 (Provide for his own household)
C3	Housing Status	Cost (Rent/Own)	20%	Luke 9:58 (Place to lay his head)
C4	Health Condition	Benefit (Chronic illness prioritized)	15%	Matt 25:36 (I was sick and you visited me)
C5	Activity/Obedience	Benefit (Optional/Nurturing)	10%	Heb 10:25 (Meeting together)

Congregant Sample Data (Alternatives)

The simulation was conducted on five fictitious congregant profiles with diverse economic conditions to observe the system's sensitivity.

Table 3. Congregant Raw Data (Alternatives)

Code	Name	Income (C1)	Dependents (C2)	Housing (C3)	Health (C4)	Activity (C5)
A1	Congregant A	Rp 1.500.000	1 Person	Rent	Healthy	Very Active

A2	Congregant B	Rp 800.000	2 Persons	Freeloading	Mildly Sick	Quite Active
A3	Congregant C	Rp 2.500.000	4 Persons	Privately Owned	Chronically Sick	Less Active
A4	Congregant D	Rp 500.000	1 Person	Rent	Healthy	Quite Active
A5	Congregant E	Rp 1.200.000	5 Persons (Widow)	Rent	Chronically Sick	Active

Calculation Steps (SAW Method):

a. **Fuzzification:** This stage converts raw data into fuzzy numbers. The author applies a special inverse logic for criteria with Cost attributes (such as income), where a small currency value is actually converted into a large fuzzy weight because it possesses the highest urgency.

For example, C_1 (Income):

- Income < 1 Million → Very High Priority (Fuzzy Value: 1.0)
- Income > 5 Million → Very Low Priority (Fuzzy Value: 0.0)

b. **Matrix Normalization (R):** It should be noted that although in Table 1 the Income criterion is categorized as a Cost, because the fuzzification process above has transformed it into an "Urgency Value" (where 1.0 is the highest priority), mathematically all criteria are now treated using the Benefit attribute principle. For benefit attributes, the formula used is:

$$r_{ij} = \frac{x_{ij}}{\max(x_{ij})}$$

(Note: The use of this Benefit formula is implemented because the data input is no longer in the form of a nominal currency/Cost, but rather the degree of priority/Benefit resulting from fuzzy conversion).

c. **Ranking (V):** The final step is calculating the preference value (V_i) for each alternative (congregant) by summing the product of the normalized matrix (r_{ij}) and the preference weight (w_j):

$$V_i = \sum_{j=1}^{n} w_j r_{ij}$$

Calculation and Ranking Process

The process begins with Fuzzification, where raw data is converted into fuzzy numbers according to predetermined set curves (e.g., Income < 1 Million is valued at 1.0; 1-2 Million is valued at 0.75, etc.). Next, Matrix Normalization (R) is performed to equalize the scale of all criteria.

Table 4. Normalized Decision Matrix (R)

Code	Name	Income (C1)	Dependents (C2)	Housing (C3)	Health (C4)	Activity (C5)
A1	Congregant A	0.33	0.20	0.75	0.25	**1.00**
A2	Congregant B	0.60	0.40	0.50	0.50	0.60

A3	Congregant C	0.20	0.80	0.25	**1.00**	0.40
A4	**Congregant D**	**1.00**	0.20	0.75	0.25	0.60
A5	**Congregant E**	0.42	**1.00**	0.75	**1.00**	0.80

The final step is to calculate the Preference Value (V) by summing the multiplication between the normalized matrix and the preference weights (W). The final preference value (V) for each candidate is calculated by summing the product of the normalized matrix value and the criteria weight. The weights used are:

C1=0,30; C2=0,25; C3=0,20; C4=0,15; and C5=0,10.

Here are the calculation details:

1. Congregant A (A1)

V1 = (0,33 x 0,30) + (0,20 x 0,25) + (0,75 x 0,20) + (0,25 x 0,15) + (1,00 x 0,10)
V1 = 0,099 + 0,050 + 0,150 + 0,038 + 0,100
V1 = 0,437

2. Congregant B (A2)

V2 = (0,60 x 0,30) + (0,40 x 0,25) + (0,50 x 0,20) + (0,50 x 0,15) + (0,60 x 0,10)
V2 = 0,180 + 0,100 + 0,100 + 0,075 + 0,060
V2 = 0,515

3. Congregant C (A3)

V3 = (0,20 x 0,30) + (0,80 x 0,25) + (0,25 x 0,20) + (1,00 x 0,15) + (0,40 x 0,10)
V3 = 0,060 + 0,200 + 0,050 + 0,150 + 0,040
V3 = 0,500

4. Congregant D (A4)

V4 = (1,00 x 0,30) + (0,20 x 0,25) + (0,75 x 0,20) + (0,25 x 0,15) + (0,60 x 0,10)
V4 = 0,300 + 0.050 + 0,150 + 0,038 + 0,060
V4 = 0,598

5. Congregant E (A5)

V5 = (0,42 x 0,30) + (1,00 x 0,25) + (0,75 x 0,20) + (1,00 x 0,15) + (0,80 x 0,10)
V5 = 0,126 + 0,250 + 0,150 + 0,150 + 0,080
V5 = 0,756

Table 5. Ranking Results for Diaconal Recipient Priorities

Rank	Code	Congregant	Preference Value (***V***)	Recommendation
1	**A5**	**Congregant E**	**0.756**	**Very High Priority**
2	A4	Congregant D	0.598	High Priority
3	A2	Congregant B	0.515	Medium Priority
4	A3	Congregant C	0.500	Low Priority
5	A1	Congregant A	0.437	Not a Priority

Simulation Results: From the 5 samples of fictitious congregant data, the system generated the final scores (V):

- Congregant E (Widow, 5 persons, sick): Score 0.756 → Top Priority
- Congregant D (Laid off, 1 person): Score 0.598 → Second Priority
- Congregant A (Single, Minimum wage salary): Score 0.437 → Not a Priority

These results demonstrate that the algorithm is capable of separating those who are "merely getting by" from those who are in an "emergency" condition, a distinction that often escapes the naked eye.

Interpretation of Normalized Matrix and Ranking Calculations

Table 4 demonstrates how matrix normalization (R) harmonizes heterogeneous units (e.g., nominal currency in IDR, headcount of dependents, and qualitative health statuses) into a uniform, non-dimensional scale between 0.00 and 1.00. For instance, although Congregant C (A_3) possesses the highest raw income among the candidates ($2{,}500{,}000$ IDR), normalization scales his income priority score down to 0.20, whereas Congregant D (A_4) receives 1.00 due to severe income deficiency ($500{,}000$ IDR).

Table 5 presents the final preference values (V_i) derived from the SAW weighted aggregation. The results highlight the non-linear decision capability of the Fuzzy MADM system. Congregant E (A_5) achieves the highest priority rank ($V_5 = 0.756$), outranking Congregant D ($V_4 = 0.598$), despite A_5 having a higher income than A_4. This outcome occurs because the algorithm holistically synthesizes multiple vulnerability vectors—specifically A_5's high burden of dependents (5 children, $\mu = 1.00$) and chronic health condition ($\mu = 1.00$). This proves mathematically that the system avoids single-variable income bias and embodies holistic distributive justice.

Theological Reflection On Technology As a Tool of Justice

The simulation results in Table 3 (and Table 4) provide profound pastoral insights. The system places Congregant E (A widow with 5 children and chronic illness) in the first rank with a score of 0.756, even though her income (Rp 1.200.000) is larger than Congregant D's (Rp 500.000). To the naked eye (without an algorithm), a deacon might be tempted to assist Congregant D first because his salary is the smallest. However, the Fuzzy MADM algorithm is able to calculate that the burden of dependents for Congregant E (5 children + sickness) is far heavier than Congregant D who only supports 1 person and is healthy. This is what is called distributive justice; looking at needs comprehensively, not partially.

The system also places Congregant A at a low priority even though he is "Very Active" in church. This affirms the theological principle that diaconia is based on urgent needs, not as a reward for piety. The algorithm helps purify the motivation for ministry so as not to fall into spiritual nepotism.(Calvin, 2021)

Thus, this technology serves as a Decision Support System that frees the board from subjectivity. The board now has a strong data foundation (evidence-based) to account for their decisions before the congregation and God. However, it should be noted that the score of 0.756 is merely a recommendation number. Algorithms are just decision support tools, but the execution of ministry still requires a servant's heart. The servant leadership model remains the foundation of church management, even if the system is digital.(Arendra & Candra, 2024) The

final decision remains in the hands of the board through prayer and field verification (visitation), because algorithms cannot replace the presence of a shepherd that touches the heart.

Implementation Limitations And Ethical Requirements

Although the Fuzzy MADM algorithm offers mathematical objectivity, this system is not exempt from the fundamental limitation of technology, namely the Garbage In, Garbage Out principle. The accuracy of the decision results depends heavily on the validity and honesty of the inputted data. If the initial data is manipulated—for example, a congregant lies about their income, or the survey team does not conduct field verification—then the algorithm's recommendation results will also be biased.

Therefore, the implementation of this system demands high spiritual integrity from its users. This system is specifically designed to be used by the Diaconia Team or the Church Board as a back-end support tool, not as a public application filled out independently by the congregants. This is to maintain the confidentiality of the congregants' poverty data and to prevent data manipulation in order to receive assistance. Technology is merely a tool; the heart of God's servant remains the key.

A primary limitation of this study lies in its reliance on simulated (dummy) datasets for initial model validation. While simulated scenarios are essential for safety testing and protecting vulnerable populations during early system architecture design, they cannot fully replicate the unpredictable dynamics of real-world ecclesiastical environments. Field data often suffer from incomplete reporting, sudden socio-economic shocks (e.g., unexpected job loss), or subjective reporting errors. Therefore, future research must conduct empirical pilot testing across diverse real-world congregational settings to calibrate membership function boundaries and validate algorithmic outputs against actual pastoral committee decisions.

Data Privacy and Ethical Governance

Implementing a digital Decision Support System (DSS) in a church environment requires strict compliance with personal data protection and ethical standards to safeguard congregational trust and the integrity of digital hermeneutics.(Sari & Candra, n.d.) Financial records, health statuses, and family structures represent highly sensitive personal data. To prevent ethical breaches, churches adopting this system must enforce the following safeguards:

1. Data Anonymization: Personal identifiers (names, addresses) must be pseudonymized into unique candidate codes (e.g., A_1, A_2) prior to algorithmic execution.
2. Role-Based Access Control (RBAC): Raw data entry and system execution must be strictly restricted to authorized diaconal officers via encrypted back-end interfaces.
3. Informed Consent & Transparency: Congregants providing socio-economic data must be informed about how their data will be processed, maintaining full transparency regarding the evaluation criteria without compromising the algorithm's integrity.

Conclusions

The integration between Theology and Informatics through the Fuzzy MADM method offers a concrete solution to the classic challenge of injustice in diaconal ministry. By converting qualitative pastoral criteria into measurable quantitative parameters, the church can minimize the bias of sinful human subjectivity. This research proves that technology, as part of the cultural mandate, can be sanctified to serve ecclesiological purposes: making God's justice

tangibly present.(Cook, 2009) In the future, churches in Indonesia need to start adopting this "Digital Theology," not to become technocratic, but to become stewards of God's mysteries who are more faithful, just, and accountable.

This study affirms an 'eschatological reserve': that this intelligent system is merely a signpost, not the way of truth itself. The justice produced by algorithms, no matter how accurate the calculation, remains an approximative justice amidst a world that is not yet fully restored. Absolute and flawless distributive justice remains the sole property of Christ, which He will fully fulfill at His second coming.

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