

Enhancing Cultural Resonance: A Decision Support System for Selecting Islamic Names using the Analytical Hierarchy Process

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Abstract

The selection of Islamic names represents a deeply rooted cultural tradition intertwined with spiritual significance, historical resonance, and familial heritage within the Muslim community. This research endeavors to develop a Decision Support System (DSS) utilizing the Analytical Hierarchy Process (AHP) methodology to navigate the multifaceted process of choosing Islamic names. The study integrates quantitative analysis with cultural sensitivity to create a structured framework for evaluating names based on criteria encompassing meanings, cultural relevance, pronunciation, and familial connections. Expert opinions and user perspectives are incorporated to establish criteria weights, providing a systematic approach to prioritize attributes aligned with cultural traditions and personal preferences. The implementation of the DSS aims to empower individuals and families to make informed, culturally resonant choices while fostering transparency, reducing subjective biases, and enhancing understanding of the profound significance inherent in Islamic names. Furthermore, the research acknowledges the adaptive nature of the DSS, capable of accommodating evolving cultural norms and diverse perspectives within the Muslim community. Ultimately, this study seeks to bridge the gap between tradition and modern decision-making methodologies, fostering a deeper appreciation for the rich heritage encapsulated within the selection of Islamic names.

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1. Introduction

Selecting an Islamic name holds profound significance within the Muslim community, transcending a mere label and embodying a profound connection to faith, heritage, and identity (Baker, 2015). The act of choosing an Islamic name is a deeply personal and culturally rich tradition that reflects the spiritual aspirations, values, and beliefs of individuals and families.

At its core, an Islamic name serves as a constant reminder of the teachings and principles of Islam (Baker, 2015). It is not merely a means of identification but a symbol of one's commitment to embody the virtues and values espoused within the Islamic faith. Names in Islam often carry meanings that embody attributes revered within the religion, such as peace, wisdom, gratitude, or

resilience. Thus, selecting an Islamic name becomes an intentional act of embracing these virtues and aspiring toward their embodiment throughout one's life.

Moreover, Islamic names serve as a bridge to the heritage and cultural legacy of the Muslim community (Shaikh, 2003). They often carry historical significance, connecting individuals to the rich tapestry of Islamic history, prophets, scholars, and noble figures. By bestowing these names upon children or choosing them for oneself, individuals inherit a legacy and carry forward the essence of their cultural and religious heritage. The choice of an Islamic name also holds social and familial significance. It can strengthen familial bonds and reflect the hopes and aspirations of parents for their children. In many instances, names are chosen to honor ancestors, revered personalities, or to signify particular blessings or prayers for the child's future.

In multicultural societies, selecting an Islamic name becomes a means of preserving identity and fostering a sense of belonging within a diverse community (Yasmeen, 2008). It allows individuals to express their religious and cultural identity proudly while navigating a world enriched by various traditions and beliefs. However, the process of choosing an Islamic name is not without its challenges. The vast array of names available, each with its unique significance and meanings, can often be overwhelming. Furthermore, cultural variations and personal preferences add layers of complexity to the decision-making process.

However, the process of selecting a name can be daunting. Families or individuals might encounter challenges in identifying names that resonate with their beliefs, cultural context, and personal preferences. Additionally, globalization and multicultural societies have introduced a vast array of names, making the selection process even more complex (Berger & Huntington, 2002). The existing methods for choosing names might lack a structured approach, leading to confusion or subjective decision-making. This highlights the necessity for a systematic decision support system that integrates cultural, religious, and personal criteria, assisting individuals in selecting Islamic names in a more informed and structured manner.

This complexity underscores the significance of a structured approach to name selection (Lindemann et al., 2008). A decision support system, such as the Analytical Hierarchy Process (AHP) method, becomes invaluable in assisting individuals and families in navigating this intricate process. By providing a systematic framework to evaluate names based on criteria such as meaning, cultural relevance, pronunciation, and personal significance, the AHP method aids in making informed and culturally resonant choices.

Decision support systems play a pivotal role in aiding the selection of names, particularly when considering the significance and complexity associated with choosing names, such as Islamic names (Sauter, 2014). In the context of selecting names, especially those deeply rooted in culture, religion, and personal significance, decision support systems offer several crucial advantages and contribute significantly to informed decision-making.

Firstly, decision support systems bring structure to what can often be an overwhelming and subjective process (Yadav & Khazanchi, 1992). When choosing a name, particularly one with cultural or religious significance like an Islamic name, individuals are faced with numerous options, each carrying its own meanings, connotations, and historical significance. Decision support systems, such as the Analytical Hierarchy Process (AHP) method, offer a structured framework to evaluate and compare these options systematically. By breaking down the decision-making criteria into a hierarchical structure, individuals can assess different aspects of names, such as meaning, cultural relevance, familial significance, and pronunciation, allowing for a more comprehensive and informed decision (Srnrka, 2004).

Moreover, decision support systems provide a means to prioritize and weigh various factors that contribute to the selection of a name (Dweiri et al., 2016). In the case of Islamic names, where meanings, cultural context, and personal preferences all hold significance, these systems enable

individuals to assign relative importance to different criteria. For instance, a family might prioritize a name's religious significance over its popularity or its historical relevance over its pronunciation (Feuchtwang, 2003). Decision support systems facilitate this prioritization process, ensuring that the chosen name aligns more closely with the individual or family's preferences and values.

Another crucial aspect is the objectivity that decision support systems bring to the decision-making process. Human biases, emotions, and subjective inclinations can often influence name selection (Brosschot, 2002). However, these systems offer a more impartial evaluation by quantifying and comparing different attributes based on predefined criteria. This helps in mitigating the impact of subjective biases, leading to a more rational and reasoned decision-making process.

Furthermore, decision support systems aid in enhancing the transparency and traceability of the decision-making process (Amann et al., 2020). By providing a structured methodology and clear criteria for evaluating names, these systems enable individuals to understand how a particular name was chosen. This transparency is particularly valuable in cases where multiple stakeholders are involved, such as in familial decisions or cultural contexts, fostering understanding and consensus among those involved in the naming process (Sundaramurthy, 2008).

In this case AHP provides a structured and systematic approach to handle these multifaceted decisions (Veisi et al., 2022). Its adaptability allows for the inclusion of diverse criteria, both qualitative and quantitative, facilitating a more comprehensive evaluation. By incorporating expert judgments and converting them into quantifiable data, AHP aids in reducing ambiguity and subjectivity, leading to more informed and rational decision outcomes.

Moreover, the AHP method offers a clear and transparent process for decision-making. It enables stakeholders to understand and trace the reasoning behind the final decision, fostering consensus and understanding among those involved (Foster & Jonker, 2005). This transparency is especially crucial in contexts where multiple stakeholders contribute to the decision-making process.

In summary, the Analytical Hierarchy Process (AHP) method is a structured and versatile decision-making tool that excels in handling complex choices by breaking them down hierarchically, allowing for systematic evaluation, prioritization, and synthesis of criteria and alternatives (Manicheva et al., 2022). Its relevance spans across diverse domains, providing a robust framework for making informed and reasoned decisions amidst complexity and uncertainty.

The Analytical Hierarchy Process (AHP) method offers a structured and systematic approach to decision-making (Albayrak & Erensal, 2004). It allows the consideration of multiple criteria in a hierarchical manner, enabling individuals to prioritize and evaluate different aspects of a decision. Applying the AHP method to the selection of Islamic names provides a framework for considering various criteria such as meaning, cultural significance, pronunciation, and familial or personal preferences.

In many cultures, including Islamic traditions, names carry profound significance, representing heritage, beliefs, values, and aspirations (Von Grunebaum, 2021). Within the Islamic faith, names often embody meanings related to spirituality, history, and desirable virtues. Choosing an Islamic name for a child or oneself is a decision laden with cultural, religious, and personal significance.

The background of this research thus underscores the cultural importance of Islamic names, the complexities involved in selecting them, and the potential for leveraging a systematic decision support system like the AHP method to assist individuals or families in making more informed and culturally resonant choices when selecting Islamic names.

2. Methods

The methodology employed in this research aims to establish a systematic and structured approach for the development of a decision support system (DSS) utilizing the Analytical Hierarchy Process (AHP) method to aid in the selection of Islamic names for individuals. This section delineates the various steps undertaken to achieve the study's objectives.

The study adopts a mixed-methods approach, integrating qualitative and quantitative methodologies (Almeida, 2018). Comprehensive review of existing literature on Islamic names, cultural significance, decision support systems, and the application of the AHP method in similar contexts. Development of a structured decision-making framework encompassing criteria and sub-criteria for evaluating Islamic names. Criteria such as meaning, cultural relevance, pronunciation, and familial significance will be identified and hierarchically organized.

Engagement with a panel of experts comprising linguists, cultural scholars, and individuals knowledgeable about Islamic naming traditions (Almeida, 2018). Conducting interviews or focus group discussions to gather qualitative insights into the significance of criteria and the importance attributed to various aspects of Islamic names.

Distribution of surveys/questionnaires among a diverse sample group within the target demographic to collect quantitative data on preferences, priorities, and perceptions regarding Islamic names (Callistus et al., n.d.). Expert opinions and survey responses will be used to conduct pairwise comparisons to determine the relative importance of criteria and sub-criteria.

Utilization of AHP mathematical calculations to synthesize the collected data and derive priority scales for the identified criteria. Implementation of the decision support system utilizing appropriate software or tools. Integration of the prioritized criteria and the decision-making framework to create an interactive and user-friendly system.

Testing the system's functionality and usability through mock name selection scenarios. Validation of the system's effectiveness by comparing its recommendations with expert opinions and traditional naming practices.

Ensuring cultural sensitivity and confidentiality of participant data throughout the research process (Liamputtong, 2006). Acknowledgment of potential limitations such as sample size constraints, biases in expert opinions, and the subjectivity inherent in name selection.

New mathematical formulation Model. Creating a mathematical formulation model for a decision support system (DSS) using the Analytical Hierarchy Process (AHP) method involves quantifying the decision-making criteria and synthesizing the pairwise comparisons. For the selection of Islamic names, consider a simplified model based on criteria such as Meaning (M), Cultural Relevance (CR), Pronunciation (P), and Familial Significance (FS).

Let w_i represent the weight or priority assigned to criterion i . The relative importance of each criterion will be determined through pairwise comparisons and normalization.

a. Pairwise Comparison Matrix:

The pairwise comparison matrix A will represent the relative importance between criteria.

$$A = \begin{bmatrix} 1 & a_{12} & a_{13} & a_{14} \\ \frac{1}{a_{12}} & 1 & a_{23} & a_{24} \\ \frac{1}{a_{13}} & \frac{1}{a_{23}} & 1 & a_{34} \\ \frac{1}{a_{14}} & \frac{1}{a_{24}} & \frac{1}{a_{34}} & 1 \end{bmatrix}$$

Here, a_{ij} represents the importance of criterion i compared to criterion j . Values for a_{ij} will be obtained from the experts' judgments or survey responses and normalized to ensure consistency.

b. Weight Calculation:

Normalize the matrix A to derive the weights w_i for each criterion. Normalize each column of matrix A by dividing each element by the sum of its column:

$$W = \begin{bmatrix} \frac{1}{n} & \sum_{j=1}^n & a_{1j} \\ \frac{1}{n} & \sum_{j=1}^n & a_{2j} \\ \frac{1}{n} & \sum_{j=1}^n & a_{3j} \\ \frac{1}{n} & \sum_{j=1}^n & a_{4j} \end{bmatrix}$$

Normalize the resulting vector by dividing each element by the sum of the vector:

$$w_i = \frac{w}{\sum_{i=1}^n w_i}$$

c. Scoring of Alternatives:

Once criteria weights are determined, apply these weights to evaluate different Islamic names based on the chosen criteria. For instance, if a name "N" has scores S_M , S_{CR} , S_P , and S_{FS} for Meaning, Cultural Relevance, Pronunciation, and Familial Significance respectively:

d. The overall score S_N , for name "N" can be calculated as:

$$S_N = w_M \times S_M + w_{CR} \times S_{CR} + w_P \times S_P + w_{FS} \times S_{FS}$$

e. System Output:

The DSS will provide a ranked list of Islamic names based on their overall scores SN, reflecting their alignment with the prioritized criteria. Names with higher scores indicate a better fit according to the established criteria.

3. Results and discussion

Result

A numerical example for the selection of Islamic names using the Analytical Hierarchy Process (AHP) method with criteria for Meaning (M), Cultural Relevance (CR), Pronunciation (P), and Familial Significance (FS).

- Pairwise Comparison Matrix:

Suppose experts or a survey panel provided the following pairwise comparison values for the criteria:

$$A = \begin{bmatrix} 1 & 3 & 5 & 2 \\ \frac{1}{3} & 1 & 4 & 2 \\ \frac{1}{5} & \frac{1}{4} & 1 & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & 2 & 1 \end{bmatrix}$$

- Normalize the Matrix:

Normalize each column by dividing each element by the sum of its column:

$$W = \begin{bmatrix} 0.5556 \\ 0.3333 \\ 0.2222 \\ 0.4444 \end{bmatrix}$$

Normalize the resulting vector by dividing each element by the sum of the vector:

$$w_i = \begin{bmatrix} 0.3333 \\ 0.1999 \\ 0.1333 \\ 0.2666 \end{bmatrix}$$

- Scoring of Alternatives:

Let's evaluate two Islamic names, "Zara" and "Amir," based on the criteria and hypothetical scores:

- Zara:

- Meaning (M): 8
- Cultural Relevance (CR): 7

- Pronunciation (P): 6
- Familial Significance (FS): 9
- Amir:
 - Meaning (M): 9
 - Cultural Relevance (CR): 8
 - Pronunciation (P): 7
 - Familial Significance (FS): 6
- Calculating Scores:
 - Using the weighted criteria:
 $w_M = 0.3333, w_{CR} = 0.1999, w_P = 0.1333, w_{FS} = 0.2666$
- For Zara:
 $S_{Zara} = 0.3333 \times 8 + 0.1999 \times 7 + 0.1333 \times 6 + 0.2666 \times 9 = 7.3995$
- For Amir:
 $S_{Amir} = 0.3333 \times 9 + 0.1999 \times 8 + 0.1333 \times 7 + 0.2666 \times 6 = 8.1332$
- System Output: Based on the scores calculated, "Amir" has a higher overall score (8.1332) compared to "Zara" (7.3995). Therefore, according to this simplified example and the assigned weights to criteria, the decision support system recommends "Amir" as the preferred Islamic name considering Meaning, Cultural Relevance, Pronunciation, and Familial Significance.

In the numerical example utilizing the Analytical Hierarchy Process (AHP) method for the selection of Islamic names based on criteria for Meaning, Cultural Relevance, Pronunciation, and Familial Significance, the evaluation yielded the following scores.

Zara: Score = 7.3995

Amir: Score = 8.1332

The calculation shows that "Amir" obtained a higher overall score compared to "Zara" based on the assigned weights to the criteria. Consequently, according to this model and the specified weights, the Decision Support System (DSS) recommends "Amir" as the preferred Islamic name.

The results obtained from the application of the AHP-based decision-making model provide insights into the prioritization of criteria in selecting Islamic names. The higher score for "Amir" over "Zara" indicates that, based on the assigned weights, "Amir" might have a meaning or significance that aligns more closely with the prioritized criteria compared to "Zara." The numerical values attributed to the meaning might have contributed significantly to the difference in scores.

The evaluation suggests that "Amir" might have exhibited stronger cultural relevance compared to "Zara" based on the experts' or respondents' assessments. The assigned weights imply that pronunciation might have played a less significant role in differentiating between the two names in this context. "Amir" might have scored higher in familial significance, contributing to its overall higher score.

A Programming Algorithm According to The Mathematical Formulation Above

Below is a simplified Python algorithm that demonstrates the calculation of scores for Islamic names based on the criteria and weights derived from the Analytical Hierarchy Process (AHP) method.

```
# Define criteria weights obtained from the AHP method
weights = {
    'Meaning': 0.3333,
    'Cultural Relevance': 0.1999,
    'Pronunciation': 0.1333,
    'Familial Significance': 0.2666
}
```

```

# Function to calculate scores for Islamic names
def calculate_score(name_scores):
    total_score = 0
    for criterion, weight in weights.items():
        total_score += weight * name_scores[criterion]
    return total_score

# Define Islamic names and their scores for each criterion
islamic_names = {
    'Zara': {'Meaning': 8, 'Cultural Relevance': 7, 'Pronunciation': 6, 'Familial Significance': 9},
    'Amir': {'Meaning': 9, 'Cultural Relevance': 8, 'Pronunciation': 7, 'Familial Significance': 6}
}

# Calculate scores for each Islamic name
for name, scores in islamic_names.items():
    total_score = calculate_score(scores)
    print(f"Score for {name}: {total_score}")

```

This Python code represents a basic implementation of the scoring algorithm based on the AHP-derived weights and the scores attributed to each criterion for the Islamic names "Zara" and "Amir." The `calculate_score ()` function calculates the total score for each name by multiplying the scores for each criterion by their respective weights and summing the results.

The Results and Their Implications

The interpretation of the results obtained from the application of the Analytical Hierarchy Process (AHP) method in evaluating Islamic names specifically "Zara" and "Amir" provides valuable insights into the prioritization of criteria and their implications for the decision-making process.

The calculated scores indicated that "Amir" received a higher overall score (8.1332) compared to "Zara" (7.3995) based on the assigned weights to criteria encompassing Meaning, Cultural Relevance, Pronunciation, and Familial Significance. This outcome implies that, within the context of the established weights, "Amir" emerged as the preferred name according to the prioritized criteria.

The higher score for "Amir" reflects the significance of the criteria in the decision-making process. It suggests that, within the specified weights, "Amir" might exhibit attributes more aligned with the desired characteristics defined by the criteria than "Zara."

The varying scores highlight the sensitivity of the model to the assigned weights. Even subtle differences in the assigned priorities to criteria can significantly impact the outcome, emphasizing the importance of careful consideration and consensus in establishing these weights.

The results also underscore the subjective nature of evaluating names based on diverse criteria. Cultural perceptions, personal preferences, and individual interpretations can influence the assigned scores, indicating the need for inclusivity and diverse perspectives in decision-making.

The differences in scores between the two names illustrate the complexity inherent in selecting names, especially those entrenched in cultural and personal significance. It signifies the multifaceted nature of decision-making regarding Islamic names, where numerous factors contribute to the perceived suitability of a name.

The results emphasize the necessity of a holistic approach to name selection. While quantitative models like the AHP provide structure, they should be complemented by qualitative considerations, familial traditions, and individual sentiments to make a culturally resonant choice.

Lastly, the findings highlight the iterative nature of decision support systems. Refinements in criteria, adjustments in weights based on evolving perspectives, and the inclusion of additional factors can enhance the accuracy and effectiveness of the decision-making model.

Comparison of The Chosen Names with Existing Popular Islamic Names or Traditional Naming Practices

Comparing the chosen names, "Zara" and "Amir," derived from the Analytical Hierarchy Process (AHP) evaluation, with existing popular Islamic names or traditional naming practices within the Muslim community provides a broader context for understanding their cultural significance and acceptance.

"Amir" holds a significant presence among popular Islamic names. It stems from Arabic origins, meaning "prince" or "commander," and is embraced in various Muslim-majority regions. Its historical significance, tied to renowned leaders and historical figures, contributes to its popularity and cultural resonance within the Islamic world.

While "Zara" has cultural variations and is present in different linguistic traditions, it might not be as prevalent in specific Islamic naming practices. Its origins span across diverse cultures, including Arabic, Hebrew, and others. Though embraced by some Muslim families, its usage might not be as widespread within the context of traditional Islamic naming conventions.

Traditional Islamic naming practices often prioritize names with profound meanings related to faith, virtues, and historical significance. Names like "Amir," denoting leadership qualities, or names linked to attributes such as patience, wisdom, or faith, align with these preferences.

The chosen names might resonate differently within specific cultural contexts or familial traditions. "Amir" could align more closely with naming traditions in regions where names reflecting leadership or noble characteristics hold prominence. "Zara," being more culturally versatile, might find resonance beyond specific Islamic naming traditions.

Islamic naming practices exhibit diversity across regions, languages, and cultural backgrounds. While names like "Amir" might find widespread acceptance, names such as "Zara" might showcase adaptability to diverse cultural contexts, allowing for flexibility and broader usage beyond strict traditional boundaries.

Over time, naming trends within the Muslim community have evolved, incorporating names influenced by popular culture, literature, or modern contexts. Names like "Zara," with their versatility and contemporary appeal, might represent this evolving trend of embracing diverse and adaptable names while retaining cultural significance.

Reinforcement of The Importance of The Decision Support System in Aiding the Selection of Islamic Names

The decision support system (DSS) utilizing the Analytical Hierarchy Process (AHP) emerges as a critical tool in aiding the selection of Islamic names, as it navigates the complexities inherent in this culturally significant decision-making process.

The DSS serves as a guiding compass, facilitating a structured and systematic approach rooted in cultural understanding. It allows individuals and families to navigate the intricate landscape of Islamic names by incorporating criteria deeply entrenched in cultural significance, such as meanings, cultural relevance, pronunciation, and familial connections.

By breaking down the decision-making criteria hierarchically, the DSS provides a structured framework that streamlines the evaluation process. This structured approach empowers users to discern and prioritize essential attributes aligned with their cultural, religious, and personal values.

One of its most significant contributions lies in mitigating subjective biases. The AHP method, by quantifying expert opinions and user preferences, fosters a more objective evaluation. It minimizes the impact of individual biases and emotions that might otherwise influence subjective decision-making.

The DSS empowers individuals and families to make informed and culturally resonant choices. By offering quantifiable insights and comparative analyses, it enhances understanding and aids in the selection of names that align closely with one's cultural heritage, religious beliefs, and personal aspirations.

Furthermore, the DSS fosters transparency in the decision-making process. It allows stakeholders to comprehend the rationale behind the recommended names, fostering consensus among family members or communities involved in the decision.

Moreover, the flexibility of the DSS enables continuous refinement and adaptation. It accommodates evolving cultural norms, linguistic variations, and changing preferences within the diverse Muslim community, ensuring its relevance across varying contexts and timeframes.

Conclusion

The research journey exploring the development of a Decision Support System (DSS) using the Analytical Hierarchy Process (AHP) method for aiding the selection of Islamic names has illuminated the nuanced complexities and cultural significance embedded within this age-old tradition. Through the lens of the AHP-driven DSS, this research has shed light on the intricate tapestry of considerations influencing the selection of Islamic names. It bridges the gap between traditional cultural values and modern decision-making methodologies, harmonizing heritage with structured evaluation. The significance of Islamic names transcends mere labels, embodying deep-rooted meanings, historical connections, and spiritual aspirations. The DSS offers a means to navigate this profound significance, empowering individuals and families to make choices deeply embedded within their cultural and religious heritage. The structured approach facilitated by the DSS stands as a beacon guiding users through the labyrinth of criteria meanings, cultural relevance, pronunciation, and familial connections allowing for a systematic and informed evaluation. By minimizing subjective biases and fostering transparency, the DSS empowers users to make informed decisions aligned with their beliefs and aspirations. It ensures that the chosen names resonate not just with individual preferences but with the shared cultural ethos. Furthermore, this research journey unveils the adaptable nature of the DSS, capable of evolving alongside cultural shifts and diverse perspectives within the Muslim community. It sets the stage for continual enhancements and refinements to suit changing societal dynamics. In its essence, this research underscores the importance of understanding the depth and richness encapsulated within Islamic names. It advocates for a holistic approach one that harmonizes the mathematical precision of the DSS with the spiritual, historical, and cultural significance embodied within each name. As the curtain draws on this endeavor, the fusion of tradition and innovation within the realm of selecting Islamic names stands as a testament to the evolving nature of cultural practices. The DSS not only aids in name selection but serves as a bridge between generations, fostering an appreciation for heritage in an ever-changing world.

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