

Transformation of Islamic Geometric Principles and Symbolic Colors in the Design of the Sign System at Ribath Al-Falah Islamic Boarding School, Mataram City- West Nusa Tenggara

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ABSTRACT

Sign systems in Islamic educational environments are often designed primarily as navigational tools, while Islamic identity is applied only as decorative ornamentation. This study develops a contextual sign system for Pondok Pesantren Ribath Al-Falah, Mataram City, through a geosemiotic visual transformation approach integrating Islamic geometry, symbolic color, and bilingual typography. The novelty of this study lies in positioning Islamic geometric principles not merely as aesthetic elements, but as structural components regulating hierarchy, modularity, and visual consistency within the signage system. The research responds to navigation difficulties and low environmental visibility identified through questionnaires, field observations, and user responses within the pesantren environment. A descriptive qualitative method was employed using a Design Thinking framework supported by Charles Sanders Peirce's semiotic theory. Islamic geometric patterns, symbolic green color, and Arabic-Latin typography were transformed into a modular Environmental Graphic Design system consisting of directional, identification, and regulatory signage. The findings indicate that repetitive geometric structures, modular layouts, and consistent information hierarchy contribute to symbolic representation and navigational communication simultaneously. User evaluations also suggested positive responses regarding legibility, visibility, and semantic clarity of the proposed signage system. Overall, this study contributes a

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contextual Environmental Graphic Design approach integrating Islamic visual identity and wayfinding communication within Islamic educational environments.

INTRODUCTION

Environmental Graphic Design discusses all forms of graphics in the environment, including a direction system that aims to connect a person with the environment (Calori & Vanden-Eynden, 2015; Tinarbuko, 2015b, 2015a). The Sign system is not just a passive navigation instrument, but a key element in building spatial experiences (Arthur & Passini, 2017; Esra Aksoy et al., 2022). The sign system is part of a visual communication system that serves as a guide in regulating certain information flows and becomes an important information medium in public spaces (Aishah et al., 2017; Aristantie, 2011). On the scale of Islamic educational institutions, namely Islamic boarding schools, the success of the sign system is measured by its ability to transform the vision and noble values embraced by the institution. Through the integration of typography, color, and graphic elements, the sign system acts as a visual narrator that reinforces the brand identity and character of the space (Anggraini & Nathalia, 2018; Setiawan, 2016). In the context of faith-based educational institutions, the challenge of design shifts from fulfilling a purely navigational function to creating a spatial atmosphere that is able to communicate spiritual values inclusively to its users (Indriati, 2020).

The need for a structured wayfinding system in Islamic boarding schools is becoming increasingly crucial (Kiatama & Hananto, 2025; Wicaksono & Nawawi, 2024) Ribath Al-Falah Islamic boarding school in Mataram City, West Nusa Tenggara is present as a research locus that represents the complexity of design challenges in Islamic educational institutions. As an Islamic education center that continues to grow, the navigation system in the pesantren environment is still conventional and has not touched the aspect of transforming religious identity into functional elements. The location of the pesantren is in the middle of a dense settlement

with an organic pattern and meeting with the absence of directions from arterial roads to the location resulting in low visibility and impeding accessibility (Calori & Vanden-Eynden, 2015). The absence of a sign system also limits the institution's opportunity to communicate its spatial identity and religious character through environmental visual communication. Based on the survey results that have been conducted to the Civitas ponpes (Islamic boarding school), as many as 70% of people have difficulty finding a location, 75% of people need directions, and 95% of people agree ponpes needs a new sign system. This makes Ponpes Ribath Al-Falah an appropriate context for exploring a contextual sign system design approach based on Islamic geometry and symbolic color.

Research on sign systems and wayfinding in public spaces has primarily focused on navigation effectiveness, legibility, and visual clarity, including studies conducted in Islamic boarding schools and mosque environments (Fathul Jannah Harahap et al., 2025; Harahap et al., 2024). Several studies have also attempted to integrate local cultural identity into visual communication systems to strengthen regional character and spatial identity (Rizqullah & Swasty, 2019). However, most existing approaches still position cultural and religious elements merely as supplementary decorative components rather than as structural principles that shape the organization of the sign system itself (Dong, 2023). Islamic visual elements are generally applied only at the surface level through ornamentation, color adaptation, or stylistic representation without influencing the hierarchy, modularity, and spatial logic of the wayfinding system (Broug, 2015). Consequently, discussion regarding the transformation of Islamic geometry into a functional Environmental Graphic Design framework remains limited, particularly in relation to how principles such as symmetry, repetition, abstraction, and modular order can systematically regulate information hierarchy, visual rhythm, and spatial consistency within a sign system (Nasr, 1987). Furthermore, previous studies have rarely explored the integration of symbolic meaning and navigational functionality through a modular wayfinding structure (Kanakri et al., 2016; Zhou et al., 2024). Therefore, this study proposes the geosemiotic visual transformation approach, which positions

Islamic geometry and symbolic color not merely as decorative identity markers, but as structural and semiotic foundations for developing a contextual sign system in Islamic educational environments.

This study is presented to answer these problems by by proposing a geosemiotic visual transformation approach for integrating Islamic geometry and symbolic color into sign system design. The novelty of this study lies in the claim that the incorporation of Islamic values into the sign system does not stop at the use of ornaments but rather becomes the basic logic in the formation of a modular system. Principles of Islamic geometry such as symmetry and repetition were transformed from purely aesthetic forms into structural elements that govern the legibility and consistency of information. By using a Design Thinking approach that is reinforced by the theory of signage & wayfinding, geometric transformation theory, and semiotics theory. this study aims to examine, transform the symbolism of color and geometric patterns into a design language that is inclusive, functional, and has a spiritual depth so that the results of the design can strengthen the identity of Ribath Al-Falah Islamic Boarding School in Mataram City, West Nusa Tenggara.

RESEARCH METHOD

This study employs a descriptive qualitative approach using the Design Thinking framework to develop a contextual sign system for Pondok Pesantren Ribath Al-Falah, Mataram City, West Nusa Tenggara. Design Thinking functions as the primary design process framework, while semiotic analysis and Islamic geometric principles serve as analytical and conceptual foundations throughout the design stages. Semiotics is used to interpret how visual elements such as geometry, color, typography, and symbols communicate both navigational and spiritual meanings. Meanwhile, Islamic geometric principles-including symmetry, repetition, abstraction, and modularity-guide the transformation of religious values into the structural organization of the sign system. Through this integration, the research positions signage not only as navigational infrastructure but also as a medium

of environmental communication and institutional identity. The research process consists of five stages: empathize, define, ideate, prototype, and test.

The following are the design thinking stages applied in this research:

1. Empathize Stage

At this stage, primary and secondary data were collected to identify navigation problems, environmental visibility, and institutional identity within the pesantren environment. Questionnaires were distributed purposively to members of the pesantren community, including students, teachers, staff, and visitors who had experience accessing the site. The questionnaire aimed to identify difficulties in navigation, spatial orientation, and perceptions regarding the absence of a structured sign system. Field observations were conducted on circulation paths, arterial road access, surrounding building density, and strategic visibility points within the pesantren area. In addition, semi-structured interviews were conducted with pesantren caregivers and teaching staff to explore institutional values, color symbolism, religious identity, and the philosophical meaning associated with Islamic visual representation.

2. Define Stage

The data collected were analyzed descriptively to formulate the primary design problems and determine the criteria for the sign system development. Questionnaire data were analyzed through percentage-based descriptive interpretation to identify dominant navigation problems experienced by users. Observation results were interpreted through spatial mapping to identify visibility constraints, circulation complexity, and potential placement points for signage. Interview findings were analyzed thematically to identify institutional values and symbolic meanings relevant to the pesantren identity. Furthermore, semiotic analysis based on Charles Sanders Peirce's (Chandler, 2002) triadic framework was used to examine how Islamic geometric forms, symbolic colors, and typography could function simultaneously as icons, indexes, and symbols within the wayfinding system.

3. Ideate Stage

At this stage, the identified problems and symbolic values were transformed into visual design concepts through a geosemiotic visual transformation process. Islamic geometric principles such as symmetry, repetition, and modular order were translated into design principles including grid systems, hierarchy, consistency, and visual rhythm. The Rub el Hizb geometric pattern and polygonal forms were developed into adaptive signage modules applicable to different categories of information, including directional signs, identification signs, and regulatory signs. This stage also involved the formulation of a visual transformation matrix connecting Islamic philosophical values with functional Environmental Graphic Design components.

4. Prototype Stage

The prototype stage involved the development of high-fidelity mockups and simulated environmental applications of the signage system. This process included the selection of bilingual Arabic–Latin typography, symbolic green color standardization, pictogram development (Mori et al., 2019), material selection, and layout composition adapted to the environmental context of Mataram City. Prototype simulations were then placed digitally at strategic circulation points within the pesantren area to evaluate visual consistency and spatial integration.

5. Test Stage

The testing stage aimed to evaluate the effectiveness of the proposed sign system design based on Environmental Graphic Design (EGD) parameters, including legibility, visibility, and semantic clarity (Calori & Vanden-Eynden, 2015). Evaluation was conducted through user responses involving representatives of the pesantren community and visitors who reviewed the prototype simulations. Legibility assessment focused on text readability, typography clarity, and information hierarchy. Visibility evaluation examined sign detectability from circulation paths, color contrast effectiveness, and recognition distance within the dense settlement environment. Semantic evaluation analyzed the extent to which users understood directional information, symbolic meaning, and

institutional identity represented by the signage system. The evaluation results were then interpreted qualitatively to determine the effectiveness of integrating Islamic geometry and symbolic visual language into the environmental wayfinding system.

Theoretical Framework

This study integrates sign system theory, semiotics, and Islamic geometric principles as the conceptual foundation for developing a contextual Environmental Graphic Design system at Pondok Pesantren Ribath Al-Falah. These three theoretical approaches are interconnected in explaining how signage functions not only as navigational infrastructure but also as a medium for communicating institutional identity and religious values within space.

Sign System

In the context of Visual Communication Design, a sign system is understood as a structured series of visual representations designed to provide information, direction, identification, and spatial orientation within a particular environment (Calori & Vanden-Eynden, 2015; Tinarbuko, 2015b, 2015a). Sign systems function as communication media that connect users with space through visual elements such as typography, color, symbols, material, form, and layout. Functionally, sign systems are categorized into informational signs, directional signs, identification signs, and regulatory or warning signs (Aristantie, 2011). Within Environmental Graphic Design, the effectiveness of a sign system is determined not only by visibility and legibility, but also by its ability to construct spatial experience and reinforce environmental identity (Wicaksono & Nawawi, 2024). Therefore, signage in Islamic educational environments requires a design approach that integrates navigational clarity with symbolic and cultural representation.

Semiotics

To understand how visual elements communicate meaning within the sign system, this study applies Charles Sanders Peirce's semiotic theory (Chandler, 2002), particularly the triadic relationship between icon, index,

and symbol. Icons operate through visual resemblance, indexes function through direct indication or spatial reference such as arrows and directional markers, while symbols communicate meaning through cultural agreement and collective interpretation. In this research, semiotics functions as an analytical framework to examine how signage simultaneously performs practical navigational functions and symbolic representation (Aiello, 2016). Through this approach, visual elements such as geometric forms, typography, color, and patterns are interpreted not merely as decorative components, but as communicative signs that convey Islamic identity, institutional values, and spatial meaning.

Principles Of Islamic Geometry

Islamic geometry serves as the primary visual and philosophical foundation in the design transformation process. According to Seyyed Hossein Nasr (Nasr, 1987), Islamic art reflects the concept of Tawhid, or divine unity, through harmonious visual order and the principle of “Unity in Diversity.” In this context, geometry is not positioned merely as ornamentation, but as a structural system that represents balance, order, continuity, and spiritual harmony. Fundamental principles of Islamic geometry include symmetry, repetition, abstraction, and modularity. Symmetry reflects balance and stability, repetition creates visual rhythm and continuity, while abstraction avoids figurative representation and emphasizes universal spiritual meaning. One of the most prominent Islamic geometric forms is the eight-pointed star (Rub el Hizb), which is formed through the intersection of rotated squares and represents order and equilibrium. In this study, these geometric principles are transformed into structural components that regulate layout hierarchy, modular organization, visual rhythm, and spatial consistency within the sign system.

Theoretical Integration in the Design Process

The relationship between sign system theory, semiotics, and Islamic geometry forms the conceptual basis of the geosemiotic visual transformation approach proposed in this study. Sign system theory explains the functional

role of signage in navigation and environmental communication, while semiotics provides a framework for interpreting how visual elements produce symbolic meaning. Islamic geometry contributes structural and philosophical principles that organize visual order and institutional identity. Through this integration, the study positions Islamic geometric elements not merely as decorative additions, but as structural and semiotic foundations that shape the modular organization, hierarchy, and visual consistency of the wayfinding system. Consequently, the resulting sign system is expected to function simultaneously as navigational guidance, spatial identity reinforcement, and representation of Islamic values within the pesantren environment.

RESULT AND DISCUSSION

The results indicate that the absence of a structured sign system at Pondok Pesantren Ribath Al-Falah contributes significantly to navigation difficulties, low environmental visibility, and weak spatial identity within the dense settlement context of Mataram City. Existing signage was inconsistent, limited in quantity, and lacked a unified visual system, making it difficult for visitors and new students to identify important facilities and circulation paths within the pesantren environment. Questionnaire findings showed that most respondents experienced difficulty locating facilities and required clearer directional information to support daily mobility and visitor circulation. In addition, users expressed the need for signage that not only functions as navigational media but also reflects the Islamic identity and character of the institution. These findings became the basis for developing a contextual signage system integrating Islamic geometric principles, symbolic color, and bilingual information hierarchy to improve environmental legibility and institutional identity.



Figure 1. Road route of Ribath Al-Falah Islamic Boarding School
Source: author's documentation

Figure 1 illustrates the environmental context surrounding the pesantren, which is characterized by dense residential patterns and limited directional visibility from arterial roads. This condition contributes to spatial disorientation and strengthens the need for a structured wayfinding system capable of improving accessibility and environmental recognition.

Geosemiotic Visual Transformation Framework

The geosemiotic visual transformation approach proposed in this study functions as a conceptual bridge between Islamic symbolic values and practical navigation needs within the pesantren environment. Unlike conventional sign systems that often position religious identity merely as supplementary ornamentation, this approach integrates Islamic geometry and symbolic meaning into the structural organization of the signage system itself. Referring to Charles Sanders Peirce's semiotic (Chandler, 2002) framework, geometric forms, typography, color, and pictograms operate simultaneously as representational, indexical, and symbolic communication elements.

The transformation process begins with the abstraction of Islamic geometric principles, particularly the Rub el Hizb pattern, into a modular layout system regulating hierarchy, repetition, consistency, and visual rhythm. Principles of symmetry and modularity are translated into repetitive visual structures that strengthen environmental recognition and continuity across different signage categories. The application of symbolic green color and bilingual Arabic–Latin typography further reinforces the relationship between navigational clarity and Islamic visual identity.

Table 1 Geosemiotik Transformation Design Sign System Matrix

Visual Element	Semiotic Function	Islamic Geometric Transformation	Functional Role in Signage System
Rub el Hizb geometric pattern	Symbolic representation of Islamic identity	Simplified into modular borders and headers	Strengthens institutional identity and visual consistency
Symmetrical composition	Symbol of balance and order	Applied through repetitive geometric layouts	Improves hierarchy and environmental legibility
Directional arrows	Indexical sign guiding movement	Integrated within geometric modular structure	Supports intuitive wayfinding and circulation
Green color palette	Symbolic association with spirituality and serenity	Applied as dominant environmental color system	Enhances visibility and reinforces Islamic atmosphere
Arabic–Latin bilingual typography	Symbolic and communicative representation	Balanced vertical and horizontal hierarchy	Improves accessibility and institutional recognition
Repetitive geometric borders	Symbolic continuity and spatial rhythm	Adapted into modular sign framing system	Creates visual continuity across signage categories
Pictograms and icons	Indexical communication element	Simplified into geometric-compatible forms	Supports rapid information recognition

Source: author's analysis

The matrix demonstrates that geosemiotic transformation in this study operates through the integration of semiotic communication and Islamic geometric structure. Visual elements such as arrows, typography, color, pictograms, and geometric repetition function collectively as a modular Environmental Graphic Design system. This finding supports the argument that Islamic geometry can operate as a structural logic organizing hierarchy, readability, and spatial communication rather than merely functioning as decorative ornamentation.

Design Results

Based on field findings and user needs, the resulting signage system was developed to address navigation clarity, spatial identity, and environmental consistency within the pesantren environment. The final design integrates Islamic geometric principles, symbolic green color, bilingual typography, and modular information hierarchy into three main signage categories: directional signs, identification signs, and regulatory signs.

1. Concept Sketch

The initial concept sketches demonstrate the transformation of Islamic geometric forms into a simplified and modular signage system. The exploration focused on adapting the Rub el Hizb geometric pattern into compositions that maintain Islamic visual characteristics while remaining functionally readable. Symmetry, repetition, and geometric framing were consistently applied to establish continuity across signage categories.

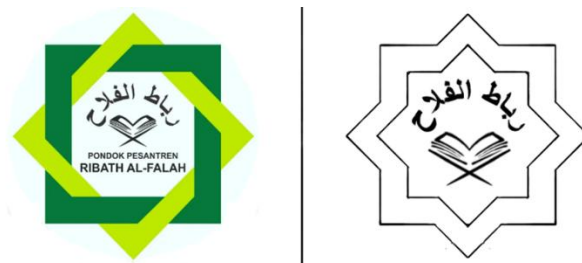


Figure 2. Concept Sketch
Source: author's documentation

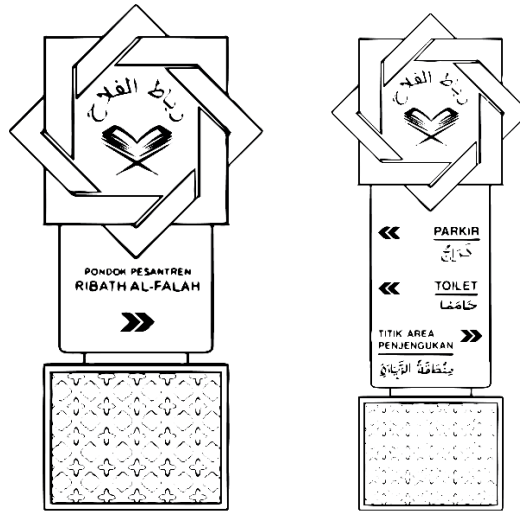


Figure 3. Concept Sketch
Source: author's documentation



Figure 4. Concept Sketch
Source: author's documentation

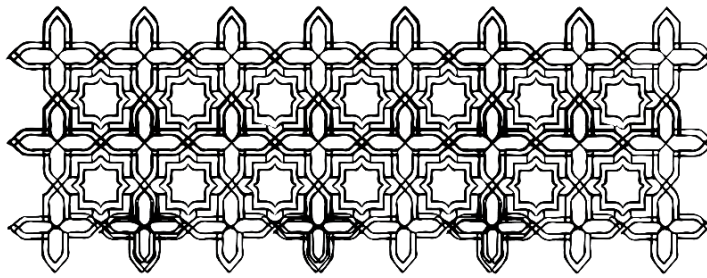


Figure 5. Concept Sketch
Source: author's documentation

The concept sketches illustrate the visual exploration process in transforming Islamic geometric motifs into modular signage compositions. These sketches later became the basis for determining layout hierarchy, border systems, icon placement, bilingual typography arrangement, and overall visual consistency within the final signage prototypes.

2. Directional Sign

The directional sign applies to the Rub el Hizb geometric structure as a modular visual header that strengthens institutional recognition throughout the signage system. From a semiotic perspective, directional arrows function indexically by guiding user movement, while the geometric pattern operates symbolically as a representation of Islamic identity. Repetitive geometric borders create visual continuity and improve environmental legibility within the dense settlement context.

The arrangement of typography, arrows, and pictograms was designed to establish intuitive reading flow and efficient circulation guidance (Calori & Vanden-Eynden, 2015). The modular layout system also allows adaptation across different circulation points while maintaining visual consistency.

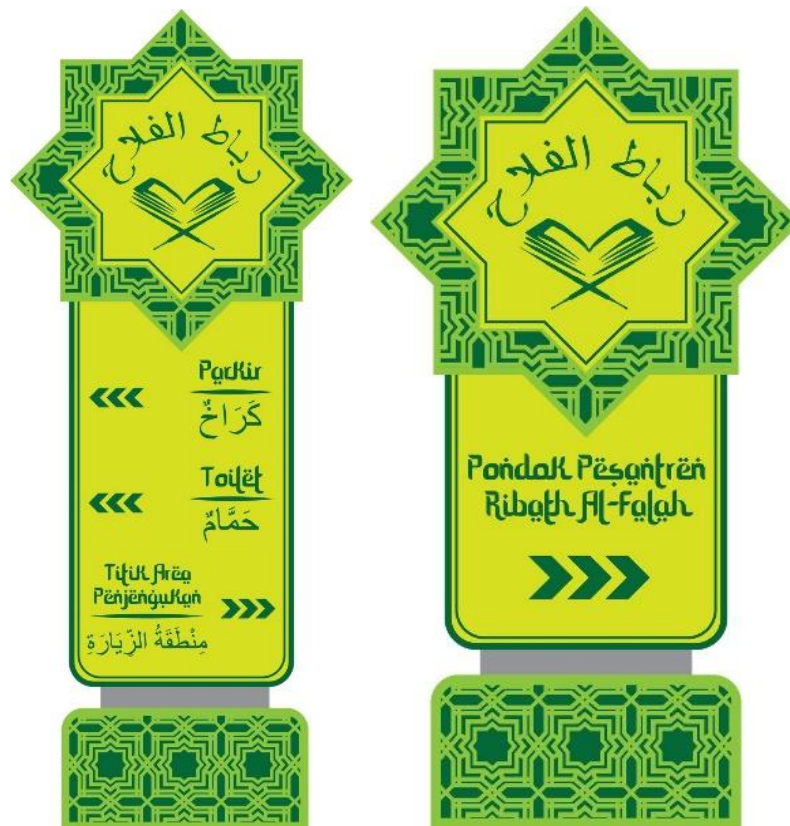


Figure 6. Directional Sign
Source: author's documentation

The directional sign prototype demonstrates the integration of geometric repetition, bilingual typography, pictograms, and directional arrows within a modular visual system. The simplified hierarchy improves readability while reinforcing institutional identity through consistent Islamic geometric framing.

3. Identification Sign

The identification sign emphasizes spatial recognition through enlarged typography, simplified information hierarchy, and symmetrical geometric composition. The geometric framing reflects the Islamic principle of balance and order, while the bilingual Arabic–Latin typography supports both institutional identity and universal readability.

The repetitive geometric structure applied across the signage border creates continuity with other signage categories and strengthens the visual identity of the pesantren environment. From a sign system perspective, the signage contributes to spatial orientation by helping users distinguish facilities and circulation destinations more efficiently.



Figure 7. Identificational Sign
Source: author's documentation

The identification sign prototype highlights enlarged typography and symmetrical geometric framing to improve room recognition and environmental orientation while maintaining visual consistency throughout the signage system (Sihombing, 2015).

4. Regulatory Sign

The regulatory sign integrates informational communication with Islamic visual identity through the consistent application of geometric borders, symbolic color, and modular layout composition. Compared to directional signage, this category accommodates longer informational content while maintaining readability through high contrast between typography and background color.

In semiotic terms, typography and icons function indexically by communicating instructions and prohibitions directly, while repetitive geometric elements symbolically reinforce the pesantren's religious atmosphere and institutional identity.



Figure 8. Regulatory Sign
Source: author's documentation

The regulatory sign prototype demonstrates the adaptation of Islamic geometric structures into informational signage containing institutional rules and instructions while maintaining readability and environmental consistency.

Transformation Of Islamic Geometric Principles Into The Visual System

Islamic geometric principles within the signage system are transformed through symmetrical compositions based on the eight-pointed star pattern as the primary visual structure. Rather than replicating historical ornamentation literally, the geometric form is abstracted into modular visual components regulating layout hierarchy, border consistency, and information organization.

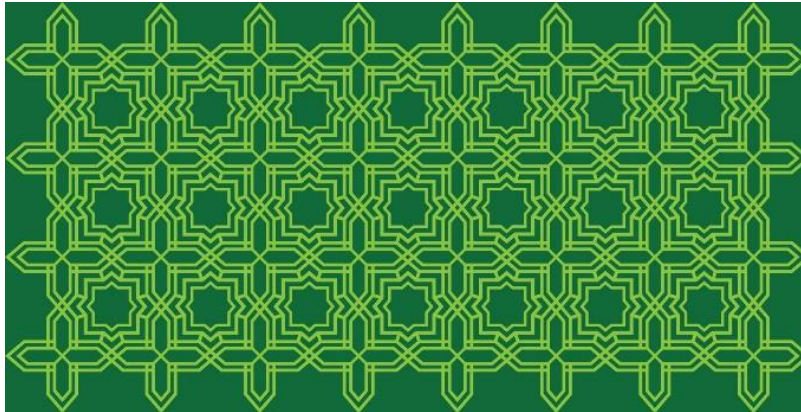


Figure 9. Islamic Pattern
Source: author's documentation

The transformation of Islamic geometry demonstrates that geometric repetition functions beyond decorative application and instead operates as a structural system regulating hierarchy, visual rhythm, and environmental continuity. In relation to Peirce's semiotics, repetitive geometric structures communicate Islamic identity symbolically, while modular consistency strengthens the indexical function of wayfinding through recognizable visual repetition. The continuous application of geometric rhythm across signage categories also contributes to environmental legibility by helping users identify navigational elements more efficiently.

Application Of Symbolic Color and Visual Identity

The transformation of Islamic geometry demonstrates that geometric repetition functions beyond decorative application and instead operates as a structural system regulating hierarchy, visual rhythm, and environmental continuity. In relation to Peirce's semiotics, repetitive geometric structures communicate Islamic identity symbolically, while modular consistency strengthens the indexical function of wayfinding through recognizable visual repetition. The continuous application of geometric rhythm across signage categories also contributes to environmental legibility by helping users identify navigational elements more efficiently (Fialkowski & Schofield, 2024).



Figure 10. Colour Palette
Source: author's documentation

Beyond symbolic meaning, color application also contributes functionally to environmental visibility (Paksi, 2021). User evaluation results indicate that the contrast between dark green and light green improved signage visibility in outdoor conditions and helped users identify informational elements more quickly. Respondents also associated the dominant green color with Islamic identity and environmental calmness, demonstrating that symbolic color contributed not only to aesthetics but also to institutional recognition and spatial orientation.

Information Hierarchy and Bilingual System

Beyond symbolic meaning, color application also contributes functionally to environmental visibility. User evaluation results indicate that the contrast between dark green and light green improved signage visibility in outdoor conditions and helped users identify informational elements more quickly. Respondents also associated the dominant green color with Islamic identity and environmental calmness, demonstrating that symbolic color contributed not only to aesthetics but also to institutional recognition and spatial orientation.



Figure 11. Font Style
Source: author's documentation

The typography system was selected based on considerations of Islamic visual identity, readability, and compatibility with the pesantren environment. Arabic typography reinforces institutional religious identity, while Latin typography ensures accessibility for broader users. The balanced arrangement between Arabic and Latin scripts minimizes visual clutter while maintaining compositional harmony.

Evaluation results indicate that the bilingual Arabic–Latin typography system improved accessibility and navigation comprehension for both pesantren residents and visitors. Users stated that the hierarchy between

primary information, directional arrows, and supporting text improved readability and reduced navigation confusion within circulation spaces.

User Evaluation and Design Effectiveness

Evaluation of the signage prototype was conducted through user responses involving members of the pesantren community and visitors who reviewed the simulated signage placements. The evaluation focused on Environmental Graphic Design parameters including legibility, visibility, and semantic clarity.

In terms of legibility, respondents stated that the typography hierarchy and contrast between text and background improved reading clarity from viewing distance. The bilingual Arabic–Latin system was considered readable while still maintaining the Islamic visual identity of the pesantren.

Regarding visibility, the modular geometric repetition and contrasting green color application helped users identify signage more quickly within the dense residential environment surrounding the pesantren. Respondents indicated that the signage was visually distinguishable from surrounding environmental clutter and easier to recognize across different circulation points.

From a semantic perspective, users were able to understand directional information, room identification, and symbolic visual elements without additional explanation. The repetitive Islamic geometric patterns were associated with the religious character of the institution, indicating that the signage system successfully communicated both navigational and symbolic meaning simultaneously.

Overall, the findings indicate that the integration of Islamic geometry, symbolic color, and bilingual hierarchy contributes not only to visual identity formation but also to navigation clarity and environmental communication effectiveness. The study demonstrates that Islamic geometric principles can function as structural components within Environmental Graphic Design rather than merely decorative visual elements, thereby supporting contextual wayfinding adapted to the spatial characteristics of the pesantren environment.

CONCLUSION

This study demonstrates how Islamic geometric principles and semiotic approaches can be integrated into the development of a contextual sign system for Pondok Pesantren Ribath Al-Falah, Mataram City. Through the geosemiotic visual transformation approach, Islamic geometric elements such as symmetry, repetition, modularity, and the Rub el Hizb pattern were transformed into structural components regulating hierarchy, visual rhythm, and environmental consistency within the signage system. The integration of symbolic green color, bilingual Arabic–Latin typography, and modular information hierarchy contributed to strengthening both navigational communication and institutional visual identity within the pesantren environment.

The findings indicate that Islamic geometry can function beyond decorative application and instead operate as a structural logic within Environmental Graphic Design. In relation to Peirce's semiotics, geometric repetition, typography, color, and directional symbols function simultaneously as communicative and symbolic elements that support spatial orientation and identity representation. User evaluation results also suggest that the signage system contributed positively to legibility, visibility, and semantic clarity, particularly in helping users recognize directional information and distinguish signage categories more efficiently within the dense residential environment surrounding the pesantren.

Nevertheless, this study remains limited to prototype-based evaluation and qualitative user responses within a specific institutional context. The effectiveness of the signage system has not yet been tested through long-term implementation or quantitative wayfinding performance measurement in real environmental conditions. Therefore, further research is recommended to explore comparative usability testing, user navigation behavior, and the application of geosemiotic transformation approaches in broader public or religious environments with different spatial characteristics.

Overall, this study contributes a contextual Environmental Graphic Design approach that integrates Islamic visual principles, semiotic

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communication, and wayfinding structure into a unified sign system framework for Islamic educational environments.

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