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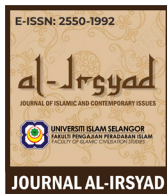
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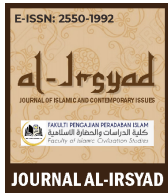
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Geometrics in the Illumination of Terengganu Quran Manuscript (L.M.N.T 2002.1)

[Geometri dalam Iluminasi Mashaf al-Quran Terengganu (L.M.N.T 2002.1)]

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Keywords:

Formalistic Visual Analysis,
Basic Geometric,
Illumination, Quran
Manuscript, Terengganu.

ABSTRACT

This article aims to identify the basic geometric structures found in the illumination of Terengganu Quran Manuscript (L.M.N.T 2002.1) collection. The study focuses on the appreciation of art, employing a formalistic approach to visually examine the evident basic geometric structures present in the illumination of the Quran Manuscript (L.M.N.T 2002.1). The research methodology involved observing the illumination of Quran Manuscript (L.M.N.T 2002.1) and analysing the basic geometric structures based on formalistic aspects such as elements of art and principles of design through formalistic visual analysis using Adobe Illustrator software. In general, the illumination image displays the shape of a rosette or medallion. This character is also viewed in the cosmology perspective whereby it is a resemblance of a glowing star and the shining sun. This is appropriate with the concept of lighting or *Shamsa*. The findings of this research indicated some views on basic geometry in the illumination of Quran Manuscript (L.M.N.T 2002.1) as an introduction to new knowledge in the field of art in general.

Kata Kunci:

Analisis Visual Formalistik,
Asas Geometri, Iluminasi,
Mashaf al-Quran, Terengganu.

ABSTRAK

Artikel ini bertujuan untuk mengenalpasti struktur geometri asas yang terdapat di dalam iluminasi mashaf al-Quran Terengganu iaitu koleksi mashaf al-Quran (L.M.N.T 2002.1). Penyelidikan ini bertumpu kepada apresiasi seni di mana pendekatan formalistik digunakan untuk melihat secara zahir struktur geometri

asas yang ditemui di dalam iluminasi mashaf al-Quran (L.M.N.T 2002.1). Metodologi penyelidikan melibatkan pemerhatian terhadap iluminasi mashaf al-Quran (L.M.N.T 2002.1) dan menganalisis struktur geometri asas berdasarkan aspek formalistik seperti unsur seni dan prinsip rekaan melalui analisis visual formalistik seni menggunakan perisian Adobe Illustrator. Secara keseluruhan gambaran iluminasi memaparkan reka bentuk 'rosette' atau 'medallion'. Reka bentuk ini turut dilihat dari sudut perpektif kosmologi di mana ia kelihatan seakan bintang yang bersinar dan matahari yang memancar bersesuaian dengan konsep pencahayaan iaitu 'Shamsa'. Hasil penemuan dalam penyelidikan ini menemui beberapa pandangan terhadap struktur geometri asas di dalam iluminasi mashaf al-Quran (L.M.N.T 2002.1) sebagai pengenalan kepada ilmu baru dalam bidang seni lukis secara umumnya.

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I. INTRODUCTION

The use of the phrase “*Lā ilāh illāllāh Muḥammad al-Rasūlullāh*” in Islamic art reinforces the values of *tawḥīd* (oneness of God) and the faith of Muslims. It carries profound meaning and serves as a reminder to Muslims about the concept of beauty that lies in devotion and obedience to Allah (Abu Hassan, Amin & Tohid, 2017). In Islamic art, the concept of *tawḥīd* influences the choice and emphasis on elements in artwork. The concept of *tawḥīd* asserts that Allah is the only One God, and there is no partner or physical form that can be compared to Him. Therefore, Islamic art rejects the depiction of figurative or direct representations of Allah and living creatures (Sabri, Mokhtar & Mahamood, 2022).

Instead, Islamic art develops the use of abstract elements that focus on geometric shapes and arabesque patterns. Geometry and arabesque are used to create intricate symmetrical patterns without depicting human or animal forms (Omar Basaree, Md Nawawi, Md Khalid, Mohd. Firdaus, & Ahmad, 2012). Geometric patterns in Islamic art reflect the beauty and order ordained by Allah in His creation. They also portray the perfection and harmony of the universe (Azad, 2020). For example, star patterns, hexagons, and other geometric motifs are often used in the ornamentation of the Quran, mosques, and other Islamic artworks. Meanwhile, arabesque is a decorative pattern composed of vegetal or geometric elements that are rhythmically repeated. Arabesque creates a sense of continuous movement and rhythm, reflecting the ongoing life within Allah's creation. By understanding the concept of *tawḥīd* and its application in Islamic art, society can appreciate the uniqueness and beauty of geometric and arabesque art, as well as understand how this art communicates Islamic values and beliefs through the use of abstract elements.

1.1 Objective

This article is conducted with the intention to identify the geometric structure viewed in the illuminated Quran manuscripts (L.M.N.T 2002.1). It is also to honour the method used to design an illuminated Quran in the Malay kingdom that is rich in adapting the skill and the nature motives effectively. The next intention is to seek the

basic structure development, the patterns and motives used which depict accuracy and the skill of using basic geometric patterns.

1.2 Significance of the Study

The decorative motifs found in Quran manuscript are meticulously crafted by skilled illuminators. These intricate designs and embellishments aim to enhance the beauty of Quranic illumination (Gallop, 2012). The study conducted on this Quran manuscript primarily focuses on a formalistic approach, emphasizing the analysis of visual elements within the decorative elements of Quranic illumination.

However, it is important to emphasize that the study has yet to comprehensively encompass iconographic analysis. Iconography involves the interpretation and analysis of symbolic and meaningful content depicted in artworks. Iconographic studies delve deeper into layers of meaning, symbolism, and narratives conveyed through illustrations, calligraphy, and other visual elements present in the Quran manuscript (Mohd Din, Mokhtar, Wan Muhammad Daud, Muhammad & Mudzafar, 2021). The vast treasury of Islamic art, encompassing various forms of artistic expression, serves as a significant source of inspiration for scholars and researchers. In this broader context, the art found in Quran manuscript, particularly the decorative art, holds immense value and deserves thorough study and full appreciation. By exploring the intricate details and symbolism embedded in the decorative motifs, researchers can gain a deeper understanding of the cultural, historical, and spiritual significance encapsulated within the artwork.

Overall, the study of Quran manuscript, with its elaborate and captivating decorative elements, provides an opportunity to further explore and appreciate the richness of Islamic art traditions. It contributes to a more comprehensive understanding of the aesthetic and cultural dimensions of art (Omar, Ibrahim, Razali, & Hashim, 2021).

1.3 Scope of the Study

This research focuses on Quran manuscript (L.M.N.T 2002.1) kept by Terengganu State Museum Board. There are five Quran manuscripts in the Terengganu State Museum Board's collection where all are elaborately adorned with various types of decorations on the illuminated areas. However, this research only focused on Quran manuscript that is L.M.N.T 2002.1 where manuscript illuminated areas were analysed. The Quranic manuscripts possess several illuminated areas such as its framework or front (*muwajjah*) and the full decorated sheet. In correspondence to that, he also said that these decorated sheets were comprised of three sections; the front (opening page illumination), centre (middle page illumination) and the rear section (closing page illumination).

Terengganu Quran manuscripts (L.M.N.T 2002.1) is a collection of manuscripts under the possession of Terengganu State Museum Board. The size of this manuscript is 32.7 x 20.2 cm, and it uses papers from Europe, and Concordia watermark. This manuscript has 3 pages that are fully decorated on the main page, centre and rear pages. The manuscript illuminated sheets are decorated with expensive shiny gold, yellow, red, blue and the original paper colour on the non-coloured areas. These Quran manuscripts are mounted in leather cover of maroon colour with gold colour embossed engravings.

Figure 1

An Illuminated Decoration on the Rear Section of a Page of Terengganu Quran Manuscripts



Source: Terengganu State Museum

2. LITERATURE REVIEW

In general, the influence of Islam's arrival in the Malay Peninsula began in the 13th century. Historical evidence such as the discovery of the Batu Bersurat (Inscribed Stone) in Terengganu indicates the arrival of Islam during that time. In the 15th century, Malay kingdoms like the Sultanate of Malacca became centres for the spread of Islam in the region. Islam became the dominant religion in the Malay Peninsula and influenced the culture, social life, governance system, as well as the local arts and crafts. The government and royal institutions played a significant role in the development and dissemination of Islam in the Malay Peninsula. The writing or copying of the Quran in the Malay world is believed to have begun at least around the late 13th century. This occurred when Pasai, a state located at the end of the Sumatran archipelago, became the first kingdom in the Malay world to embrace Islam after the conversion of their Sultan or Raja. However, the writing of Islamic manuscripts using paper in Southeast Asia only began in the 16th century, and most of it started in the early 19th century. As for the complete illuminated manuscript of the Quran found so far, it is believed to have been produced in the 17th century. The writing of Quranic manuscripts in the Malay world progressed more rapidly due to the awareness of the society at that time to master the Quran. More Quranic manuscripts began to be produced in the 19th century or the early 20th century in various places and regions (Azmi & Abdullah, 2017).

The writing and production of manuscripts (using paper) were supported by the royal institution based on studies of illuminations with beautiful characteristics. The production of Quranic manuscripts became easier when paper became readily available in the market, which encouraged the people at that time to copy the Quran. However, due to the high costs of pigments, gold, and binding, this production was limited to the nobility and royal families (Barakat & Rusli, 2019). The Sultanate of Terengganu highly valued the Quran and actively promoted the production of Quranic manuscripts during that time. This proves that the role of caliphs, Sultans, and the government was crucial in producing the Quranic manuscripts and spreading them for the purposes of preaching and the development of Islam (Azmi et al., 2022). The history of Quranic writing and production in Terengganu started between the 18th and 19th centuries (Azmi & Abdullah, 2017). There have been various studies that discussed the illuminated decorations of Quranic manuscripts from Terengganu. However, the study on the Quran manuscript LMNT2002.1 is still lacking and has not been extensively examined, especially in terms of its illuminated decorations.

2.1 Quran Manuscripts

The Quran manuscript was revealed to Prophet Muhammad (PBUH) and narrated to the Muslims. The Quran is used as guideline and reference to mankind on this earth and to provide proof on the existence of the creator and divinely messenger that started with the first *surah al-Fātiḥa* [1] and ended with *al-Nās* [114]. The *Ayahs* (verses) revelation by Allah have its own in-depth meaning and can be clearly understood without any ambiguity, or implicitly understood that requires the Prophet Muhammad (PBUH) to explain and clarify in order to elaborate the verses through the Prophet's hadith (Harun, Lubis, & Abdul, 2010).

This most precious and sacred treasure of the Muslims is managed with full attention, love and sense of respect. The content in the Quran is the best and is incomparable to other religious text. The beauty is not just in the words but also the meanings. It has its own structure that makes reading easy. There are *Suwar* (surahs) or chapters in the Quran, divided into 30 *juz'* (parts), 6616 *ayahs* (verses), 779934 sentences and 323671 words. Every *juz'* contains words, sentences, verses, paragraphs, diacritic markings and total markings for the verses read. These areas contain decoration and reflectors. All decisions pertaining to decorations on texts and folios were made with the intention of helping with the readings including to awaken the emotion and aesthetic feel (Md Zain, 2007).

In the 19th century or early 20th century, an increasing number of Quran manuscripts were produced in various locations across Southeast Asia, including the Sultanate of Aceh, Banten, Sumatra, South Sulawesi, Terengganu, Patani, Kedah, Yogyakarta, Cirebon, Mindanao, and others. The oldest and earliest known Quran manuscript was produced in Kedah. This manuscript is preserved in Masjid Raya Sultan Riau located in Pulau Penyengat, Riau Islands, Indonesia (Azmi, 2017).

The popular Quranic ornamentation features the use of basic colours and accents of gold, showcasing the artistic aspect influenced by local culture (Azmi & Abdullah, 2018). The Quran manuscripts exhibit exquisite decorative styles, intricate calligraphic craftsmanship, and a luxurious appearance, illustrating the involvement of royal institutions during that time. The calligraphy is meticulously written using easily legible colours, often supplemented with gold as a symbol of opulence. Basic markers such as the *juz'* markers, chapter headings, *niṣf* markers, *sajadah* (prostration) markers, and others are adorned beautifully and differ from one another (Azmi & Abdullah, 2018).

2.2 Illumination as Art in Quran Manuscripts

In Greek language, illuminate is phrased as “*illuminare*” which means illumination in English language. The term illumination here is the description for lighting or brightening by decoration using gold, silver, and colourful materials (Omar et al., 2021). An example is the Terengganu style manuscripts which have beautiful and elaborated deco using gold glitter. According to Gallop (2007), illumination means every decoration used is to beautify the texts. Various colours like gold and silver were used including monochrome colours with tints of black and red. According to Azmi & Abdullah (2017), illumination also refers to the decoration found on the pages of the manuscript of the Quran, involving patterns and colours. He also stated that the illumination can be divided into several sections, as follows:

- i. Opening page illumination - This page contains Surah *al-Fātiḥah* [1] and the beginning of surah *al-Baqarah* [2], starting from verse 1 to verse 4.
- ii. Middle page illumination - This page contains a portion of surah *al-Kahf* [18].
- iii. Closing page illumination - This page includes the last three surahs, namely *al-Ikhlāṣ* [112], *al-Falaq* [113], and *al-Nās* [114].

According to Md Zain (2007), the decorative styles of Quran manuscript in the Malay world are categorized based on characteristics such as colour, overall format, decorative format, and *sulur* motifs. He also introduced various elements in manuscript illumination, including *Muwajjah*, *Shamsa*, frames, *jidar*, *sulur* motifs, and domes. Md Zain (2007) is a prominent researcher who is well-versed in studies related to illumination art. He described manuscript illumination as a hidden beauty that needs to be explored, where these decorative arts reflect the philosophy of the Malay world. His research findings are widely referenced and utilized in exploring the art of manuscript decoration.

2.3 Pattern/Geometric Use

One of the major forms of Islamic art is the geometric design that is used to provide a symmetrical accuracy especially in architecture. Most craftsmen or makers use several simple shapes such as circles, squares, stars, lozenges and hexagon, while mixing them to form a beautiful art piece. The Egyptian people used the term ‘land measurement’ prior to changing into Greek language that described geometry as ‘geo’ which means earth and ‘metric’ that give the meaning of measure or earth measurement (Abd Rahim, Ujang & Said, 2018). Geometric objects inclusive geometric space depicts the abstract elements such as dots, lines, cubes, spheres, and several others. The dots, lines and the geometric field are the base terms (Arlin, 2020). In mathematical term, geometry provides an approach to solving problems pertaining to diagrams, figures, systems, coordination, vectors, and transformations (Abdussakir, 2012). Geometry is a shape created using straight lines which is formed by using the measurement skill with circles, ovals, triangles, squares, rectangles, pentagons, hexagon and several other shapes. The development of these geometric shapes has the character of being well structured, formal and organized which make it arranged into proper dynamic shapes. This is done through calculation, distance, measurement, and change of direction, rounding, transformation, scaling change and symmetry (Suharyoso, 2021).

Several Islamic scholars had contributed in the development of this geometric field that is still used until today. An Islamic scholar named *al-Khawārizmī* made improvements in several areas pertaining to geometric knowledge in the 19th century. Though he was better known as the father of algebra, he had also contributed to the development of geometry and discovered several new ideas related to space (Ramli, Othman, Wan Alias, Wan Nordin & Rosli, 2022). As such, Islamic arts in particular comprise of three main subjects namely the calligraphy, floral patterns and geometric patterns. In general, these elements are combined and used on the same object. Geometric shapes and floral are two important components in Islamic arts because any subject related to human and animals are prohibited. Although the main objective of geometric and floral patterns is for decorative reason, it has several Euclidean rules and geometric structures. The patterns are used on several types of surfaces such as tiles, glasses, papers, woods, plasters, metals, stones and bricks. Islamic patterns are usually seen on the *mihrab*, podium (*mimbar*), window shutters and doors, the water fountain façade, tiles, the Quran stand (*rehal*), ceilings and walls (Cenani & Cagdas, 2007).

A covered geometric polygon is one of the most popular two-dimensional geometric shapes in Islamic art. The geometric decorations and floral patterns are derived from certain geometric regulation. An example of such regulation is the isometric transformation that contains transition, rotation, reflection, and sliding reflection. This rule is also called as Euclidean transformation (Cenani & Cagdas, 2006). Prior to this, the primary

tools to build a geometric pattern were just a compass and a ruler. Both tools were able to produce drawings of circles and lines. The geometric decorative patterns can be traced specially in the Islamic architecture which is a source of inspiration to artisans whether through the ideas of structure form, symbolic or aesthetics (Al-Arifi, 2023).

Illuminated pages are often adorned with intricate and detailed geometric embellishments. For example, circles, squares, hexagons, and other geometric patterns are used to create motifs that adorn the margins of the pages, fill empty spaces around the Quranic text, or form decorative frames around illustrations or calligraphy (Al-Yassiry & Twajj, 2020). For instance, geometric motifs such as regular stars, double patterns (interlocking triangles), or repeated interlaced patterns forming geometric grids are often used as ornaments in Quranic illuminations. These patterns are often combined with other elements such as flowers, leaves, or Arabic calligraphy to create harmonious and aesthetic compositions. The geometric patterns applied in Quranic illumination not only provide visual beauty but also hold deep meanings and symbolism within the context of Islamic art. For example, circles symbolize unity and eternity, while star patterns represent the beauty and complexity of the universe. The use of geometric ornamentation reflects Islam's understanding of beauty as a reflection of the order of nature and a broader understanding of the cosmos (Khasawneh, 2020).

Geometric ornamentation is frequently used in the process of illuminating the Quran to embellish the pages and complement other artistic elements within the manuscript. Geometry is regarded as an essential element in Islamic art, and its use in Quranic illumination provides visual beauty and aesthetic harmony to the pages of the Quran (Jahameh, 2020). However, the Malay culture is rich in patterns and floral motifs. The use of floral elements in Malay art reflects the deep appreciation and connection to nature within the Malay culture. Floral motifs are often intricately designed and incorporated into various art forms such as textiles, wood carvings, ceramics, and architecture (Ismail & Hamdan, 2019). The geometric patterns used in Malay art are limited; unlike the Islamic art of the Middle East. Nevertheless, the practice of using geometric design in Malay art is enhanced when it is used as a structure in designing that acts as a base to related motives. The illumination art is known as a form of Malay art, which uses complex geometric shapes. The traditional practice of decorating Quran manuscript was said to be stopped in the 20th century including the knowledge buried since then (Gallop, 2010).

As such, the researcher has step forward and take an initiative to research on different aspects of designs through this Quran manuscript LMNT 2002.1. It is necessary to identify the designs in order to prove the use of basic geometric in the design. This research involves observing the illumination of the Quran manuscript and analysing the basic geometric structures based on formalistic aspects such as lines, shapes, colours, and space. The importance of this identification is to provide compelling evidence on the use of basic geometric in the design found in the Quran manuscript.

3. METHODOLOGY

This research involved field observation by examining the illumination of the Quran manuscript (L.M.N.T 2002.1). The observation process was conducted by capturing visual images through photography and making manual notes. Subsequently, the researcher analysed the basic geometric structures based on formalistic aspects such as elements of art and principles of design through formalistic visual analysis using Adobe Illustrator software. The methods used by Sulaiman (2019) in her research involved examining paintings through two observation methods: non-participant observation and observation through notes or checklists. Meanwhile Padil (2019) focused on visual image recordings that involved the use of photography with the aim of exploring and observing.

The researcher's approach here will enable us to understand the Malay's excellent culture. The word formalistic is derived from the word form that indicates formal quality, adapted to elements of arts; emphasizing on forms and not the content where the form and content are complimentary in every artwork (Hashim et al., 2021). In the next step the researcher shall bring forward the geometric base structure by drawing lines using the Adobe Illustrator software. This analysis entails the process of sketching the illuminated structure design, motive structure and details of every motive available on the sheets.

3.1 Formalistic

In a particular artwork, formalistic aspect can be seen through its physical characteristics while the content is derived from the meaning of the artwork. Formalistic is the physical characteristics which are significant in the analysis and assessment of an artwork. In art history, it is one way to criticize and analyse a certain artwork. The

formalistic approach in art is divided into two parts, namely the elements of art and the principles of design (Ibrahim, Razali, Omar, Hashim & Badaruddin, 2020).

The elements of art being used in this research include lines, shapes, forms, colours, and space. Meanwhile, the principles of design refer to harmony, variety, proportion, balance, rhythm/movement, contrast, unity, patterns, and emphasis. According to Ocvirk, Stinson, Wigg, Bone & Cayton (2012), the elements of art are fundamental components that contribute to the creation and appreciation of artwork. These elements include line, shape, form, colour, value, texture, and space. Each element plays a crucial role in conveying artistic expression and communicating meaning to the viewer. By evaluating these elements in artwork, one can assess its visual impact, technical skill, creativity, and ability to communicate ideas or emotions.

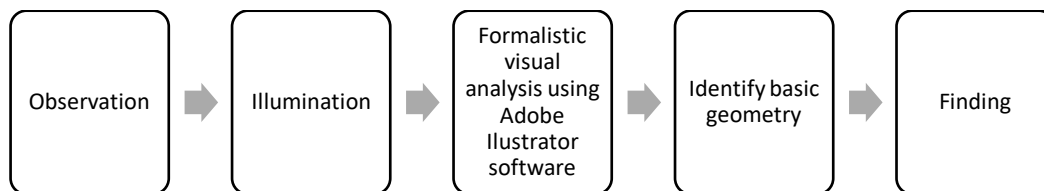
3.2 Basic Geometric

According to Pendergrast, Lipka, Watt, Gilliland and Sharp (2019), geometric elements refer to four basic shapes or "repeating units" that form more complex patterns. These basic shapes include circles, squares or quadrilaterals, star patterns, triangles, and other polygons. Examples of basic geometric shapes include:

- i. Circle: A geometric shape with a radius that is the same distance from the centre to every point around its circumference.
- ii. Square or Quadrilateral: A geometric shape with four equal sides and four equal angles.
- iii. Star Pattern: A geometric shape that forms a pattern resembling a star, with interconnected and protruding sides.
- iv. Triangle: A geometric shape with three sides and three angles.
- v. Other Polygons: Geometric shapes with multiple sides and angles, such as pentagon, hexagon, and so on.

In illuminated Quran manuscript, there are various types of geometric patterns that adorn the background of the pages, the structure, and surrounding the text of the Quran. These geometric patterns provide aesthetic beauty and rich symbolism in illuminated Quran manuscript (Jahameh, 2020).

Figure 2
Workflow Chart



4. FINDING

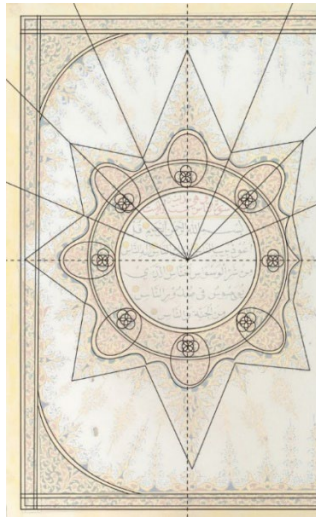
Figure 2 is sketched by the researcher using lines and looks with an intention to portray the basic geometry structure. Adobe illustrator software is used to give an accurate picture of the lines and appearance. This illumination sheet appears to be symmetrical when it is two identical sheets decorated in pairs. At an early stage, the researcher made a sketch on the left side of the sheet. This illumination sheet space is divided into vertical and horizontal. The shapes near the margin section have square structures that act as layered frame and support the circular motive inside. The centre illumination holds a round structure that acts as a centre point. The circles are then encompassed with eight dome structures embellished with entwined floral motifs. The structure and space on the dome are triangular while the floral motifs spread to the top.

This dome is positioned below the oval-shaped element on every eight dome structures. All the domes are connected to each other with two connected curves. The frame on the round structure encompasses four small circles that are inside every oval structure. Four small round circles are merged to form the motifs. The position of this small structure in every oval element is seen as not in a fixed angle. In general, the illumination image displays the shape of a rosette or medallion. This character is also viewed in the cosmology perspective whereby it is a resemblance to a glowing star and the shining sun. This is appropriate with the concept of lighting or *Shamsa*. *Shamsa* medallions, which are ornamental illuminated rosettes, were commonly employed as frontispieces in various books, particularly in Qurans. These medallions served as a means to honour and

celebrate the book's owner or patron, with their name often featured at the center. *Shamsa* medallions are found to be particularly significant in Quran, as depictions of animals or individuals are strictly prohibited. However, these medallions offer an elegant and permissible form of decoration for the sacred manuscript (Khazaie, 2023).

Figure 3

Line Sketch and Geometry Appearance



5. RESULT AND DISCUSSION

In reference to the analysis on basic structure of geometric shapes in this illumination, the researcher made a conclusion that there is a use of basic geometric found in illumination design of Quran manuscript. This indicated the wisdom of the locals and their high knowledge in Quran manuscript embellishment at that moment. With this uniqueness in decorating, it reflects their creativity and expertise of the decorators.

Table 1

Result of Formalistic Visual Analysis

Elements of Art		Principles of Design	
1.	Line- Vertical, horizontal, diagonal	1.	Balance-Symmetry is observed in both illuminated pages, the centre illumination holds a round structure that act as a centre point
2.	Shape (geometric)-Square, circle, triangle, oval	2.	Repetition of patterns and geometric structures- Layered frame
3.	Colour-Shiny gold, yellow, red, blue and the original paper colour on the non-coloured areas.	3.	Rhythm - All the domes are connected to each other with two connected curves, the structure and space on the dome are triangular while the floral motifs spread to the top.
4.	Space -Filled with patterns or decorations	4.	Harmony - Uniformity of colours used especially shiny gold and yellow colour.
		5.	Unity- oval-shaped element on every eight dome structures, four small round circles are merged to form motifs.

The results of the analysis lead into two perspectives:

- i. Compass and ruler were used by decorators at the time. According to Gallop (2012), there was certainly some use of mechanical implements: the base circles of the marginal ornaments were drawn with a compass, and a semicircle motif commonly found around the outer frames may have been stencilled.

Based on the illumination of Quran manuscript LMNT 2002.1, the basic geometric structure such as the central circle demonstrates the use of a compass as a perfect focal point supporting the surrounding motifs and patterns.

- ii. After the analysis, it was found that there were repetition details on every structure and the geometric elements were not in the same fixed position. The researchers also argued that the decorators did not fully use measuring equipment in overall illumination. The techniques used may be difficult for us to identify how the decorator can complete the structure and decoration in such illumination without the presence of significant shortcomings. This is supported by the findings of Gallop (2012) in which there is an unfinished illumination that shows the illuminating decorator at the time used inks directly on paper without using a pencil.

In illuminated Quran manuscript, geometric patterns play a significant role in the overall design and visual appeal. These patterns are meticulously crafted and intricately woven to create a harmonious and visually stunning composition. The geometric patterns found in illuminated Quran manuscript often consist of repetitive and symmetrical elements. These patterns can include intricate interlocking designs, tessellations, and complex geometric motifs. Common geometric shapes used in these patterns include Square, circle, triangle and oval-shaped. These shapes are combined and arranged in various ways to create mesmerizing patterns that fill the pages with beauty and elegance (Al-Yassiry & Twaij, 2020).

Geometry patterns can also be applied with philosophy and implicit meanings such as circular shapes. It is associated with the meaning of no beginning and no end or as a symbol of eternity (Zakaria, 2011). The circle shape symbolizes the emphasis on One God and the role of the qibla in the Kaaba, Mecca for Muslims. From a spiritual point of view, it should remind us of what is meant as human beings, in the universe and our role as the caliph of God on earth (Isa, 2021). The use of geometric patterns in illuminated Quran manuscripts goes beyond mere decorative elements. They also hold symbolic significance. The repetition and symmetry of these patterns symbolize the unity and perfection of God's creation. They reflect the divine order and harmony present in the universe. The concept of tauhid, which is the basis of Islamic art in particular, represents the spiritual and physical aspects of the life of Muslims. The forms of geometry, repetition and variation reflect the fundamentals of Islam's belief in a chain of natural events and the harmony that comes from different elements to unity (Abd Rahim et al., 2018). Moreover, the precise execution of these geometric patterns demonstrates the skill and craftsmanship of the artists and calligraphers involved in the creation of illuminated Quran manuscript. The meticulous attention to detail and the intricate interplay of shapes and forms showcases the dedication and reverence of the sacred text.

6. CONCLUSION

In conclusion, the basic geometric structure found in the illumination of Quran manuscript (L.M.N.T 2002.1) describes the ability of decoration at the time to use the expertise and mastery of such high manufacturing techniques. The techniques and methods of decoration are unknown but based on clear findings, it indicated that the decorators had a sharp mind so that they were able to produce symmetrical, balanced illumination and such beautiful pattern repetition either using measuring equipment or not. Observation through the combination of formalistic aspects of art and the basic structures of geometry are the key approaches of this study to unravel the secrets behind the techniques of production of art of illumination especially the Quran manuscript. In addition, this study can be continued by studying in detail the symbols and implicit meanings behind the underlying geometric structure studied. Particularly, this illumination decorations from Terengganu showcase the colours of the golden beams that show the luxury and majesty which represented the king at the time. The illumination art depicts the skill and distinctiveness of the manuscript decorators in exposing the nature's beauty of the Almighty. Beauty as pictured in illuminated Quran manuscripts is priceless and important to be researched in order to raise the art and the Malays natural heritage. The uniformity, the fineness of its motif's decoration and the complex geometric structures proved obviously show they were highly creative. This is especially seen on the illumination design from Terengganu that reveals the colour of gold tinsel which shows wealth and majestic that signify the royalties then. Therefore, this treasured knowledge of Malay art heritage ought to be put forward and studied in-depth in several field of knowledge.

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