

Symmetry Patterns: An Analysis on Frieze Patterns in Malay *Telepuk* Fabric

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ABSTRACT

Research on the study of the motif and symmetry of the Malay Telepuk (Gilding Cloth) are not extensive in Malaysia. Many documented research by textile artists and researchers mainly touch on the history, aesthetics, motif representations/meanings, development of textile design and textile cosmology especially of the Songket and Batik. The Telepuk or Gilding Cloth is generated from the technique of enhancing and beautifying cloth using gold paper. The Malaysian States of Selangor, Perak, Kedah, Johore, Pahang, Terengganu and Kelantan are the main producers of the Telepuk (Gilding Cloth). This paper is an analysis and the classification of the structure of the design pattern of the Telepuk (Gilding Cloth) through its symmetrical group that is the frieze pattern. The design pattern analysis is carried out on the cloth structure (badan kain, tepi kain, kaki kain and kepala kain) the sarong, kain lepas or selendang and the headgear. The sample of the Telepuk sourced from the Selangor State Museum was selected and reproduced in the form of a sketch using Adobe Illustrators. The design pattern of the Telepuk resulting from this study will be documented and catalogued and serves as a useful guideline for relevant professional bodies as well as serving as a database for future reference. The study contributes effectively in the use of the grid system in the process of pattern and motif design from the creativity of Malaysian Telepuk (Gilding Cloth) weavers. It also serves as evidence of the existence of geometrical and symmetrical patterns in the Telepuk (Gilding Cloth) that will be useful to the Telepuk design industry, leading to it being an effective model to the other Malaysian arts and craft in coming out with ideas in motif and pattern design.

Keywords: *Telepuk (Gilding Cloth), Geometrical, Symmetrical Groups and frieze patterns.*

1. INTRODUCTION

The Malay proverb that gives prominence to quality and popularity, *Tidaklapukdehujantidaklejangdepanas*, has often been used to portray the Malay textile, the *Telepuk*. Just as other fabrics, the *Telepuk* has been used by the Royal Households especially during the reign of the Old Malay Sultanate in the 15th century. Since the 18th century, the *Telepuk* was increasingly popular in Selangor, Pahang, Terengganu, Perak, Kedah, Melaka and Johore [15]. The *Telepuk* is an age-old fabric decorated by gold prada paper applied on the fabric using Arabic Gum as adhesive [11]. The definition of *Telepuk* is closely linked to material that has been enhanced with the sprinkling of gold water. The *Telepuk* too, has been assigned a wider usage, that is, *bertelepukkan* meaning the use of *Telepuk* [14].

Motif is an important element in the ornamentation and pattern design. The various styles in motif arrangement are referred to as the pattern design. The common motifs used in the Malay textile are sourced from the flora, fauna, the world and the cosmos. While the pattern design is focused on geometrical shapes, realistic, and abstract styles [5]. Motif forms in the *Telepuk* are flora-based like *bunga kenanga*, *bunga cempaka*, *bunga cengkih*, *bunga tanjung*, *sulur*, *pucuk rebung* and *awan larat* patterns [13, 15].

The layout design of the Malay textile has six distinct types[4, 10 &12]. The six main designs in the textile layout are rhomboid patterns (*corak songket teluk berantai*) or full patterned songket (*corak songket bunga penuh*), spotted, scattered or isolated pattern (*corak songket bunga bertabur*), striped or banded patterns (*corak songket jalur berdiri & corak jalur melintang*), chevron pattern or zig-zag pattern (*corak songket corak siku keluang*), checked pattern (*corak songket tapak catur*) and bamboo shoot patterned songket (*corak songket pucuk rebung*).

The concept of symmetry inspires the artistes and scientists [6]. Symmetry evokes the sense of balance and harmony, and wholesome or partial organic linkages. Symmetry helps the designer unravel complications of design in developing the work of art. Basically, the weaving technique has the tendency to lead the motif design becoming geometrical. Weaving motifs generally has symmetrical lines. Symmetry is one of the elements of geometry. The word symmetrical transformation and operation is linked closely to the process of repetitive repositioning of motif in forming a pattern design. The repetitive motif and pattern design process may be classified into symmetrical characteristics such as translation, reflection, rotation and glide reflection.

Frieze patterns were discovered and studied some 100 years ago. In mathematics, there is one group set known as symmetrical group [17]. This group functions as a guide in the process of structural categorization of a pattern design. Frieze patterns fall under 2 dimensional pattern designs. Seven types of pattern designs have been discovered in Frieze patterns. These seven pattern designs are identified through motif motion that moves in only one direction. Frieze patterns can be seen in spotted, scattered or isolated pattern (*corak songket bunga bertabur*), striped or banded patterns (*corak songket jalur berdiri & corak jalur melintang*), chevron pattern or zig-zag pattern (*corak songket corak siku keluang*), checked pattern (*corak songket tapak catur*) and bamboo shoot patterned songket (*corak songket pucuk rebung*). In textiles almost all pattern designs used in the songket structure such as *kain punca*, *kepala kain*, *kaki kain* and *pengapit kepala kain* are Frieze patterns.

2. TELEPUK

Telepuk is the art of decorating fabric with gold dust. It is used to beautify the sarong that is worn for *kain dagang*, or *kain persegi* used as *tengkolok* or *tanjak*. It was said that the art of *Telepuk* began in the 17th to the 18th century. It was brought and introduced to the Malay Archipelago through Bugis merchants from Sulawesi.

Telepuk is derived from the infusion of three important elements namely weaving, smoothening the fabric by rubbing or polishing it using the shell of a big snail, and the motif engraving template or mould that is specially crafted. The cloth or fabric that is used for the printing process should be woven finely and compact. It is polished using the shell of the snail before the printing process begins by using gold leaves or gold dust [1].

The pattern design of the Malay *Telepuk* fabric rests on six different basic patterns. They are rhomboid patterns (*corak songket teluk berantai*) or full patterned songket (*corak songket bunga penuh*), spotted, scattered or isolated pattern (*corak songket bunga bertabur*), striped or banded patterns (*corak songket jalur berdiri & corak jalur melintang*), chevron pattern or zig-zag pattern (*corak songket corak siku keluang*), checked pattern (*corak songket tapak catur*) and bamboo shoot patterned songket (*corak songket pucuk rebung*) [9&12]. Many of the *Telepuk* motifs are inspired by the flora and fauna and the surrounding environment. Subsequently the pattern created encompasses geometry, abstract, stylistic and realistic patterns [5].

The *Telepuk* has its own distinct fabric structure especially the sarong and *kain lepas (selendang)* fabric. On the sarong, the *Telepuk* fabric structure encompasses the head of the fabric, the *kepala kain*, *badan kain* dan *kaki kain* that include the *pengapit kepala kain* and the *kendik*. The *kendik* is the small section present on both the edges of the *pengapit kepala kain* and *kaki kain sarung* (refer to Figure 1). The structure on *kain lepas* comprise the *punca kain*, *badan kain* and *kaki kain* (refer Figure 2).

A) Structure of *kain sarung*

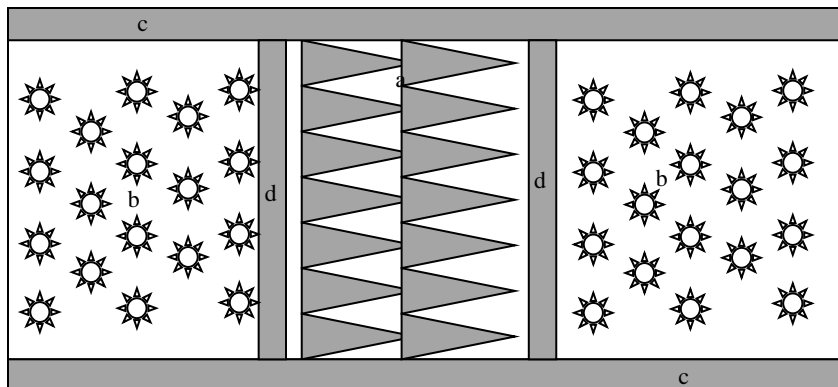


Figure 1. a) *Kepala kain* , b) *badan kain*, c) *kaki kain*, d) *pengapit kepala*

B) Structure of kain sarung

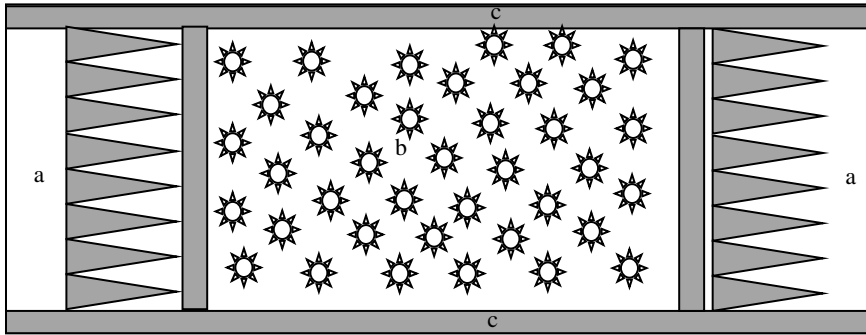


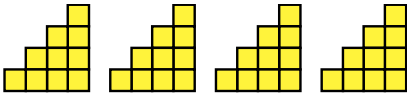
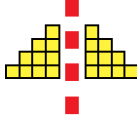
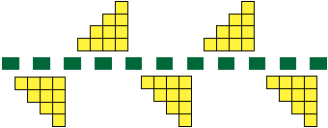
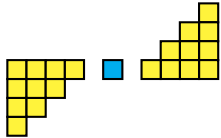
Figure 2. a) Punca kain, b) badan kain, c) kaki kain, d) pengapit badan kain

3. GEOMETRY, SYMMETRY AND FRIEZE PATTERNS

Geometry is a Greek term where 'Geo' refers to the earth or the world and 'Metria' means measurement [3]. The study of Geometry touches upon shapes, sizes and the relative positioning from a diagram and spatial characteristics such as circle, oval, triangle, square and polygon. Geometrical designs or patterns are formed from geometrical objects that have been arranged methodically by specific repetitive units [16].

Summetria which points to the similarity of balance in measurement is also a Greek word. *Summetria* or symmetry is evident where an object has a middle line or axis dividing two parts equally. This object remains fixed and unchanged even if it is flipped over or spinned. Hence, symmetry is a form of inversion or reflection. This is also a notable element in Geometry. In creating pattern design especially for textiles, an object or motif may be categorized under four basic transformation forms or symmetrical operations and they are; translation, reflection, rotation and glide reflection [8]. Refer Table 1: Transformations or symmetry operations.


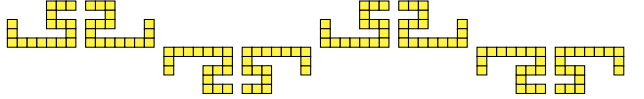
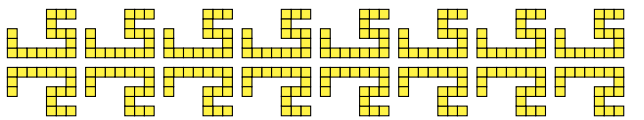
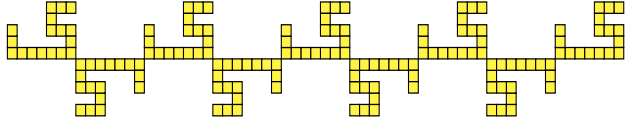
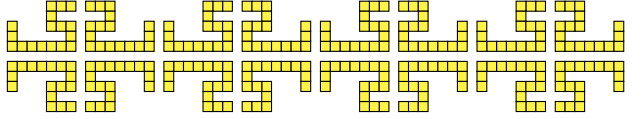
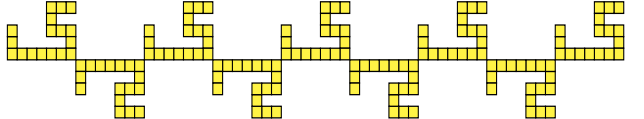
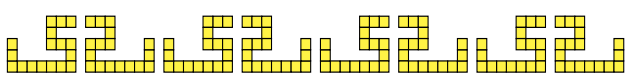
Table 1. Transformations or symmetry operations

Transformations or symmetry operations	Samples
Translation	
Reflection (Horizontal and Vertical)	
Glide reflection	
Rotation (Rotations of orders two, three, four & six fold. The angle of rotation can be 60°, 90°, 120° & 180°)	

The transformation set that forms a symmetrical pattern design has a specific structure group. This group structure is named as the symmetry group of the pattern and it comprises three forms made up of the 2 dimensions (frieze pattern and wallpaper pattern) and 3 dimensions (crystal patterns) [17].

Frieze patterns are decorative pattern designs or repetitive stripes known as border patterns [2]. The term frieze is used from the decorative patterns from architecture. The décor and design pattern forms are more horizontal and they can be mostly observed in the straight lines below the roofs or ceilings. Frieze patterns have seven design patterns [7]. The design patterns can be seen in the Malay *Telepuk* fabric. There are seven types of Frieze Patterns (Refer Table 2: Seven types of Frieze Patterns):

Table 2. Seven types of Frieze Patterns

Symbols of Frieze Patterns	Frieze Patterns	Descriptions
11		Translation only in horizontal directions
mg		Vertical reflection Two fold rotation Glide reflection
1m		Horizontal reflection
12		Two fold rotation
mm		Horizontal and vertical reflection Two fold rotation
1g		Glide reflection
m1		Vertical reflection

4. RESEARCH DESIGN

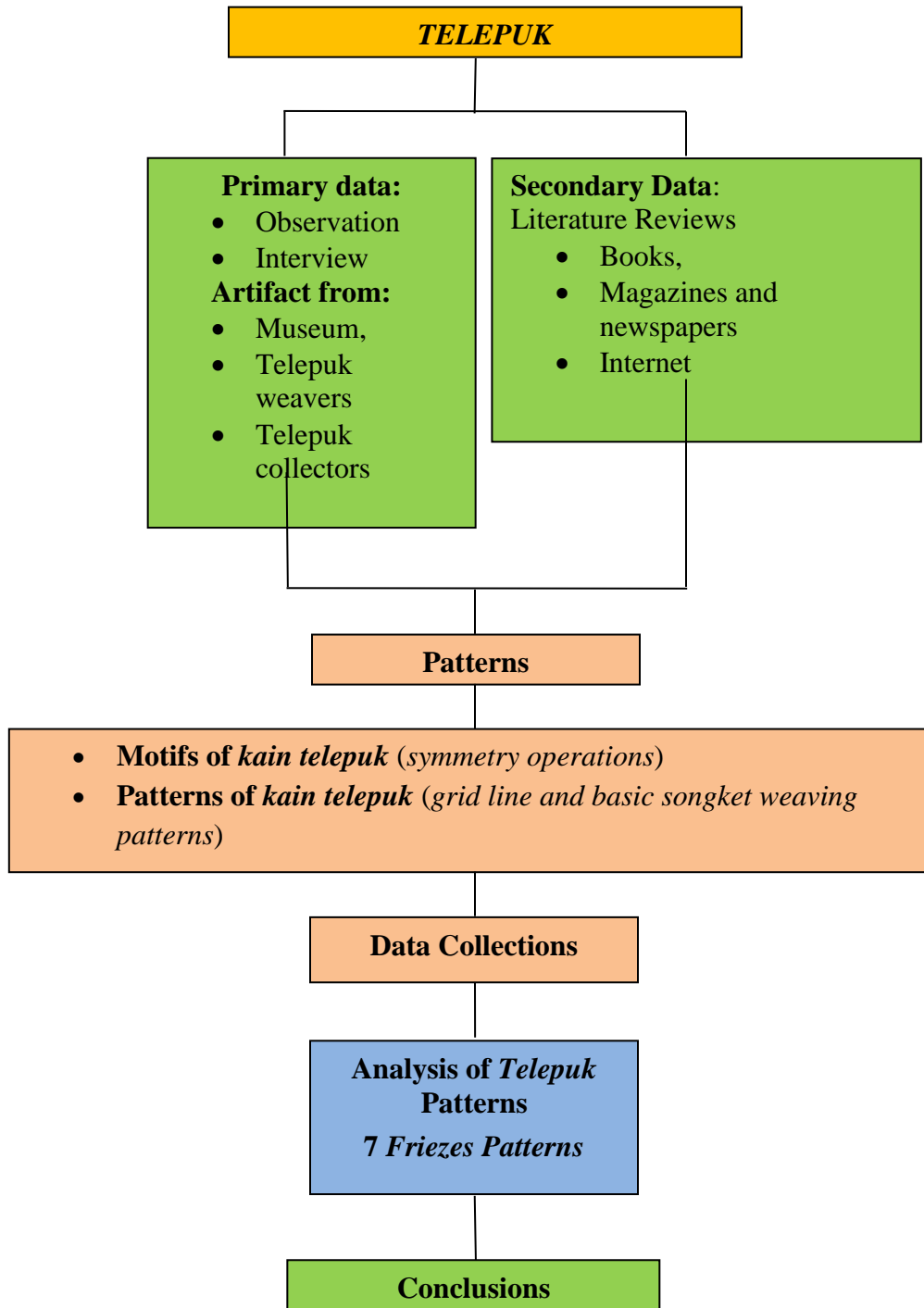


Figure 3. Research Design

The study of the *Telepuk* began with data collection from primary and secondary sources. The data collection stage aims to provide an understanding of and classifying geometrical design characteristics in the design of the *Telepuk* fabric. Samples of the *Telepuk* fabric were made available by the Selangor State Museum, which is also the producer and collector of the *Telepuk*. Simultaneously, interviews were conducted with individuals having the knowledge and experience of the Malay *Telepuk* especially in dealing with the *Telepuk* design pattern.

10 fabric samples were selected with the objective of identifying characteristics of geometrical pattern design in the *Telepuk* fabric design (the *kain sarung*, *kain lepas* / *selendang* and *tanjak*). The selected motifs and *Telepuk* pattern designs are translated into a sketch form using the Adobe Illustrators. The method used in classifying the geometrical pattern designs in the *Telepuk* fabric design is by 4 types of symmetry operations: translation, reflection, rotation and glide reflection, as well the symmetry group of Frieze patterns. Descriptive analysis was conducted upon completion of data collection.

5. FRIEZE PATTERNS IN THE TELEPUK FABRIC

Frieze patterns are 2 dimensional and they belong to the symmetry group. The pattern designs of the Frieze patterns come in stripes, formed in one direction, a single path or one straight line. This design can be seen in objects that have sections or edges. These sections or edges serve as separators to specific parts of the object design patterns. Based on the elements of symmetry, frieze patterns are categorized into 7 types. Frieze patterns can be identified on various parts; the *badan kain*, *punca kain*, *kepala kain*, *kaki kain* and *pengapit kepala kain* in the structure of the *sarong*, *kain lepas songket* and *tanjak*.

A) Classification of frieze pattern on *kain lepas*: *Corak bunga tabur*

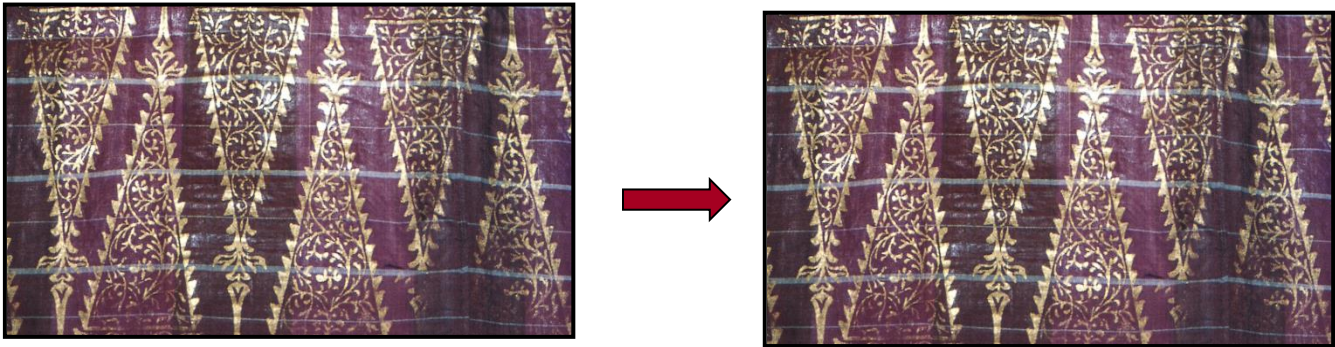


Figure 4. Frieze patterns on *punca kain* (*kain lepas*). *Corak pucuk rebung* is found as translation type 11 (frieze patterns)

B) Classification of frieze pattern on *kain sarong*: *Corak bunga penuh*

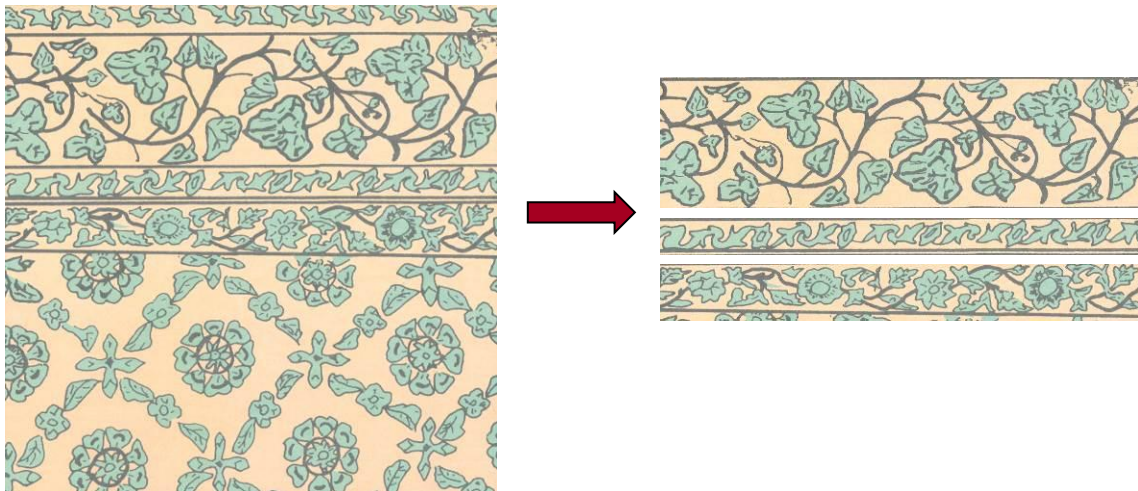


Figure 5. Frieze patterns on *pengapit kepala kain* (*kain sarong*). Arrangement of *bunga pecah empat* motif is classified as frieze patterns of translation type 11

C) Classification of frieze pattern on *kain sarong*: *Corak bunga tabur*

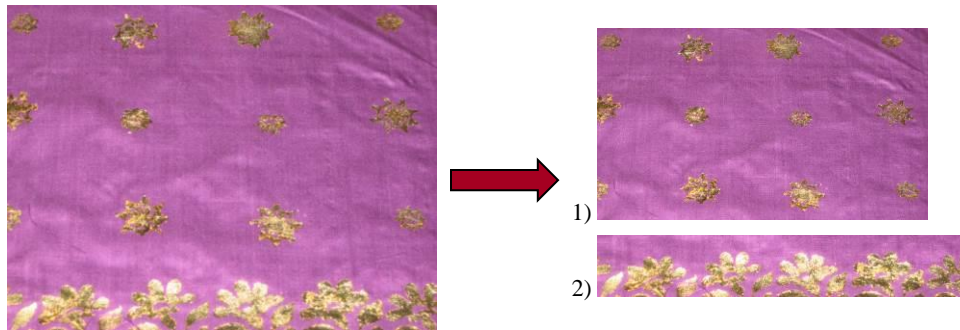


Figure 6.

- 1) Motif of *bunga pecah lapan* on *badan kain* is classified as frieze patterns of translation type 11.
- 2) Motif of *bunga on kaki kain* is classified as frieze patterns of translation type 11.

D) Classification of frieze pattern on *tanjak*: *Corak tapak catur*

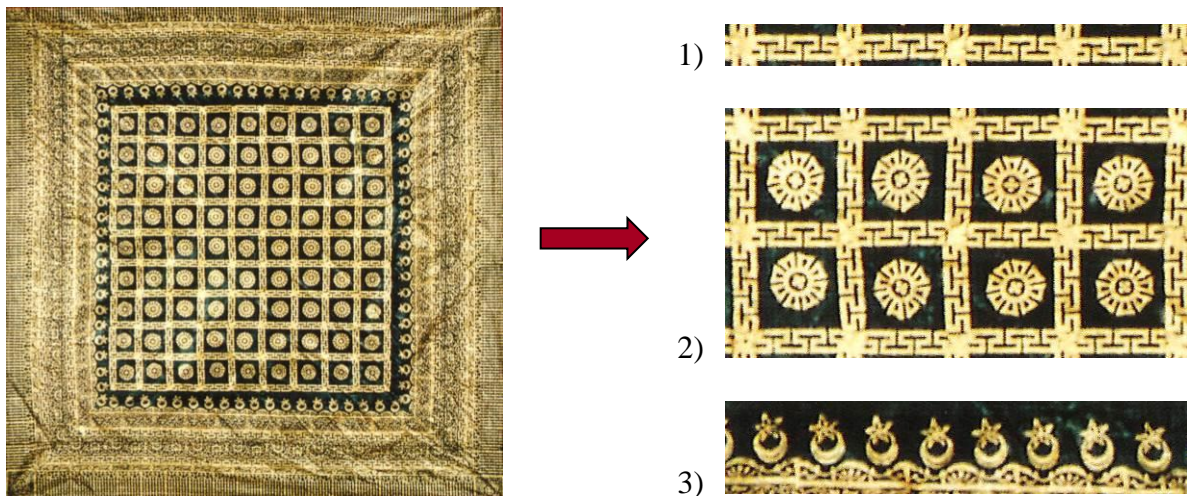


Figure 7.

- 1) Motif of *awan larat* on *badan kain* classified as frieze patterns of two fold rotation type 12.
- 2) Motif of *bunga pecah lapan* on *badan kain* classified as frieze patterns of translation type 11.
- 3) Motif of *bulan and bintang* on *tepi kain* classified as frieze patterns of translation type 11.

6. SUMMARY

Based on the analysis of the data, it is found that most of the repetitive design patterns of the *Telepuk* in the form of Frieze patterns are made up of translation, reflection and rotation. In reference to the *Telepuk* fabric samples, (the sarong *kain lepas* and *tanjak*), the repetitive pattern design of the Frieze patterns type 11, that is, *Translation* has been the most identified, especially in diagrams 3,4,5 and 6 (the *punca kain*, *kepala kain*, *badan kain*, *kaki kain* and *tepi kain*). The repetitive pattern design of the Frieze patterns type 12 that is the two-fold rotation is observed in diagram 6, on the *badan kain* with *corak tapak catur*.

The overall data analysis of the *Telepuk* pattern design signifies the existence of repetitive pattern design in the form of Frieze pattern design in the traditional Malay *Telepuk* fabric. The outcome of this study is a method of classifying the pattern design of the *Telepuk* fabric into specific classes according to standards that have been set in the form of repetitive pattern design of the Frieze pattern design.

The researcher is of the opinion that there is still insufficient exploration of studies in the area of symmetry by local textile experts especially with regards to the *Telepuk* craft. In general, the *Telepuk* motif is traditionally made up of organic design. The study on organic

pattern design on the *Telepuk* fabric indirectly serves as a guide to, and provides an alternative method for foreign researchers in conducting a more in depth study on the composition of any pattern design. Hence it is important for the researchers to fill this gap in the study of organic and symmetry in relation to the production of the *Telepuk* pattern design.

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