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Exploration of motif patterns using the space-time-plane system and flat design stylization with *La Galigo* epic inspiration

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ABSTRACT

The development of storytelling motifs is enhanced through the Space-Time-Plane (STP) system, a drawing technique that integrates Image Way and Grammar principles. This system adeptly represents spatial and temporal dimensions, facilitating the creation of illustrative storytelling. Its application extends to translating images into meaning and vice versa, showcasing its impact on the textile sector. Notably, it drives the evolution of non-repetitive motif compositions embodying story concepts presented with flat design styling. Despite its successes, applying the STP system to motif development poses challenges, particularly when incorporating motifs into product patterns, leading to story truncation. Conversely, the non-repetitive motif composition using the STP system ensures the entire narrative is encapsulated in a single image, preventing any intersection of motifs. Motif development with the STP system draws inspiration mainly from modern sources despite its closer connection to traditional Indonesian art, particularly heroic stories like the epic *La Galigo*. While developments inspired by heroic narratives, including *La Galigo*, exist, their visualization remains confined to single-image models. The primary aim of this research is to generate an inspirational motif rooted in Indonesian traditional art, specifically the *La Galigo* epic. This is achieved through the utilization of the STP system, flat design styling, and repetitive composition or repeated illustration models. Employing an exploratory method, the research culminates in a repetitive motif composition, providing an alternative resolution to the issue of truncated motifs in non-repetitive composition models. The study aspires to contribute significantly to research focused on enriching the application of the STP system in visualizing stories through the manipulation of textile motif compositions.

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1. Introduction

Designs or patterns used in textiles, often for decorative purposes, come in a diverse range of artistic styles [1]–[3]. These styles span from abstract representations, which are non-representational or non-literal and may involve shapes, colors, and patterns that do not necessarily mimic real-world objects, to realistic forms, which strive to accurately portray objects, scenes, or details as they appear in reality [4]. In the context of textiles, motifs refer to repeated, decorative elements that form a pattern [5]–[7]. The use of various graphic styles in these motifs allows for a broad spectrum of artistic expression and design [8]–[10]. Some textile motifs may be more abstract, relying on creative and non-literal representations, while others may adopt a realistic approach, attempting to faithfully reproduce elements from the observable world [11]. The diversity in graphic styles provides designers and artists with the flexibility to create textiles that cater to different aesthetic preferences and design objectives [12]–[14].

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Textile motifs, typically depicted in a range of graphic styles from abstract to realist forms [15], are two-dimensional illustrations possessing narrative-figurative properties capable of conveying stories [16]. Indonesia has a drawing system, exemplified by the Space-Time-Plane System (STP), closely aligned with traditional Indonesian art. This system employs principles such as Image Way (the method of drawing) and Grammar (image layout) to portray dimensions of space and time, distinct from mere storytelling illustration [17]. Farhani's study reveals that Indonesian traditional art significantly influences the character of flat design illustrations prevalent in contemporary textile motifs [18]. Flat design, characterized by simple illustrative features, clean layouts, and complementary color combinations, is a graphic style acknowledged for its impact [19].

Building on previous research, the STP system has been utilized to create images inspired by the epic *La Galigo* and applied to textile media like silk using silk painting and hand embroidery techniques. Challenges of inaccurate visualization during the application process have been documented [20]. In Azzahira's work, the STP system collaborates with flat design styling to develop a motif inspired by Damar Kurung. Azzahira's innovative motif, characterized by flat design elements and presented in a non-repetitive motif, incorporates characters from the flat design style [21]. Azzahira's motif development aims for a non-repetitive composition, adhering to the principles of story unity. Observational data analysis indicates that Indonesian brand products predominantly feature flat design characters and the STP system.

Brands such as Melekat Sejiwa, Smitten by Pattern, The Baby Bird, Giok, OH.IRV and Numiaa showcase novelty and stylized motifs presented in both non-repetitive and repetitive composition models. Referring to the challenges faced in previous research [20], [21]. This study aims to continue the development of the *La Galigo* epic by applying flat design styling to create digital motifs. The proposed digital motif will adopt a repetitive composition as a solution to potential motif intersections, ensuring a complete presentation of the narrative. The research will focus on developing motifs inspired by the epic *La Galigo*, employing the STP system and flat design styling within a repetitive motif composition. This research needs to be carried out because there has not been much research related to the use of the STP system. The application of the STP system can actually be found in various design products, but it is not specifically identified as an application of the STP system. This research is a reference for how one of these products, namely textile motifs, applies the STP system through exploration.

2. Method

This research was conducted with a qualitative approach using a creative method adapted from the Three Stages of Design Process by Sawaguchi *et al*. [22], which divides the design process into three stages, namely analysis, synthesis, and evaluation, as in Fig. 1. The following are the research stages based on the adaptation of this method:

- Input: Problem Identification. This stage is the process of reviewing the problem, starting with conducting literature studies on previous research and books to find problems that have opportunities for development. In this process, several research problem variables were identified, including the STP system, flat design styling, the *La Galigo* epic, and motifs. Apart from that, offline and online observations were carried out on several brands to find out the latest motif developments, followed by conducting interviews with two experts to find out the character of the latest flat design images and the extent of the development of the work and the intricacies related to the *La Galigo* epic.
- Process: Analysis, Synthesis, and Evaluation. The analysis stage is to formulate alternative solutions, starting by analyzing the data in the input process so that opportunities are found to develop alternative solutions from previous research problems. From the formulation of alternative solutions, it is known that the method used to design solutions is the exploration method. The Synthesis stage is an exploration process that begins with recognizing and understanding drawing techniques through duplication and analysis of the STP system on inspired illustrations. Continue to make a pattern board that becomes the boundaries for the development of visual motifs, in this research the *Mula Tau* pattern board. After that, a depiction design was created in the form of a description of how to

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depict the storyline using the STP system. Then, we entered the exploration stage of creating the stylization of the *La Galigo* epic by applying the STP system and flat design styling. The stylization of the *La Galigo* epic is then processed to the exploration stage of motif composition; the STP system is only used to arrange the modules into one motif composition, then explore motif design using repetitive composition techniques and setting the direction of the modules. The Evaluation Stage is the process of ensuring that the motif meets the development constraints on the pattern board. If it is not met, then the design process will return to the Synthesis Stage; if it is met, then the design process is complete.

- Output: Conclusions and Suggestions. This stage contains conclusions from a series of development processes and suggestions for development in further research.

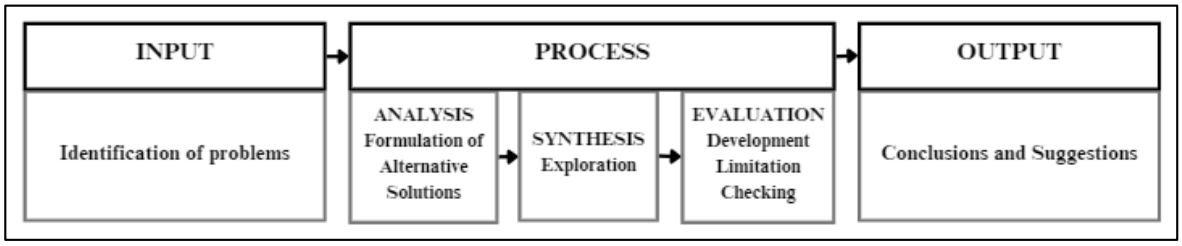

Fig 1. Research method adaptation of Three Stages of the Design Process by Sawaguchi *et al.* [22]

3. Results and Discussion

3.1. Analysis of Design Data

The development of motifs with the STP system and Diani Apsari's recent flat design processing began by tracing and understanding the principles of the STP system and the use of visual analysis, literature studies, and subsequent interviews with DA, found that recent flat design developed with the character line (outline) and texture effects. Others, such as crayons, charcoal, and lime. Another interview with SMB, found that the development of the visual interpretation of the *La Galigo* epic was based on discussion and tracing of artifacts and that the visual representation of the epic was more about *Sawerigading's* story even though *La Galigo* was known as the first human creation and descent of *Batara Guru*. Through these methods, the potential for the development of repetitive motif composition using the STP system and the recent flat design style with inspiration from the early sequence of the *La Galigo* epic, namely *Batara Guru's* descent into the world.

The descending sequence of *Batara Guru* in this study is called *Mula Tau*, which means the beginning of life or the first human; this sequence is not a sequence that has a visual archive, so visual interpretation is needed before compiling motif composition. Previously, Rosandini and Kireina carried out a description of the Image Content in the *Lasem sling batik* cloth to find out what visual language and what story is implied in the waste [23]. This translation is done with the pattern of translating illustrations to stories through the identification of languages; this translation shows that the illustrations of building *batik* cloth originally depart from the story and are interpreted into images (visual) with the implementation of the STP system. Thus, in this study, the development of a visual interpretation of the stylation of the *La Galigo* epic, particularly the *Mula Tau* sequence with the implementation of the STP system and the style of flat design, will be carried out. Then, the repetitive composition is developed with the help of the Image Way (IW) and Grammar (G) systems, either Inner Grammar (IG) or Outer Grammar (OG). Development is done through exploration. The STP Image Way System is presented in Table 1.

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Tabel 1. The STP Image Way System [24]

Image Way Category	Image Way (IW)
IW 1: Basic Shots	Zoomed in, zoomed out, from head to toe.
IW 2: Angle of Shots	Normal angle, top angle, bird view, various views, x-rays.
IW 3: Scale	Smaller than the original, the same as the original, larger than the original, gigantic size.
IW 4: Way to Draw	Stylized, expressive, schematic, decorative, *blabar* (outline), lines, silhouettes, colors, fields, events, various looks, and representations..
IW 5: Way to See	Top viewing angle, normal viewing angle, bottom viewing angle, normal viewing direction, *pradaksina* view, top view below, center view, side view, center edge view, face to face, chase view, average view, look around, look from anywhere.

The STP Grammar System is presented in Table 2.

Tabel 2. The STP Grammar System [24]

Grammar Category		Grammar (G)
Inner Grammar (IG)	IG 1: States Space	Naturalization, relief, and barricades, without ground lines, ground lines, a number of backgrounds, shifted, space, rebar, space identification.
	IG 2: States Motion	Expressive lines, additional lines, dynamic forms, plural images, movement characteristics.
	IG 3: States Time and Space	Multiple images, blends, dismix, multiple space and time (dream time), twins, features of time and space, layers of backgrounds, sequences in a setting, plural groundlines, chronology in an image, flashback, flash forward.
	IG 4: States Important	Compound scale, center, left/ top, frequency of appearance, zoomed in, zoomed in detail, typical features, x-rays, right/ bottom.
Outer Grammar (OG)	OG 1: States Space	-
	OG 2: States Motion	Dismix
	OG 3: States Time and Space	Chronological, flashback switch, flashforward switch, dismix switch.
	OG 4: States Important	Appearances frequency, the direction of looking right and left for *pradaksina*, the direction of looking left and right for *pradaksina*, the direction of looking right and left — prasavya left, the direction of looking left and right — right prasavya.

Through the application of the drawing system in the design of story interpretation to illustrations, the exploration process will be carried out in stages as shown in Fig. 2.

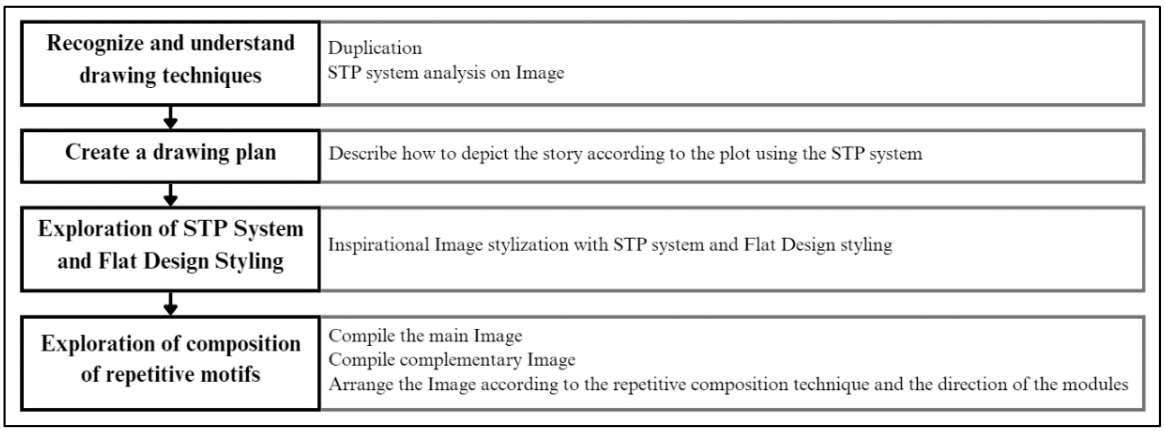

Fig 2. Exploration Stage.

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3.2. Exploration Process

The initial stage of exploration begins with duplicating illustrations of the epic *La Galigo* with the aim of knowing and understanding the characters of the illustrations and the depiction of the story. Duplication exploration can be seen in Fig. 3 (a) and Fig. 3 (b). Through the duplication process it was found that the illustration of the *La Galigo* epic has the character of an object with full outlines (outline), has no perspective and volume, and looks flat and parallel. This outline character is in accordance with the STP Image Way, namely *blabar* (outline) and the latest flat design styling. The images in the illustration consist of three inspirations, namely humans, objects, and plants. Human objects are animate with dynamic gestures and display a full body, then objects become identification marks for space, for example, umbrellas, stretchers, and palaces, while plant objects are part of palace ornaments and manuscripts. In addition, sequences or sequences of scenes are presented separately in the script, but arranged chronologically. Based on the findings of this duplication exploration, further exploration will be carried out on stylized images with the characters found in epic illustrations by utilizing the Image Way and considering the Functions of Grammar, as well as the latest flat design styling.

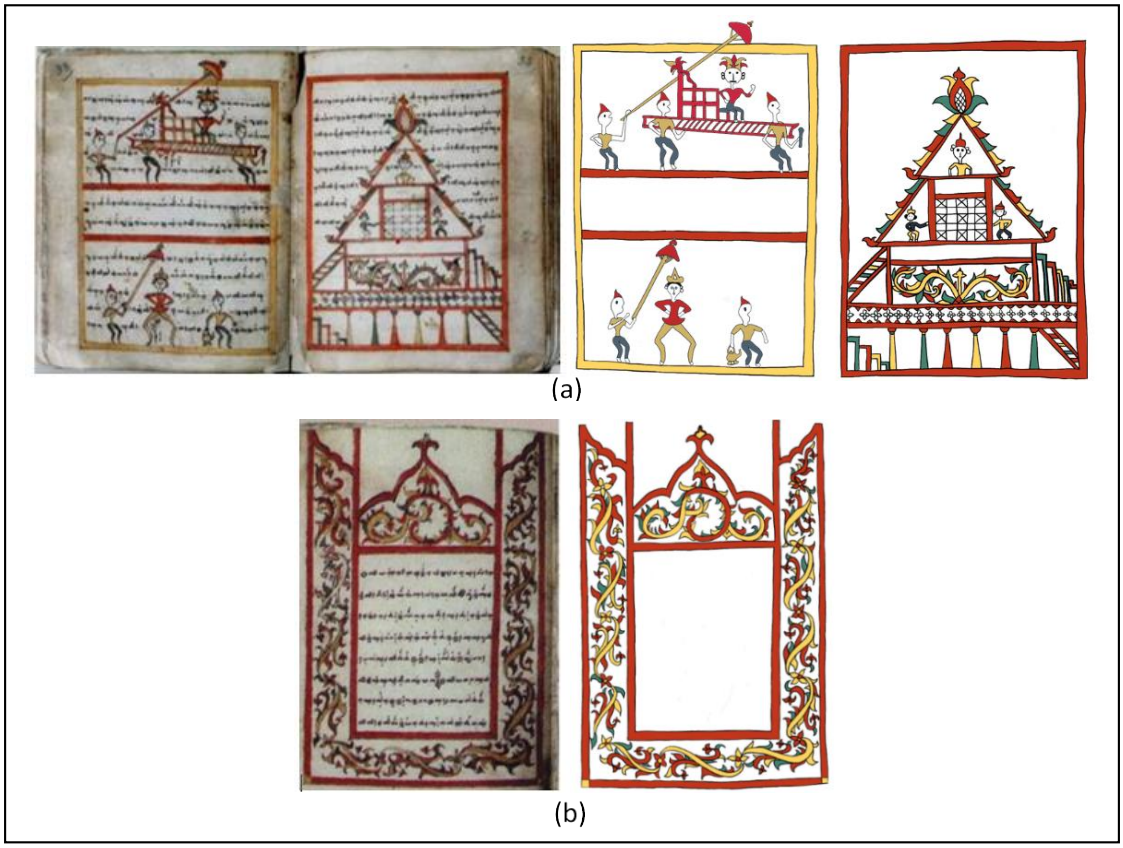

Fig 3. (a) Exploration of illustrated duplication of the epic *La Galigo*, (b) Exploration of illustrated duplication of the epic *La Galigo*.

3.3. Advanced Exploration

In the advanced exploration stage, a form modification stilation was performed based on the *Mula Tau* pattern board, can be seen in Fig. 4. This concept led to the recent application of flat design illustration styles, namely grain textured Images such as karyons and the corresponding outline characters in *La Galigo's* epic illustrations. The Image shape character also follows the shape already in the Illustration. As for the color inspired by the Indonesian Trend Forecasting 23/24 CoExist-Rural which has a color derivative similar to the *La Galigo* illustration with one or two accent colors, this trend carries the meaning of local identity symbols, folkloric, and memento in its embodiment, which in this study is the *Mula Tau* sequence of the *La Galigo* epos.

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Fig 4. Pattern board of the *Mula Tau* sequence of the epic *La Galigo*.

Before starting the Image stylization process, details of the scene to be drawn are first made to find out which Image needs to be visualized. Details of the scene from the script and the depiction design are in Table 3. The left column is a *Mula Tau* sequence from the epic *La Galigo* script that will be developed into a visual distillation, the sequence using the classical Indonesian Language. The right column is a depiction design arranged based on the *Mula Tau* sequence.

Tabel 3. The depiction design

***Mula Tau* Sequence** [c]	**The Depiction Design**
Patotoqe memutuskan untuk mengirim putra sulung mereka, La Togeq Langiq yang juga bernama Batara Guru ke dunia tengah, dan dengan demikian menjadikannya manusia pertama.	Batara Guru descended from heaven to earth riding a bamboo stick. The background is from the sky. Batara Guru is shown small to indicate the plot told at the beginning.
Beberapa penghuni langit lain menyanggupi untuk mengirim beberapa anak mereka ke dunia Kawaq.	Batara descended with the messenger of heaven.
Batara Guru diberi tugas untuk turun ke Kawaq serta melanjutkan penyebaran warga keturunan Patotoqe dan Datu Palingeq di Kawaq, serta berbagai petunjuk untuk sepanjang perjalanan menciptakan gunung, hutan, lautan, dan berbagai burung serta hewan lain dan tanam-tanaman.	The arrangement of the mountains and trees along Batara Guru's descent, the further forward the colors of the mountains and trees become clearer. The way of twins in Batara Guru with bigger depictions indicates that the plot is getting more advanced, and there is a change in time.
Batara Guru ditempatkan pada batang bambu dan diturunkan pada sebuah buaian ke Kawaq. Sepanjang perjalanan itu Batara Guru melaksanakan seluruh tugas yang diterimanya.	Same as plot 1.
Patotoqe lalu menurunkan sebuah istana, inang-inang pengasuh, pohon-pohon asam serta rombongan pengiring bagi putranya. Batara Guru kemudian menuju ke istana, tempat ia disambut semestinya dengan kebesaran yang sesuai.	The depiction of the palace is near large and close as the foreground and final plot.

[a.] Enre, 2017

From the depiction design identified the images needed in visualizing the scene, including *Batara Guru*, heavenly messengers, palaces, bamboo, clouds to describe the sky, natural objects such as mountains, plants, and rocks to describe the middle world, as well as the addition of expressive lines to help move the storyline. Next, an inspirational image stylization is explored with shape modifications in accordance with the latest flat design illustration characters, namely outlined images with grain characters achieved with a crayon brush, which is applied to the depiction and un-clean coloring style as well as the application of Image Way and considerations of STP Grammar Functions in depiction, presented in Table 4. Image Way is divided into categories: IW 1 asic Shots, IW 2 Angle of Shots, IW 3 Scale, IW 4 Way to Draw, and IW 5 Way to See [25], while the Grammar system is divided into several function categories, namely G 1 states space, G 2 states motion, G 3 states time and space, G 4 states important [24].

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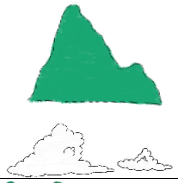
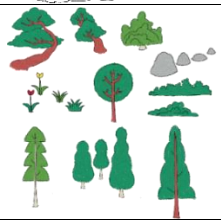
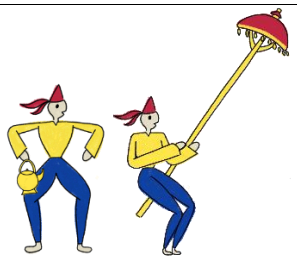
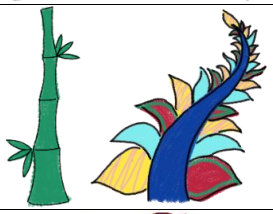
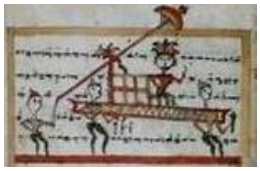
Tabel 4. The stylization exploration of inspirational images.

Inspirational Images	Image Stylization [b]	Principles of STP
Mountains, clouds 		IG 1: space identification
Plants, rocks 		IG 1: space identification
Batara Guru 		IW 1: complete from head to toe IW 4: stylized, *blabar/outline* IW 5: normal viewing angle and direction IG 2: movement characteristics/gesture
Heavens messenger 		IW 1: complete from head to toe IW 4: stylized, *blabar* IW 5: normal viewing angle and direction IG 2: gesture
The palace 		IW 2: x rays IW 4: stylized, *blabar* IW 5: normal viewing angle and direction
Bamboo, gate tendrils 		IW 4: stylized, *blabar* IW 5: normal viewing angle and direction
Stretcher 		IW 1: complete from head to toe IW 4: stylized, *blabar* IW 5: normal viewing angle and direction IG 1: space identification IG 2: gesture

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Inspirational Images	Image Stylization [b]	Principles of STP
Expressive lines 		IG 2: expressive lines

[b.] Author Documentation, 2023

From the exploration of the Image stylization, a visual interpretation module of the *Mula Tau* sequence is realized, which applies the latest flat design illustration style with the application of Image Way and consideration of the STP Grammar Function. Next, an exploration of the composition is carried out by considering the *Mula Tau* sequence flow. The preparation of the composition begins with first composing the main images involved in the core flow of the *Mula Tau* sequence, as seen in Fig. 5 (a). The second process, compiling complementary images that become the background to support the storyline, as presented in Fig. 5 (b). The first and second processes are carried out by considering the STP Grammar Function.

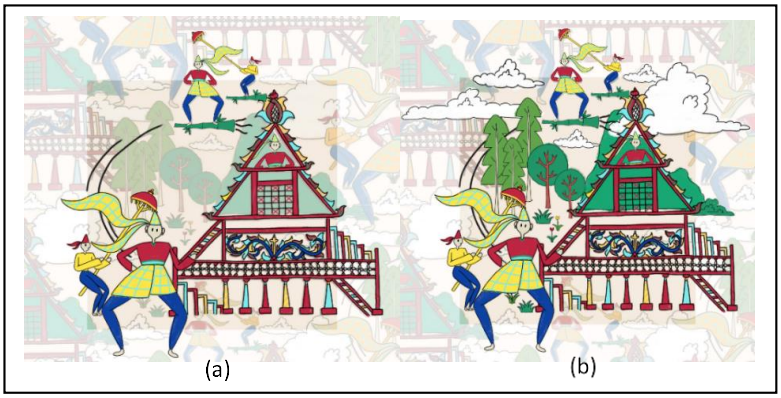

Fig 5. (a) Arrangement of the main images from plot *Mula Tau* in the composition, (b) Arrangement of complementary background image for the *Mula Tau* plot.

The third process is arranging images with repetitive composition techniques. There are many choices of repetitive composition techniques that can be done, and some are used in this study, including the hex by column, half brick repeat, and half drop repeat techniques, as well as module direction setting techniques, namely one-way print, two-way print, four-way print, and tossed-way print. Fig. 6 is an example of applying the half-drop repeat technique with a one-way print module direction.

Fig 6. Image arrangement with repetitive motif composition techniques.

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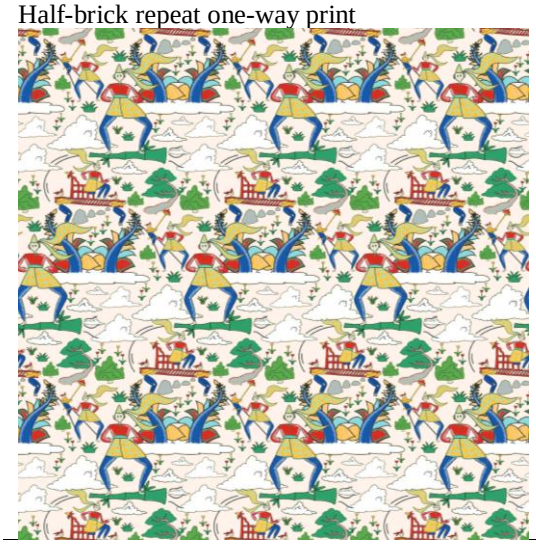
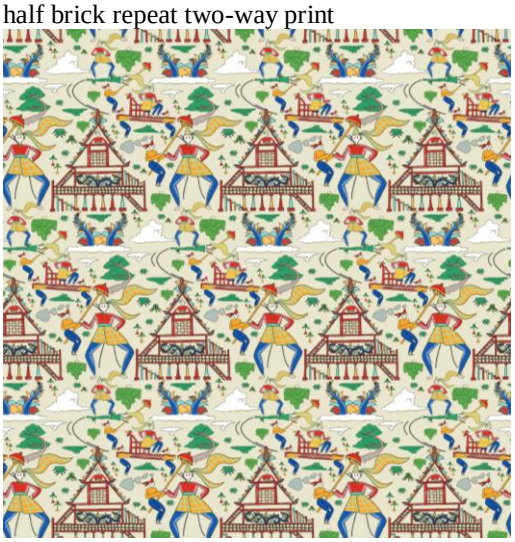
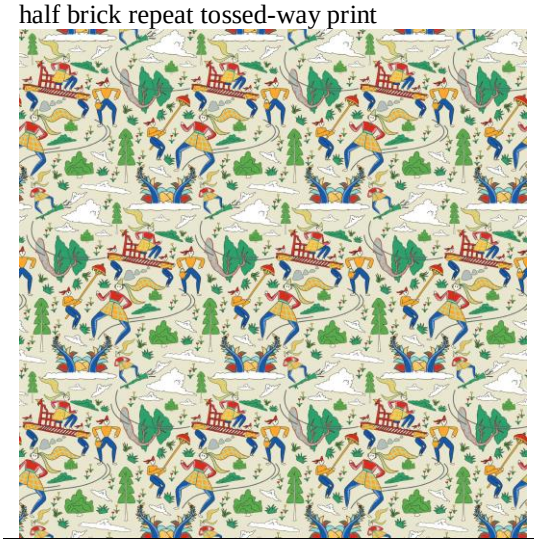
The results of motif exploration with repetitive composition techniques are presented in Table 5.

Tabel 5. Results of motif composition exploration

Composition Repetitionc	Module (M)	STP Grammar
Half-brick repeat one-way print 	M 1: clouds M 2: plants, rocks M 3: Batara Guru M 4: heaven messenger M 6: bamboo, gate tendrils M 7: stretcher M 8: expressive lines	IG 1: space identification IG 2: expressive lines, gesture IG 3: twins IG 4: zoomed in OG 3: chronological OG 4: appearances frequency
half brick repeat two-way print 	M 1: clouds M 2: plants, rocks M 3: Batara Guru M 4: heaven messenger M 5: the palace M 6: bamboo, gate tendrils M 7: stretcher M 8: expressive lines	IG 1: space identification IG 2: expressive lines, gesture IG 3: twins IG 4: x rays, zoomed in OG 3: chronological OG 4: appearances frequency
half brick repeat tossed-way print 	M 1: clouds M 2: plants, rocks M 3: Batara Guru M 4: heaven messenger M 6: bamboo, gate tendrils M 7: stretcher M 8: expressive lines	IG 1: space identification IG 2: expressive lines, gesture IG 3: twins IG 4: zoomed in OG 3: chronological OG 4: appearances frequency

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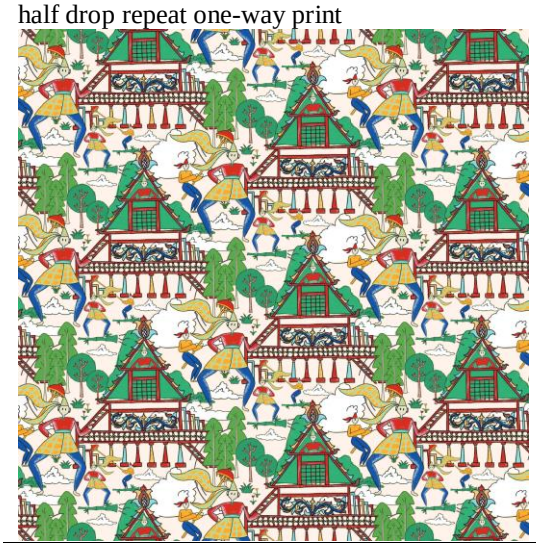
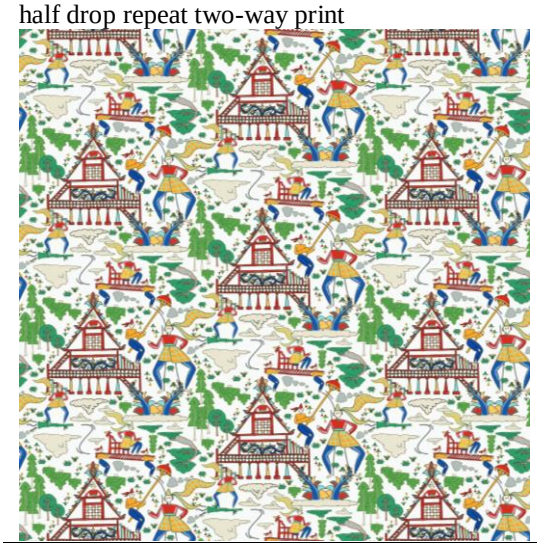
Composition Repetitionc	Module (M)	STP Grammar
half drop repeat one-way print 	M 1: clouds, mountains M 2: plants M 3: Batara Guru M 4: heaven messenger M 5: the palace M 6: bamboo M 8: expressive lines	IG 1: space identification IG 2: expressive lines, gesture IG 3: twins IG 4: x rays, zoomed in OG 3: chronological OG 4: appearances frequency
half drop repeat two-way print 	M 1: clouds M 2: plants, rocks M 3: Batara Guru M 4: heaven messenger M 5: the palace M 6: bamboo, gate tendrils M 8: expressive lines	IG 1: space identification IG 2: expressive lines, gesture IG 3: twins IG 4: x rays, zoomed in OG 3: chronological OG 4: appearances frequency

[c.] Author Documentation, 2023

In the final exploration stage, namely repetition of the composition, changing the background color and adjusting the color intensity to help emphasize the grain texture of the crayon and adding a pencil texture. The entire exploration was successful; this was measured by the achievement of motifs that interpreted the inspirational story of the epic *La Galigo* in a repetitive composition model no longer using the language of the implementation of STP's Image Way and Grammar using the latest flat design styling characters.

4. Conclusion

The development of repetitive motifs using the Space-Time-Plane system, flat design styling, and inspiration from the *La Galigo* epic are forms of reference for alternative solutions to the challenges of applying the STP system to non-repetitive or single motif composition models. The development process uses an exploration method starting from visual introduction, and story translation using the STP system method to motif composition. This research can also be a reference for developing motifs with concepts or story inspiration and contribute to enriching research related to the application of the STP system. The challenge in this research is in processing the composition, specifically setting the direction of the module because the arrangement of the modules must not damage the storyline, so far, the exploration of setting the direction of the four-way print module has not yet been achieved. Apart from that, in this research, it is not yet known what market segmentation corresponds to the character of the STP system illustrations; the next development could be to explore the character of the image based

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on the market segmentation of motif users. Therefore, there needs to be further research regarding the STP system.

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Declarations

Author contribution	:	AFM: as a primary researcher, contributed to collecting data, analyzing data, and exploring design. MR: as a supporting researcher and advisor, contributed to determining the research topic and initial research problem, providing initial data, and supervising the timeline of the research. GST: as a secondary advisor, had a role in guiding the exploration process
Funding statement	:	This research funded independently by the researcher.
Conflict of interest	:	The authors declare no conflict of interest.
Additional information	:	No additional information is available for this paper.

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