

Fabric Design Identity: Implementation of Pattern Formation into *Kain Punca Potong* (KPP) Weaving Design

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Abstract

Kain punca potong (KPP) is a long fabric generally crafted via the ikat technique resulting in square patterns with striped motifs consisting of a decorative limar pattern. Instead of decorative motifs and KPP design, this paper will embark on a discourse on pattern formation style specific to the design style and pattern composition of KPP motifs, design and use in Malay society. The paper shows that this textile provided some valuable insights into Malay culture and fabric identity. Regarding the Malay textile context, the main issue revolves around local textile's Malay fabric identity pattern formation. This issue came to be when it was discovered that other communities lack awareness when it comes to understanding the fabric identity of Malay textiles, let alone its fabric design identity. This paper also provides enhanced deliberation on the use of pattern formation basis inspired by design style consisting of selected motifs and pattern composition to identify the identity of fabric design. The researcher used qualitative approach to identify the attributes of fabric design identity, which included pattern formation and style process. This paper will therefore seek to uncover viable concepts and techniques that passed as feasible guidelines for new designers when incorporating a "distinctive" national identity in their design. For this study, in addition to interviews, fieldwork notes, photography and video documentation, participant observation in the form of a master weaver apprenticeship will aid better understanding of weaving design learning process while participation in design education will provide insights on how design knowledge is transmitted. It also explores the potential of pattern formation style to further develop the identity of fabric design in various design forms, particularly in the field of textile weaving design.

Keywords: *pattern formation, design identity, weaving design*

1. Introduction

The art of Malay weaving is priceless and shoulders the main identity that depicts a nation. This art is the heritage that warrants vigilant care and is deeply linked to the culture that shaped a society and a nation. In Malaysia, various valuable Malay weaving art existed, including those connected to *kain punca potong* (KPP). KPP is an antiquity of a weaved cloth once worn in the olden days. This research attempted to provide a discourse on the process of pattern formation in KPP production. Malay weaving art are a work of art created to be functional and used but is also skilfully crafted with art motifs that are not only beautiful but also appealing. The fabric creation necessitates expertise and skill in the ordered manipulation of basic materials from initial process until fabric creation completion. Thus, it follows that the fabric creation demands aesthetic sense for breath taking and appealing design to be crafted.

Weaving is one of mankind's oldest traditional crafts. The majesty of textile weaving, which is one of Malaysia's renowned handicrafts, are showcased by its beautiful designs and motifs that were inherited by descendants of traditional weaver ancestors and subsequently adapted and modified by modern designers. The surroundings, the weaver, and the elements of the daily life of the weaver

largely influenced the motifs and patterns used on the textile items. Motif arrangements in Malay art pieces usually centred around its people's appreciation towards the creation of God. One of the ways to achieve this is by appreciating nature when attempting to address the questions of human existence. However, respecting Islamic religious restrictions, some floral and faunal motifs are stylized to be Syariah compliant. To understand the symbolism of the motifs, it is necessary to consider the location of the motifs or the structure of their fabric. It was also thought that the motifs originated as early as the 1st century AD and currently is still in use [1].

With that in mind, this study delved into the identity of fabric design based on KPP pattern formation, with the aim to enhance KPP weaving craft public understanding via three main functional steps, namely the development of pattern formation tools, identity of fabric design and design of KPP weaving. In this research, we primarily study how to incorporate KPP's cooperative pattern forming mechanism, build a platform to support cooperative work for textile products, and lastly, ensure multiple users work together. Due to its suitability for pattern design creation, a workflow is used in this research to implement a pattern forming model of KPP and can provide adequate information to users, particularly those interested in creating fabric design identity. This is an important design element that influences human behaviour and the weaver's environment to create the weaving design pattern formation.

Malaysian brand is facing quite a challenge in defining the local product brand. New designers should take the initiative to promote our local product design identity in order to create awareness about the traditional influences of Malay heritage that represent our local design identity [2]. This matter led to the question of how the design identity can be established in textiles. The design identity of pattern formation offers an up to date state of design awareness snapshot, thus defining areas that need more work and those that are ready for full fabric design. Regarding the Malay textile context, the main issue revolves around local textile's Malay fabric identity pattern formation. This issue came to be when it was discovered that other communities lack awareness when it comes to understanding the fabric identity of Malay textiles, let alone its fabric design identity.

Traditionally, weaving has been used in the textile industry to produce a fabric by interlacing two separate sets of yarns parallel to each other. The warp and weft of the yarns needs to be interlaced in a specific orientation that not only does it strengthens and stabilizes the fabric but also gave a stunning visual [3]. The physical geometrical structure of a textile craft is represented by its weave pattern, whereby two different sets of yarns or threads are interlaced to create a fabric or cloth. Prioritization of pattern formation apparently involves the process of human cognition of pattern interpretation and understanding [4]. A rectangular crossing of so-called waft and weft yarns produced what can be defined as woven fabrics. Weaving machines also known as looms are used to create these woven fabrics [5]. This paper also provides enhanced deliberation on the use of pattern formation basis inspired by design style consisting of selected motifs and pattern arrangement to identify the identity of fabric design.

2. Literature Review

2.1. Malay Traditional Kain Punca Potong (KPP)

In this study, KPP is deemed as a local Malay heritage that is aesthetically linked as a result to its decorative and stylish beauty that reflects the artistry of Malay society arts and unique pattern seeped deeply in heritage, since KPP is a Malay art heritage inherited from previous generations to the next. The Malay art heritage is immense and stretches through the slip of time, the woes of occupation and the changes in modern life contributing to its spread far and wide. For generations, the Malays accorded hand-woven cloths high value; with the weavers pouring their heart and soul into fabric creation and bequeathing woven fabric parts names akin to the human body. Two main parts known as the main body and the end cloth makes up the rectangular piece of woven cloth. Both of KPP ends are free and unstitched, with intricate designs called '*punca kain*' [6].

KPP is also known as a long fabric it means *kain lepas*. It is woven to be approximately two to three meters in length in the shape of a square, unstitched and with both of its *punca* end let loose. This cloth paraded the usual pattern of blank weave pattern, checkered and *tapak catur* pattern,

vertical stripe pattern and lastly, horizontal stripe pattern. KPP measures at five castes, that is 200cm long and 80cm width. This cloth is characterized by the decorative pattern known as *ikat limar*, present either on its main body or the *punca kain* end.

KPP is a kind of Malay woven cloth also known as *kain lepas* or *kain panjang* that served as the original Malay attire of the past, which begets its name from the way it was worn unstitched and draped over the body. The *punca* or its end will be let flowing down loosely and its ties neatly tightened with a *pending* belt. Its design pattern was created by the organization of threads according to dye colour that differentiates between pattern, background colour of the cloth body and cloth end (the unconnected *punca*). The cloth end that flows to the ground appeared slanted with the '*berpotong*' pattern or also known as '*punca berpotong*' [7]. These textiles have been recognized for their role in the region's cultural life, where they are seen as status indicators, used as decorative hangings to demarcate ritual spaces, exchanged as ritual gifts during marriage ceremonies, engaged in birth- and death-related rites of passage and not forgetting as artistic achievements of their own accord.

2.2. Structure of Fabric

The structure of the KPP is usually in the form of *kain lepas* (shawl). Traditionally, the Malays people attribute a high value to hand-woven cloths, therefore, the weavers weave the fabric with their hearts and souls, so much so parts of the woven fabric are named after parts of the human body. The length and the wide of KPP are varied because it depends on the size of the weaver and the nature of the hand-woven fabric.

In this study, KPP was designated as a local Malay heritage linked to the aesthetics, due to its exquisite decorative style that showcases the Malay community artistic arts and unique pattern that is infused with heritage, since KPP is a traditional Malay art that was passed down from generations to the next. The Malay art heritage is vast, and it spans over the overall aspect of life that moves through the passes of time, occupation experiences and the changes of modern life that irrevocably disseminate it everywhere. However, the shape of KPP will be the same, that is a rectangular shape unsewn at both ends of the cloth (see Figure 1).

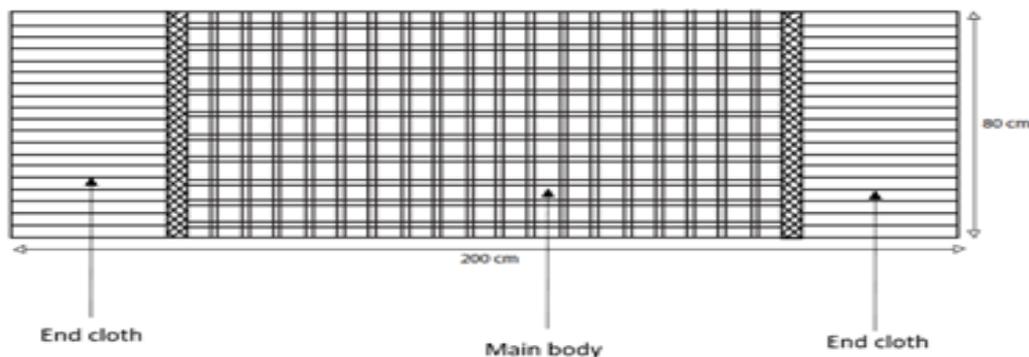


Figure 1. The Structure of KPP

3. Methodology

Qualitative research methods are especially suitable for investigating tacit and intuitive knowledge of cultures and systems, enabling background analysis to be carried out and individual actions and interactions to be observed [8]. For this study, in addition to interviews, fieldwork notes, photography and video documentation, participant observation in the form of a master weaver apprenticeship will aid better understanding of weaving design learning process while participation in design education will provide insights on how design knowledge is transmitted. The study conducted was a qualitative study, it comprises of participant observation which involves learning-cum-observation of the design, coding and weaving from experts that are video-recorded coupled with document analysis and semi-and-unstructured interactions with the society that focused on

situated, cognitive and creative aspects of their particular tasks. Qualitative approach was used throughout the study. To complete the objectives, this study was conducted through; (phase 1) literature review via information collection from books, journals and research websites; (phase 2) observations on artefact images; (phase 3) interview relevant expertise: academics, cultural experts, collectors, curators, designers and weavers. Figure 2 illustrates the above research phases and course.

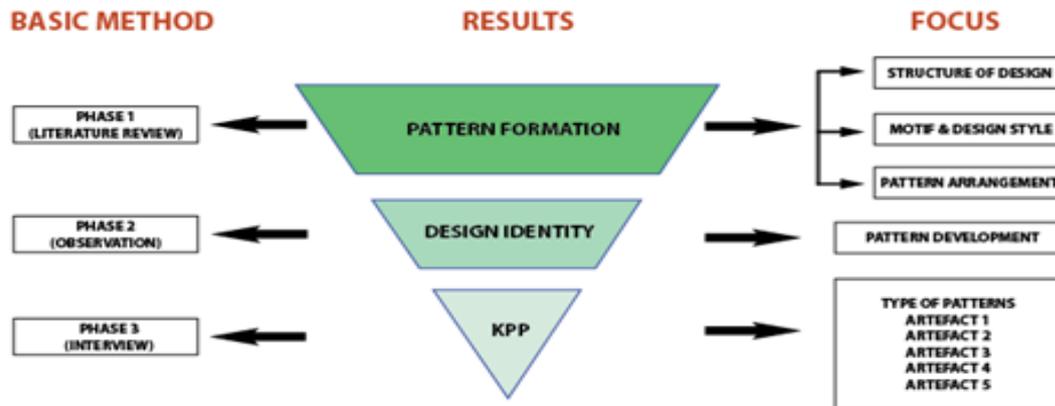


Figure 2. The Research Design Methodology Flowchart (adapted from [21])

4. Results and Discussion

4.1. Pattern Formation

The detection of a weave pattern in the textile industry are usually performed manually and requires copious human effort. To design the weaved fabric, this difficult process requires pattern formation. It is therefore highly recommended to first establish the fabric design identity before moving on to pattern recognition for weaving design. Supporting pattern forming to define design identification is one of the ever-present aspects of design protocol studies and has the complementary relationship for design protocol data that has yielded important results in terms of the contribution of activity modes to design creation [9]. In a study summary, pattern formation is a challenging research area that investigates the ways simple research interacts with each other and their environment to create a complex system [10].

Weaving design is a tough creative process that consumes time; when dealing with open-ended, unresolved problems, a developer also uses domain-specific knowledge-based general heuristic techniques to narrow down the search existing in a vast problem space. The key aspects of the design process are the collection and use of domain-specific knowledge in conjunction with the visual and technical features of the intended textile. In view of this, the knowledge of traditional weaves, models and weaving methods, the study of materials, their interrelationships and the arrangement of visual elements are then essential in the creation of textiles [11].

A variety of techniques are available at our disposal when engaging the production of decorated textiles, including *ikat*, warp patterning, weft patterning, batik and embroidery [12]. Subsequently, production workflow can be differentiated into two parts: the designing part and the production part. The design company completed the art processing of the pattern in accordance with the design part. Final product fabrication is a collaborative process that followed a workflow [13].

4.2. Fabric Design Identity

In addition to supporting the cultural values derived from local design, fabric design identity is important in representing a nation. In this research, KPP is considered to be an aesthetically related local Malay heritage that resulted from its decorative and stylish beauty which in turn represent the art of Malay society that highlighted distinctive patterns deeply embedded in heritage, as KPP is a Malay art inherited and passed downs to countless generations. The Malay art heritage is immense and continues through the passing of time, with the hardships of occupation and the changes in

modern life leading to its widespread growth.

This study describes identity as a privilege designated to a certain matter or subject. Identity is important because it can help society define a subject from different aspects of life, for example culture, religion or politics. A region's identity is crucial in the sense that it reflects the sense of self or characters that describes the region. In addition to setting goals in life, identity can sketch an overall take of a region. On top of that, insights on specialties, upper hand or disadvantages of a state can be gained by the comparison of various existing identities in communities or the state itself. As reported by [14] identity could be articulated as the value, quality or similarity of a subject, composition, universe, nature, content similarity and fundamentals. The method of designing fabrics that are esthetically suitable is a creative work, entirely dependent on the designer's abilities. Albeit the existence of certain rules to help ease the process, even with the help of formal education this endeavor is still essentially a creative artistic work [15].

4.3. Pattern Development of KPP

This study regarded KPP as a local Malay heritage that is aesthetic, since its decorative style and beauty highlighted the arts and distinctive pattern of Malay society art that is immersed in heritage which comes as no surprise since KPP is traditionally passed down from generations of Malays. Malay art heritage are vast and transcends over all facets of life aspects throughout time, such as the times of occupation and modern life transition which spread it widely. KPP development history can be traced back from the point of origin, influence, function, privilege and social culture of the Malays. A look on the KPP pattern type, decoration and motifs were also covered in this study through participant observation mainly from designers, curators, artefact collectors, and academicians. Compared to other fabrics, the KPP structure is different. The pattern formation process of the KPP spans over fabric structure, motifs and design style, and arrangement of the pattern.

Table 1. KPP Pattern Formation Data Collection

Classification of Fabric	Types of Motifs					Design Style			Pattern Arrangement		
	Bunga Sinar Matahari/Sunflower	Bunga Melur/Jasmine Flower	Bunga Pucuk/Flower Bud	Pucuk Rebung Kayohan/Bamboo Shoot	Pagar Istana/Castle Wall	Checkered	Vertical and horizontal Stripe	Limar (Ikat)	Body of cloth (Badan Kain)	Side border of the cloth (Pengapit Kain)	End of Cloth (Punca Kain)
Artefact 1						/	/	/	/	/	/
Artefact 2						/	/	/	/	/	/
Artefact 3	/					/	/	/	/	/	/
Artefact 4	/	/	/	/	/	/	/	/	/	/	/
Artefact 5	/	/	/	/	/	/	/	/	/	/	/

Textiles and patterns are currently tools that describe garments and establish their distinctive characteristics, in addition to being elements of branding not only for a single product or series, but also for brands. Patterns are described as the superficial appearance of the fabrics identified by eventual decorative elements, from printed patterns to finishing, with reference to the textile surface's esthetic sense [16]. The data collected from KPP pattern formation is shown in Table 1. A collective of units known as motifs that comprises of checkered design and stripe design being regularly repeated to fill a flat surface makes up a KPP pattern. Motifs can consist of any type of figure, image or illustrative drawing created by artists or designers. These collections are an important legacy used by designers as a source of inspiration. The creative work of designers usually starts with the search and redesign of existing elements from previous collections. [17]. Artefact 1 to artefact 5 describes the cloth classification that covered motif types, pattern design style and pattern design organization. All artefacts were studied based on the various motifs present on KPP cloths. The result uncovered artefact 1 and 2 lack motifs in comparison to artefact 3, 4 and 5 that was found to be created with appealing motifs and pattern design organization. The design of the decoration on artefact 1 and 2 were very common as it was specifically designed for the dress of the subordinates or the general public. Whereas, the pattern formation of artefact 3, 4 and 5 were remarkable because they were specially designed for the nobility or the royal.

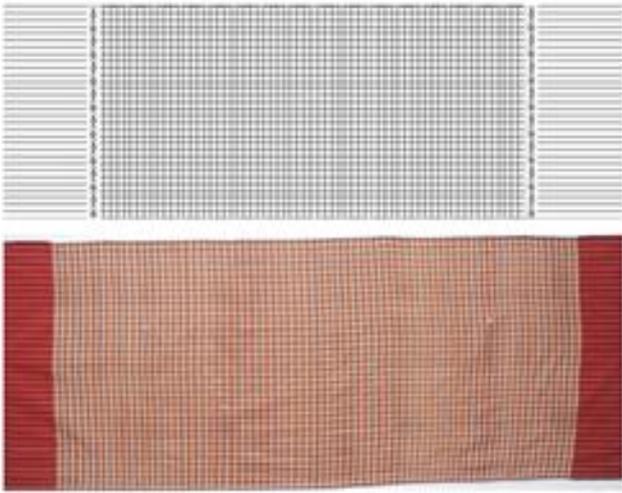


Figure 3. Artefact 1

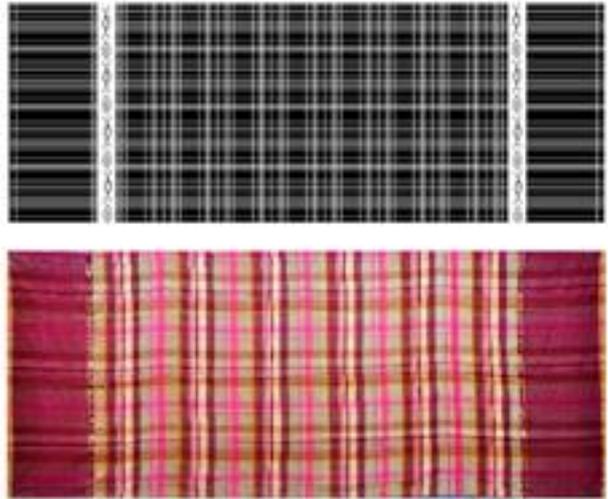


Figure 4. Artefact 2

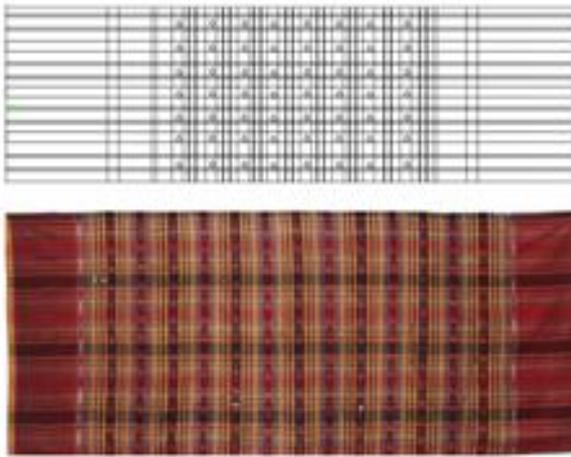


Figure 5. Artefact 3

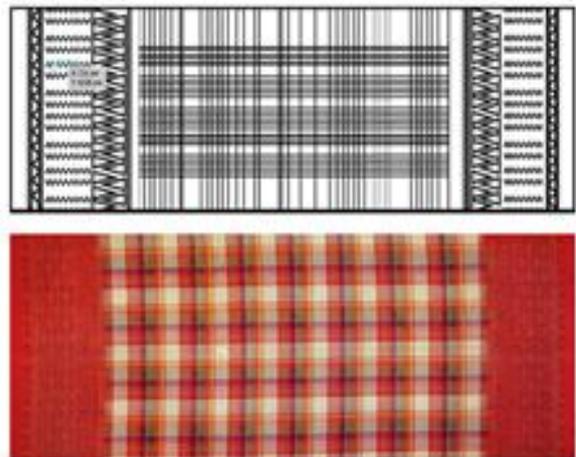


Figure 6. Artefact 4

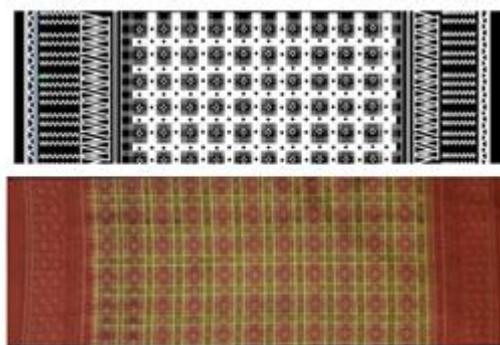


Figure 7. Artefact 5

All studied artefacts depicted the process of pattern design, whereby initially the design for cloths with less motifs comprises of checkered and stripe patterns exclusively. Gradually, the following designs started to exhibit change in terms of increasing number of motifs and designs that are more beautiful and appealing. The design process of a creation using idea development requires “a sophisticated mental process capable of manipulating many types of information, combining them all into a cohesive set of ideas and eventually producing some realization of those ideas”, and were

identified to be of three stages that is common for designing process across the field: problem definition and research, creative exploration, and implementation [18].

There is tremendous industrial potential and interest in the ability to design features into other products that accommodate future but unknown developments. It is also intended to greatly improve designers' inherent creative skills by providing them with ideational directions outside and beyond their experience, concentrating on brand versatility for future developments that are not a priori expected [19]. This study is also carried out to explore the potential of pattern formation style technique to further develop and expand the fabric design identity into different design forms, especially in the field of textile weaving design. The mixture of tastefully organized theory and design elements can result in an excellent artwork. The art principle should be present in order to create an artful textile design, thus enhancing the beauty of the textile produced. Art is the face of a race or society. This is because the created arts have their own meanings and philosophy which give humanity understanding and fulfillment [20].

5. Conclusion

Each Malay woven cloth showcases their own specialty and beauty, and the same goes for *kain punca potong*. The beauty of this cloth radiates due to its production that incorporated a gamut of colors to give its cheerful and colorful presentation. The beauty of pattern placing and arrangements on each weave speak volumes of its weaver's and designer's prowess. Most of the pattern design were inspired from nature, where it was a subject matter especially stylized and arranged to beautify a weave. The weave's exquisite arrangement makes it special and regarded as an art masterpiece. Besides, the Malay society art emphasizes on characteristics like fineness, carving, equilibrium, harmony, beauty and serenity.

The weaving textile will continue to spread its wing with the accompaniment of consumer awareness in valuing local artwork. Each civilization is equipped with its own art content, and this is also true for Malay weaved cloth that possesses its distinct identity. Regardless of the pattern design and motifs produced, weaved cloths can exhibit interesting development. It is a work of art that has the potential to break through trade space. We need to keep in mind that in order to elevate weaving industry to a higher level, the preservation of textile design value and traditional art must first be accomplished. Once achieved, the textile can retain its personality in Malay art heritage, where it serves as the cloth's identity.

In conclusion, this research can be treated as a source to ensure the sustainability of Malay society's art heritage among our young generation and prevent its obsolescence. The significant behind KPP pattern design highlighted in this research showcases pattern formation is a crucial potential for future textile produce and education for the young generation as its exquisiteness of Malay design that embodies the cloth identity. It is suggested that future research should focus on the improvement of the pattern formation process for it can be proposed to be used as a symbol to represent the identity of KPP fabric design. In addition, this study will also curate literature reviews and patterns that will subsequently be developed the pattern formation to identify the fabric identity into the sustainability of the preserve to educate and attract people to learn more about KPP weaving design.

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References

- [1] Shayestehfar, M. "A Comparative Study of Brocade Weaving Art Motifs and Designs in Iran and Malaysia", in *Islamic Perspectives Relating to Business, Arts, Culture and Communication*. Omar, R., Bahrom, H. and de Mello, G. (eds.), Springer, Singapore, (2015), pp. 59-68.

- [2] Abidin, S.Z., Othman, A., Shamsuddin, Z., Samsudin, Z., Hassan, H. and Mohamed, W.A.W. "Malaysian Product Design Identity: Issue, Transformation, and Challenges", 2nd International Colloquium of Art and Design Education Research, (2016), pp. 305-318.
- [3] Sabuncu, M., Ozdemir, H. and Akdogan, M.U. "Automatic Identification of Weave Patterns of Checked and Colored Fabrics using Optical Coherence Tomography", IEEE Photonics Journal, 9(5), (2017), pp. 1-8.
- [4] Zheng, D., Baci, G., Hu, J. and Xu, H. "Cognitive weave pattern prioritization: An application-oriented approach", IEEE 10th International Conference on Cognitive Informatics and Cognitive Computing, (2011), pp. 85-95.
- [5] Gloy, Y.S., Cloppenburg, F. and Gries, T. "Integration of the vertical warp stop motion positioning in the model-based self-optimization of the weaving process", International Journal of Advanced Manufacturing Technology, 90(9-12), (2017) pp. 3619-3632.
- [6] Norwani, M.N. "Ikat Limar the Ancient Malay Textile", Dewan Bahasa dan Pustaka, Kuala Lumpur, (2016), pp. 107-111.
- [7] Siti Zainon, I. "Pakaian Cara Melayu", Universiti Kebangsaan Malaysia, Selangor, (2009), pp. 146.
- [8] Tracy, S.J. "Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating impact", John Wiley and Sons, New Jersey, (2019).
- [9] Akin, O. and Lin, C, "Design Protocol Data and Design Decisions", Journal of Design Studies, 16(2) (1995), pp. 211-236.
- [10] Varghee, B. and McKee, G. "A Review and implementation of Swarm Pattern Formation and Transformation Models", International of Journal of Intelligent Computing and Cybernetics, 2(4), (2009), pp. 786-817.
- [11] Seitamma-Hakkarainen, P. and Hakkarainen, K, "Composition and Construction in Experts' and Novices' weaving Design", Journal of Design Studies, 22(1), (2001), pp. 47-66.
- [12] Buckley, C.D, "Investigating Cultural Evolution using Phylogenetic Analysis: The Origins Descent of the Southeast Asian Tradition of Ward Ikat Weaving", Plos One, 7(12), (2012), pp. 1-20.
- [13] Bai, X, "Design and Implementation of a Workflow- Driven Cppperative Weave Platform", IEEE 10th International Conference on Computer-Aided Industrial Design and Conceptual Design, (2009), pp. 953-956.
- [14] Zakaria, A. "Halus Seni dan Seni Esei-esei Seni Halus", Dewan Bahasa dan Pustaka, Kuala Lumpur, (1989).
- [15] Grundler, D. and Rolich, T, "Evolutionary Algorithms Aided Textile Design", International Journal of Clothing Science Technology, 15(3/4), (2003), pp. 295-304.
- [16] Colombi, C. "Pattern to Product, Pattern Through Product Traditional Tools and Process Innovation in Textile Design", Research Journal of Textile and Apparel, 16(4), (2012), pp. 39-47.
- [17] Valiente, J.M., Albert, F., Carretero, C. and Gomis, J.M. "Structural Description of Textile and Tile Pattern Design using Image Processing," IEEE 17th International Conference on Pattern Recognition, (2004), pp. 498-503.
- [18] Calamari, S., and Hyllegard, K.H, "The Process of Designing Interior Textile Products & the Influence of Design for Environment (DfE)", Journal of Fashion and Textiles, 2(1) (2015), pp. 1-17.
- [19] Tilstra, A.H., Backlund, P.B., Seepersad, C.C., and Wood, K.L, "Principle for Designing Products with Flexibility for Future Evolusion," International Journal of Mass Customission, 5(1), (2015), pp. 22-54.
- [20] Abd. Rasid, I. "Alam Sebagai Motif Kraftangan Fabrik Melayu", Universiti Teknologi MARA Press, Selangor, (2014).
- [21] Blessing, L.T.M., Chakrabarti, A. and Wallace, K.M. "An overview of descriptive studies in relation to a general design research methodology", in Designers. Frankenberger E., Birkhofer H. and Badke-Schaub P. (eds.), Springer, London, (1998), pp. 42-56.