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Design Application for Balinese Songket Weaving Motif

Nyoman Dewi Pebryani[1], Tjok Istri Ratna, C.S.[2], Putu Manik Prihatini[3]

[1,2] Program Studi Desain Mode, Institut Seni Indonesia Denpasar, Indonesia
[3] Program Studi Rekayasa Perangkat Lunak, Politeknik Negeri Bali, Indonesia

dewipebryani@isi-dps.ac.id[1] , ratnacora@isi-dps.ac.id[2] , manikprihatini@pnb.ac.id[3]

Songket weaving is an Indonesian cultural heritage that has been passed down from generation to generation. Every region in Indonesia has its own Songket weaving, depending on the region's characteristics. Bali island is one well-known region in Indonesia for Songket weaving. In the past, Songket weaving in Bali was only made for caste members and the royal family. At that time, only people in the royal family were able to make Songket weaving. The songket weaving process in Bali was mainly performed using a weaving tool called *cagcag*. The songket weaving pattern (motif) was made using a *sungkit* technique—interlace between threads to create a motif. The making of the songket motif begins with arranging the thread according to the desired motif before the weaving process. Information about the motif was spread in *Guun*. In general, songket weaving in Bali island has tens to hundreds of *Guun*. The skills to break the desired motif into the *Guun* is quite a complicated process. Therefore, not many weavers master the process of making songket motifs. Most of the motif makers continue or imitate existing motifs. Currently, a motif maker who can make a motif from scratch is rare. In order to help break motifs into *Guun*, an in-depth understanding of the calculation of making songket motifs is required. Then, this understanding is transformed into an application that can help motif makers to visualize motifs into *Guum*. The design application will provide multiple benefits for the motif makers and serve as an effort of culture preservation by introducing a design application to make songket motifs for younger generations. Therefore, they are expected to contribute to making songket weaving motifs.

Keywords: motif, songket, guun, design application

Aplikasi Desain Motif Tenun Songket Bali

Songket merupakan warisan budaya Indonesia yang diwariskan dari generasi ke generasi. Tenun Songket di masing-masing daerah di Indonesia memiliki ciri khas sesuai daerahnya masing-masing. Pulau Bali memiliki tenun songket yang pada zaman dahulunya hanya dibuat di lingkungan puri atau kerajaan, karena saat dahulu hanya orang dalam lingkaran kerajaan yang mampu membuat tenun Songket. Proses tenun songket di Pulau Bali sebagian besar dikerjakan dengan alat tenun cagcag. Motif pada tenun Songket dibentuk dengan teknik sungkit atau menyungkit benang untuk membentuk motif. Pembuat motif songket dimulai dengan mengatur benang sesuai dengan motif yang diinginkan sebelum proses tenun. Informasi motif tersebut tersebar dalam guun. Tenun Songket di Pulau Bali memiliki jumlah guun antara puluhan hingga ratusan. Kemampuan pembuat motif dalam memecah motif yang diinginkan ke dalam guun adalah proses yang cukup rumit, sehingga tidak banyak yang menguasai proses pembuatan motif songket. Sebagian besar pembuat motif melanjutkan atau mencontoh motif-motif yang sudah ada sebelumnya, dan saat ini jarang ditemui pembuat motif yang mampu untuk membuat motif baru dari awal. Untuk memudahkan proses memecah motif ke dalam guun, maka diperlukan pemahaman perhitungan pembuatan motif untuk songket. Kemudian, pemahaman mengenai perhitungan pembuatan motif untuk songket ditransformasi ke dalam sebuah aplikasi yang mampu membantu pembuat motif dalam memvisualisasikan motif ke dalam bentuk guun. Aplikasi desain ini akan memberikan manfaat bagi pembuat motif sekaligus sebagai upaya pelestarian budaya dengan mengenalkan aplikasi desain pembuatan motif songket kepada generasi muda, sehingga mereka dapat berkontribusi dalam pembuatan motif tenun Songket.

Kata kunci: motif, songket, guun, aplikasi desain

INTRODUCTION

A songket-weaving technique is one of the archipelago (nusantara) cultures that has been passed down from generation to generation. According to CTI (2010), this technique exists in several areas in *Nusantara*, such as Sumatera, Jawa, and Bali. Every region has its uniqueness characterized by the weaving's motifs, coloring techniques, and weaving equipment. These characteristics grow together with the culture that develops in each region. According to Hauser-Schaublin, et al. (1991), songket weaving in Bali was mainly rooted in the royal family (Kingdom). At that time, only certain people could afford the gold threats and had expertise in weaving songket. However, today, songket weaving can be owned by any group of people. In Bali, the songket weaving develops in several areas, such as Klungkung, Singaraja, Negara, dan Gianyar.

Making songket weaving takes quite a long time because the motifs that appear on the songket weaving are formed while weaving. This process is called *nyuntik* – the motif makers must determine the number of threads that are inserted and then picked to create a motif. They must be able to visualize the motif to be made into pixels. Pixels are image fragments that are formed when people weave. Interestingly, this ability is not possessed by all motif makers. In the past, Songket weaving motif makers could produce various beautiful motifs according to the character of their respective regions. The fragmented document of the motif was made into a *tulad* form, which consisted of several *Guun*. *Guun* in *tulad* is made using a stick, which tells how many strands of thread are positioned up (picked) and down (inserted) in forming the motif.

However, most motif makers today make motifs in the songket weaving by imitating motifs that existed from one *tulad* to another. They imitate the motifs because not all motif makers can visualize motifs in pixel. The complexity of this process causes the number of motif makers to decrease. As a result, it negatively affects the young generation since they are not interested in continuing the noble cultural heritage. Moreover, as documentation of today's songket weaving motif, *tulad* is made of sticks, making it poorly maintained because the sticks become stale. One of the strategies to preserve cultures is by documenting the work in a digital form. The Guidelines for the Preservation of Digital Heritage classify properties that are included in digital formats, such as text, data collection, photo, audio, visual graphic, software, website, and other digital properties. (National Library of Australia, 2003, p.13). Digitizing the traditional design process into digital format is one of the efforts to preserve this culture.

According to Pebryani (2019), another challenge is how the digital format can benefit the community owning the traditions. Sometimes, the preservation process stops at the digitization stage and is then stored. As a result, the preservation process becomes passive. In order to make it active, the digital format should be utilized by the community that owns the traditions. Hence, the digitization process can go on to the digital tradition as expressed by Shinzo Abe, who argues that society 5.0 should live hand in hand with technology.

The transformation process into a digital format must be carried out carefully by understanding local cultures to avoid misinterpretation. Thus, it requires an understanding of the process of making songket woven motifs which are then translated into digital form. This digital format can be taken advantage of by motif makers of songket weaving and the younger generation. In addition, it can provide public with a source of information about songket weaving motifs in the Gelgel area. This paper aims to 1) identify the concept of *Guun* calculation on the songket weaving motifs and 2) to translate the calculation into a digital application format that can help motif makers to visualize a songket weaving motif.

METHODOLOGY

Making a digital format needs an understanding, especially about calculating songket weaving motifs commonly applied by weavers and motif makers. This research was conducted in one of the weaving centers in Bali, called Gelgel, Klungkung. The Gelgel area used to be the first Kingdom on Bali island. It is located in Klungkung Regency (Berata, et al., 2011; Mardika, 2020). The research went through several stages, starting from design thinking in transition to digital tradition. Pebryani (2021) adds that the stages include 1) a field study to better understand local people's habits and cultures, 2) data analysis that is collected from the previous stage, 3) translating the design knowledge possessed by the local community into several digital format ideas, 4) turning digital format ideas into a design application, and 5) inviting local people to use the completed application. In this research, the first and second stages were classified as the understanding or exploration stages. Meanwhile, the third and fourth stages were combined into the simulation stage. Finally, the fifth stage was the evaluation or testing stage.

This research collected data by interviewing five motif makers of songket weaving in Gelgel, Klungkung. Besides, they were observed, particularly during the motif-making process or the *nyuntik* process. In order to better understand data in the field, the researchers decided to conduct participant observation where the researcher was involved in the *nyuntik* process to obtain more detailed and accurate information. Results obtained from the investigation were then advanced to the simulation stage. Sommer (1991) explained that simulation is a visualization process that results from an investigation. The design application generated during the simulation process was tried out and tested to ensure that the application has followed the actual procedures of making the songket weaving. The design results were then tested to be carried out where the younger generation and songket weaving motif makers were taught to use this digital application tool. Then, the results were tried to be woven with a *Cagcag* loom.

RESULT AND DISCUSSION

Data collection and analysis in this research went into three categories. 1) The first category was an exploration or understanding stage that consisted of the field study process and the results of the data analysis. 2) The category went on the simulation stage containing the process of expressing ideas for making web design applications and describing the application's functions. 3) The final category was the evaluation or testing stage that was undertaken by inviting participants to attend training to use the design application.

The Exploration or Understanding Stage
This research conducted interviews with five motif makers. One of the interviewee, an expert in songket weaving – I Nyoman Sudira, stated that the making of songket weaving was divided into several stages: *mengelos, nganyinin, nyuntik,* dan *menenun*.

Mengelos can be defined as the activity of sorting the threads per strand from the purchased threads, as shown in Figure 1. The yarn was purchased in kilograms in this research, so the pieces must be separated. After *mengelos*, the next stage was *nganyinin*.

Figure 1. The Process of Mengelos (Source: Author, 2022)

At the **nganyinin** stage, the threads in the loom were arranged in strands before being transferred to the cagcag loom. Transferring the threads into the loom is called the *nganyinin* process, as shown in Figure 2. This stage was adjusted to the intended use of the cloth because it would affect the number of strands of yarn. The number of strands of threads needed for *kamen* sheet was the same as the *saput* and *udeng*. A motif maker stated that 5-cm material consisted of 80 strands of the threads. Therefore, in order to produce a *saput* or *kamen* sheet, he needed 840-880 strands of threads.

Figure 2. The Process of Nganyinin (Source: Author, 2022)

Nyuntik is the activity of creating a motif in the *lungsi* thread. This activity is highly complicated. The motif makers must be able to visualize the intended motif into pixels or in the form of plaits, as in Figure 3(a). The motif maker must be able to identify how many threads go up and down in

forming a motif. During the process, the motif makers usually make *tulad*, as shown in Figure 3(b). *Tulad* is a motif design document whose contents are information on how many *Guun* are needed to make a motif. *Guun* contains information about when the strands of thread go up (picked) or down (inserted) in making motifs.

One of the participants admitted that the process of *nyuntik* was very complicated. The process fell into two categories. The first category was a *nyuntik* process that only continued from *tulad* (in other words, the *nyuntik* process used an existing motif). The second category was the process of *nyuntik*

which began from scratch without any help from *tulad* or previous motifs.

Guun is a key variable in a songket design. The number of *Guun* employed to create Gelgel songket motif varies between tens and two hundred at most. The motif makers must be able to estimate the number of guns for the desired motif. Additionally, they must be able to visualize the shape of the motif into how many threads must go up (be picked) and down (be inserted). The Gelgel motif has a characteristic where the smallest number of strands is three strands of the picked thread. This process counts as a one-box count.

Figure 3. (a) Left: motif in guun; (b) Right: tulad
(Source: Author, 2022)

During the **menenun** (weaving) process, the weaver will use information from *Guun* to create motifs in the threads, as presented in Figure 4. The information of one *Guun* is usually performed by inserting horizontal threads three to five times to make the motifs visible, as shown in Figure 4.

Figure 4. Menenun (Weaving) (Source: Author, 2022)

Simulation Stage

Having seen the making of songket weaving, the next stage was a translating process to create an application. Songket weaving motifs are made using threads that go up and down. Thus, the need for the number of *Guun* can be associated with the form of a cross or squares, where the *Guun* calculation exists on the vertical side, while the horizontal side is like a thread that goes through the *Guun*.

An application is hoped to become a translator of the motif makers. For example, suppose the motif makers want to create a Jalak Bali motif. In that case, the Jalak picture should be inserted to gain the number of *Guun*. Further, this application provides flexibility to users in accommodating the users to edit the picture, as illustrated in Figure 5.
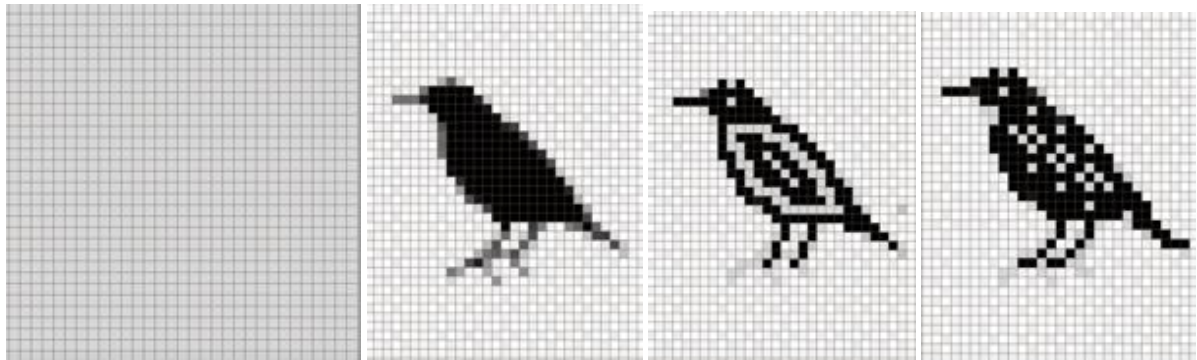
Figure 5. Simulation of the Jalak Bali motif's plan (Source: Author, 2022)

The picture above shows a series of *Guun*-sized fractions. The picture used 40 *Guun*. The number could be identified by counting the vertical squares, of which there were 40. The application then helped users edit the picture by adding or reducing the strands of the existing threads. Thus, the users could estimate the number of strands that went up and down.

While this application initially focused on creating a new motif, it could also be used to record motives in *tulad,* especially when the sticks employed in the *tulad* have been damaged and obsolete, as presented in Figure 6.
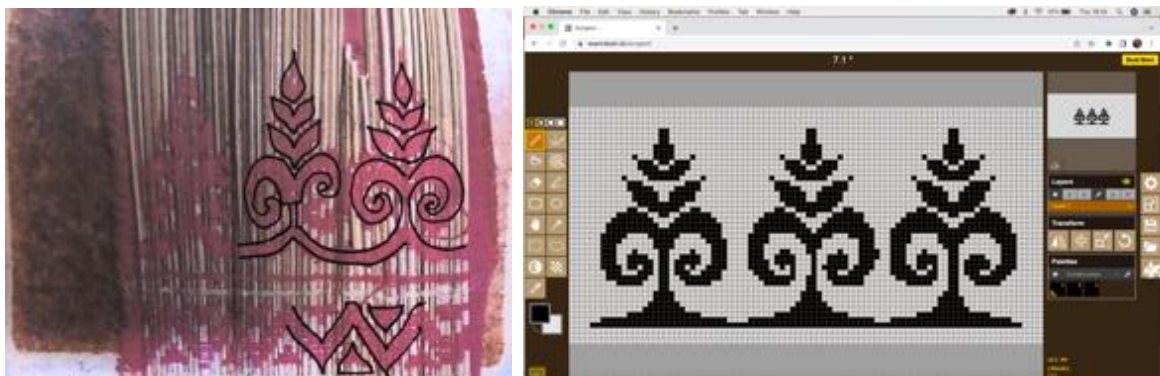

Figure 6. Re-drawing the first motif of tulad into the application (Source: Author, 2022)

As mentioned earlier, this design application can be utilized to store and record motifs in *tulad*. In this research, converting the motif to the design application was made based on the information in *tulad.* First, the number of *Guun* was counted. After that, the canvas size on the web/application was arranged following the number of *Guun*. The motif in the *tulad* was then drawn on the application. The motif was then recorded and stored digitally as a database. The file was stored on the website so that it could be accessed at any time.
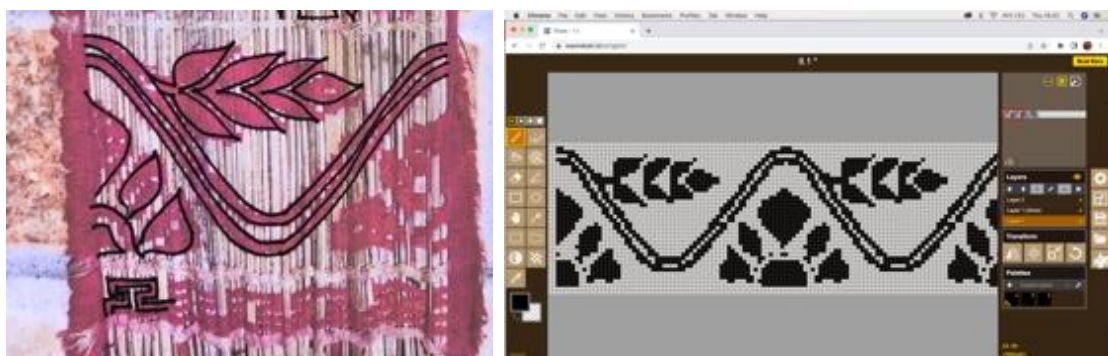

Figure 7. Re-drawing of the second motif of tulad into the application (Source: Author, 2022)

Evaluation and Testing Stage

Having completed the simulation and develoment stages, the application was introduced to motif makers and the young generation who were interested in making songket weaving in Gelgel. With this application, the youths can contribute to creating weaving motifs and preserve motives in Gelgel to be stored in a database. This research, therefore, hopes that weavers in Gelgel can learn to use this application so they can use it to preserve Songket weaving in their region. This training (as shown in the Figure 8) is also expected to obtain feedback from participants that might be used to improve the quality of the application in the future.

Figure 8. Design application training to create songket weaving motifs (Source: Author, 2022)

CONCLUSION

The transformation of Songket weaving motifs from traditional to digital format requires an in-depth understanding to produce an application that resembles the actual process in the field. For that reason, this research was divided into three stages, starting from understanding the motif-making process, the simulation process, and the evaluation process. The understanding process provides a rich picture to the researchers of the number of strands used in the Cagcag loom. It helps us understand the number of *Guun* commonly applied for the Gelgel motif. Meanwhile, the simulation process began after obtaining field information, such as step-by-step motif making. Thus, the application provided templates, like a cross, to help the motif makers create their own designs. After this stage, the design application was introduced to several motif makers and young generations in the Gelgel region to have their feedback. This feedback will help the researchers to improve the application in the future. Therefore, the improved version can be distributed to those who need this application to create a songket weaving motif.

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