

Wibawanto et al., 2020

Volume 6 Issue 2, pp. 568-574

Date of Publication: 11th October 2020

DOI- <https://doi.org/10.20319/pijss.2020.62.568574>

This paper can be cited as: Wibawanto, W., Triyanto, Cahyono, A. & Rohendi, T. R. (2020). Digital Innovation for Traditional Batik Crafter. *PEOPLE: International Journal of Social Sciences*, 6(2), 568-574.

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## **DIGITAL INNOVATION FOR TRADITIONAL BATIK CRAFTER**

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### **Abstract**

*Significant market developments demand speed in creating batik motifs. In several studies, it was found that traditional batik craftsmen are still unfamiliar with the use of digital technology in creating batik motifs. So we need a method to introduce digital techniques to traditional craftsmen. This article discusses the use of D-Batik software as an application to accelerate the creation of batik motifs. Using a mixed-method with a field test approach this study aimed to find the fastest method to create the batik motifs. D-Batik was tested on 2 groups of traditional batik crafter in the Semarang. Based on the results of trials, it is known that D-Batik can be easily coordinated by batik craftsmen who are still unfamiliar with technology and are able to produce new motifs with high complexity faster than manual techniques. This study provides technical recommendations for*

*the use of digital technology for traditional craftsmen.*

## **Keywords**

Batik, Motifs, Digital, Innovation, Crafter, Digital Technology

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## **1. Introduction**

Indonesian Batik has been established as one of the UNESCO's Representative Lists of the Intangible Cultural Heritage of Humanity. This official recognition brings batik to the stage of protecting, preserving, developing, and promoting Indonesian batik throughout the world. Over time, the competition of the batik industry to seize domestic and foreign markets has increased. Trade-in apparel products worldwide which reached USD442 billion are a great opportunity for the batik industry to increase its market share. The Indonesian Ministry of Industry noted, more than 110 batik centers throughout Indonesia in 2019. Also, the export value of batik products in 2019 reached USD52 million (Kemenprin, 2019) which ultimately led to high competition among batik entrepreneurs in Indonesia. The market is always demanding new batik motifs but the creation of new batik motifs is not as fast as market demand.

Batik crafter easily makes motifs using paper and pencil. This technique is carried out from generation to generation, and only a few craftsmen can create new motifs. Generally, batik motifs development is carried out conventionally by taking inspiration from conditions in the surrounding environment (Bifadlika & Russanti, 2016). The use of digital technology in production systems has been proven to be able to significantly reduce the time required by a designer to design and develop a product when compared to the conventional design process (Hsu and Sinha, 1992). However, in several studies, it was found that batik crafter is still unfamiliar with the use of digital technology in creating batik motifs (Adnyana, Kesiman, & Series, 2013). Introducing digital techniques to batik crafter who generally has never been learned digital technology is a challenge.

In 2016 the Department of Industry held training for batik crafter on making motifs with digital techniques. It uses graphics software such as CorelDraw and Photoshop to generate the motifs. Participants who are mostly unfamiliar with this technology cannot follow the steps in making motifs digitally, have difficulty understanding the tools available in the software, and are stuck at a further level. In the end, the training did not get optimal results (Wibawanto & Nugrahani, 2017). The feedback obtained from the training is that it requires a simple digital technology that is easily operated by traditional batik crafter. The complexity level of the software must be following the user's experience who are not familiar with complex software but are familiar with the use of pencil and paper.

## 2. Batik Motifs Creation using Digital Technology

Batik has certain ornaments that are geometrical and non-geometric. There are several groups in geometric patterns namely Ceplok, Kawung, Machete, Slope, and Nitik. While non-geometric motifs consist of Lung lungan, Cement, Pagersari, Tablecloth, and Wayang motifs (Arymurthy et al., 2016). In further developments batik crafter develop new motifs that combine several existing motifs and create new motifs with natural inspiration and objects that are around the craftsman.

In the field of research on the use of digital technology, Wibisono and Toha (2000) have developed a CAD batik stamp software, design, and coloring system in the software using a *canting cap* database system and color database. Wyvill et al. (2004) developed a batik CAD system with a fracture engineering simulation method on "rendering cracks in batik". Hariadi et al. (2007) has also developed software to make batik designs under the name of fractal batik. This software uses fractal mathematics through Fourier transform and then produces a motif design with the term fractal batik (Asmal, Subagyo, Wibisono, & Sudiarso, 2015). Some of these digital technologies require advanced understanding such as understanding mathematical algorithms, making curves (bezier), and operating complex features. Several studies have proven that developing batik motifs using digital software can produce motifs faster, but the ability to operate the software is the main key in creating batik motifs. The software should be simpler and simulate the conventional process as if drawing a motif on a piece of paper.

D-Batik is a software developed in 2017 that tries to imitate the conventional method of drawing batik motifs (Wibawanto, 2019). Operating under the Android platform, this application works with a very simple interface and finger touch to produce lines and curves. Software AI will help users to produce the desired motifs and combined with the pattern repeating feature so this application is easy to operate.



Figure 1: Warag Ngendog Motifs produced through D-Batik Application

### 3. Method

A field test is one of the evaluation methods applied to assess D-Batik in making motifs. Tests were carried out on twenty participants. Participants were batik crafter from 2 batik communities in the city of Semarang with the age range of 35-50 years. The participants do not have a background in operating graphical software and are asked to make batik motifs using the D-Batik. User behavior is observed through the field testing process. It captures the D-Batik features used to make motifs, motif complexity, duration of motif creation, and problems that arise when operating the apps.



**Figure 2:** *D-Batik Field Test in Batik Crafter communities*

*(Left: Research Participant, Right: Making Batik Motifs during the Research)*

### 4. Result and Discussion

Based on the field test it is known that the use of the D-Batik application can increase the productivity of making batik motifs. Batik craftsmen who are laymen of digital technology can operate applications. Adaptation of the process of creating conventional batik motifs into digital format can be seen in table 1.

**Table 1:** *Conventional Method to Digital Format through D-Batik Application*

Motifs creation process	Conventional Method	Digital Adaptation
Drawing tools	Paper and pencil	The touchscreen on Android Mobilephone
Drawing line	Manual stroke with pencil	Smooth line prediction with AI that mimics the hand movements of batik crafter
Symmetry pattern	Using transparent paper and folding the paper to form symmetrical images	Automatic symmetry is visible on the screen with several options

Motifs repetition	tracing the master pattern several times	Automatic repetition with one-touch
Final result	B/W motifs on paper	B/W motifs or color version ready to print
Time of creation	Based on complexity	Based on complexity, and mostly faster

In the process of the field test, it was also found that introducing a digital method to create batik motifs requires special conditions and prerequisites. At least we note the following conditions:

- a companion is required to begin the introduction and use of digital applications.
- traditional craftsmen without a background in digital technology are not necessarily able to install and operate applications independently, so the first step must be done by a companion
- it takes some time to explain about the features of digital applications, because of the tendency of traditional craftsmen not to explore deeper
- the motives produced in the first learning stage are the imitation of the existing motives. After trying several times, new motifs began to be developed.
- some users who are more than 50 years old initially refused, thinking they were too far behind. After several mentoring processes they began to try to operate the application and produce several motives.
- more than 60% of users continue the process of digitally making motifs while the rest return to conventional techniques considering the digital method is too complicated to do.



**Figure 3:** *Batik Motifs produced by D-Batik Software*



**Figure 4:** *Implementation of Batik Motifs with the Stamp Technique*

## 5. Conclusion

The D-Batik application has features that facilitate the creation of batik motifs including making lines, curves, and repetition, reflection, and other features that are adapted from the conventional method. This application is trying to imitate as closely as possible the conventional process of creating batik motifs then presented digitally with a very simple interface. The use of D-Batik for traditional batik crafter is expected to increase the quantity and quality of batik motifs. This research is still limited to small scope trials. The D-Batik application then needs to be developed and further investigated, especially the integration of the application with several other technologies such as printing technology, 3D printing for making batik stamps, and other technologies. D-Batik also needs to be researched further about user experience to find the most effective model in creating batik motifs.

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