The application of jBatik software for batik products

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Abstract. Batik is one of Indonesia's cultural heritage that must be preserved. jBatik is an application that introduces the process of making batik motif designs using technology. The purpose of this study is to apply the technology for making batik motif designs in the batik industry. The use of technology in batik designs is expected to facilitate the making of motif designs and provide more creative quality craftsmen, and can prepare for industry challenges of the 4.0 era. The technology used is JBatik is an application to make batik motifs with fractal principles. The paper writing method is in the form of jBatik application analysis which is already available on the internet. This finding shows that the process of making batik motif designs using jBatik application is faster and more effective by producing two types of motifs namely 2D and 3D motifs depending on the parameters used. The use of jBatik application is practical and facilitated by various variations of batik motifs.

1. Introduction

Technology will continue to spread rapidly throughout the world so that this technology becomes an absolute necessity that cannot be avoided because it brings practicality to people's lives. Understanding of technology is very important to learn as a self-orientation in modern society and in making good and bad decisions in their use [1-3]. The development of increasingly sophisticated technology that affects the industrial world including simple industrial tools for designing batik motifs on computers. This software application is software that uses computers as a means to write, draw and store important data digitally. One of the technology in drawing on a computer that is computer aided design is a computer program to draw parts of a product and by using this CAD can improve the creativity of craftsmen, especially in the use of the development of a product [4,5]. Besides there are still many applications that can be used in making designs on computers.

The use of technology in the industry begins with the manufacture of simple tools that support human needs, in addition to the technology emerging now in the form of new applications that have advantages and can be utilized by humans [6]. As for applications to make batik motif designs that are more effective and fast [7]. One application that can be developed in the batik industry is jBatik software that can create manual to digital batik patterns [8].

Batik is one of Indonesia's cultural heritages that must be preserved and must be developed by today's young generation. To invite young people to preserve batik, the use of applications can help in making innovative motif designs. So that the batik pattern can develop into an attractive batik motif [9-11]. The first process of making batik with traditional is the design of batik by making desired drawings/sketches on the fabric using a pencil or pen [12-14]. As well as the craftsman's body posture, he is very concerned because there is a lot of pressure that will be felt by the body with a variety of abnormalities of muscles
and bones, arms and wrists as well as causing less optimal work [15]. Therefore, the researchers analyzed this jBatik application so it could be used in the industry. Craftsmen competencies that are needed will use the jBatik application by increasing creativity and accuracy when working [16]. Most of the use of technology in the batik production site the design of batik motifs using only traditional tools from this study also shows that the application of jBatik is a software developed by the Pixel People Project to design batik patterns using fractal [17]. Applying existing ideas to new areas as in previous studies that explain the application of jBatik for the development of motif designs, to create new motifs and be able to make batik patterns as desired depending on the parameters used in addition to the counts in mathematics which is translated into the L-system/programming language [18].

2. Method
This research begins by describing the application of technology used in the batik industry using a literature review. The literature review can be broadly described as a systematic way of gathering and synthesizing previous research [19,20]. The paper writing method is by analyzing the jBatik application which is already available on the internet as well as trying to apply it in the place batik production. Literature studies such as data collection are sourced from electronic scientific journals, proceedings that discuss jBatik software, technology in batik available on the internet that is accessed from scanned and cross-referenced. As well as direct observation in the field to see various data and phenomena that occur at the location of the place of making fractal batik in Bandung.

Data collection techniques that are covering journals and proceedings about batik, technology in batik production and applications that support the production of batik in the industry. Once found, it is downloaded and grouped into the appropriate research journal topics. Data processing is taken from the results of data retrieval which can be concluded from the results of data retrieval contained in the contents of each journal. Analysis of the data from the journal by conducting a journal review one by one by looking for similarities (compare), looking for inequalities (contrast), providing views (criticize), comparing (synthesize), and summarizing (summarize). After that, researchers processed the data by the research objectives of applying jBatik application to batik production. This research was conducted in May until June 2019.

3. Result and discussion
The results and discussion obtained through research are seen from the use of technology in batik production and specifically in the making of batik motif designs.

The results obtained after analyzing from several application journals are effectively used in batik production so that craftsmen are faster and easier to make batik motif designs. This jBatik application can improve batik designs using computers, thereby encouraging creativity in the process of making batik motif designs [21,22]. First of all, using jBatik application requires skilled, trained and experienced workers and can effectively realize the process [23]. To use this jBatik application requires special training for craftsmen in using this application. The use of this application is facilitated with various inspirational innovations for batik motif designers [24,25]. The training was conducted to train the use of the application because making batik motifs in this application requires patience, accuracy, and creativity of the craftsmen. As well as being able to prepare for industry 4.0 era is considered as a new industrial stage where the manufacturing process of integration and product connectivity can help the industry to achieve higher performance [26].

Pixel Indonesia created the jBatik application, a technology that creates fractal batik patterns. jBatik application to make batik motifs using the fractal principle. the word fractal means the branch of mathematics that deals with repetition. The process of making motif designs using this application can improve the performance of more competent craftsmen in the field of batik motif design. The appearance of the jBatik application is as follows:
In Figure 1 shows the appearance of jBatik application images used in the batik industry. This jBatik application has a serial number and can only be used on one computer. The user pays to purchase this jBatik application once and for the minimum specifications needed to install this application as follows:

- Windows operating system, Windows 7
- Intel Core i3 Processor Series 3rd Gen
- 4GB of RAM
- 215MB hard disk
- 1280x800 display (1366 x 768)
- OpenGL 2.0-capable system (jBatik Pro)
- The internet is required to enter jBatik Serial Number

Besides, this application can also help in making batik motifs. In this application, you can easily place colors on the batik motif [27]. In this jBatik application is divided into two kinds of motif design results, namely 2 dimensions and 3 dimensions as follows:

Figure 2 showing interesting images on the results of 2-dimensional batik designs or having 2-dimensional motifs can choose jBatik Basic application. So the results of the previous image can be saved in *. Png format and have a background. many features available on the jBatik application by simple drawing to make batik patterns.
Figure 3. Example of a drag and drop motif to the arrangement layout.

Figure 3 shows the forms of batik motifs that will be used in this jBatik application so that the results are just drag and drop to arrange the motifs into one interesting batik motifs, all they need to do is place them in the commanded position on the application.

Figure 4. The design motif 3 dimensions.

Figure 4 shows images of the results of 3 dimensional batik motif design so that it enriches the innovative batik motif so that it uses jBatik pro.

Figure 5. Example of motive 2D and 3D.

Figure 5 shows the results of the design of batik motifs using jBatik basic and jBatik pro and the results obtained are 2-dimensional and 3-dimensional batik motif designs. Users can choose the type of application needed in the industry so that users will develop batik motifs using technology. These batik motifs can then be saved in an image format (*.Png) which can then be printed on paper or cloth. Batik motifs can also be saved in 3-dimensional format (*.obj). The development of industrial technology can have a positive impact both for the entry of workers who are open to the latest innovations as well as those who have the ability in the technology field [28]. Especially craftsmen must be creative, and can develop their ability to try new things. making batik designs using an application does not eliminate the value of local wisdom on the batik motif [29]. In addition to jBatik applications that can be used in batik production, as for other technologies to market batik, that is with web-based applications that are useful
for selling batik products [30]. One of the production sites that once held activities for training to make motifs using jBatik is batik production in Cirebon so that craftsmen in the field of motif design can be directed to make batik motif designs using the jBatik application. After being implemented in the industry, it experienced significant changes and felt the effectiveness and ease of making the batik motif. The number of employees or craftsmen who are elderly makes this application not used again so that the craftsmen in the industry continue to choose the process of making traditional batik motifs, the higher selling value of making batik motifs using traditional methods compared to using technology. The batik industry in Cirebon prioritizes making batik manually rather than using technology. The results of the use of jBatik applications in the industry in the form of printed batik motifs made specifically by fractal motifs designers for the batik industry.

4. Conclusion
This study focuses on the use of technology in making batik motif designs. The process of making batik motifs using this jBatik software is first, batik motifs are transformed into fractal mathematical formulas with the L-system language. Furthermore, the formula results are modified by changing the parameters to be used and producing more complex formulas. The formula is processed with the jBatik software program and produces images of batik motifs that are different from the original motifs. This application makes it easier for craftsmen to make batik motifs. So that the motifs to be used are available in this application view, the user just needs to drag and drop to the layout. The use of this application requires high accuracy and creativity to produce good batik motif designs. Besides making motifs, it can also be given colors and colors on the motif.

The application usage training is needed by the craftsmen in making innovative batik motif designs. As well as the development of today's technology with the use of technology in batik production can improve the quality of craftsmen at work to prepare for the challenges of the 4.0 era industry, the advantage of this application has a generative design philosophy, where this application can produce various forms of a design motif depending on the parameters used. Besides, the use of this application is very helpful batik craftsmen more effective in making batik motifs ranging from making batik designs to the fabric to be printed.

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