

## Research Article

# Indonesia-Malaysia Batik Pattern Collaboration Creation with Artificial Intelligence Platform

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**Abstract.**

The problem with making batik in Indonesia and Malaysia so far is that it is still very manual and has not taken much advantage of technological advances. The development of Artificial Intelligence (AI) technology is currently very advanced, continues to innovate, and has even touched various aspects of human life. Limitations in ideas, human resources, knowledge, tools, and internet networks are the dominant conditions that cause problems in Indonesian and Malaysian batik creations. This study aims to use Artificial Intelligence to describe the combination of Indonesian and Malaysian batik patterns. This paper uses a descriptive-qualitative method with an experimental approach in the form of trials for the creation of batik patterns using the Imagine Artificial Intelligence platform; each trial is based on three basic patterns of batik, namely *Sawat* and *Gurdha* (Indonesia) and *Orchid* and *Tiger* (Malaysia). The results of this paper generated eight totally new Indonesian-Malaysian batik patterns. Artificial Intelligence (AI) was very helpful for the development of batik patterns. Through the creation of new batik patterns with the support of Artificial Intelligence (AI), it certainly creates new opportunities for the creation and business of batik to become more advanced. It is hoped that this paper will succeed in solving the problem of limited ideas in creating Indonesian-Malaysian batik motifs.

**Keywords:** Artificial Intelligence, batik, creation, Indonesia-Malaysia

## 1. Introduction

Artificial intelligence has changed our world forever [1]. The change due to AI may happen sooner than most people realize including for the people of Indonesia and Malaysia. In batik creation activities, AI will further improve the creation process, including the creation of batik motifs. Using AI in the batik creation process has marked the beginning of a new era of information technology management. The use of AI involves communicating, leading, coordinating, and controlling the ever-expanding frontiers of

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computing advances that refer to human intelligence in dealing with increasingly complex decision-making problems. That means making decisions about three related and interdependent aspects of AI – autonomy, learning, and ignorance [2].

The condition of the existence of batik in Indonesia and Malaysia is quite apprehensive. Indonesian - Malaysian traditional batik should continue to exist and be sustainable in keeping with the times, but we also need to accelerate the latest technology in batik production because market demand continues to increase [3]. The benefits of Artificial Intelligence in the field of batik can also be used to identify genuine or counterfeit batik. This can make people's batik businesses in Indonesia and Malaysia continue to produce [4].

Researchers have carried out several experiments combining patterns of batik motifs, including using software technology support in an effort to speed up the making of batik motifs [5]. The use of technology really helps speed up and increase the richness of patterns in the batik industry. Research that proves this has been carried out by Wibawanto *et al.* [6]. The D-batik application was used to make batik motifs. The results of the study show that the use of the D-Batik application was able to accelerate the production of batik motifs and create new motif patterns. Another study conducted by Ratnadewi *et al.* [7] also emphasized that technology can make it easier to create new motifs that are unique to a region. a computer programming pseudocode (algorithm) was used to create autogenerative motifs on Purwakarta batik that did not exist before. The results of the batik designs are the morning glory pattern and the Jatiluhur dew pattern which are made based on the local wisdom of food and tourist attractions in Purwakarta. The use of digital technology facilitates the process of repeating patterns and storing data. Apart from creating new patterns, digital technology has also been used to re-define existing batik patterns, even those that are almost extinct. Ihsan's research [8] uses a convolutional neural network to reconstruct batik images to develop batik patterns, colors, and textures by integrating traditional and digital batik surface design techniques. Gondoputranto and Dibia's research [9] has also used the -Jbatik software and batik pattern data which are almost extinct from the Turkish Digital Textile Archive (TUDITA) to be reconstructed. The results of his research show that traditional Indonesian and Turkish batik Sumerbank motifs have been successfully preserved by technology.

Although there have been many uses of technology to help describe batik patterns, however, combining batik patterns that are typical of two different regions is still rarely done. Moreover, the merging of batik patterns from two different countries has not been done. Even though the combination of batik patterns from the two countries can create

mutually beneficial cooperation, create new, unique batik patterns, thus enabling the development of industry for both parties.

Therefore, the aim of this paper is to create new batik motifs, a collaboration between Indonesian and Malaysian educational staff, using Artificial Intelligence technology, namely the Imagine platform. Through this collaboration, it is hoped that a better synergy of cooperation will be created in the batik culture of the two countries.

## 2. Method

The method for creating batik motifs in the Indonesian-Malaysian collaboration in this research was done by qualitative-experimental. The process stages in the creation of this batik motif were: (1) Ideation; (2) Prompt engineering (as a fundamental and technical aspect, elements, knowledge); (3) Generate; (4) Outcomes. All of these stages of the process were carried out using Artificial Intelligence technology, namely the Imagine platform.

## 3. Result and Discussion

### 3.1. Ideation

Ideas are the main creative activity in design. However, it is actually a difficult thing because it is exploratory and rapidly developing in computing [10](Ji et.al, 2020). This idea is the human imagination as a technology user. Ideas can be expressed in various forms ranging from words, gestures, images and sounds. The idea used in this study is the two patterns of Indonesian and Malaysian batik which are only expressed in the mention of words.

### 3.2. Prompt Engineering

Prompt engineering is a critical skill set required to communicate effectively via big languages (LLMs) such as ChatGPT as well as Imagine AI platforms [11](White et.al, 2023). At this engineering prompt stage, the user can enter words, sentences, or sounds to be processed into new batik motifs. In this study, the words “Gurdha motif (Javanese) blend with Tiger motif (Kelantan)” and “Indonesian wing/sawat motif blend with Orchid Malaysian motif”.

### 3.3. Generate

AI helps generate innovation as well as has a transformative impact on digital organizations [12] (Haefner et.al, 2021). AI processes the prompts given using various databases on the internet. AI takes a text prompt and turns it as closely as possible into an image that matches the text provided.

### 3.4. Outcome

The results of the collaboration of Indonesian-Malaysian batik motifs using artificial intelligence with the prompt text “*Gurdha* motif (Java) blend with Tiger motif (Kelantan)” are presented in Figure 1. The *Gurdha* motif is a typical Indonesian Javanese batik. The *Gurdha* motif is a stylization of the Garuda bird, which is a mighty bird like the Eagle. In the view of the Javanese people, the Garuda bird has a very important position. The form of this *gurdha* motif consists of two wings (lar) and in the middle there is a body and a tail [13]. This *gurdha* batik motif is also inseparable from past beliefs. Garuda is the mount of Batara Wisnu who is known as the God of the Sun. Garuda became Batara Wisnu’s mount and was used as a symbol of the sun. By the Javanese people, besides being a symbol of life, Garuda is also a symbol of virility. The important point in this motif is the depiction of curves that resemble bird wings. The tiger motif has characteristics resembling a tiger’s head with a characteristic depiction of the dominant eye. The results of the AI visualization combine these two motifs to form a new motif that does not eliminate the characteristics of the two previous motifs.



**Figure 1:** The results of the collaboration of batik motifs with *gurdha* and tiger motifs.

Figure 1 above shows 3 new batik motif creations, which have never been produced in Indonesian and Malaysian batik before. New ideas can be seen visually in the 3 batik motif creations resulting from an artificial intelligence processing. The process of creating the new 3 motifs uses the stages of ideation - prompt engineering - generate - outcome, from word-based artificial intelligence.

The second experiment was carried out using the Indonesian word *Sawat* motif combined with a Malaysian orchid flower motif. The results of the creation of batik motifs with the prompt text “Indonesian wings/*sawat* motifs blend with Orchid Malaysian motifs” are presented in Figure 2. The *sawat* or wings motif is a typical batik motif for the Solo area, Central Java Province, Indonesia. The *Sawat* motif has a motif resembling the shape of sawat or wings [14]. This batik motif is considered sacred because previously it was only used by kings and their families. The meaning of the Sawat batik motif is associated with the Garuda bird as a vehicle for Lord Vishnu with the symbol of king or power. So that the philosophy of this batik motif also symbolizes the majesty and prosperity of the person wearing it. Solo batik with the Sawat motif is often worn by bridal couples at traditional Javanese weddings with the meaning that it can protect the lives of users of the Sawat batik cloth. Figure 2 shows that the orchid motif dominates the batik pattern, however, the characteristic of the sawat batik motif, in the form of stripes resembling wings, are still found. So that this new batik pattern does not leave the characteristics of the *sawat* batik pattern or the orchid pattern itself.



**Figure 2:** The results of the collaboration of batik motifs with *sawat* motifs and orchid motifs.

In the result of the second experiment above, there are 5 new batik motifs can be seen in Figure 2. The combination of Indonesian *Sawat* motifs, blend with Malaysian orchid, create a new idea in the form of batik compositions that never been produced before. The process of creating the new 5 motifs above, uses the stages of ideation - prompt engineering - generate - outcome, from word-based artificial intelligence.



## 4. Conclusion

New ideas can continue to be created through the support of human intelligence technology, on the basis that human brain as the main characters. Technological progress as part of human civilization will continue to develop. The development of creating new batik motifs can also be supported by advances in artificial intelligence tools and technology which are developing very rapidly. It's time to create collaboration batik motifs between Indonesia and Malaysia using the support of AI technology. The help of the Imagine AI platform technology makes it very easy to make batik motifs including lines, curves, repetitions, reflections, and adaptations of conventional methods. The AI Imagine application can create digitally, has an easy-to-use interface for Small and Medium Enterprises in Indonesia - Malaysia. The use of AI Imagine software is expected to increase the quality and quantity of creating new batik motifs. The Imagine AI application can continue to be developed and integrated with other AI applications. Integration with other applications such as making copper stamps, canting applications and user convenience is expected to advance the batik industry of both countries.

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