

Transformation of East Kalimantan Batik into Ready-to-Wear Fashion with Augmented Reality for Creative Economy IKN

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ABSTRACT

The uniqueness of East Kalimantan batik lai in its motifs and colors which are influenced by motif designs inspired by the Dayak tribe, local flora, and fauna. The transformation of East Kalimantan batik into ready-to-wear fashion is a strategic initiative to combine cultural heritage with modern design trends, and contribute to the creative economy in Indonesia's new capital city. This research explores the development of batik from a traditional fabric into a contemporary fashion product, with the aim of strengthening local identity so as to expand market reach. Augmented reality technology is used to enhance the consumer experience through a virtual try-on feature, allowing users to view batik clothing in real time. The problem formulation in this research is how the transformation process of East Kalimantan Batik into ready-to-wear fashion products, and how the use of Augmented Reality technology can provide solutions to improve user experience in trying and deciding product purchases effectively. The method used is the Design Thinking method which is carried out with 4 stages namely discover, define, develop and deliver. The results obtained Augmented Reality in the promotion of ready-to-wear batik not only supports the preservation of local culture, but also strengthens the competitiveness of batik products in the modern era. This is an important step in making batik a highly competitive ready-to-wear fashion product in supporting IKN's creative economy.

KEYWORDS

Augmented Reality
Batik
IKN
Ready-to-wear

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INTRODUCTION

The plan to relocate the State Capital (IKN) in the East Kalimantan region is written in Law Number 3 of 2022 concerning the State Capital on 15 February 2022. Currently the central government is accelerating in building infrastructure, (Prabawati, 2023) according to Budi Widihartanto IKN can be a driver of economic progress in the East Kalimantan region, this was also expressed by Sri Wahyuni (Regional Secretary of East Kalimantan) in economic growth in East Kalimantan increased by 6% since the construction of IKN (Isma, 2023). The existence of IKN encourages the economic growth of the local MSME sector, Sandiaga Uno as Minister of Tourism and Creative Economy, encourages tourism and creative economy actors in Balikpapan city to maximise opportunities from the development of IKN by increasing innovation and creativity of MSME products and promoting through digitalisation (Rara, 2024).

Batik was originally only developed in the palace area, as the times developed batik experienced transformation into contemporary batik which experienced many changes such as motifs, techniques and philosophy (Rudianto, 2023). Regional batik identity can characterise local wisdom (Ihsan & Surya Utami, 2022). One of the creative economy products in the East Kalimantan

region is batik, which has a uniqueness and distinctiveness that is different from other batik, this is influenced by local culture, Dayak tribes, flora and fauna which are a source of inspiration for craftsmen in creating local motifs. Each region in East Kalimantan has a distinctive motif such as Bontang egret motif, Penajam Paser Utara (PPU) deer motif, Paser carving motif, Kutai Kartanegara dragon motif, East Kutai spike motif, West Kutai tiger limb motif, and Berau, Balikpapan and Mahakam Ulu princess maluung batik motif. Development and Transformation of motifs by doing stilation, which is changing the shape without losing the character of the original form (Pujiana & Novrita, 2023) Batik is the nation's cultural heritage, in East Kalimantan it has a huge opportunity for the batik business, but the number of batik craftsmen in the region is still very minimal, so it is necessary to encourage the millennial generation to start pursuing the batik business (Putri, 2021). East Kalimantan batik is a form of Indonesian cultural diversity and reflects the uniqueness and distinctiveness of the East Kalimantan Region. Batik is also a symbol of local values that the local community itself always upholds. The motifs used for East Kalimantan batik are often inspired by endemic flora and fauna as well as natural resources, batik culture has an important position in the preservation of local culture. Batik has a meaning implied in each motif that is passed down from generation to generation.

The community has an important role in producing and wearing it as an effort to preserve their local culture and identity in the face of globalization. East Kalimantan batik contributes greatly to the local economy. Batik production creates ample employment opportunities for many people, ranging from artisans, designers, to sellers. In addition, with the increasing market interest in authentic local products, East Kalimantan batik has a huge opportunity to be developed into a superior product that can penetrate the national and international markets (Wulandari, 2022). This batik is a distinctive product that participates in supporting local tourism, where visitors can buy batik as a souvenir from the IKN.

The application of traditional ornamentation on ready-to-wear fashion products can be done as an effort to attract the interest of the younger generation in preserving local culture (Andriyanti et al., 2022). The development of East Kalimantan batik products as ready-to-wear fashion in standard sizes hopes that this product can be reached by a wider market. Distribution and acceptance in any location is easier, both domestically and internationally, because consumers can buy and wear it directly without having to make further adjustments. Then, at this standard size, it will be easier for mass production to be more economical and affordable so that it is more affordable and has a high appeal for batik in the global market. In the face of global competition, batik needs to adopt innovations in both design and production to become an attractive ready-to-wear fashion product.

Batik transformation in industry 4.0 is to carry out innovation and technology in the batik industry (Kholifah et al., 2024). Technology-based batik innovation needs to be done to build the sustainability of the batik industry (Sharmistha & Sinambela, 2023). Augmented Reality (AR) combines virtual objects with real environments, so that virtual information can be perceived by viewers through digital devices such as smartphones. AR has become a successful marketing tool in providing additional experiences for customers through smartphones (Wiley, 2017). Augmented Reality can be used as a promotional medium in displaying products that will sell (Bagus & Putra, 2020). To apply Augmented Reality is done using markers to display products in 3-dimensional form so that it combines the real world and the virtual world (Wuryandari & Retnowati, 2023). The use of Augmented Reality in clothing catalogues can provide interactive experiences to customers in virtual fitting, Augmented Reality used with the markerless method so that it does not require marker scans to display 3D objects (Sutianto & Wulandari, 2024). In this study, researchers used Augmented Reality that uses markers, namely the human body so that batik is displayed as an option in virtual fitting.

To prepare East Kalimantan to become IKN, it is necessary to take a role in creating distinctive batik by innovating products into ready-to-wear fashion products that are promoted using AR technology so that customers can do virtual fittings when shopping on e-commerce.

Previous research that has been done is Batik Sekar Buen in the Penajam Paser Utara area which is projected to be a typical batik from IKN, the technique used is using a CNC machine,

colouring using remasol dyes, motifs that are the source of ideas, namely local potential and Dayak Paser culture (Aka et al., 2022). In addition to the use of Augmented Reality as a promotional media for clothing catalogues, this research uses the markeless method, namely the application does not require humans to try on the clothes (Sutianto & Wulandari, 2024). Based on these two studies, the novelty of this research is to use Augmented Reality as a Try-on media on IKN ready-to-wear batik.

METHOD

The Design Thinking method is an approach to generate solutions to user needs that are carried out in innovating and developing products through the process of understanding problems in the field, then generating creative ideas that are applied to prototyping. Design thinking can make it easier to overcome problems and formulate solutions according to needs. (Dumamika et al., 2023) The Design Thinking framework used is the Double Diamond popularised by the Design Council in the UK, this framework has 2 diamonds where the first part understands a problem and the second understands a solution. (Somia Customer Experience, n.d.).

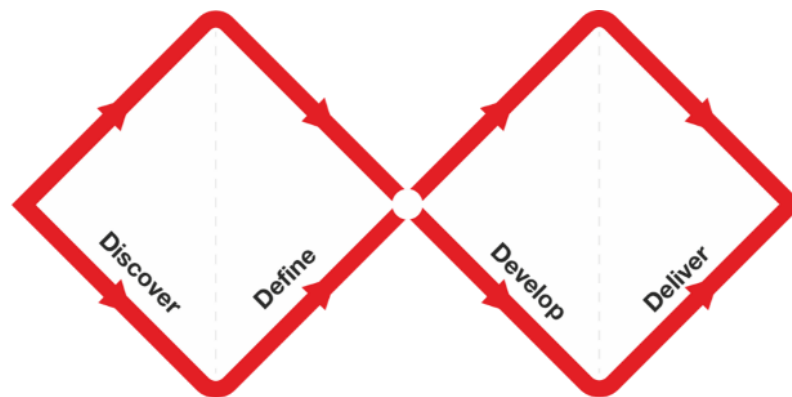


Figure 1. Flowchart of The Double Diamond Framework in Design Thinking (Framework for Innovation, n.d.)

There are 4 stages of the Double Diamond framework in Design Thinking :

1. *Discover*

At this stage is done to understand the problems that exist in the community (*Framework for Innovation*, n.d.), the purpose of this stage is to find variables that can affect a problem in research and formulate possible solutions (Yapary, 2022). The approach is done through observations and interviews to both craftsmen and users. In this research, observation is done directly at Batik Sekar Buen Penajam Paser Utara and Batik Shaho Balikpapan, besides that, virtual observation is also done about people's behaviour in making decision when buying products.

2. *Define*

At this stage, the researcher synthesises the problems that have been found at the discover stage (*Framework for Innovation*, n.d.). Furthermore, in the define phase, the problem that will be solved in the research is filtered (Yapary, 2022). In this process, an in-depth analysis of the findings in the field was carried out to understand the root of the problem comprehensively. Then the problem was formulated to be resolved in this research.

3. *Develop*

At this stage the main focus is on formulating solutions to previous problems. Researchers began to compile mind-maps to make it easier to formulate problem-solving solutions, in this process a literature study was carried out as a reference taken from previous research (*Framework for Innovation*, n.d.).

4. Deliver

In the deliver stage, the researcher tests the solution that has been chosen, testing this idea is done on the prototype and then testing it on the user to get feedback on whether the solution offered can solve their problems (*Framework for Innovation*, n.d.). In the prototyping stage, the process of finding ideas is visualised into a sketch of the motif, the idea is developed from the local potential of East Kalimantan. Then the design is applied to batik with the batik tulis technique, after becoming a batik cloth, the process of sewing batik into ready-to-wear products, namely clothing. Finally, researchers integrate Augmented Reality technology on batik products to enhance the user experience in interacting with batik. To evaluate user interest in using augmented reality as a medium for promoting local culture and products, researchers use qualitative methods with descriptive analysis of the results of questionnaires given to respondents who use augmented reality batik. Qualitative method is research that is carried out to understand holistically to understand the results of data from research subjects, the analysis is carried out using description analysis in the form of words and language (Karmanis & Karjono, 2022). The questionnaire questions were asked to determine the level of respondents' interest in using augmented reality in the promotion of batik culture and local products. The answers are in the form of numbers 1 to 5, 1 as coding is not interesting and number 5 as coding is very interesting, this question is shared with respondents 18-55 years old with experience shopping for batik and Tiktok users. The following flow chart is done during the prototype making:

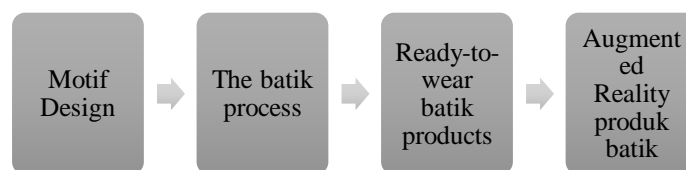


Figure 2. Flowchart of the prototyping process

RESULT AND DISCUSSION

1. Discover

The field findings of this study show that the Batik Sekar Buen industry in Penajam Paser Utara and Batik Shaho in Balikpapan face challenges in expanding market reach and also attracting buyers' interest in buying local batik. Based on observations, the craftsmen still focus on traditional techniques and regional motifs, but still do not utilise technology, especially in marketing so as to increase buyer attractiveness. The rise of digital market sales has many customers experiencing disappointment with the products purchased because the product cannot be fitted.

2. Define

Based on the findings in the field, at this stage the researcher formulates the problem to be solved. The problem formulation in this research is how the transformation process of East Kalimantan Batik into ready-to-wear fashion products, and how the use of Augmented Reality technology can provide solutions to improve user experience in trying and deciding product purchases effectively.

3. Develop

At this stage, a mind map of the research flow was made to serve as a reference during the research process. The mind map is made based on the method used, namely the double diamond framework, as follows:

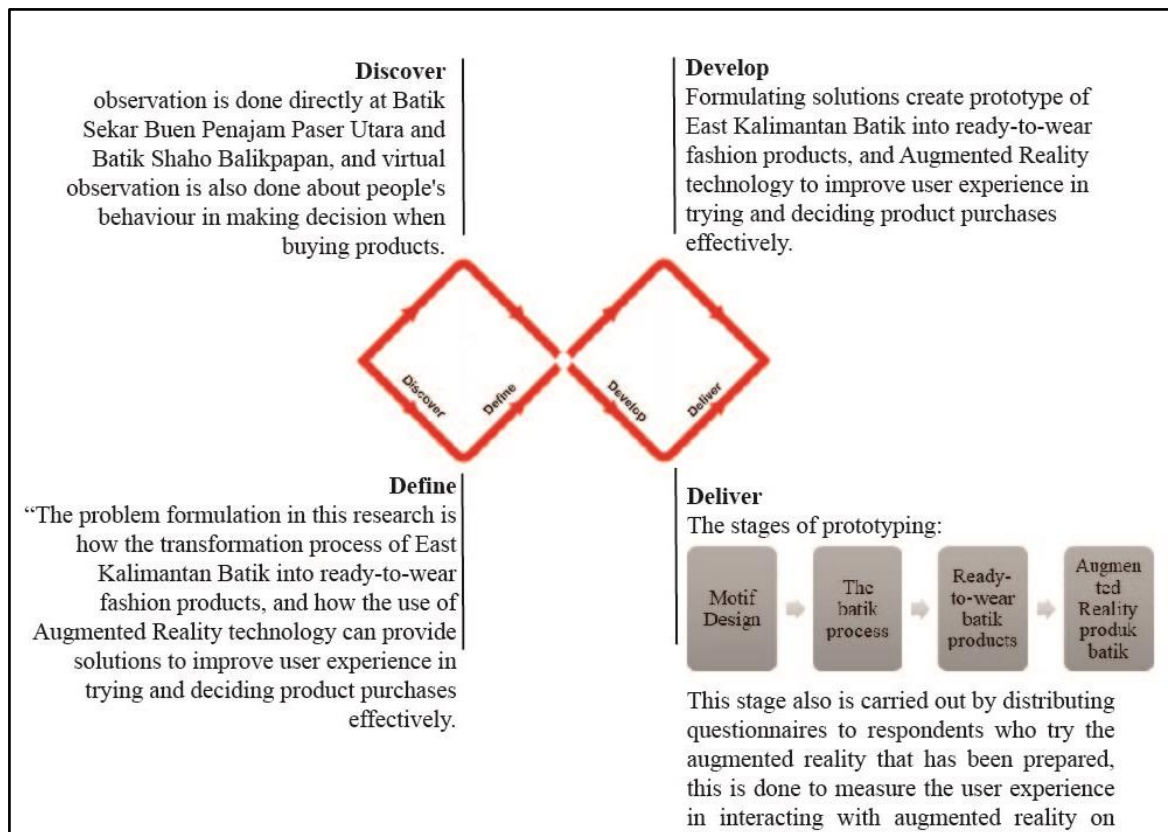


Figure 3. Flowchart of The Double Diamond Framework

4. Deliver

At this stage, the prototyping process is carried out starting from the first stage of making East Kalimantan batik motifs and batik making process. After that, the second stage of making ready-to-wear batik East Kalimantan. Moreover, the third stage of conducting trials and distributing questionnaires to research samples to measure customer interest in using augmented reality on ready-to-wear batik products.

The first stage, the inspiration for the idea that was raised into a motif is the *durio kuthejensis* fruit or better known as the elay fruit which is an endemic fruit of East Kalimantan. This motif can reflect the uniqueness and local culture. Thus, this motif is able to display the identity of Kalimantan which is rich in biodiversity. This motif will also be a symbol of the natural diversity of the archipelago because the elay fruit is a type of durian fruit, which is known that durian itself is a plant that symbolises the wealth of Indonesian flora and also the importance of environmental conservation. The communal nature of this motif in batik products is a very broad identification with tourist attractions, empowering the creativity of local craftsmen, and providing new business opportunities. As the new capital city, this motif can strengthen cohesiveness and intercultural integration in Indonesia. Thus, using the *durio kuthejensis* motif can not only preserve culture and nature, but can also support the creative economy in the area around IKN, so that cultural values can continue to be introduced to the community. Below is a sketch of the *durio kuthejensis* motif:

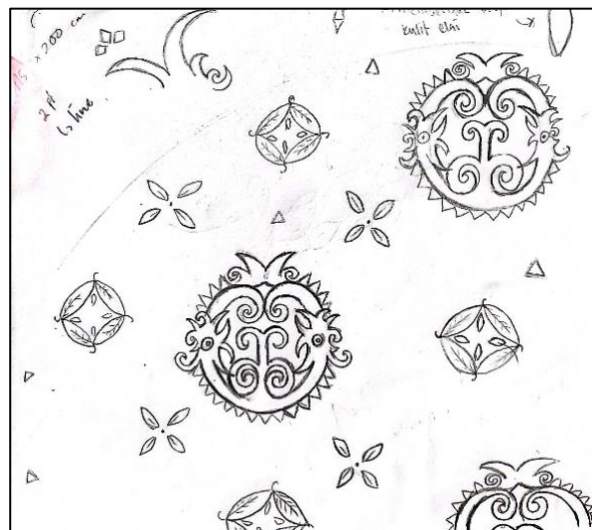


Figure 4. Motif design sketch

After the sketch is made, the motif is designed using digital. This can facilitate the process of transferring the design to the fabric. Then the design is carried out in the colouring process which becomes a reference for the batik colours to be made.



Figure 5. Digital design of batik motifs

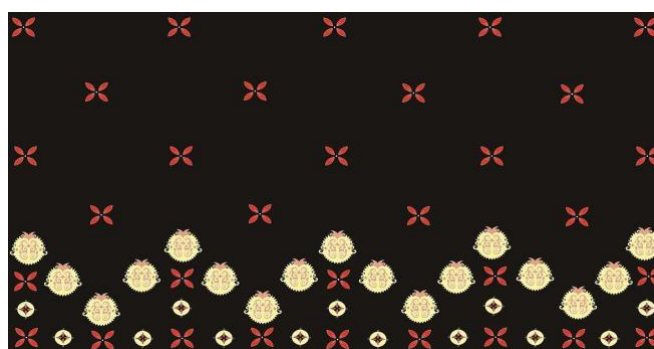


Figure 6. Batik motif colour

The next process is to develop the design that has been made into batik through the written batik technique, which is a traditional method and requires skill. At this stage, what is done is preparing raw materials such as mori cloth, wax and remasol colouring. After that, the design is transferred to the cloth and the canting process continues. After all the motifs are finished *mencanting*, then the colouring process uses the *colet* technique with remasol dyes, so that the fabric covered by the *lilin malam* will be blocked by the entry of colour, because this process is what brings out the motif on the fabric. After the coloring process is complete, for finishing the cloth is boiled to

remove the *lilin malam* or called the *melorod* process, resulting in a clear and colourful batik motif. This process not only produces beautiful and unique products, but also expresses deep artistic and cultural values, creating works that combine tradition with creativity. Thus, the hand-drawn batik technique plays an important role in producing high-quality batik, which can reflect local cultural identity and art.

The second stage, the batik that has been produced is then developed into Ready-to-Wear batik, which is a fashion concept that prioritises practicality and comfort for modern consumers. In this process, East Kalimantan batik motifs and designs are applied to clothing, creating a product that is not only attractive but also functional. Batik that has been made in the previous stage is sewn into ready-to-wear clothes. This Ready-to-Wear batik is very attractive to consumers who want to wear clothes with a touch of culture but with a modern and stylish design. In addition, by producing batik in Ready-to-Wear form, the product becomes more accessible to the wider community, thus increasing awareness and appreciation of batik as Indonesia's cultural heritage. This concept also creates economic opportunities for local batik artisans and designers, while helping to promote East Kalimantan batik to a wider market. Thus, the development of Kalimantan batik into Ready-to-Wear batik not only contributes to cultural preservation, but also improves the competitiveness and sustainability of the local fashion industry. Here are the batik that have become ready-to-wear products:



Figure 7. Ready-to-wear batik products

The third stage, the use of Augmented Reality on East Kalimantan batik using the tiktok application, then the user scans the barcode, the user stands up until the camera sensors the body, then the camera will display the Augmented Reality Batik Try-on results. The following is the barcode that needs to be scanned to try-on Augmented Reality Batik:



Figure 8. East Kalimantan Batik AR Barcode

The following are the results obtained from the Augmented Reality Batik try-on test using the barcode:



Figure 9. East Kalimantan Batik AR experiment results

Researchers conducted experiments on a sample of users using Try-on Augmented Reality, point 1 for not interesting and point 5 for very interesting, the following results were obtained in the chart:

Seberapa menarik menggunakan teknologi AR dalam mempromosikan budaya dan produk lokal?

11 responses

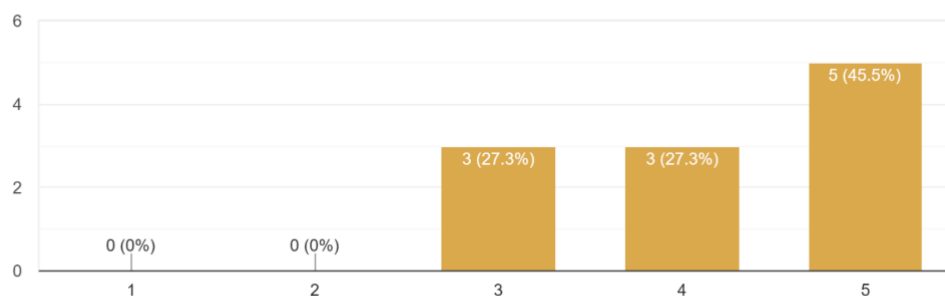


Figure 10. Result of Users Using Try-on Augmented Reality

Based on the results of a survey conducted on a sample of 11 TikTok users, data was obtained showing that the use of Augmented Reality (AR) on batik has great potential as an attractive promotional tool for local culture and products. The survey involved a number of respondents who actively use the TikTok platform, which is known for its engaging and interactive visual content. In The survey using the previous questionnaire then shows the results almost 50% of the users who tried the AR application applied to batik stated that this feature was very interesting. This shows that users have a high interest in technological innovations that can bring to life the experience of interacting with batik products. AR allows users to see products in a more interesting and interactive context during try-on.

The use of AR can also provide a richer visual experience, where users can see how the batik will look when the motif is applied to clothing. This not only enhances the appeal of batik products, but also encourages users to recognise and appreciate the local culture contained in each batik motif. In addition, the survey results show that many TikTok users feel that AR can enhance the promotion of batik culture among the younger generation, who are more familiar with digital technology. Thus, AR becomes a bridge between tradition and innovation, introducing batik to a wider and more diverse audience. Overall, the positive response to the use of AR in batik reflects the need to adapt the promotion of local products in a more modern and engaging way, while making a positive impact in

cultural preservation. This opens up opportunities for batik artisans and industry players to utilise technology as a means to increase the visibility and appeal of their products in the global market.

CONCLUSIONS

The development of East Kalimantan batik into ready-to-wear products in addition to preserving culture also has a practical and easy-to-use functional. The idea raised is *durio kutejensis* which is an endemic fruit of East Kalimantan, this fruit is still a durian group, which is known to be a plant that symbolises the wealth of Indonesian flora and also the importance of environmental conservation. The transformation carried out in this study uses Augmented Reality as Try-on media so that it can increase interaction with the user. The results obtained Augmented Reality in the promotion of ready-to-wear batik not only supports the preservation of local culture, but also strengthens the competitiveness of batik products in the modern era. This is an important step in making batik a highly competitive ready-to-wear fashion product in supporting IKN's creative economy.

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