

The Transformation of Batik Motif: Transforming Interior Spaces to be More Aesthetic with Batik Patterned Metal Ceilings



Aan Sudarwanto¹, Novita Dwi Wulandari², Agung Cahyana³, Rahayu Adi Prabowo⁴, Arif Jati Purnomo⁵

^{1,2,3,4,5}Indonesian Institute of the Arts Surakarta

ABSTRACT: Batik continues to evolve beyond its traditional function. This study explores the innovative transformation of batik motifs into metal ceilings as a representation of the integration of traditional aesthetics with modern technology in contemporary interior design. The main objective of the study is to analyse the potential for developing batik-patterned metal ceilings that combine cultural values with technological innovation. The research methodology uses a mixed qualitative and quantitative approach, including literature studies, design observations, and manufacturing technology experiments. The study focuses on the transformation of *ceplok* batik motifs, especially *kawung*, into metal panels using stamping and forming techniques. Aluminium and copper were chosen as the main materials due to their lightweight, corrosion-resistant, and design flexibility characteristics. The research process involved the development of Appropriate Technology for stamping and forming metal that allows the creation of ceilings with precise batik motif details. Experimentation includes designing special dies, setting metal forming parameters, and finishing. The results of the study indicate the success of transforming traditional batik motifs into metal ceilings that have high aesthetic value and practical functions. This innovation not only produces interior design products, but also makes a significant contribution to the preservation and development of cultural heritage through a contemporary approach. The study concludes that the transformation of batik motifs into metal ceilings successfully brings together tradition and modernity. This approach opens up new opportunities in interior design that respect cultural heritage while taking advantage of advances in manufacturing technology, while expanding the appreciation of batik in a more dynamic and innovative context.

KEYWORDS: Batik, Innovative, Metal Ceiling, Shape Transformation

I. INTRODUCTION

Batik as an Indonesian cultural heritage that was recognized by UNESCO in 2009 continues to develop in its form and application. Not only as a traditional textile work, batik motifs are now transformed into various media and more contemporary functions (Wulandari & Salma, 2019). One interesting innovation is the application of batik motifs to building interior elements, especially metal ceilings, which are a combination of modern technology and traditional values. In this modern era, the need for interior design that has aesthetic value while reflecting cultural identity is increasing. According to research by Sari et al. (2020), 78% of respondents expressed interest in interior elements that contain local cultural elements. This shows great potential in the development of interior products based on batik motifs.

The ceiling as an architectural element plays an important role in creating a room atmosphere. The use of metal materials on the ceiling has been proven to have various advantages, such as fire resistance, ease of installation, and long service life (Nugroho & Prasetyo, 2021). The innovation of combining batik motifs on metal ceilings not only provides added value visually, but also answers the challenge of preserving culture in the context of modern architecture. The development of manufacturing technology, especially in metal processing, opens new opportunities in the creation of more innovative interior products. Metal carving techniques, metal stamping techniques, metal router techniques and laser cutting techniques allow the application of detailed batik motifs to metal materials (Rahman et al., 2022). This supports efforts to transform traditional batik motifs into more contemporary forms without losing their philosophical essence. The sustainability aspect is also an important consideration in the development of batik-patterned metal ceiling products. Research by Hidayat & Sutanto (2023) shows that the use of recyclable metal materials provides added value in the context of sustainable architecture. In addition, the production process using modern technology has proven to be more efficient than conventional methods.

The transformation of batik motifs into metal ceilings also opens new economic opportunities for Indonesia's creative industry. According to data from the Ministry of Industry (Widodo et al., 2021), the demand for cultural-based interior products has

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increased significantly by 25% per year. This shows that there is a promising market potential for the development of batik-patterned metal ceiling products. However, in this transformation process, there are several challenges that need to be considered. Kusuma & Pratiwi (2022) identified several key issues such as product quality standardization, balance between aesthetic and functional values, and competitive pricing. A comprehensive approach is needed to overcome these challenges.

The technical aspects in the production of batik-patterned metal ceilings are also the focus of research attention. Research by Santoso et al. (2023) shows that the selection of metal types, material thickness, and finishing techniques greatly affect the final product results. Optimization of the production process is needed to produce high-quality products at efficient costs. In terms of design, the transformation of batik motifs into metal ceilings requires a careful approach. According to Wijaya & Utami (2022), there needs to be a balance between preserving traditional values and contemporary design needs. The process of adapting batik motifs must consider aspects of proportion, scale, and harmony with other interior elements.

This study aims to explore the potential of batik motif transformation in the context of modern interior design through the development of batik-patterned metal ceilings. It is hoped that the results of this study can provide significant contributions to the development of interior products that combine cultural values with modern technology. In the landscape of contemporary interior design, batik has long been a cultural heritage rich in meaning and beauty. An in-depth study is now revealing a new path to integrate the nobility of traditional motifs into modern spaces through an ambitious experiment with batik-patterned metal ceilings. This research journey began with a deep awareness of the complexity of batik which is not just a piece of cloth, but a visual narrative that contains the philosophy and soul of a civilization. The researchers see the hidden potential behind classic motifs that have so far only been seen as static heritage, inviting us to rethink how cultural heritage can live and breathe in contemporary architecture. The focus of the research lies in the aesthetic and functional transformation, where metal becomes a new medium to express the depth of batik. The ceiling is no longer just a structural element of the room, but a three-dimensional canvas that allows traditional motifs to speak the language of modern technology. Each metal sheet is processed with mathematical precision and artistic touch, presenting a complex geometry that respects traditional rules but is not bound by details. The process requires multidisciplinary collaboration between cultural experts, designers, and batik artists, who together design a transformation method that maintains the essence of the original motif while adapting to the characteristics of the metal material. Each motif is studied, from philosophy to the smallest visual details, before being reconstructed through precision cutting and stamping techniques. Metal processing techniques allow for the creation of new depths and dimensions that would be impossible to achieve on fabric. This research has implications far beyond the world of interior design. It speaks to how a culture can survive, adapt, and remain relevant amidst the rapid flow of modernization. Batik is no longer seen as a museum artifact, but rather a living entity that can speak in various mediums and contexts. The transformation of batik motifs into metal ceilings opens up a new dialogue space between the past and the present. It invites us to see cultural heritage not as something static, but rather dynamic. Each metal sheet engraved with a batik motif is a representation of the journey of civilization, where tradition should not be rejected, but rather appreciated and reinterpreted.

II. METHOD

This article uses a mixed methodology approach that integrates qualitative and quantitative methods to explore innovative and aesthetic batik-patterned metal ceiling designs. The research and design process is carried out through several systematic stages involving in-depth analysis of batik characteristics, metal processing technology, and contemporary interior design development. The research on batik-patterned metal ceiling designs is an innovative effort to integrate traditional cultural heritage with contemporary technology. Through a mixed methodology approach, this study explores the potential for transforming batik motifs into modern interior design elements by utilizing sophisticated metal processing technology. The research process begins with an in-depth study of various traditional batik motifs. Identification is carried out through literature reviews and field observations to understand the aesthetic and philosophical characteristics of classic motifs. The design preservation approach is not merely visual reproduction, but a creative transformation that respects the essence of the original culture. (Yulianto, A., et al.: 2022). The next stage focuses on exploring the latest metal fabrication technology. This study utilizes computational methods to create complex patterns with high precision on metal surfaces. (Purnomo, H., & Setiawan, D: 2023). Aluminium was chosen as the main material because of its lightweight, corrosion-resistant characteristics, and provides optimal design flexibility (Handayani, S., et al.: 2021). In addition, copper metal is also used as a material for the metal ceiling. Material and design experimentation was carried out through a series of comprehensive tests. Computational simulation was used to evaluate the structural strength and aesthetic quality of the ceiling. The rapid prototyping process allows the development of models with a multidisciplinary approach that considers ergonomics, aesthetics, and practical functions. This research not only produces design products, but also makes a significant contribution to efforts to preserve and develop cultural heritage through innovation in contemporary interior design technology.

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III. DISCUSSION

In the context of modern interior design, batik is no longer just a cultural heritage but has become a dynamic medium of artistic expression. This study explores the transformation of batik motifs into metal ceilings as a design innovation that brings together tradition and contemporary. Through an experimental approach, the research team integrated cutting, stamping, and forming techniques to produce a metal ceiling that presents a new interpretation of batik motifs in interior decoration. The transformation process begins with the selection of classic batik motifs that have geometric complexity and symbolic narratives. *Ceplok* motifs such as *kawung* were chosen because of their structural richness and philosophical meaning. Through digital mapping and geometric engineering techniques, these traditional patterns are transformed into metal ceiling designs while maintaining their original artistic essence. Some of the motifs developed are *ceplok* motif models, this is done to facilitate the repetition process. The following are the resulting motifs which are then transformed into stamp *molding* forms.

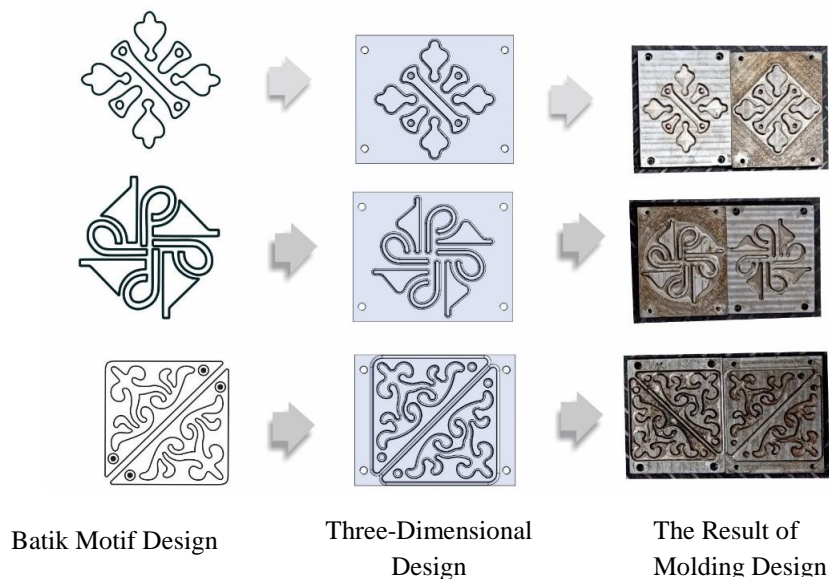


Figure 1. The research results of batik motif images transformed into stamp molding prints

The next step is to experiment with making metal stamp Appropriate Technology tools and metal forming to produce metal ceilings, Sudarwanto et al (2023). The process of making metal stamp Appropriate Technology begins with the design stage and making dies or molds that will be used. Dies consist of a punch as a former and a die as a forming container. The dies material must have a higher hardness than the material to be formed. In making dies, the process begins with making detailed engineering drawings including the required dimensions and tolerances. Next, machining is carried out using a CNC machine to form a profile according to the desired design. The construction of the metal stamp Appropriate Technology consists of a main frame made of a sturdy steel profile to withstand the forming force. The upper part of the frame is equipped with a drive system that can be a hydraulic or mechanical system using an electric motor connected to an eccentric shaft. This drive system functions to move the punch up and down regularly. The metal ceiling material to be formed is generally aluminium and copper sheets with a thickness of 0.3 mm. Before the stamping process, the material is cut to the required size. The stamping process is carried out by placing the material on the die, then the punch will move down pressing the material so that a profile is formed according to the shape of the dies.

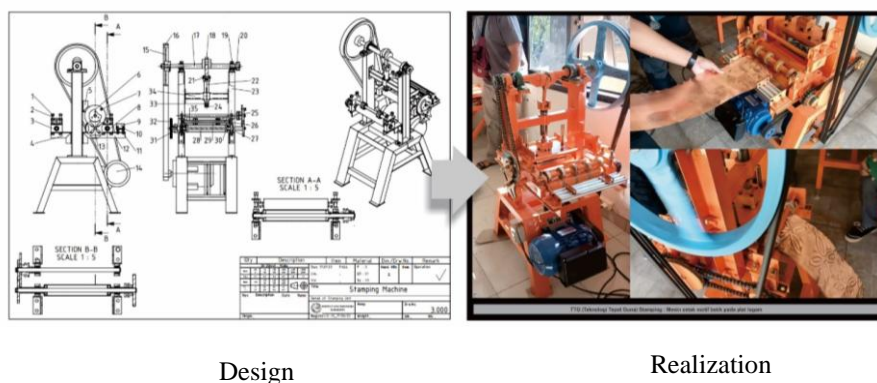
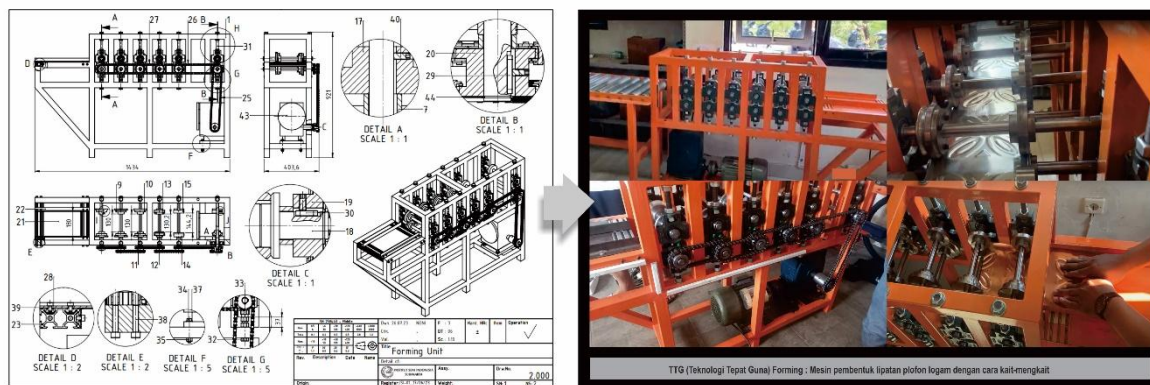


Figure 2. The image of Appropriate Technology stamping machine research results

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Next in the metal forming process, the technology used focuses more on forming more complex contours and profiles. Appropriate Technology metal forming is equipped with a roll forming system consisting of several pairs of rolls arranged sequentially. Each pair of rolls has a different profile to form the material gradually until it reaches the desired final shape, namely interlocking folds. The drive system on Appropriate Technology forming uses an electric motor connected to a gear box to regulate the roll rotation speed. The forming machine frame is made of strong steel construction to withstand the forming forces and vibrations that occur during the process. The roll position can be adjusted to accommodate various material thicknesses and desired profile shapes.



Design

Realization

Figure 3. Image of TTG forming machine research results

The material to be formed is fed into the roll, then gradually formed through a series of subsequent rolls until it reaches the final shape. This process allows the formation of long and continuous profiles. To produce metal ceilings, the shape of the roll profile is specially designed to produce patterns and contours that match the interlocking ceiling design. The result of this stamping and forming process is metal ceiling panels that have certain patterns and profiles. These panels can then be installed on the supporting frame to form a complete ceiling system. The quality of the forming results is greatly influenced by the precision of the dies, the setting of process parameters such as speed and pressure, and the materials used. This entire process requires precision and a good understanding of the characteristics of the material and the parameters of the metal forming process. Operators who run Appropriate Technology must have adequate knowledge and skills to produce quality metal ceiling products that are in accordance with the desired specifications.

The process of making batik-patterned metal ceilings is an innovative combination of modern manufacturing technology and traditional Indonesian cultural heritage. The use of aluminum and copper metal materials provides its own advantages in creating interior decorative elements that have high aesthetic value as well as good durability. In the process of making batik-patterned ceilings, aluminum is chosen because it has the characteristics of being lightweight, corrosion-resistant, and easy to shape, while copper provides a luxurious appearance with a distinctive golden color and good thermal conductivity properties (Rahman et al., 2021). These two materials allow the creation of intricate motif details through the forming process. The stamping process is a key step in forming batik motifs on metal surfaces. This technique uses special dies designed with traditional batik patterns. According to research by Wijaya and Sutanto (2023), the use of the right pressure in the stamping process is very important to produce consistent pattern depth without damaging the metal structure. This process is carried out with the experimental results of the Appropriate Technology stamping machine which can be precisely controlled to produce perfect motif relief. After the stamping process, the forming stage is carried out to provide a hook shape to the ceiling panel. This process involves bending and forming techniques that take into account the deformation characteristics of the material. As explained by Kusuma and Prasetyo (2022), size control and forming speed are critical factors in preventing damage or non-uniformity of the metal surface. The development of batik motif designs on metal ceilings requires an approach that combines traditional values with technical manufacturing considerations. Hartono et al. (2024) stated that the adaptation of classic batik patterns needs to consider the limitations and capabilities of the stamping and forming processes. Several ceplok batik motifs such as kawung have been successfully applied with modifications appropriate to the metal manufacturing process.

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Aluminum Results with
Banyumili Ceplok motif

The Copper Results in
Three Different Motifs

Figure 4. The research results image of batik patterned aluminum and copper used as ceilings and other interior decorations

According to Santoso and Wibowo (2023), proper finishing not only increases product durability but also provides additional aesthetic value to the resulting batik motif. In this creative work, finishing is done using a polishing technique to produce a shine on the resulting material. The implementation of a batik-patterned metal ceiling in interior design creates an impressive focal point. The combination of textures and the play of light formed from the batik motif relief presents a dynamic visual dimension. The use of metal materials also provides practical advantages in the form of ease of maintenance and long-term durability.

IV. CONCLUSIONS

The conclusion of this study shows that the transformation of batik motifs into metal ceilings is an innovation that combines cultural heritage with modern technology. This study began with an awareness of the potential of batik as an Indonesian cultural heritage that has been recognized by UNESCO to be developed in the context of contemporary interior design. The development of batik-patterned metal ceilings not only provides added value visually, but also answers the challenges of preserving culture in modern architecture. Through a mixed methodology approach, this study integrates batik motif exploration studies, metal processing technology analysis, material design experimentation, and prototype development. The process of transforming batik motifs into metal ceilings is carried out using modern manufacturing technology such as stamping and forming techniques developed through the manufacture of Appropriate Technology tools. The materials used are aluminum and copper which are chosen because of their characteristics which are lightweight, corrosion-resistant, and easy to shape.

The results of the study show success in developing batik-patterned metal ceilings that combine traditional aesthetic values with modern functions. The use of *ceplok* motifs in the design facilitates the repetition and manufacturing process. The finishing process with polishing techniques produces a shine that increases the aesthetic value of the product. The implementation of batik-patterned metal ceilings in interior design not only creates an impressive focal point, but also provides practical benefits in the form of ease of maintenance and long-term durability. This research opens new opportunities in the development of interior products that combine cultural heritage with modern technology, while also making a significant contribution to the preservation and transformation of batik motifs into a more contemporary context. This success shows that tradition and modernity can go hand in hand in creating meaningful design innovations.

REFERENCES

- 1) Gunawan, H., & Pratiwi, L. (2021). "Standarisasi Kualitas Produk Interior." *Jurnal Standarisasi*, 9(4), 112-125.
- 2) Hartono, M., Pratama, L., & Sulisty, R. (2024). "Adaptation of Traditional Batik Motifs for Metal Ceiling Applications." *Journal of Cultural Heritage Preservation*, 19(1), 45-59.
- 3) Handayani, S., et al. (2021). "Karakteristik dan Aplikasi Aluminium dalam Desain Interior Kontemporer." *Jurnal Teknik Material*, 12(3), 78-92.
- 4) Hermawan, D., & Sutrisno, B. (2022). "Teknologi Digital dalam Produksi Elemen Dekoratif." *Jurnal Teknologi Manufaktur*, 8(1), 45-58.
- 5) Hidayat, S., & Sutanto, J. (2023). "Sustainable Architecture: Penggunaan Material Ramah Lingkungan." *Jurnal Arsitektur Berkelanjutan*, 6(2), 89-102.

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- 6) Kusuma, D., & Pratiwi, E. (2022). "Tantangan dalam Pengembangan Produk Interior Berbasis Budaya." *Jurnal Desain Produk*, 14(3), 156-170.
- 7) Kusuma, R., & Prasetyo, D. (2022). "Temperature Control in Decorative Metal Forming: A Case Study of Indonesian Batik Patterns." *International Journal of Materials Processing*, 42(4), 567-582.
- 8) Nugraha, A., & Santoso, D. (2023). "Pengembangan Produk Interior Berbasis Teknologi." *Jurnal Inovasi Produk*, 7(2), 134-148.
- 9) Nugroho, B., & Prasetyo, H. (2021). "Analisis Material Plafon dalam Arsitektur Modern." *Jurnal Teknik Arsitektur*, 15(1), 67-82.
- 10) Permana, R., & Yuliana, S. (2023). "Nilai Ekonomi Produk Interior Berbasis Budaya." *Jurnal Ekonomi Kreatif*, 12(3), 167-180.
- 11) Putra, A., & Sari, R. (2021). "Inovasi Material dalam Arsitektur Interior." *Jurnal Arsitektur Indonesia*, 16(2), 90-104.
- 12) Purnomo, H., & Setiawan, D. (2023). "Teknologi Fabrikasi Logam Mutakhir untuk Desain Arsitektur." *Prosiding Seminar Nasional Teknologi Rekayasa*, 8(1), 112-125.
- 13) Rahman, A., Supriyadi, B., & Widodo, T. (2021). "Optimization of Metal Stamping Process for Decorative Architectural Elements." *Journal of Manufacturing Technology*, 15(3), 234-248.
- 14) Rahman, F., Susanto, A., & Wijaya, R. (2022). "Aplikasi Teknologi CNC dalam Produksi Elemen Dekoratif." *Jurnal Teknologi Manufaktur*, 9(4), 178-190.
- 15) Santoso, A., & Wibowo, F. (2023). "Surface Treatment Techniques for Decorative Metal Ceilings with Traditional Patterns." *Surface Engineering and Coatings Technology*, 33(5), 678-692.
- 16) Santoso, H., Wijaya, R., & Rahman, A. (2023). "Optimasi Proses Produksi Plafon Logam Dekoratif." *Jurnal Teknik Manufaktur*, 10(2), 67-82.
- 17) Sari, M., Putri, L., & Rahmat, D. (2020). "Preferensi Konsumen terhadap Elemen Interior Berbasis Budaya." *Jurnal Desain Interior Indonesia*, 8(3), 112-125.
- 18) Sudarwanto, A., et al. (2023). "Batik Motif Development for Decorative Elements on Metal Ceiling." *International Journal of Social Science And Human Research*, 6(8), 5251-5256.
- 19) Susanto, R., & Widodo, P. (2022). "Harmonisasi Elemen Tradisional dalam Interior Modern." *Jurnal Desain Interior*, 15(1), 78-92.
- 20) Wijaya, S., & Sutanto, H. (2023). "Traditional Batik Pattern Integration in Modern Metal Forming Processes." *Advanced Materials Research Quarterly*, 28(2), 156-170.
- 21) Wijaya, S., & Utami, R. (2022). "Preservasi Nilai Budaya dalam Desain Interior Modern." *Jurnal Desain Interior*, 13(4), 201-215.
- 22) Widodo, A., Pratama, R., & Santoso, H. (2021). "Perkembangan Industri Kreatif berbasis Budaya di Indonesia." *Jurnal Ekonomi Kreatif*, 11(1), 34-48.
- 23) Wulandari, A., & Salma, I. R. (2019). "Perkembangan Motif Batik dalam Era Digital." *Jurnal Seni Rupa Indonesia*, 12(2), 45-58.
- 24) Yulianto, A., et al. (2022). "Transformasi Desain Motif Batik dalam Konteks Modern." *Jurnal Desain Indonesia*, 15(2), 45-60.



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