BIS HUMANITIES AND SOCIAL SCIENCE

Volume 4 2026 | DOI: 10.31603/bishss.506
7th Borobudur International Symposium on Humanities and Social Science (BIS-HSS) 2025

UNIMMA PRESS
Universitas Muhammadiyah Magelang

Batik MSME acceptance model for appropriate technology on fabric laying tables and dye liquid containers in East Kalimantan, Indonesia

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Abstract

The creative industry is a strategic sector that plays an important role in strengthening the national economy. One of its promising sub-sectors is craft, which continues to grow due to the availability of natural resources and the support of creative and innovative human resources. Craft products, including handicrafts, traditional textiles, and art objects, have gained attention in international markets. In East Kalimantan, batik has developed not only as a craft product but also as a fashion product. This is reflected in the increasing number of fashion shows using batik as the main material. Therefore, East Kalimantan batik has strong potential because it belongs to both the craft and fashion sub-sectors, which are among the top contributors to the creative industry's national GDP. Innovation is an important element in business strategy. One innovation introduced to support batik production is a cloth placement table equipped with a hanging container for dye liquid. This tool is designed to assist batik makers during the coloring process using the dabbing technique. It reduces the risk of dye spilling onto the cloth and can be adjusted according to the worker's position because it is supported by a rail system. Based on this background, this study examines the acceptance of appropriate technology among batik MSMEs regarding the cloth placement table and dye container. The analysis used validity, reliability, and Spearman rank correlation tests. The results show a positive and significant relationship between Perceived Usefulness and Actual System Use, with a correlation value of 0.915, and between Perceived Ease of Use and Actual System Use, with a value of 0.850.

Published:
May 04, 2026

Selection and Peer-review under the responsibility of the 7th BIS-HSS 2025 Committee

Keywords

Acceptance, Batik, Appropriate technology, Batik table, East Kalimantan

Introduction

The creative economy is currently growing rapidly, especially in the regions. Data shows a positive trend, with exports reaching US$26.68 billion from January to October 2025.

The creative economy's contribution to national GDP was expected to reach Rp1,611.2 trillion in 2024 (Mulyana, 2025). According to the Minister of Creative Economy, Teuku Riefky Harsya, the creative industry is a strategic sector that is not merely complementary but can significantly boost the national economy (Antara News, 2025). In order to have a further advance the creative economy, the government had demonstrated its commitment by facilitating the 2025 Indonesia Design Week (IDW) event, designed as a comprehensive platform to enhance the capacity and competitiveness of the Indonesian Creative Industry. The three creative industry sub-sectors that contribute the most to national GDP are the fashion subsector, followed by crafts and culinary (Christa, 2024). Crafts are one of the creative industry sub-sectors that have significant potential for continued growth due to its abundant natural resources and the support of creative and innovative human resources (Matra et al., 2024). According to a researcher from the East Kalimantan Regional Research and Innovation Agency (Brida), there were more than 1,000 entrepreneurs in the creative economy sector, and their products had the potential to be exported if given the right attention and innovation (Kaltimfaktual, 2024). The total export value of East Kalimantan's SMEs during January–May 2024 was recorded at US$9,960.99 million (BPS, 2024). Meanwhile, the export potential of East Kalimantan's crafts sector was also increasingly wide open. Craft products such as handicrafts, traditional textiles and art objects had attracted interest from overseas markets, especially with the increasing demand for unique and high-quality products (Nugroho, 2024).

The support and commitment of the East Kalimantan Provincial Government in developing the craft industry in order to penetrate the national and international levels through training, promotion to marketing networks (Putri, 2025). According to the Regional Secretary of East Kalimantan Province, Sri Wahyuni, East Kalimantan had a variety of quality and unique textiles such as iconic weaving namely Tenun Doyo, Badong Tencep, Kriong, to the Samarinda Sarong which had long been widely known. In addition, East Kalimantan also had extraordinary textiles, namely batik from all 10 districts/cities that had their own uniqueness and continue to develop (Pedia, 2025). Another textile-based craft product that is currently gaining attention is East Kalimantan batik. In recent years, this batik has been increasingly promoted as a fashion product, particularly through various fashion shows that feature batik as one of the main materials. This indicates that East Kalimantan batik has strong development potential, as it belongs not only to the craft subsector but also to the fashion subsector. Both subsectors are among the three largest contributors to the national GDP within the creative industry. Moreover, several batik MSMEs in East Kalimantan have achieved relatively high business performance, with annual turnover reaching IDR 1 billion and continuing to increase each year.

Compared with batik from Java, batik MSMEs in East Kalimantan are still relatively new and therefore need to develop strong competitive advantages among other textile-based MSMEs in the region, such as Samarinda sarongs and Ulap Doyo. Innovation can

serve as an important strategy to improve their competitiveness. One form of innovation designed to support batik production is a special table for placing batik cloth during the coloring process using the dabbing technique. This table is fitted with a hanging container for dye liquid, allowing batik makers to work more easily while reducing the risk of dye spilling onto the cloth. In addition, the table can be adjusted to follow the position of the batik maker because it is equipped with a rail system. It also has clamp holes to keep the fabric steady during the coloring process, making the work more practical and efficient (Andansari & FebriYana, 2021).

Historically, batik originated and developed in Java, where it has long been part of the community's living cultural tradition. Damayanti et al. (2021), in their study on acculturation in the visual language of Dutch Cirebon batik motifs and coastal Javanese batik, explain that batik is a cultural product in the form of a distinctive Indonesian textile dyeing technique that experienced rapid growth, particularly in Java (Damayanti et al., 2021). Rouffer further explained that the gringsing batik motif had already been known and used by the people of Kediri, East Java, as early as the 12th century. However, the development of batik in East Kalimantan occurred in a much later period. According to Fatmawati (2021), batik art in East Kalimantan began to appear only in 1983 and started to develop more actively in the 2000s. As a result, the development and adoption of technology in East Kalimantan batik production have not progressed as rapidly as in Java (Fatmawati, 2021). Based on this background, it is important to examine the acceptance model of batik MSMEs toward appropriate technology, particularly the use of fabric placement tables and dye containers.

Method

The research took place in East Kalimantan and specifically examined batik MSMEs operating in Samarinda, Balikpapan, and Kutai Kartanegara. According to data from the Indonesian Provincial Government, the number of workers involved in batik MSMEs in East Kalimantan totaled 101 people (Siregar et al., 2020). The sample size was determined using the Slovin formula, as explained by Sugiyono (2017). This formula was selected because it allows researchers to obtain a representative sample so that the findings can be generalized. In addition, the Slovin formula does not require a sample size table, as the sample can be calculated using a simple mathematical equation. The Slovin formula is expressed as follows: $n = N / (1 + Ne^2)$ where n represents the sample size, N represents the population size, and e represents the margin of error. In the Slovin formula, the margin of error is generally set at 0.1 for a large population and 0.2 for a small population. Since the population in this study consisted of only 101 respondents, a margin of error of 20% or 0.2 was used. Therefore, the sample size for this study was calculated as follows:

$$n = 101/(1+101x0,2^2)$$
$$n = 101/5,04 = 20, 04;$$

Rounded up to 20 respondents.

Based on the calculations above, the minimum number of respondents in this study was 20. In this study, there were 28 respondents, meaning they met the applicable formula. Prior to discussing the data analysis findings, this section outlines the descriptive statistics derived from respondents' responses to each indicator used to measure the research variables. The descriptive statistical results for each variable are explained as follows:

1. Perceived Usefulness Variable (X1)
   The Perceived Usefulness variable (X1) was measured using four question items distributed to 28 respondents, as shown in Table 1.
2. Perceived Ease of Use Variable (X2)
   The Perceived Ease of Use variable (X2) was measured using four question items distributed to 28 respondents, as presented in Table 2.
3. Actual System Use Variable (Y)
   The Actual System Use variable (Y) was measured using two question items distributed to 28 respondents, as shown in Table 3.

Table 1. Variable perceived usefulness

No	Statement	1	2	3	4	5	6	7	Total
1	Using a batik coloring table improves my work performance.	3.6%	0%	0%	3.6%	14.3%	28.6%	50%	100%
2	Using a batik coloring table speeds up my work.	3.6%	0%	3.6%	3.6%	10.7%	21.4%	57.1%	100%
3	Using a batik coloring table improves my work effectiveness.	3.6%	0%	0%	7.1%	0%	39.3%	50%	100%
4	Finding out that a batik coloring table is useful in my work.	0%	0%	0%	3.6%	7.1%	25.0%	64.3%	100%
	Average	2.3%	0%	0.9%	4.5%	8%	28.6%	55.4%	

Table 2. Variable perceived ease of use

No	Statements	1	2	3	4	5	6	7	Total
1	Applying batik coloring table is clear and easy to be understood.	0%	0%	0%	7.1%	3.6%	46.4%	42.9%	100%
2	Becoming an expert in using the batik coloring table is easy.	0%	0%	3.6%	7.1%	17.9%	35.7%	35.7%	100%
3	Learning and Using the batik coloring table is easy	0%	0%	0%	3.6%	7.1%	46.4%	42.9%	100%
4	Using the batik coloring table doesn't require much effort.	0%	0%	3.6%	10.7%	14.3%	32.1%	39.3%	100%
	Average	0%	0%	1.8%	7.13%	10.73%	40.15%	40.2%	

Table 3. Variable actual system use

No	Question	1	2	3	4	5	6	7	Total
1	Using the batik coloring table improves my work performance.	0%	0%	0%	3,6%	10,7%	35,7%	50%	100%
2	Using the batik coloring table speeds up my work.	3,6%	0%	0%	0%	25%	17,9%	53,6%	100%
	Average	1,8%	0%	0%	1,8%	17,85%	26,8%	51,8%	

Results and discussion

After presenting the descriptive statistics of the respondents' responses, the analysis proceeded to examine the relationship between Perceived Usefulness, Perceived Ease of Use, and Actual System Use. The data were processed using the Statistical Package for Social Science (SPSS) software. The analysis included validity testing, reliability testing, and the Spearman Rank correlation test.

According to Sugiyono (2016), the validity criteria are as follows:

1. If r ≥ 0.3, the item is considered valid.
2. If r ≤ 0.3, the item is considered invalid.

The results of the validation test that was carried out using SPSS can be seen in the following table:

Validity test

Validity test is necessary to ensure the data is reliable and accurate enough to measure what it is supposed to measure, in accordance with reality. The results of the validity testing conducted in this study can be seen in Table 4.

Table 4. Validity test of variable perceived usefulness

Correlation	r- calculated value	Standard Value	Declaration
Between statement 1 and total	0, 977	0,3	Valid
Between statement 2 and total	0,982	0,3	Valid
Between statement 3 and total	0,953	0,3	Valid
Between statement 4 and total	0,72	0,3	Valid

The correlation analysis of each item measuring the Perceived Usefulness variable shows that all instrument items met the validity criteria. This is indicated by the r-count values, which were all higher than 0.3.

Table 5. Validity test variable perceived ease of use

Correlation	r- calculated value	Standard Value	Declaration
Between statement 1 and total	0, 904	0,3	Valid
Between statement 2 and total	0,901	0,3	Valid
Between statement 3 and total	0,865	0,3	Valid
Between statement 4 and total	0,830	0,3	Valid

The item correlation test for the Perceived Ease of Use variable indicates that all research instrument items were valid. This is shown by the r-count values, which exceeded the minimum validity threshold of 0.3. The validity test results for the Perceived Ease of Use variable are presented in Table 5.

Table 6. Validity test variable perceived ease of use

Correlation	r- calculated value	Standard Value	Declaration
Between statement 1 and total	0, 831	0,3	Valid
Between statement 2 and total	0,938	0,3	Valid

The correlation analysis for each item in the Actual System Use variable shows that all instrument items fulfilled the validity requirements. This is indicated by r-count values that were higher than 0.3. The validity test results for the Actual System Use variable are shown in Table 6.

Reliability test

The reliability analysis in this study was conducted using the Cronbach's Alpha (α) method. The reliability criteria were based on Nunnally's opinion, as cited in Ghozali (2007:42), which states that a variable is considered reliable if its Cronbach's Alpha value is greater than 0.60. Thus, the minimum acceptable coefficient for reliability is 0.6. The reliability test results obtained using SPSS are presented in Table 7.

Table 7. Reliability test

Variable	Alpha Cronbach value	Standard Value	Declaration
Perceived Usefulness	0, 939	0,6	Reliable
Perceived ease of Use	0,884	0,6	Reliable
Actual System Use	0,689	0,6	Reliable

The reliability analysis of the instruments for Perceived Usefulness, Perceived Ease of Use, and Actual System Use shows that each variable met the reliability standard. This is evidenced by Cronbach's alpha values exceeding 0.6. Thus, the instruments applied in this research can be declared reliable.

Correlation rank spearman test

This study employed nonparametric statistical analysis to test the hypotheses, as this method is more appropriate for ordinal data. Specifically, the Spearman Rank correlation test was applied. The results of this test are presented in Table 8. Based on the Spearman Rank correlation analysis conducted using SPSS, the correlation coefficient between Perceived Usefulness and Actual System Use was 0.915. Meanwhile, the correlation coefficient between Perceived Ease of Use and Actual System Use was 0.850. The interpretation criteria for the relationships between Perceived Usefulness and Actual System Use, as well as between Perceived Ease of Use and Actual System Use, are shown in Table 9.

Table 8. Correlation Spearman test

			Perceived Usefulness	Perceived Ease of Use	Actual System Use
Spearman's rho	Perceived Usefulness	Correlation Coefficient	1.000	.862**	.915**
		Sig. (2-tailed)	.	.000	.000
		N	28	28	28
	Perceived Ease of Use	Correlation Coefficient	.862**	1.000	.850**
		Sig. (2-tailed)	.000	.	.000
		N	28	28	28
	Actual System Use	Correlation Coefficient	.915**	.850**	1.000
		Sig. (2-tailed)	.000	.000	.
		N	28	28	28

**. Correlation is significant at the 0.01 level (2-tailed).

Table 9. Spearman correlation coefficient interpretation criteria

Correlation Interval	Correlation Level
0,00 – 0,19	Very Low
0,20 – 0,39	Low
0,40 – 0,59	Fair
0,60 – 0,79	Strong
0,80 – 1,00	Very Strong

Source : Sugiyono (2012;250)

Based on the criteria presented in Table 9, the correlation between Perceived Usefulness and Actual System Use indicates a very strong relationship. This is shown by the correlation coefficient of 0.915, which falls within the range of 0.80–1.00. The two-star notation in the correlation test result also indicates that the relationship is statistically significant. Therefore, Perceived Usefulness has a positive and significant relationship with Actual System Use. Furthermore, another correlation value of 0.850 also demonstrates a very strong relationship because it is within the same 0.80–1.00 interval. The presence of the two-star notation likewise confirms its statistical significance. Thus, it can be concluded that there is a strong, positive, and significant relationship between Perceived Usefulness and Actual System Use.

Conclusion

The study found that perceived usefulness and perceived ease of use significantly influence the actual use of appropriate technology in fabric placement tables and dye liquid containers based on the Technology Acceptance Model. Users considered the technology helpful, effective, and supportive of productivity, with 91.95% stating that it helped them complete their work. In terms of ease of use, 91.08% of respondents agreed that the technology was easy to operate. The correlation results also showed strong and significant positive relationships between perceived usefulness and actual system use (0.915), as well as between perceived ease of use and actual system use (0.850). Overall, the findings indicate that the technology is both useful and easy to use, encouraging its actual adoption by users.

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