

THE IMPLEMENTATION OF TECHNOLOGY READINESS AND ACCEPTANCE MODEL FOR INDUSTRIAL RESILIENCE IN BATIK MSME DURING THE DISRUPTION ERA

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ABSTRACT

This research aims to analyze the readiness and acceptance of Batik UKM technology and analyze the influence of perceived ease of use and perceived usefulness of technology on interest in using technology in Batik UKM. This research is survey research with a quantitative approach which aims to test hypotheses. The population in this study were Batik UKM owners spread across 20 batik center villages in Purbalingga. Determining the sample uses a purposive sampling technique, namely selecting a group of subjects based on certain considerations, with the aim of obtaining sampling units that have the desired characteristics so that 100 are obtained. The analytical method used in this research is SEM PLS. The results of research conducted by researchers show that perceived ease of use has a positive effect on perceived usefulness and perceived usefulness has a positive effect on intention of use. Meanwhile, perceived ease of use and technology readiness do not influence intention of use. We also found that technology readiness had a positive effect on perceived ease of use but had a negative effect on perceived usefulness.

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1. INTRODUCTION

Technological developments have provided many changes for people in carrying out their activities, including the ease of digital transactions. Current consumer purchasing behavior patterns are starting to shift from conventional (offline) consumption styles to online. Technological advances in the use of e-commerce make it very easy for consumers today to fulfill their needs and desires. This is what business people, including SMEs, must follow. Gunasekaran, Rai, & Griffin (2011) (1) emphasized the importance of Resilience for SMEs to survive and have a competitive advantage. Resilience can be seen as the ability to adapt, responsiveness, sustainability and competitiveness in developing markets. To be resilient, SMEs must perfect their operational strategies, ready to embrace new advances in science and technology.

Readiness to accept technology is often anchored in the Technological Readiness (TR) theory and the Technological Acceptance Model (TAM). Triple disruption has changed the behavioral patterns of all aspects and elements of society, where technological disruption, millennial disruption and pandemic disruption have led to increasingly massive use of technology. Technological Readiness has been developed by Parasuraman (2000) (2) and is used to determine individual behavioral tendencies in using technology in everyday life. Technological Readiness can be seen from four personality dimensions, namely: optimism, innovativeness, discomfort and insecurity. The dimensions of optimism and innovativeness are mental enablers that encourage people to accept new technology, whereas the dimensions of discomfort and insecurity are mental barriers. The Technological Acceptance Model (TAM) or technology acceptance theory explains how individuals accept technology. David, et al. (1989) (3) stated that in the TAM model, an individual's actual use of a system or technology is determined by behavioral intentions, which are influenced by the individual's perceived usefulness and the individual's perceived ease of use (perceived ease of use).). The TAM model holds the view that individual acceptance of a system or technological development is determined by these two variables. Perceived usefulness and perceived convenience will shape attitudes towards behavior which in turn will influence behavioral

intentions. TAM was initially developed to predict individual technology adoption behavior in the world of work, but as existing studies have developed, TAM has been used in various research contexts.

TR and TAM are then integrated or used simultaneously in a theory called the Technology Readiness and Acceptance Model (TRAM) and is used to see the extent of individual readiness in accepting technology in the current era of digitalization. In this case, TRAM implements and provides better explanations compared to previous models. TRAM is used to determine the influence of user readiness on the acceptance of information technology or systems in organizations (Lin, Shih and Sher, 2007) (4). Referring to this explanation, this model can be used to determine the readiness and acceptance of technology among SMEs, especially in using information technology and production process innovation technology.

Information technology has a very important role in efforts to build MSME resilience. However, several studies show that the level of adoption of information technology in MSMEs is still relatively lower than expected (Pavic, et al., 2007) (5). This is due to limited capital and resources and the unpreparedness of MSMEs to adopt it (Satria, Imam and Kholid. 2017) (6). Similar research conducted by Astuti and Nasution (2014) (7) proves that the level of readiness of business actors in accepting technology is moderate and the level of internet adoption by respondents is still low, namely only 36.3 percent. Interestingly, another study conducted by Sari and Santoso (2020) (8) showed a high total Technological Readiness Index (TRI) score among MSMEs in Karawang Regency. Of the 300 SMEs studied, it is known that 234 SMEs (78% of SMEs) have used the pillars of industry 4.0 technology in running their businesses. This shows that they are ready to accept, implement and use it (Sari and Santoso, 2020).

The differences in research findings as explained previously provide an opportunity for the study to be carried out again on different respondents. The differences in the results of these studies also provide an illustration of the differences in MSME readiness before and after the triple disruption era. This research aims to test the readiness and acceptance of digital technology in Batik SMEs in Purbalingga using the integrated TRAM model.

Literature Review

Resilience in MSMEs

Resilience can be seen as adaptability, responsiveness, sustainability, and competitiveness in developing markets (Gunasekaran, Rai and Griffin, 2011). The main factors identified as influencing resilience include Internal Factors, External Factors and Enabler (Supporting) Factors. Internal factors consist of organizational structure, people management. External factors are globalization and supporting factors consist of: use of technology, agility in capital generation, information gathering, network capabilities, supply chain integration and flexibility, market knowledge, production quality, marketing and distribution techniques.

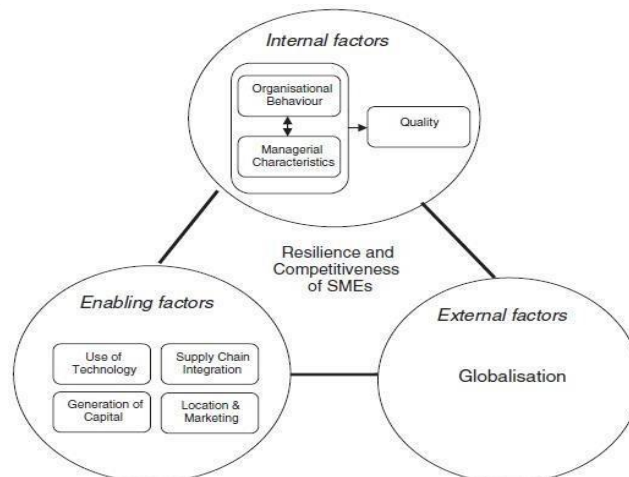


Figure. 1. Resilience Factors and Competitiveness of SMEs

Technology Adoption Implementation Model (TR, TAM and TAM)

The conceptual model used in this research is an integration of theories regarding technology readiness and acceptance, namely TAM and TR or often called the Integrated Model TRAM. TR has four subdimensions: optimism, innovation, discomfort, and insecurity (Parasuraman and Colby, 2000). In general, optimism and innovation are positive contributors or motivators that can increase readiness to

use technology, while discomfort and insecurity are obstacles that can suppress technological readiness and act as factors inhibiting the acceptance of new technology. In the TRAM model, TR is a variable that influences 2 (two) constructs in TAM, namely Perceive Usefulness and Perceive Ease of Use. (perception of Usefulness and Perception of Convenience) which then influences interest in using technology.

Technology acceptance in the Technology Acceptance Model (TAM) theory was developed by Davis (1986). The TRA model assumes that human behavior is driven by intentions, attitudes, beliefs which are influenced by subjective norms to do something consciously. While Davis, et al. (1989) in TAM stated that, the actual use of the system in individuals is determined by behavioral intentions, which are influenced by perceived usefulness and perceived ease of use. TAM's argument is that individual acceptance of information technology systems is determined by these two constructs. Perceived ease of use concerns the extent to which a person believes that the use of technology is free from any complicated efforts and the extent to which certain system application activities are considered enjoyable in the individual's mind. Perceived usefulness is a construct that describes the extent to which someone believes that using technology will improve their work performance (Davis, 1989) (8).

Purbalingga Regency Batik UKM

There are several different definitions of SMEs based on various perspectives. A survey of small businesses in the UK in 2004 defined businesses according to the number of employees, annual turnover and annual balance sheet total (Gunasekaran Rai and Griffin, 2011). The SME phenomenon is always interesting to discuss regarding its problems, challenges, potential and critical role in the economy of a government area. Batik UKM is one of the UKM in the creative economy sub-sector (crafts) which is also often discussed in various studies. This research raises the issue of Batik SMEs in Purbalingga Regency because batik is one of the 6 superior regional products.

Even though it is still far behind Yogyakarta Batik, Solo Batik and Pekalongan Batik, Purbalingga Batik actually has the potential to be developed. Currently there are 20 Purbalingga batik center villages spread across various sub-districts. Based on data from the batik community, the number of active batik craftsmen is around 470 people. Some of these craftsmen are members of batik groups and are members of the Purbalingga Batik Craftsmen Forum (FPB). Some of these batik craftsmen make batik activities their main source of income. However, most of it is just part time work in between being a housewife or other activities.

Based on the results of research on Purbalingga Batik Competitive Strategy Development Using the Analytical Hierarchy Process (AHP) and Quantitative Strategic Planning Matrix (QSPM) Approach (Suliyanto, Novandari, Wulandari, 2010) (9), operational factors are the biggest obstacle according to entrepreneurs' perceptions in developing the Purbalingga batik business. The obstacles faced are the very simple technology used and the low level of innovation. Meanwhile, the results of Creativepreneurship research; Analysis of the Role of Human Resource Innovation and Creativity in the Development of Creative Industries in the Craft Sub Sector (Novandari and Indriati, 2011) (10) shows that the level of creativity and innovation of batik craftsmen in Purbalingga Regency is relatively low because only a small portion of the total existing batik craftsmen are willing to explore and develop their creativity and carry out innovations in the batik making process. Referring to several similar studies (Balakrishnan, Othman and Zaid, 2021) (11), this research will analyze intentions to use technology based on 4 (four) TR indicators and 2 (two) TAM indicators, namely optimism, innovativeness, discomfort, insecurity as well as perceived usefulness and perceived convenience. use of technology in Batik SMEs in Purbalingga.

Conceptual framework

Based on the description above, it can be built research framework as follows:

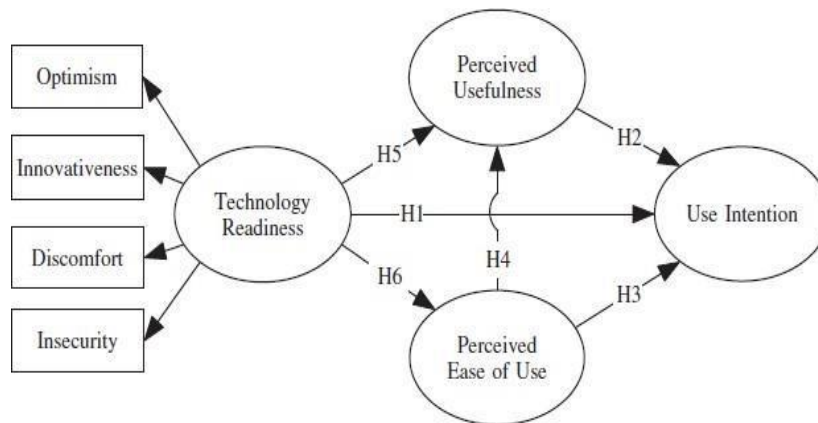


Figure 2. Research Framework

Research Hypothesis

Based on the problem formulation and conceptual framework above, the research hypothesis put forward by the researcher is as follows:

- H1: technology readiness influences intention of use
- H2: perceived usefulness influences intention of use
- H3: perceived ease of use influences intention of use
- H4: perceived usefulness influences intention of use which is mediated by technology readiness
- H5: technology readiness influences perceived usefulness
- H6: technology readiness influences perceived ease of use

2. METHOD

This research uses a quantitative approach with a survey method. In this research, intention of use is the dependent variable, while perceived convenience, perceived usefulness, and technology readiness are independent variables. This research was conducted to examine 20 Batik Center Villages in Purbalingga, Banyumas, Central Java. The research time starts from March 2023. The population in this research are Batik UKM owners. The selection of respondents in this research was determined based on a purposive sampling method with certain criteria so that the characteristics of the respondents matched those desired by the researcher. In this case, the criteria used by researchers are respondents as owners of batik MSMEs (not just as batik makers). Researchers then distributed questionnaires to 110 respondents, considering questionnaires that were not returned and other possibilities. The questionnaire measurement scale uses a Likert scale approach. The primary data source is by distributing research questionnaires to respondents or research samples. The secondary data in this study are journal articles, books, *website* government and *website* validated data relating to the research conducted. The scale used in this measurement is the Likert scale. To reduce the impact of bias and the occurrence of concentration of data during analysis, the scale used can be seen in the following table:

| No | Question | Score |
|----|-------------------------|-------|
| 1. | Strongly Disagree (STS) | 1 |
| 2. | Disagree (TS) | 2 |
| 3. | Disagree (KS) | 3 |
| 4. | Agree (S) | 4 |
| 5. | Strongly Agree (SS) | 5 |

Data Analysis Techniques

Data analysis was carried out by the method Partial Least Square (PLS) Structural Equation Modeling.

Hypothesis test

Hypothesis testing using analysis *full model structural equation modeling* (SEM) with PLS. *Infull model structural equation modeling* besides confirming the theory, it also explains whether there is a relationship between latent variables. Hypothesis testing by looking at the calculated value *Path Coefisien* on testing the inner model. The hypothesis is said to be accepted if the significance value 0.05 (α 5%) and the hypothesis is rejected when the significance value 0.05 (a 5%) .

3. RESULT AND DISCUSSION

Respondent Profile

From the results of data collection, the characteristics of respondents based on gender, age and education are known, as can be seen in the following table. Based on the results of the analysis that has been carried out, several characteristics of respondents are known as follows:

Table 1. Characteristics of respondents based on gender

| Gender | Amount | Percentage (%) |
|--------|--------|----------------|
| Male | 6 | 6 |
| Female | 94 | 94 |
| Total | 100 | 100,00 |

Based on this table, the majority of respondents are women. This is because the researchers conducted a survey of Batik MSME owners who the researchers were able to meet and met the criteria as respondents, without being determined first. However, this can also prove that batik making in Purbalingga is dominated by women because making batik requires perseverance and creativity in mixing and matching patterns to produce quality batik products.

Table 2. Characteristics of respondents based on age

| Age | Amount | Percentage (%) |
|-----------|--------|----------------|
| < 25 | 6 | 6 |
| > 26 - 40 | 36 | 36 |
| > 40 | 58 | 58 |
| Total | 100 | 100,00 |

Based on this table, the majority of batik MSME owners in Purbalingga are over >40 years old. At this age, respondents find it more difficult to adapt to technological developments compared to those aged under 40.

Table 3. Characteristics of respondents based on education

| Education | Amount | Percentage (%) |
|-----------|--------|----------------|
| SMP | 15 | 15 |
| SLTA | 12 | 12 |
| Sarjana | 4 | 4 |
| Lain nya | 69 | 69 |
| Total | 100,00 | 100,00 |

There were 69 respondents with less than primary school education, which means that the average education level of Batik MSME actors in Purbalingga is still low. The respondents' low level of education is an obstacle for them to adapt to rapid technological advances, such as optimizing digital marketing or promotion via social media. Many respondents only rely on offline sales.

Statistical Description of Data

The initial analysis that we carried out contained 5 constructs including Technology Readiness with 6 indicators, Perceived Usefulness with 5 indicators, Perceived ease of use with 5 indicators, and Intention to use with 4 indicators. The average response given to the technology readiness construct ranges from 2 to 4, which means that batik makers in the Purbalingga area are quite able to accept technology, however there are several issues that are obstacles for them, especially in terms of security and privacy.

Tabel 4. Statistical Description of Data

| Construct | Indicators | Mean | Standard Deviation |
|----------------------|------------|------|--------------------|
| Technology Readiness | KT1 | 3.76 | 0.873 |
| | KT2 | 3.89 | 1.157 |
| | KT3 | 3.70 | 1.127 |
| | KT4 | 2.12 | 0.972 |
| | KT5 | 3.30 | 1.285 |
| | KT6 | 2.87 | 1.180 |
| Perceived Usefulness | PU1 | 3.65 | 0.853 |
| | PU2 | 3.99 | 0.768 |
| | PU3 | 3.83 | 0.749 |
| | PU4 | 3.89 | 0.733 |
| | PU5 | 4.13 | 0.783 |

| | | | |
|-----------------------|-----|------|-------|
| Perceived Ease of Use | PE1 | 3.61 | 1.019 |
| | PE2 | 3.61 | 1.009 |
| | PE3 | 3.45 | 1.043 |
| | PE4 | 3.92 | 1.065 |
| | PE5 | 3.79 | 0.952 |
| Intention to Use | IU1 | 4.08 | 0.688 |
| | IU2 | 3.99 | 0.685 |
| | IU3 | 4.18 | 0.433 |
| | IU4 | 3.96 | 0.662 |

In the construct of perceived usefulness, perceived ease of use and intention of use, scores tend to be higher than technology readiness, namely ranging from 3 to 4. This shows that they agree that technology can help increase productivity, reduce costs and make work faster. Apart from that, they agree that technology makes it easier for them to interact with the market, and is more flexible in managing batik MSMEs.

Discussion

In measuring the structural equation model, testing the validity and reliability of each indicator needs to be carried out in the analysis. We use construct validity to test the ability of indicators to explain the model (Azwar, 2005) (12). In this research, there are 2 construct validity tests, namely convergent and discriminant validity. Hair, Black, Babin, et al., (2013) (13) explained that the convergent validity test for each factor loading (λ) value must be above 0.5 in order to be accepted as a valid indicator for use in analysis. From the initial tests that have been carried out, we found that there are 3 indicators that have factor loading values below 0.5, namely the KT1, KT2 and KT4 indicators. Therefore, these three indicators cannot be included in the research model, so we continue the analysis without including these three indicators.

Tabel 5. Construct Validity

| Construct | Code Indicator | Indicators | λ | AVE | α | CR |
|-----------------------|----------------|--|-----------|-------|----------|-------|
| Technology Readiness | KT3 | • Saya merasa banyak ide baru dengan memanfaatkan teknologi baru | 0.927 | 0.686 | 0.841 | 0.896 |
| | KT5 | • Saya merasa kurang nyaman menggunakan teknologi | 0.706 | | | |
| | KT6 | • Saya merasa data pribadi saya tidak aman ketika menggunakan teknologi terbaru | 0.714 | | | |
| Perceived Usefulness | PU1 | • Teknologi dapat membantu meningkatkan produktivitas kerja UKM Batik saya kelola | 0.899 | 0.674 | 0.877 | 0.911 |
| | PU2 | • Teknologi membantu saya mendapatkan lebih banyak Ide kreatif | 0.720 | | | |
| | PU3 | • Teknologi dapat mengurangi biaya yang saya keluarkan | 0.830 | | | |
| | PU4 | • Dengan teknologi pekerjaan saya menjadi lebih mudah | 0.850 | | | |
| | PU5 | • Dengan teknologi pekerjaan saya menjadi lebih cepat | 0.796 | | | |
| Perceived Ease of Use | PE1 | • Saya mudah untuk mempelajari teknologi terbaru | 0.882 | 0.761 | 0.922 | 0.941 |
| | PE2 | • Saya dapat menggunakan teknologi terbaru untuk mempermudah saya mengelola UKM Batik | 0.914 | | | |
| | PE3 | • Saya terampil dalam menggunakan teknologi terbaru sehingga membantu saya dalam mengelola UKM Batik | 0.773 | | | |
| | PE4 | • Dengan teknologi terbaru, saya dapat | 0.888 | | | |

| | | | | | | |
|------------------|-----|--|-------|-------|-------|-------|
| | | berinteraksi dengan lebih mudah dan jelas | | | | |
| | PE5 | • Saya merasa bahwa teknologi terbaru untuk pengelolaan UKM Batik lebih fleksibel | 0.897 | | | |
| Intention to Use | IU1 | • Saya ingin mulai menggunakan teknologi terbaru dalam pengelolaan UKM Batik | 0.861 | | | |
| | IU2 | • Saya ingin lebih sering menggunakan teknologi terbaru karena kemudahan dan manfaat yang saya rasakan | 0.949 | | | |
| | IU3 | • Saya merasa lebih mudah mendapatkan informasi apapun dengan menggunakan teknologi terbaru | 0.688 | 0.748 | 0.884 | 0.921 |
| | IU4 | • Saya ingin merekomendasikan pengelola UKM Batik lain untuk mengikuti perkembangan teknologi | 0.936 | | | |

Note: λ = loading factor value; AVE = average variance extracted; α = cronbach alpha value; CR = composite reliability.

Apart from calculating factor loading values, convergent validity requires an average variance extracted (AVE) value above 0.5 for each construct to be accepted in model analysis. We found that the overall AVE value in the model used was above 0.5. The final test in construct validity testing is measuring the value of cronbach alpha, the rule of thumb required by Hair, Black, Babin, et al. (2013) construct can be accepted in the model if it meets Cronbach alpha and composite reliability values of more than 0.5. The results of our analysis show that both Cronbach alpha and composite reliability are 0.5. So the construct used in our model can be continued for discriminant validity testing.

The next construct validity test is the discriminant validity test. The rule of thumb that must be fulfilled in order for a construct to be accepted for further analysis is that the value obtained from calculating the square root of AVE has a value greater than the correlation between the constructs used. Table 5 shows that the square root value of AVE has a greater value than the correlation between constructs. Therefore, the results of the discriminant validity test of this research can be accepted and used for further analysis.

Tabel 6. Discriminant Validity

| Variables | Intention received of Use | Perceived ease of Use | Perceived Usefulness | Technology Readiness |
|-----------------------|---------------------------|-----------------------|----------------------|----------------------|
| Intention of Use | 0.859 | | | |
| Perceived Ease of Use | 0.501 | 0.873 | | |
| Perceived Usefulness | 0.850 | 0.548 | 0.814 | |
| Technology Readiness | -0.089 | 0.280 | -0.040 | 0.820 |

The results of the influence between variables and hypothesis testing are shown through path analysis and can be seen in the table below.

Tabel 7. Path Analysis

| Structural Path | β | t-value | p-value | Results |
|---|---------|---------|---------|----------|
| Perceived Ease of Use -> Intention of Use | 0.074 | 1.595 | 0.111 | Rejected |
| Perceived Ease of Use -> Perceived Usefulness | 0.607 | 8.875 | 0.000 | Accepted |
| Perceived Usefulness -> Intention of Use | 0.816 | 16.438 | 0.000 | Accepted |
| Technology Readiness -> Intention of Use | -0.077 | 1.227 | 0.221 | Rejected |
| Technology Readiness -> Perceived Ease of Use | 0.280 | 2.048 | 0.041 | Accepted |
| Technology Readiness -> Perceived Usefulness | -0.210 | 2.126 | 0.034 | Accepted |

The results of testing the first hypothesis show that perceived ease of use does not influence the intention of use of MSME batik makers in the batik center village of Purbalingga. This is because batik makers find it difficult and are not used to using technology in managing their MSMEs. This is in line with previous research conducted by Hotlan et al (2022) (14) which stated that perceived ease of use does not directly influence consumer intentions in using digital payment platforms, but is directly influenced by other variables such as consumer trust when using the platform. digital payments.

In the second finding, we found that perceived ease of use had a positive effect on perceived usefulness by 60.7%. This is because MSME batik makers in the Purbalingga batik center village feel the benefits of using technology in managing MSMEs. Online sales are considered more flexible and effective in the current digital era compared to offline sales. This is in line with previous research conducted by Hotlan et al (2022) which stated that perceived ease of use has a direct effect on perceived usefulness in using digital payment platforms where consumers are greatly helped by the practicality of digital payments.

The results of the third analysis found that perceived usefulness had a positive effect on intention of use by 81.6%. Purbalingga batik MSME players want to start using technology in managing their MSMEs. Respondents felt that the use of technology could expand their market share, which is currently still limited to the area around the village so of course sales are very limited. Especially during the Covid-19 pandemic. Respondents find it difficult to survive in the era of digitalization so they want to start learning to use technology to be able to compete. This is in line with previous research conducted by Kim and Song (2010) (16) which stated that perceived usefulness has a significant effect on online purchases. Consumers in Pakistan experience many benefits when purchasing online. Especially if the seller can be trusted and guarantees the security of consumers' personal data.

The results of the fourth analysis show that Technology Readiness has no effect on Intention of Use. This is not in line with research from Dewi and Endang (2020) (17) which states that one way to increase the resilience of MSMEs is by using technology. This means that currently MSMEs must immediately automate their businesses to be more effective and efficient in terms of time, energy and materials. MSMEs can start by recording business operations by not only relying on manual recording, but by utilizing technology with software. Apart from that, MSMEs also optimize online sales as a sales strategy. Purbalingga batik MSME batik makers basically have the desire to explore new technology but they find it difficult and have limitations in operating new technology so they are not ready to switch to using technology in managing their MSMEs.

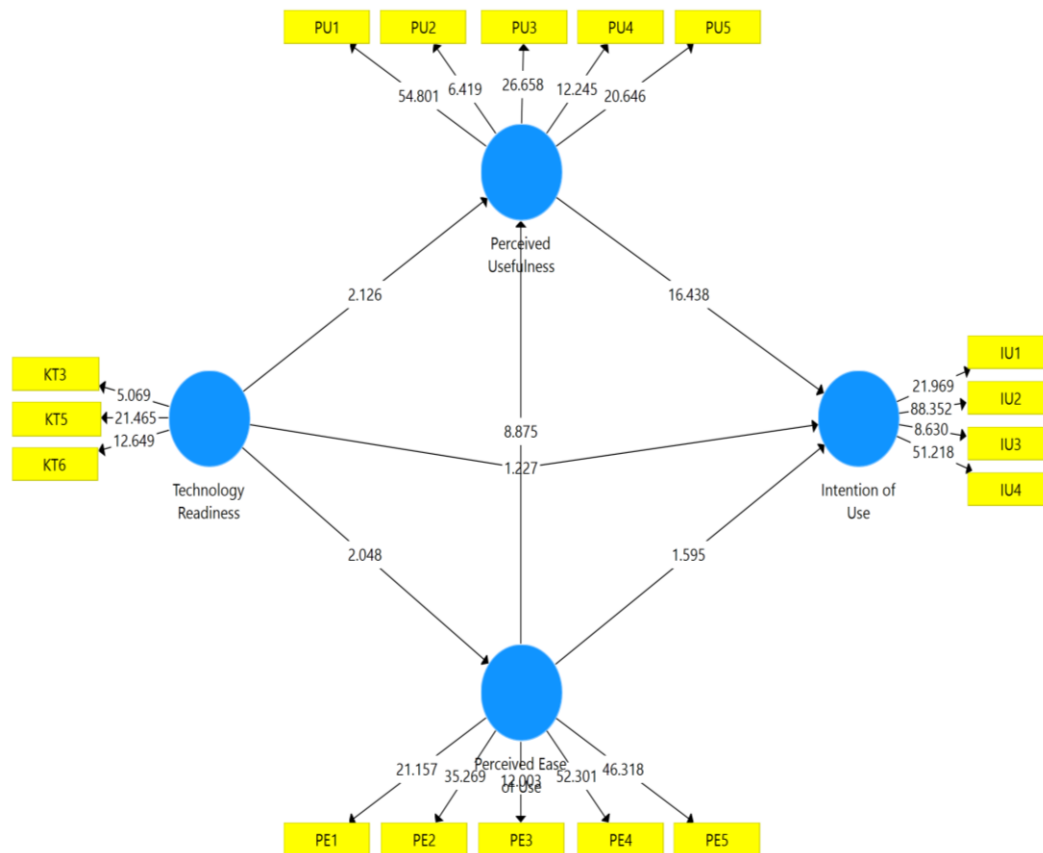


Figure 2 Structural Equation Modeling

The results of the fifth analysis show that technology readiness has a positive effect of 28% on perceived ease of use. This is in line with the findings of Septi and Aries (2021) (17). This finding may

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occur because respondents have an optimistic attitude and have a positive view that adopting technology in managing batik MSMEs will be beneficial in managing their business because they feel it can provide convenience both in terms of operations in transactions and can improve the quality of sales transactions to be more effective and efficient even though the percentage is low.

In the results of the final analysis, we found that technology readiness had a negative effect of 21% on perceived usefulness. This is not in line with the findings of Septi and Aries (2021). This finding may occur because MSME players still feel uncomfortable and insecure regarding personal data when switching to using digital platforms to manage their business even though they feel that they will get many benefits.

4. CONCLUSION

This research tested the readiness and acceptance of digital technology among 100 craftsmen at Batik UKM in Purbalingga using the integrated Technology Readiness and Acceptance Model. Our research provides a new perspective regarding empirical evidence of how perceived ease of use, desire to use, perceived usefulness, influence technology readiness among 100 Batik craftsmen in Purbalingga. We found that perceived ease of use and perceived usefulness influenced the intention of use among MSME batik makers in the batik center village of Purbalingga. This shows that the ease of using technology and the perception of usefulness obtained from applying science and technology to batik craftsmen in Purbalingga are able to encourage a desire to use the technology itself. In other findings, we found that the perception of usefulness was significantly influenced by the perceived ease and readiness of technology, this shows that the ease and readiness of technology plays an important role in influencing the perception of usefulness of technology for batik craftsmen at batik centers in Purbalingga. Finally, we found that technological readiness influenced the perception of convenience experienced by batik craftsmen in Purbalingga. Based on the results of the research above, there are several suggestions that researchers can provide that might be useful, with some of these suggestions as follows: Seeing the considerable potential in the era of technological disruption, the urgency of technological readiness and change becomes important. Our research proves that technological readiness plays an important role in usefulness, apart from that technological readiness also influences the perception of ease experienced by batik craftsmen in Purbalingga. The government is expected to be able to facilitate technological changes for batik makers who tend to be over 50 years old so that they are able to adapt to technological changes that are bound to occur. Apart from that, there is a need for assistance for SMEs in preparing technology both in terms of materials and knowledge so that it makes it easier for craftsmen to be more advanced in marketing through technology.

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