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"E-UMKM" Mobile Application to Increase Productivity and Competitiveness of MSMEs in the Digital Era: Evaluation and Implementation in the Digital Era

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ABSTRACT

Digital technology continues to develop rapidly and influence the MSME sector. The development of digital applications for MSMEs, such as BukuKas and Majoo, has helped business people manage their business more efficiently, from financial management to digital marketing. These applications simplify administrative tasks, expand market access, and increase competitiveness. This research uses the 4-D model in development application, involving media, content and MSME practitioner expert validators to assess the feasibility of the application. The research instrument is a questionnaire with a Likert scale, assessed by Media, Content and MSME Practitioner experts with results showing the application is very suitable for use. This application provides account verification features, MSME profiles, MSME news updates, and online seminars. The feasibility assessment shows very good results from media experts being 89.5%, content experts being 85.5%, and practitioner experts being 89%, making this application a potential digital tool to support the digital transformation of MSMEs. In conclusion, this application is suitable for use to increase productivity and the competitiveness of MSMEs in the digital era.

1. INTRODUCTION

Digital technology continues to develop rapidly and has brought major changes to various sectors, including Micro, Small, and Medium Enterprises (MSMEs)[1],[2]. In the era of digital transformation, MSMEs are faced with the challenge of adapting quickly to remain competitive in an increasingly global market[3]–[5]. One important innovation that is now getting attention is the development of digital applications specifically for MSMEs, which aims to improve operational efficiency and expand market access[6]–[9].

Mobile and web applications designed for MSMEs have shown great potential in facilitating business management, from financial management, inventory, to digital marketing. These applications allow business actors to run their businesses more efficiently and automatically, without having to spend a lot of time on repetitive administrative tasks[10]–[12]. With the support of technology, MSMEs can manage their businesses better, reach wider consumers, and strengthen their position in the digital ecosystem.

Application development for MSMEs also focuses on user experience that makes it easier for business actors with diverse technological backgrounds[13]–[16]. Applications such as BukuKas and Majoo have been widely used by MSMEs to help record transactions, financial reports, and integrate digital payments. Applications like this support MSMEs in running their businesses more easily and in a structured way, without requiring in-depth technical knowledge[17]–[19].

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In addition to operational aspects, these applications also strengthen the digital marketing capabilities of MSMEs. Applications that provide features for social media management, online promotions, and sales data analysis help MSMEs increase visibility and support more targeted marketing strategies[20]–[22]. By using applications, MSMEs can leverage the power of digital platforms to expand consumer networks and promote their products more efficiently[23][24].

This study focuses on the development of applications for MSMEs, with a visual presentation of the developed applications and assessments from expert validators. The assessment by these experts will cover aspects such as ease of use, effectiveness, efficiency, and its impact on MSME productivity[25]–[27]. With a comprehensive evaluation, it is hoped that the resulting application can support MSMEs in facing the challenges of digitalization and help them innovate in their business[28][29].

In the context of MSME digitalization, the development of innovative and effective digital applications is essential to address the operational and marketing challenges faced by small business owners[30]. This study plays an important role in identifying the specific needs of MSMEs and comprehensively evaluating the developed application through expert assessments on aspects such as ease of use, effectiveness, efficiency, and its impact on productivity. Through this research, the resulting application is expected not only to provide technical and operational convenience for MSMEs but also to open new opportunities for expanding consumer networks and creating more targeted marketing strategies. Thus, the contribution of this study lies in providing strategic digital solutions to strengthen the competitiveness of MSMEs in the digital transformation era.

2. METHOD

This research is a type of development research or Research and Development (R&D)[13]. The development model used in this study is the 4-D model, which includes four stages, namely Define, Design, Develop, and Disseminate[31].

2.1. **Define**: In this stage, a needs analysis is conducted to understand the challenges faced by MSMEs in their daily operations. Based on the initial analysis, it was found that MSMEs require an application that facilitates financial management, inventory control, and digital marketing. This information serves as the foundation for designing the main features of the application.

2.2. **Design**: This stage involves creating a prototype of the application with the main features identified during the Define stage. The prototype is designed to have a simple, user-friendly interface so that users with diverse technological backgrounds can operate it easily. The design also considers navigational elements to help users access various features and includes supporting visuals to enhance the user experience.

2.3. **Develop**: In the development stage, the prototype is tested and validated by expert validators, including media experts, content experts, and MSME practitioners. Feedback from these validators is used to make revisions to the application, thus improving product quality before further testing. Each feature of the application is evaluated for feasibility based on usability, effectiveness, and efficiency in supporting MSME operations.

2.4. **Disseminate**: This stage involves the distribution of the application for testing by end users, namely MSME actors. However, since the instrument to measure the application's impact on MSME performance is still under development, the Disseminate stage has not been conducted in this study. The primary focus of this research is to ensure that the developed application is ready for further testing in subsequent stages.

This model was chosen to accommodate the research objectives, namely developing digital applications designed to support MSME operations. However, the main focus of this study is the presentation of data related to the assessment of the feasibility of the application validated by experts. This study focuses only on the design and development process because the primary goal of this research is to create a digital application that meets the operational needs of MSMEs. Focusing on the design and development stages allows researchers to thoroughly explore user needs and design a solution relevant to the challenges faced by MSMEs in the digital era[32][33]. During these stages, the application is also assessed for feasibility by expert validators to ensure product quality before it is more widely used. The dissemination and end-user testing phases have not been conducted in this study, as additional instruments are still needed to measure the application's impact on MSME performance directly. Therefore, this research emphasizes the development of a product that is ready for further testing in subsequent stages.

The subjects of this study involved several elements, namely expert validators and MSME practitioners. The expert validators consisted of 2 media expert validators and 2 content expert validators, while the practitioners who participated were 3 MSME actors, so that the total research subjects were 7 people. The data collection technique used was a non-test technique using an application feasibility validation questionnaire

instrument[6][13]. This questionnaire uses a Likert scale with 4 levels, namely Very Poor, Poor, Good, and Very Good[34]–[36].

The validity of the instrument is carried out through a judgment process by experts, where this instrument is first consulted and validated by competent experts in related fields[37]–[39]. The instruments used in this study are presented in Table 1 and Table 2.

Table 1. Instrument Validation by Media Experts

No	Aspect	Indicator
1	Software	Easily manageable: Easy to use and simple, Can be installed and run on various hardware and software, Ease of operating the product, Easy to reuse by user
2	Visual Communication	Communicative: Availability of navigation, Availability of audio, Availability of supporting visuals, Availability of animation

After validation by media experts focusing on software and visual communication aspects, the next step is content validation by content experts. This content validation aims to ensure that the material presented in the application is relevant, comprehensive, and suited to the needs of MSME users. The aspects evaluated by content experts include content suitability, context, and the motivational support provided to users in managing their businesses.

Table 2. Instrument Validation by Content Experts

No	Aspect	Indicator
1	Content Relevance	Suitability of the presented content, Contextuality of the content, Depth and completeness of the content, Clarity of delivery, Suitability to user needs, Motivation aspects for user.

The data obtained from the validation results by media expert validators, content experts, and MSME practitioners will be analyzed descriptively using percentages to determine the level of application feasibility. Table 3 presents the eligibility criteria and application categories that have been adapted according to the needs of this study.

Table 3. Eligibility Criteria

No	Percentage	Qualification	Meaning
1	82-100%	Very Good	Very Eligible
2	63-81%	Good	Eligible
3	44-62%	Enough	Less Eligible
4	25-43%	Less	Not Eligible

This research procedure focuses on the design and development process of MSME applications. The initial product design will be developed and then validated by media expert validators, content experts, and MSME practitioners[40]–[42]. The validation results will be analyzed, and the product will be revised if there is input from the assessors, in order to improve the quality of the product being developed[43][44]. Thus, this application is expected to meet the eligibility standards and is ready to be used by MSME actors as a digital tool for managing their business.

Figure 1 shows a brief flow of the research and development procedures carried out, with an emphasis on the design and development process of applications for MSMEs.

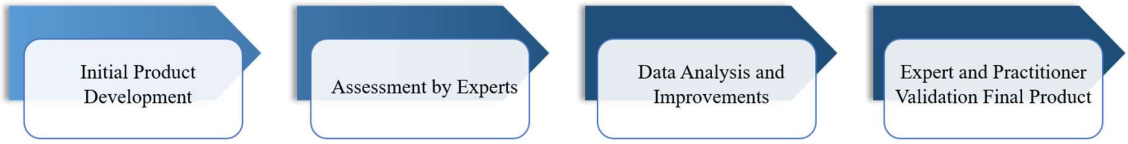

Figure 1. E-UMKM Product Assessment Procedure

3. FLOWCHART, DATABASE & APPLICATION DISPLAY

Following is the flow form of creating an E-UMKM application which can be seen in the following image.

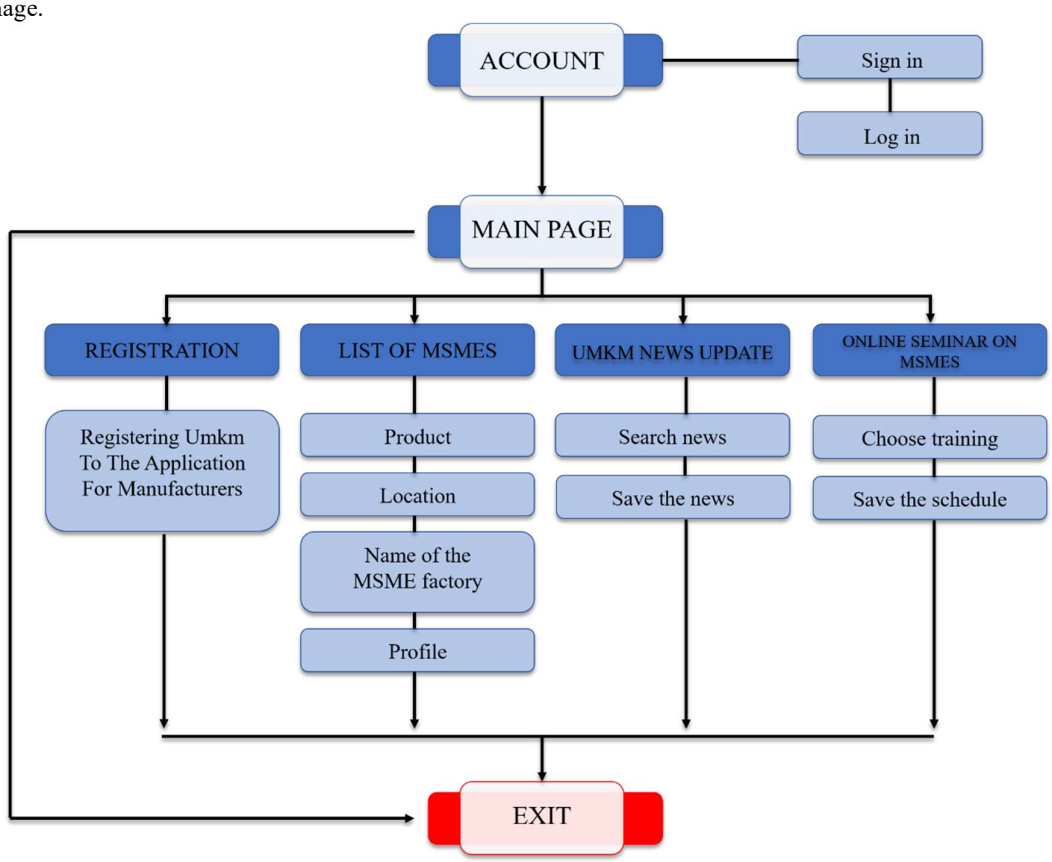

Figure 2.Flowchart E-UMKM Product

Apart from that, it is also presented how the application database flows, from a producer and also a buyer in using the application in the picture below.

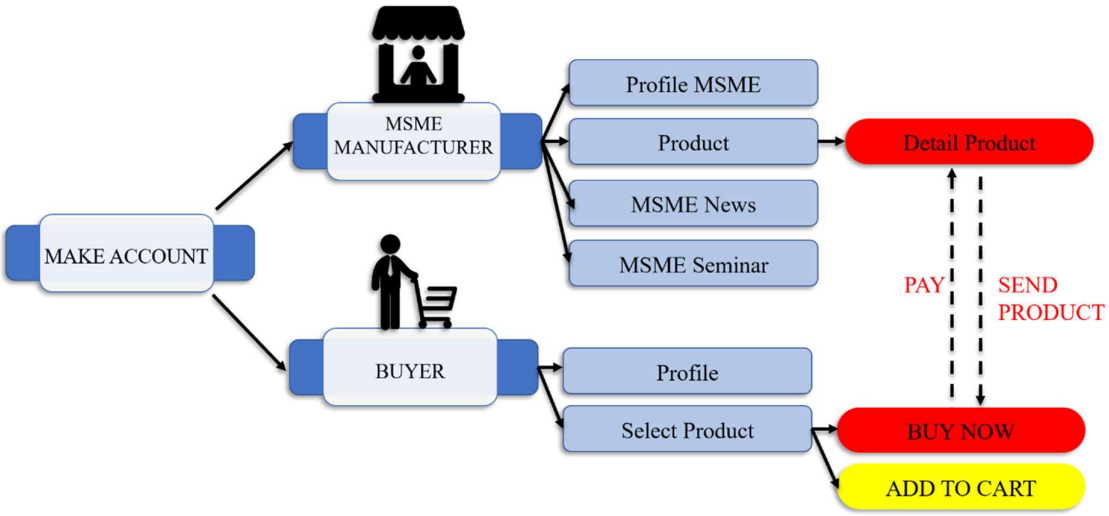

Figure 3. Database Flow Of E-UMKM Product

After that, it is also presented how the application that has been described looks like and the function of each page which is explained in the pictures below

3.1. Account Verification, This feature requires prospective users who will access this application to have an account first to be able to access all the facilities in the application.

Figure 4. Account Verification

3.2 Main View, on this display, 4 main menus will be presented that can be used by users, including: UMKM List, Registration, UMKM News Update, UMKM Online Seminar.

Figure 5. Main View

3.3 The “List of MSMEs” menu is used to see various types of MSMEs in Indonesia and we can shop in them. The method is to press the “List of MSMEs” button on the main display in this application. To make it easier to find the MSMEs we want, we can use the “Search” feature. After selecting the type of MSME, consumers can also sort by selecting the desired city. In addition, consumers can also see in detail the targeted MSMEs that have been filled in with location, profile, products, and can buy them

Figure 6. List of MSMEs

3.4 “MSME Profile” view. To see the profile of the MSME that has been verified.

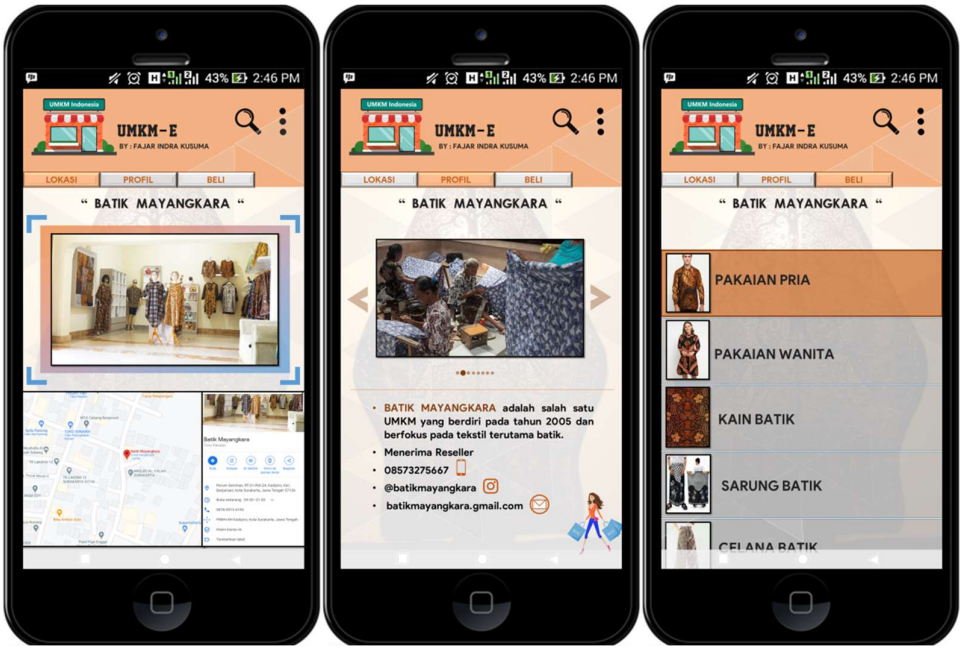

Figure 7. MSME Profile

3.5 The "UMKM News Update" menu functions to display the development of UMKM in Indonesia, in addition, application users are also facilitated with the "search" feature to make it easier to find interesting news and information related to UMKM.

Figure 8. UMKM News Update

3.6 "Online Seminar on MSMEs" menu, this menu contains the schedules of UMKM seminars that have been provided, and the schedule will always be updated according to existing activities. Every user of this application can attend the scheduled seminar by registering.

Figure 9. Online Seminar UMKM

4. RESULTS

In this study, the main focus is on the application design and development stage. The Define stage has been carried out in the initial study presented by the author, so it does not need to be repeated to avoid violating scientific writing ethics. In short, the Define stage shows that the use of digital media in the context of MSMEs is still limited and less innovative. Digital technology such as smartphones, laptops, and computers have not been optimally utilized to support MSME operations. Therefore, innovations that use information and communication technology (ICT)-based materials in the form of digital applications are expected to provide useful alternatives in managing MSMEs, making it easier for business actors to achieve better efficiency and productivity.

Meanwhile, the Disseminate stage involving application trials on end users (MSMEs) to assess product effectiveness cannot be carried out in this study, because we are still in the process of developing an instrument to measure the impact of the application on MSME performance. Therefore, this study has not reached the Disseminate stage. Based on the findings of the initial study, it was identified that MSMEs currently need innovative ICT-based digital solutions in application format. This application is expected to increase the operational effectiveness and managerial skills of MSME players, in addition to achieving the desired results. From the results of this research, the idea emerged to develop a digital application product that is suitable for use as a tool in managing MSMEs.

As a research objective, this digital application for MSMEs will be assessed based on the results of the assessment and product development. The testing process is carried out in accordance with the research flow, namely validation by media experts, content experts, and MSME practitioners. After the questionnaire containing the application feasibility assessment is distributed to each assessor, the figure shows the results of the assessment from the media experts.

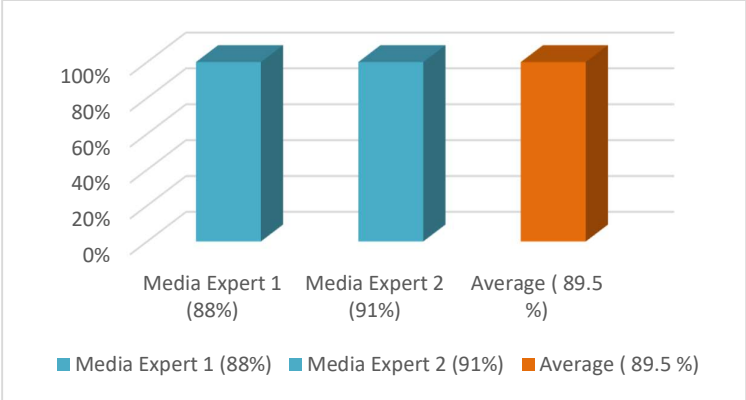

Figure 10. Results of Assessment by Media Experts

From the results shown in the figure, it can be seen that the digital application received a total assessment from Media Expert I of 88%, which is included in the 'very good' category, and the assessment results from Media Expert II were 91%, which is also included in the 'very good' category. The average assessment from both media experts was 89.5%, indicating that the application qualifies as a quality digital media from the perspective of media experts.

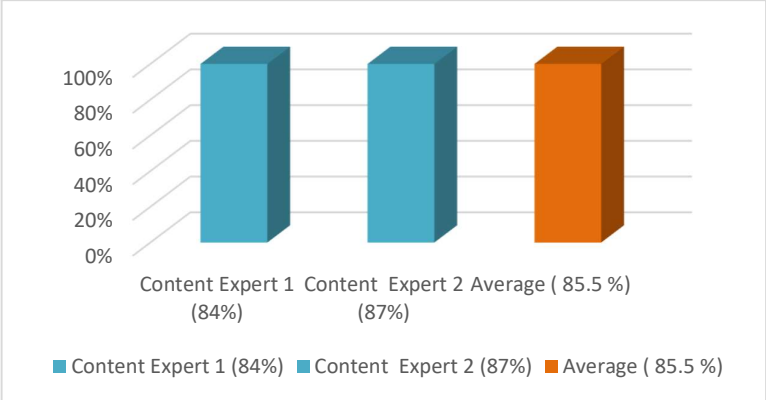

Figure 11. Results of Assessment by Content Experts

Next, Figure 9 shows the assessment results from content experts. The digital application received a total rating from Content Expert I of 84%, which is in the 'very good' category, and a rating from Content Expert II of 87%, also in the 'very good' category. The average assessment from the two content experts was 85.5%, which shows that the information and features in the application are in accordance with MSME business needs, are relevant to actual conditions, and support operational improvements and business competitiveness.

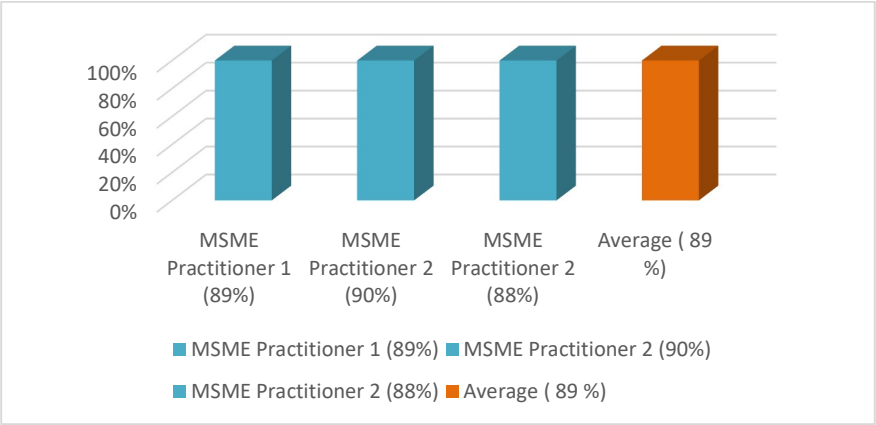

Figure 12. Results of Assessment by Practitioner

The next assessment results are from MSME practitioners. Figure 3 shows the assessment results from each MSME practitioner. Practitioner I gave a total assessment of 89%, which is included in the 'very good' category, Practitioner II gave a rating of 90%, also in the 'very good' category, and Practitioner III gave a rating of 88%, which is included in the 'very good' category. The average assessment from the three practitioners was 89%, which shows that this application meets the needs of competence, ease of use, actuality, and factuality of the material in accordance with the implementation of the needs of MSMEs.

Overall, it can be concluded that this digital application is included in the 'very feasible' category based on the assessment of all validators as a tool for managing MSMEs, and is eligible to be tested on MSMEs.

5. DISCUSSION

From the results of this study, it can be concluded that the E-UMKM application developed is feasible for use by MSME actors as a digital media to improve their business capabilities digitally. An application product must be tested for its feasibility to determine whether the application is suitable for its use, at least through assessments from media experts, content experts, and practical users, in this case MSME actors. The assessment results from the validator show that the feasibility of this application cannot be separated from the components contained in the application. Several application components, based on needs analysis, include motivational elements, ease of use, interactive features, and the ability to present information not only through text, but also through video, images and audio that attract the user's attention. These components are designed to make it easier for MSMEs to manage their business more efficiently and effectively. Thus, this application product was developed according to the needs of MSMEs who need a platform to manage their business digitally.

As a form of innovation in business activities in the digital era, E-UMKM applications can be integrated with various business management approaches. For example, research states that digital applications can be integrated with a problem-based approach in business management, where the research results show that the products developed are suitable for use and proven effective in improving the analytical and decision-making skills of MSME players. Another study successfully integrated digital business applications with a contextual-based approach, which after going through a series of validation processes by content experts, media experts, and practical users, the product was feasible to use and proven to increase user interest in adopting digital technology in managing their business.

Given the ongoing development of information technology, digital-based application products that are being developed can be one of the innovations that support and facilitate MSMEs in the process of digitizing their businesses. This is important considering that MSMEs are currently accustomed to ICT devices and the presence of smartphones that are easily accessible. These digital products not only have a positive impact on increasing business productivity but also contribute to the ability of MSMEs to adapt to rapid technological changes.

Currently, the use of digital applications to assist the business management process in MSMEs has been proven to improve their business performance. Several studies have also revealed that innovation in the use of digital technology can help MSMEs understand complex management concepts, as well as improve their abilities in digital marketing and financial management. The E-MSME application products that have been developed have successfully passed a series of expert assessments and user validations, and have been proven to be able to increase the productivity and digital skills of MSMEs, which has implications for improving overall business performance.

From various previous research results, it can be seen that digital applications such as E-UMKM can be integrated with various approaches to improve the expected results. In addition, this application has also been proven to be able to improve user abilities in cognitive, affective, and practical skills related to business management. Thus, the E-UMKM application developed is worthy of being used as a digital media in supporting the digital transformation of MSMEs, which is expected to have a positive impact on their business development.

6. CONCLUSION

The development of E-UMKM applications shows great potential in supporting micro, small, and medium enterprises to utilize digital technology in expanding markets and increasing operational efficiency. This application is designed with an emphasis on ease of use, interactive features, and accessibility capabilities that can be relied on by users from various backgrounds. Based on the validation results by media and content experts, the E-UMKM application was declared very feasible to be used as a tool for MSMEs in maximizing their business potential.

Testing and assessment of the application by experts shows that this application has a high level of feasibility in terms of interface design, usability, and relevance of the content provided. This underlines that this application is able to provide real benefits for MSMEs in increasing competitiveness in the digital market. The existence of features such as inventory management, financial reports, and integration with e-commerce platforms have proven effective in helping MSMEs run their businesses more efficiently and in a structured manner.

Thus, the E-UMKM application can act as an innovative solution for MSMEs in facing the challenges of digital transformation. The development of this application is expected to be the first step in advancing a more digital, modern, and competitive MSME ecosystem. Further studies need to be conducted to test the wider application of this application and its impact on improving MSME performance in various sectors.

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