Vol. 9, No.06; 2025

ISSN: 2456-7760

# The Effect of Technology Characteristics on Merchant Competitiveness Through Task-technology Fit in CFD Solo Raya MSMEs

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doi.org/10.51505/IJEBMR.2025.9607 URL: https://doi.org/10.51505/IJEBMR.2025.9607

Received: May 28, 2025 Accepted: May 29, 2025 Online Published: Jun 07, 2025

#### Abstract

This study discusses the utilization of digital technology by Micro, Small and Medium Enterprises (MSMEs) in the Car Free Day (CFD) community-based public space of Greater Solo. The growing adoption of technologies such as QRIS, e-commerce, and Customer Relationship Management (CRM) among CFD merchants raises the question of whether the characteristics of these technologies can affect merchants' competitiveness. This study specifically examines whether task-technology fit (TTF) is an important mediator in the relationship. Few studies have evaluated how TTF plays a role in bridging the relationship between technology and competitiveness in informal community-based sectors such as CFDs. This study uses a causal quantitative approach by distributing questionnaires to 200 MSMEs operating in CFDs in Greater Solo. Data were collected directly through printed questionnaires and Google Forms during January-February 2025. Data analysis was conducted using Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) approach through the SmartPLS 4 application. The results showed that QRIS, e-commerce, and CRM have a positive and significant effect on TTF, and TTF has a significant effect on merchant competitiveness. TTF also significantly mediates the relationship between each technology and competitiveness. These findings indicate that the fit between technology and operational tasks is a key factor in improving the competitiveness of MSMEs. The practical implication of this study is the importance of appropriate technology selection, needs-based technical training, and policy support for MSMEs in the digitalization process, especially in community economic areas such as CFDs.

**Keywords:** QRIS, e-commerce, customer relationship management, task-technology fit, MSME competitiveness

#### **1. Introduction**

Micro, Small, and Medium Enterprises (MSMEs) are the main pillars of the Indonesian economy. Based on Indonesian SME (2022) data, this sector contributes 61% to the national Gross Domestic Product (GDP) and absorbs more than 97% of the workforce. In facing the era

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of digital transformation, MSMEs are required to not only survive, but also thrive through the utilization of relevant and appropriate technology.

The adoption of digital technology has opened up great opportunities for MSMEs in terms of market expansion, business process efficiency, and increased customer interaction. Technologies such as QRIS, e-commerce, and CRM are proven to provide a competitive advantage. Research by Dewi (2022) shows that the utilization of information technology has a direct impact on transaction efficiency and customer experience. Digital payment systems such as QRIS provide flexibility for merchants in accepting various payment methods, while supporting more accurate financial records (Kwabena, et al., 2019; Talom & Tengeh, 2019). On the other hand, some obstacles are still found, such as a lack of technical understanding and the Merchant Discount Rate (MDR) fee of 0.7% which is considered burdensome by some business actors (Sulistyawati, 2020).

The Surakarta region presents an interesting context for the study of technology adoption, particularly through public spaces such as Car Free Day (CFD), which has evolved into a community economic arena. Economic activities in CFDs provide direct access for MSMEs to reach consumers on a large and informal scale. Rukayyah et al. (2024) mentioned CFD as a strategic medium for promotion, transactions, and strengthening customer relations. The number of QRIS-using merchants in Solo Raya increased from 36,881 in December 2019 to 358,410 in July 2022, with Solo City accounting for 26 percent of the total (Hasyim et al., 2024). This surge shows that digital transformation is starting to reach the informal sector, albeit unevenly in terms of the effectiveness of technology use.

However, the dynamics of MSME development in Solo Raya are not uniform. Data from BPS (2024) shows that while there was an increase in the number of micro and small enterprises in Surakarta City and Boyolali during 2021-2022, other regions such as Klaten, Sukoharjo, Sragen, Karanganyar, and Wonogiri experienced a decline. This decline reflects complex economic challenges, including possible limitations in technology adoption or lack of systemic support. These differences suggest that the digital adaptation readiness of MSMEs in each region varies widely and requires a contextualized approach.

QRIS as a digital payment system offers real benefits for MSME players, especially in terms of ease of use, operational efficiency, and reliability of transaction recording. The use of QRIS is considered capable of meeting daily operational needs due to its flexibility in the integration of non-cash transactions (Sulistyaningsih & Hanggraeni, 2021). The ease of the application interface and the speed of scanning QR codes also support the widespread adoption of this system (Davis, 1989). In addition, the efficiency generated through this system has proven to be able to simplify the business processes of MSMEs (Wibowo et al., 2022), coupled with system stability and maintained transaction data accuracy (Irawan et al., 2023).

E-commerce is also a significant driver in the expansion of the MSME market. Its presence increases opportunities for businesses to reach consumers across regions through online

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#### ISSN: 2456-7760

platforms (Khoo et al., 2018). The synergy between e-commerce platforms and social media strengthens digital marketing strategies, making communication with customers more effective and personalized (Iansiti & Kaim, 2014). Along with the increasing use of digital wallets in online transactions, e-commerce also facilitates a practical and secure payment process (Puspaningrum & Atahau, 2023), while increasing efficiency in order management (Paulina et al., 2024).

Meanwhile, Customer Relationship Management (CRM) technology contributes to strengthening the relationship between MSMEs and customers. The success of building customer loyalty is often associated with the consistency of services provided and well-organized data management (Alam et al., 2021; Wibowo et al., 2022). The activity of tracking transaction history and customer feedback allows businesses to design more adaptive service strategies (Dewi, 2022). Personalized approaches, such as the delivery of information tailored to customer preferences, are also believed to increase consumer attachment to brands (Gefen & Straub, 2004).

The successful implementation of various digital technologies is largely determined by the extent to which their characteristics are in line with the work needs of MSME actors. Task-Technology Fit (TTF) comes as a concept that bridges the relationship between technology and tasks, and has been widely used in assessing the effectiveness of technology adoption in an organizational context. According to (Goodhue & Thompson, 1995), a high fit between the system and work needs will increase productivity and efficiency. Several studies have shown that appropriately designed or selected technology will have a direct impact on individual and organizational performance (Isharyani et al., 2024), especially in dynamic operational environments (Tjahjono, 2009).

Finally, the competitiveness of MSMEs is a reflection of the success of the digital strategy implemented. In a competitive market situation, businesses that are able to offer better prices than competitors will have a stronger position (Bayhaqy et al., 2018). Adaptability to changing trends and service innovation also determine business sustainability (Bharadwaj et al., 2013). In addition to retaining existing customers, the ability to attract new customers and increase profitability are important parameters in measuring competitive strength (Alam et al., 2021; Wibowo et al., 2022).

Previous studies have mostly examined one or two technologies separately. Not many studies have integrated QRIS, e-commerce and CRM simultaneously in one model framework, especially considering the role of TTF as a mediating variable in informal spaces such as CFDs. The focus on CFD MSMEs in Greater Solo also offers an unexplored empirical context. In addition, this model emphasizes the quality of technology use over the frequency of use, as advocated by Muchenje & Seppänen (2023), and corroborates the findings of Telukdarie et al. (2023) that alignment between digital strategy and business task structure can strengthen competitiveness.

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This study specifically fills the gap in the literature by integrating QRIS, e-commerce, and CRM within one unified model, focusing on the informal public space of CFD—a context rarely explored in prior research. Moreover, it contributes by shifting the focus from technology usage frequency to usage quality and strategic alignment, which has been underemphasized in existing studies.

Based on the above background, the author builds a research framework as follows:



Figure 1. Theoretical Framework

This study uses a quantitative approach with *Partial Least Squares-based Structural Equation Modeling* (SEM-PLS) analysis and involves 200 MSME respondents in CFDs in the Greater Solo area. The main objective of this study is to analyze the effect of *technology* characteristicsrepresented by QRIS, e-commerce, and CRM-on merchant competitiveness, with *Task-Technology Fit* as the mediating variable. The research questions underlying this study are: *Do technology characteristics* (*QRIS, e-commerce, and CRM*) affect the competitiveness of MSME *traders in CFD Solo Raya through the mediating role of Task-Technology Fit (TTF)*? Through the conceptual model developed, this study not only answers the gap in the literature but also provides a practical framework for MSME players and policy makers in optimizing digitalization based on real operational needs.

Based on the problem formulation and conceptual framework in Figure 1, the research hypothesis proposed by the researcher is as follows:

- 1) Quick Response Code Indonesian Standard (QRIS) has a positive effect on TTF.
- 2) E-commerce has a positive effect on TTF.
- 3) Customer Relationship Management (CRM) has a positive effect on TTF.
- 4) Task-Technology Fit (TTF) mediates the effect of QRIS on Market Competitiveness.
- 5) Task-Technology Fit (TTF) mediates the effect of E-commerce on Market Competitiveness.
- 6) Task-Technology Fit (TTF) mediates the effect of Customer Relationship Management on Market Competitiveness.
- 7) Task-Technology Fit (TTF) has a positive effect on Market Competitiveness.

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#### 2. Method

This study applies a causal research design using a quantitative approach and Structural Equation Modeling–Partial Least Squares (SEM-PLS) as the main analytical tool. This approach is used to determine the cause-and-effect relationship between the variables studied, namely the effect of technological characteristics on the competitiveness of MSME traders through the mediating role of Task-Technology Fit (TTF). The independent variables in this study include Quick Response Indonesian Standard (QRIS), e-commerce, and Customer Relationship Management (CRM), while the mediating variable is TTF, and the dependent variable is Merchant Competitiveness. The causal quantitative approach was chosen because it is able to measure direct and indirect effects between variables using numerical data and statistical analysis, and provides objective and measurable results (Sugiyono, 2020).

The data used in this study came from primary and secondary sources. Primary data were collected directly from MSMEs trading in the Car Free Day (CFD) area in the Greater Solo area, which includes Surakarta City, Sukoharjo Regency, Klaten Regency, Sragen Regency, Boyolali Regency, and Wonogiri Regency. Data collection was conducted through two approaches, namely the distribution of physical questionnaire sheets directly to potential CFD traders, as well as the distribution of questionnaires in the form of Google Forms through the WhatsApp application during a one-month period, namely January to February 2025. The research instrument was structured in the form of closed statements using a five-point Likert scale to measure respondents' perceptions of each construct, namely QRIS, e-commerce, CRM, TTF, and merchant competitiveness. There are 20 questions based on the theoretical indicators of each variable. In its preparation, the instrument contains positive and negative statements to avoid answer bias and improve perception accuracy, in accordance with the suggestions of Norman (2010). Secondary data were obtained from reports and documents related to MSMEs as well as academic references on the adoption of digital technology by small businesses.

The population in this study were all MSME players who participated in the Solo Raya CFD activity. The sampling technique used a purposive sampling method, namely by setting the criteria that respondents were MSME players who had used or recognized at least one of the three digital technologies studied. The amount of initial data collected was 216 respondents. However, after the data filtering and cleaning process, 16 responses were found to be invalid or did not meet the analysis criteria. Therefore, the amount of data analyzed in this study is 200 respondents, which is considered adequate in accordance with the provisions for using Structural Equation Modeling (SEM) analysis which requires a minimum of 10 respondents per latent construct (Sarstedt et al., 2021).

The data analysis technique used in this research is Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) approach, which is processed using SmartPLS version 4 software. SEM was chosen because it allows testing structural and measurement models simultaneously and can handle measurement errors (Ghozali & Latan, 2015). The analysis procedure was carried out through several stages. The first stage is descriptive analysis to describe the characteristics of respondents in general. The second stage is the analysis of the

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measurement model (outer model) which is used to test convergent validity through the Average Variance Extracted (AVE) value and factor loading of each indicator, and test construct reliability using the Composite Reliability and Cronbach's Alpha values. A construct is said to be valid if the AVE value> 0.50 and loading> 0.70, and reliable if the Composite Reliability and Cronbach's Alpha values> 0.70. The third stage is structural model analysis (inner model) to determine the relationship between latent constructs through the path coefficient value, R-square (R<sup>2</sup>), and Goodness of Fit (GoF) value. Furthermore, hypothesis testing is carried out using a bootstrapping technique of 5,000 subsamples to produce a T-statistic value and p-value which is used as a basis for decision making. The relationship between variables is declared significant if the T-statistic value is greater than 1.96 and the p-value is less than 0.05. A mediation test was also conducted to determine whether TTF mediates the effect of QRIS, e-commerce, and CRM on merchant competitiveness.

This study has obtained ethical approval from the university's internal research committee. All respondents were informed about the aims and objectives of the study, and data confidentiality was guaranteed. Consent for participation was given voluntarily through digital informed consent listed on the first page of the questionnaire. The identity of the respondents was kept confidential and all data was only used for academic purposes.

#### 3. Results

The following demographics form the basis for analyzing the profile of survey respondents.

Characteristics	Items	Frequency			
			(%)		
Gender	Male	95	47.5		
	Female	45	52.5		
Age	16 - 25 Years	39	19,5		
	26 - 35 Years	emale       45         5 - 25 Years       39         5 - 35 Years       96         6 - 45 Years       63         45 Years       2			
	36 - 45 Years 63		31,5		
	>45 Years	2	1		
Education	SD	$ \begin{array}{r}     95 \\     45 \\     $ 39 \\     $ 96 \\     $ 63 \\     2 \\     \hline     4 \\     14 \\     56 \\     46 \\     56 \\     24 \\ \end{array} $	2		
	SMP	14	7		
	SMA/SMK	56	28		
	Diploma	46	23		
	Bachelor	56	28		
	Master	24	12		

 Table 1. Characteristics of Respondents

The 200 respondents involved in this study in Table 1 consisted of 95 men (47.5%) and 105 women (52.5%). This shows that the majority of respondents in this study were female. Based on age, the respondents were dominated by the age group 26-35 years as many as 96 people (48%), followed by the age group 36-45 years as many as 63 people (31.5%), the age group 16-25 years

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as many as 39 people (19.5%), and the remaining 2 people (1%) came from the age group above 45 years. In terms of the latest education, most respondents are graduates of Bachelor and SMA / SMK, each totaling 56 people (28%). There were 46 Diploma graduates (23%), 24 Master graduates (12%), 14 Junior High School graduates (7%), and only 4 people (2%) had a primary school education. This data shows that the majority of respondents have a medium to high educational background, and are in the productive age range, which is an indication that they are active business actors with the potential to be adaptive to technology and managerial strategies in the context of this study.

#### 3.1 Convergent Validity

The results of convergent validity testing for the variables in the research configuration are constructed as follows.

Constructs	Items	Code	Factor Loading	
Quick Response Indonesian Standard (QRIS)	How much does QRIS support your smooth digital transactions?	QRIS1	0.857	
	Do you find it difficult to understand the features of QRIS?	QRIS2	0.846	
	How much does QRIS support your business operational efficiency?	QRIS3	0.821	
	How often do you experience technical glitches when using QRIS?	QRIS4	0.722	
E-Commerce	To what extent can your store reach a wider market through the use of QRIS, especially in the face of competition in the Car Free Day (CFD) environment?	ECOM1	0.778	
	How effective is the social media you use integrated with <i>e-commerce</i> in increasing sales and attracting new customers?	ECOM2	0.900	
	Does the use of <i>e-wallet</i> payment methods in <i>e-commerce</i> help facilitate transactions and increase your sales yolume?	ECOM3	0.869	
	How quickly and easily can customers make <i>online</i> transactions through the <i>e-commerce</i> you use?	ECOM4	0.767	
Customer	How effective is the CRM	CRM1	0.916	

Table 2	. Measurements	and	outer	loading
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Constructs	Items	Code	Factor Loading
Relationship Management (CRM)	technology used in managing your customer data, such as purchase history and customer preferences? How well does CRM technology help you monitor interactions with customers, whether through social media or other customer services?	CRM2	0.826
	Does your CRM technology help in providing more personalized service to customers based on recorded data?	CRM3	0.927
	How satisfied are your customers with the service provided, based on interactions recorded in CRM technology?	CRM4	0.853
Task-Technology Fit (TTF)	How appropriate are the features of the technology systems used in your business, such as QRIS or <i>e</i> - <i>commerce</i> , in supporting the operational tasks that must be performed?	TTF1	0.910
	To what extent do you utilize technology such as QRIS or CRM in carrying out daily tasks at your business?	TTF2	0.910
	Does the fit between the technology used and the operational tasks at your business affect sales and customer service performance?	TTF3	0.941
	Do the features in QRIS, <i>e-commerce</i> , or CRM technology make sales and data management easier for your business?	TTF4	0.930
Market Competitiveness	To what extent does the use of technologies such as QRIS, e- commerce and CRM help you offer more competitive prices compared to competitors in the <i>Car Free Day</i> (CFD) environment?	DSP1	0.920
	How quickly can you innovate and adapt to market changes or new trends using the technology you	DSP2	0.892

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Constructs	Items	Code	Factor Loading
	have?		
	Does the technology used help you attract new customers and retain existing ones?	DSP3	0.911
	To what extent has the implementation of technologies such as QRIS, e-commerce, and CRM in your store had an impact on increasing market share and profits in the face of competition at <i>Car</i>	DSP4	0.918

Convergent validity in this study was analyzed using the outer loading value and average variance extracted (AVE) to ensure that the indicators used were able to reflect the construct consistently. Convergent validity is considered fulfilled if the outer loading value of each indicator  $\geq 0.70$  (Hair et al., 2019). All indicators in this study show an outer loading value that meets this threshold, indicating that these indicators have sufficient contribution in forming the latent construct being measured.

Construct	Cronbach's	Composite	AVE
	Alpha	Reliability	
QRIS	0.828	0.886	0.661
ECOM	0.848	0.899	0.690
CRM	0.904	0.933	0.777
TTF	0.942	0.958	0.851
DSP	0.931	0.951	0.829

Table 3. Construct Reliability

AVE analysis is also used to evaluate the amount of indicator variance that can be explained by the construct. An AVE value greater than 0.50 indicates that more than half of the indicator variance is successfully represented by the construct. The AVE value in this study shows good results, with Task-Technology Fit (0.851) as the construct with the highest value, followed by Merchant Competitiveness (0.829), Customer Relationship Management (0.777), E-commerce (0.690), and QRIS (0.661). All AVE values have exceeded the minimum recommended limit, so each construct is declared to meet convergent validity.

Meanwhile, to assess construct reliability, this study uses two main measures, namely Cronbach's Alpha and Composite Reliability. Constructs are considered reliable if they have a Cronbach's Alpha value  $\geq 0.70$  and a Composite Reliability value  $\geq 0.70$  (Hair et al., 2019). The test results

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show that all constructs have a very good level of internal consistency. Task-Technology Fit recorded the highest Cronbach's Alpha value (0.942), followed by Merchant Competitiveness (0.931), and Customer Relationship Management (0.904). The QRIS variable shows the lowest Alpha value of 0.828, but the value remains above the recommended threshold. The Composite Reliability value for all constructs is also above 0.90, indicating that each indicator is consistent in measuring the variable in question.

	<b>R</b> -square	Adjusted R-square
TTF	0.825	0.822
DSP	0.948	0.948

The R<sup>2</sup> values displayed in Table 4 show that trader competitiveness has an R<sup>2</sup> value of 0.948, meaning that 94.8% of the variability in competitiveness can be explained by the constructs in the model, while the rest is influenced by external factors outside the study. Meanwhile, the R<sup>2</sup> value for the Task-Technology Fit (TTF) construct is 0.825, indicating that the model is able to explain 82.5% of the variability in the fit between tasks and technology, while the remaining 17.5% comes from other variables outside the model. All R<sup>2</sup> values obtained are above the threshold of 0.67 as suggested by Hair et al. (2019), indicating that this model has a very strong predictive ability and is suitable for further testing.

#### 3.2 Hypothesis Testing

The findings regarding the relationship between variables in the research framework are described as follows.

	Variables	Original sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-statistics ( O/STDEV )	P-values	Description
H1	QRIS -> TTF	0.439	0.440	0.060	7.325	0.000	Accepted
H2	ECOM -> TTF	0.176	0.175	0.053	3.342	0.001	Accepted
H3	<i>CRM</i> -> <i>TTF</i>	0.346	0.344	0.051	6.838	0.000	Accepted
H7	<i>TTF</i> -> <b>DSP</b>	0.950	0.948	0.058	7.417	0.000	Accepted

Table 5. Hypotheses Testing

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	Variables	Original sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-statistics ( O/STDEV )	P-values	Description
H4	QRIS -> <i>TTF</i> - > DSP	0.428	0.429	0.058	7.417	0.000	Accepted
H5	<i>ECOM -&gt; TTF</i> -> DSP	0.171	0.171	0.051	3.334	0.001	Accepted
H6	<i>CRM</i> -> <i>TTF</i> -> DSP	0.338	0.335	0.050	6.760	0.000	Accepted

Table 6. Mediation Testing

# 4. Discussion

The results of hypothesis testing and mediation show that all hypotheses proposed in this study are statistically supported, strengthening the theoretical model that links technological characteristics (QRIS, e-commerce, CRM) to merchant competitiveness through the mediating role of Task-Technology Fit (TTF). In the first hypothesis (H1), QRIS was shown to have a positive and significant effect on TTF ( $\beta = 0.439$ ; t = 7.325; p < 0.000). This finding shows that QRIS successfully fulfills technological functions that are in accordance with the operational tasks of MSMEs, especially in facilitating the transaction process, increasing financial transparency, and providing flexibility in the payment system. These results are in line with research by Talom & Tengeh (2019) and Kwabena et al. (2019) which show that digital payment systems improve efficiency and provide easily accessible transaction records. The practical implication is that MSME players need to be provided with training so that the utilization of QRIS is truly in line with their work routines.

The second hypothesis (H2) also shows significant results, where e-commerce has a positive effect on TTF ( $\beta = 0.176$ ; t = 3.342; p = 0.001). This indicates that the use of e-commerce platforms can support the implementation of MSMEs' daily tasks, such as reaching a wider market and speeding up transactions. This is reinforced by the findings of Iansiti & Kaim (2014) which state that e-commerce accelerates business processes and operational efficiency. In addition, the integration of social media in digital platforms as stated by Huang & Benyoucef (2013) also strengthens the suitability of technology for tasks. Therefore, e-commerce adoption strategies need to be directed towards integration that supports the specific needs of MSMEs, not just the use of digital platforms in general.

Furthermore, the third hypothesis (H3) confirmed that Customer Relationship Management (CRM) also has a positive and significant effect on TTF ( $\beta = 0.346$ ; t = 6.838; p < 0.000). This finding supports previous literature by Alam et al. (2021) which states that CRM can increase customer loyalty and service effectiveness through structured data management. In the field, the use of WhatsApp Business features is one proof that even simple CRM can create a harmonized relationship between technology and tasks, such as customer interaction and order monitoring (Jamiati et al., 2022). Other studies by Jam'an (2021) and Laksono & Gultom (2022) also

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reinforce that CRM integrated with business strategy can expand market reach while shortening service cycles.

In the mediation test, hypotheses H5, H6, and H7 each show that TTF significantly mediates the relationship between QRIS, e-commerce, and CRM on the final outcome, namely merchant competitiveness. The coefficient values of QRIS on TTF ( $\beta = 0.428$ ; t = 7.417; p < 0.000), e-commerce on TTF ( $\beta = 0.171$ ; t = 3.334; p = 0.001), and CRM on TTF ( $\beta = 0.338$ ; t = 5.760; p < 0.000) confirm that technology adoption does not necessarily improve competitiveness if it is not aligned with operational task characteristics. This corroborates the Task-Technology Fit theory of Goodhue & Thompson (1995) and is supported by the research of Isharyani et al. (2024), which states that the fit between technology and tasks is the main foundation for the success of digital transformation of MSMEs.

Finally, the seventh hypothesis (H7) shows that TTF has a strong effect on merchant competitiveness ( $\beta = 0.950$ ; t = 7.417; p < 0.000), suggesting that when technology truly fits the needs of the task, MSMEs can compete more effectively. This not only corroborates the theoretical concept, but also provides practical implications that MSME digitization strategies should focus on technology fit, not just adoption. Technology training programs, user-friendly application design, and government support in accessing digital infrastructure are important to ensure that digital transformation produces real impact on MSME competitiveness.

Although this study makes an important contribution to understanding the influence of technological characteristics on merchant competitiveness through the mediating role of tasktechnology fit (TTF), there are several limitations that need to be considered. The focus of this study only covers MSMEs in the Greater Solo Car Free Day (CFD) area, which is geographically and socioculturally limited to the central part of Indonesia. Thus, generalization of the results to other regions or countries with different economic and cultural characteristics must be done carefully. Future research is recommended to conduct cross-cultural comparisons to understand how differences in societal value systems-such as between collectivist and individualist societies-may affect the relationship between technology adoption, technology-task fit and competitiveness. In addition, since the data is obtained through self-reported methods via questionnaires, there is a potential response bias from respondents that needs to be considered. Experimental research that involves simulating the use of technology in real situations or observing user behavior can provide a more in-depth and accurate understanding of the digital decision-making process by MSME players. Further research also needs to expand the scope of demographic variables such as income level, differences between urban and rural areas, and educational background, to reveal more comprehensive and contextual patterns of technology adoption and competitiveness in the MSME ecosystem in Indonesia.

#### 5. Conclusions

This study concludes that technological characteristics such as QRIS, e-commerce, and CRM have a significant influence on the competitiveness of MSME traders in the Greater Solo Car Free Day (CFD), with task-technology fit (TTF) acting as an important mediating variable.

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These results make an empirical contribution to the literature on technology adoption by MSMEs, particularly in the context of community-based economic spaces such as CFDs. Theoretically, the findings extend the understanding of the TTF model in the informal sector and emphasize the importance of the fit between technology features and merchants' operational needs in creating competitive advantage.

Practically and economically, this study shows that the use of digital technology that is tailored to the characteristics of the tasks of MSME actors can improve efficiency, expand markets, and strengthen customer relationships. The findings also confirm that mere technology adoption is not enough without customization to the work process and user skills.

However, this study has several limitations. First, the use of self-report survey-based data raises the potential for self-report bias, where respondents may provide answers that do not fully reflect reality. Second, the limitation of the study area, which only includes CFDs in Greater Solo, may limit the generalizability of the results to other regions or business types with different characteristics. Third, although this model includes the TTF variable as a mediator, there has been no further testing of other factors that may play a role, such as digital literacy skills, external support, or competition intensity.

These limitations do not stem from methodological errors, but rather from the deliberately limited focus and scope of the study to keep the analysis in-depth and contextual. For future research, it is recommended to involve mixed-methods or longitudinal approaches in order to observe the dynamics of technology adoption over a longer period of time. Future researchers can also expand the scope of the region and consider additional variables such as technology resistance, market orientation, or government policies in supporting the digitalization of MSMEs.

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