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RESEARCH PAPER

Digital Transformation Framework for SMEs: Study of Consumer Goods Wholesale in Indonesia

Hasbullah Hasbullah*[1], Zulfa Fitri Ikatrinasari[2] & Humiras Hardi Purba[3]

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ABSTRACT

SMEs (Small and Medium Enterprises) play a vital role in developing countries like Indonesia, contributing 12.85% to the GDP. However, Indonesia ranks low in the Global Index of Digital Entrepreneurship Systems by the Asian Development Bank. A study in Bekasi regency found that nearly 100% of SMEs still rely on conventional systems, facing common issues like low stock accuracy and lack of transparency. While software solutions exist, they often fail to address the real issues SMEs face in the real world. This research aims to create a digital transformation framework tailored to the real issues of SMEs, confirmed by stakeholders. This study used exploratory mixed methods, identifying seven steps for digital transformation: defining customer needs, identifying gaps, setting goals, selecting technology, addressing current problems, planning and financing, and evaluation. These steps cover six dimensions: Customer needs, Processes, Planning and Strategy, Technology, Resources, and Financing. The findings highlight that digital transformation is not just about adopting technology but involves a comprehensive approach grounded in customer needs. This framework offers significant value as a main contribution to academics, practitioners, policymakers, and stakeholders by addressing SMEs' real-world challenges and ensuring that digital transformation is effective and relevant.

KEYWORDS: Digital transformation; Framework; Steps; SMEs; Wholesales.

1. Introduction

SMEs (Small and Medium Enterprises) are vital in developing countries like Indonesia. MSMEs have reached 4.19 million, contributing 99.7% of the industry. The Government of Indonesia classify SMEs as Micro Enterprises with maximum assets of 50 Million Rupiah, Small Enterprises between 50 to 500 Million Rupiah, and Medium Enterprises between 500 million to 10 Billion Rupiah (Law No. 20, 2008). This study focuses on the Wholesale and Retail Trade Sector, based on the Indonesian Trading and Distributor Companies Directory 2023, reaching IDR 2,517 Trillion, contributing 12.85% to the GDP (Gross Domestic Product). This sector has a reasonably significant contribution to the economy, with a growth rate of 7.04%, according to the 2023 Central Statistics Agency Report.

Unfortunately, This positive trend does not align with SMEs' digital transformation level. Indonesia has a low ranking in the world, even in Southeast Asia, in the Global Index of Digital Entrepreneurship Systems (GIDES) according to the Asian Development Bank Report 2023[1]–[3]. The reality on the ground reflects the same thing. From initial observations in this study, 92% of SMEs complained about classic problems with the conventional system: shortage, overstock, and weak supervision. However, they comprehend that technology is one of the best ways to overcome this, proven by the confirmation that 80% of SMEs acknowledge that technology is essential in their business operation. This problem is one of the main motivations underlying the aim of this study, namely designing a framework for digital transformation steps for SMEs, especially the Wholesale and Retail Trade sectors, as a reference guide for SMEs in overcoming the real problems they face realistically and affordably.

This research follows up on previous research to examine the mechanisms in more detail for digital transformation steps [4]-[5] and emphasizes that

* **Corresponding author: Hasbullah Hasbullah**
hasbullah@mercubuana.ac.id

1. ***Department of Industrial Engineering, Universitas Mercu Buana, Meruya Selatan, West Jakarta, Indonesia .***
2. ***Department of Industrial Engineering, Universitas Mercu Buana, Meruya Selatan, West Jakarta, Indonesia .***
3. ***Department of Industrial Engineering, Universitas Mercu Buana, Meruya Selatan, West Jakarta, Indonesia .***

digital transformation does not always involve high technology and investment [6]–[8]. Digital transformation is part of the Industry 4.0 phenomenon in the current disruptive era [9]-[10], in the form of fundamental change through the use of innovative digital technology by utilizing resources and capabilities, even culture and leadership [1][2][3], aimed at radically improving an entity and redefining the value proposition for the organization [6][11], oriented towards the values of visibility, transparency, decision predictability, and adaptability [12].

This study also addresses gaps in previous research, which often view digital transformation as primarily about technology and software, even for SMEs, while overlooking real-world issues and lacking comprehensive steps for adopting appropriate technologies. By exploring feedback and challenges SME owners, stakeholders, and policymakers faced, this study developed a framework for digital transformation tailored to SMEs. It offered significant value as a main contribution by addressing SMEs' real-world challenges and ensuring that digital transformation is practical and relevant.

2. Literature Review

SMEs must implement digital transformation by adopting technologies that align with their capabilities and resources through investment and collaboration while seeking free applications, low-cost technology, open-source technologies, and available applications to improve efficiency, add value, and enhance competitiveness [4]. If an organization remains passive and indifferent to digital transformation, the outside world will evolve dynamically, requiring business interactions and transactions to be conducted digitally [5]. Every organization, including SMEs, must implement digital transformation.

Many people think that digital transformation in the Wholesale and Retail Trade Sectors for SMEs is effortless; just by buying software for US$ 1000 to 2000, a business model like a modern supermarket can be implemented. A computer system can record incoming goods, putting away, delivery, and transactions. Moreover, business processes in SMEs are more straightforward and less complicated. But the question is, do all SMEs have the money to buy software? Although financing is mandatory for adopting technology [6], Do they have access to technology? This study tries to provide a workforce, especially policymakers, stakeholders, or government, who want to carry out the digital transformation that suits the needs and conditions of the field. Many technologies are suitable and accessible for business models in the Wholesale and Retail Trade Sectors, such as Appsheet, Gemini, Googlsheet, or applications connected to the WhatsApp business application, which can record and display important information in inventory flow. The question is, what are the steps? Where do you start? Is it safe?

Digital transformation is not about investing in technology and software [7]. Steps refer to several leading references, including those related to SMEs such as Peffers, Siebel, and Queiroz [5][6][11][13][14][15]. Of course, many other references are outlined in Table 1 below.

Tab. 1. SMEs digital transformation

No	Digital Transformation Steps	References												Total Ref
		[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	
1	Identifying problems, opportunities, motivation & readiness		✓	✓		✓	✓	✓	✓	✓	✓	✓		9
2	Strategy, Planning, Designing, Implementation, & Evaluation	✓		✓	✓	✓	✓		✓	✓			✓	8
3	Selecting appropriate technology	✓	✓	✓			✓	✓				✓	✓	7
4	Goals and solution	✓	✓		✓	✓				✓	✓	✓		7
5	Evaluation		✓	✓	✓	✓	✓		✓			✓		7
6	Gap analysis and initial evaluation	✓	✓		✓		✓	✓		✓				6
7	Leadership and developing team			✓	✓		✓	✓	✓		✓			6

8	Communication and idea			✓	✓		✓	✓				✓	4
9	Training and Awareness								✓	✓	✓	✓	4
10	Vision and Mission		✓			✓		✓					3
11	Developing culture		✓										3
12	Collaboration									✓	✓	✓	3
13	Understanding customers and the market clearly			✓		✓							2
14	Investment Priorities			✓							✓		2
15	Project Pilot								✓				1
16	Developing Roadmap									✓			1

Table 1 cites 12 references related to SME digital transformation. Many articles quote the five significant steps from Peffers, Siebel, and Queiroz: Identifying problems, opportunities, motivation and readiness, strategy, planning, design & implementation, selection of appropriate technology, determining solution objectives, and evaluation. However, Table 1 adds several other essential steps in digital transformation, especially in the scope of SMEs from other references. All the steps above are arranged based on those most frequently mentioned by the 12 primary references above. This sequence of the top five digital transformation steps seems aligned with five significant steps from Peffers: identifying problems, strategy, selecting technology, goals, and evaluation. Apart from the steps of digital transformation, SME digital transformation needs to consider the dimensions of digital transformation that the organization must fulfil [4][24][25]. Table 2 presents several critical dimensions in SME digital transformation readiness.

Tab. 2. Transformation digital dimensions

No	Digital Transformation Dimensions	References No.												Tot
		[23]	[9]	[21]	[24]	[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]	
1	Resources and People		✓			✓	✓	✓	✓	✓		✓	✓	8
2	Technology & Digital development			✓			✓	✓	✓	✓	✓	✓	✓	8
3	Process						✓	✓		✓	✓	✓	✓	6
4	Organization structure		✓			✓				✓	✓			4
5	Culture		✓			✓		✓		✓				4
6	Digital Literacy & Awareness	✓			✓				✓					3
7	Strategy							✓	✓	✓				3
8	Information System		✓			✓								2
9	Product							✓		✓				2
10	Stakeholder Attributes (Gender, Education, Age)				✓									1
11	Connectivity	✓												1
12	Internet Activity	✓												1
13	Leadership							✓						1
14	Monitoring and Control										✓			1
15	Customers							✓						1
16	Integration			✓										1

Table 2 cites several leading articles related to the dimensions of digital transformation from

Günther, Schumacher, Leyh, and others. Resources, people, technology, processes, culture, and organizational structure are the five most widely cited dimensions. Although some references classify dimensions into three parts: technology, human capital, and organization [33], All other dimensions of digital transformation are covered extensively in various reviews and viewpoints in many references. It does not mean that the different dimensions not disclosed in Table 2 are not critical. It may not have been reviewed in digital transformation studies and needs to be carried out with more intense follow-up studies. This research examines further the steps and dimensions of digital transformation according to the context of practicality in overcoming real problems currently faced in Indonesia that are realistically affordable following the research objectives.

3. Method

The study is a multiphase research study with an exploratory mixed method to identify steps for the digital transformation of SMEs. It is based on a combination of quantitative and qualitative research philosophies (positivism and interpretivism), which leads to pragmatism and post-positivism as a combination of both [34], [35], [36]. Phase 1 began with a qualitative approach by collecting data and information related to digital SME transformation steps, including the dimensions of obstacles, real problems, and factual conditions on the ground, which include challenges and supporters. Phase 1: qualitative research results were confirmed by Phase 2: quantitative research in a survey conducted on the SME stakeholder population, including business actors and the parties involved. Table 3 below explains the research design in multiphase form with research objectives, questions, and types of collected data.

Tab. 3. The multiphase research design with research objectives, questions, and types of collected data

Research Objective	Research Question	Data Collection Method	Types of Data	Respondents	Procedure
Pre-Research • Collecting and Selecting literature review & documents • Identifying gaps, problems, objectives & research questions • Affirming problem and observation • Selecting a method to achieve research objectives	What are the steps of digital transformation in SMEs?	1. Documents & literature review 2. Field observation 3. Focus Group Discussion	Qualitative	• 2 PhD • 2 Practitioners • 2 Students	Preparing Research : • Defining objectives • Establishing plans and methods • Collecting and selecting relevant papers and documents • Identifying gaps
Phase 1 (Qualitative) Identifying steps of digital transformation in SMEs, especially the Wholesale and Retail Trade sectors, through interview		• Interview 1 • Interview 2 • Interview 3		• 3 Academicians • 2 Practitioners • 3 SME Players Total 8 Respondents (RSP1,2,3,4,5,6,7,8)	• Establish interview goals and plans. • Create interview procedures • Selecting qualified interview respondents Designing questions (semi-structured) • Analysis of results • Determine the digital transformation steps from interviews and develop the survey instrument.

Phase 2 (Quantitative) Confirming transformation steps for SMEs, especially the Wholesale and Retail Trade sectors, through an evaluation survey Developing a framework for digital transformation steps for SMEs,	How is each step's approval level related to digital transformation from the SMEs' and stakeholders' perspectives on the real problem they are facing?	Evaluation Survey	Quantitative	30 respondents: Stakeholder of SMEs (Non-Probability Purposive Sampling)	• Planning and preparation of the survey • Executing surveys • Descriptive, Cluster and Anova analysis • Identify Confirmation and approval levels from the survey • Translating steps and digital transformation • Designing a framework for SME digital transformation steps

4. Result and Discussion

Tables 1 and 2 above are the results of exploring various literature and documents related to the steps and dimensions of digital transformation. In addition to selecting the most frequently cited references in Tables 1 and 2, the Focus Group Discussion (FGD) consisting of PhDs, practitioners, and experts who qualified, experiencing, and involving in SMEs digital transformation considered other factors such as similarity, business process complexity, scope, characteristics, and factual existence condition of the SME business sector, in this case, the Wholesale and Retail Trade Sectors in Indonesia. Therefore, the dimensions and steps from Tables 1 and 2 have been simplified, reduced, and ordered in sequence as follows (Table 4).

Tab. 4. Steps and dimensions of digital transformation for SMEs

Steps of Digital Transformation (From Table 1)		Dimensions of Digital Transformation (From Table 2)	
No	Description	No	Description
1	Understanding customers and the market needs clearly: (No.13)	1	Technology & Connectivity (No.1, 5, 8, 11, 12, 16)
2	Identifying the problem (No.1)	2	Process (No.3)
3	Gap analysis (No.6)	3	Product (No.9)
4	Developing team (No. 7, 9, 10)	4	Strategy (No.7)
5	Communication and idea (No.8)	5	Customers (No.15)
6	Goals and solution (No.4)	6	Resources & People (No. 1, 4, 5)
7	Selecting technology (No.3)		
8	Strategy, planning & Roadmap (No. 2, 14, 16)		
9	Training and Awareness (No. 9, 11)		
10	Execution and evaluation (No. 5, 15)		

After organizing the steps and dimensions of digital transformation, a material on the relationship between the two was created to develop the Steps and Dimensions of Digital Transformation for SMEs. This matrix was also filled in through FGDs and conclusions from interviews with experts, SME practitioners, and academics, as shown in Table 5.

Tab. 5. Matrix of the Relationship of Steps and Dimensions of Digital Transformation

No	Digital Transformation Steps	Dimensions					
		1	2	3	4	5	6
1	Understanding customers and the market needs clearly			✓	✓	✓	
2	Identifying problem		✓			✓	
3	Gap analysis and initial evaluation	✓	✓		✓	✓	
4	Developing team				✓		✓
5	Communication and idea	✓	✓	✓			✓
6	Goals and solution	✓	✓		✓	✓	
7	Selecting technology	✓	✓			✓	
8	Strategy, planning & roadmap				✓		✓
9	Training and Awareness	✓		✓			✓
10	Executing and evaluation	✓	✓		✓		✓

*Note: 1. Technology and Connectivity, 2. Process, 3. Product,
4. Strategy, 5. Customers, 6. People and Resources

The steps and dimensions of digital transformation in Table 5 above then became a platform for compiling semi-structured questions to eight respondents who were selected and had qualifications and experience involved in the digital transformation of SMEs, following the results of the interview analysis from eight respondents, RSP (Respondent) 1 to 8 (see Table 1, Phase 1 Qualitative Method) as shown in Figure 1;

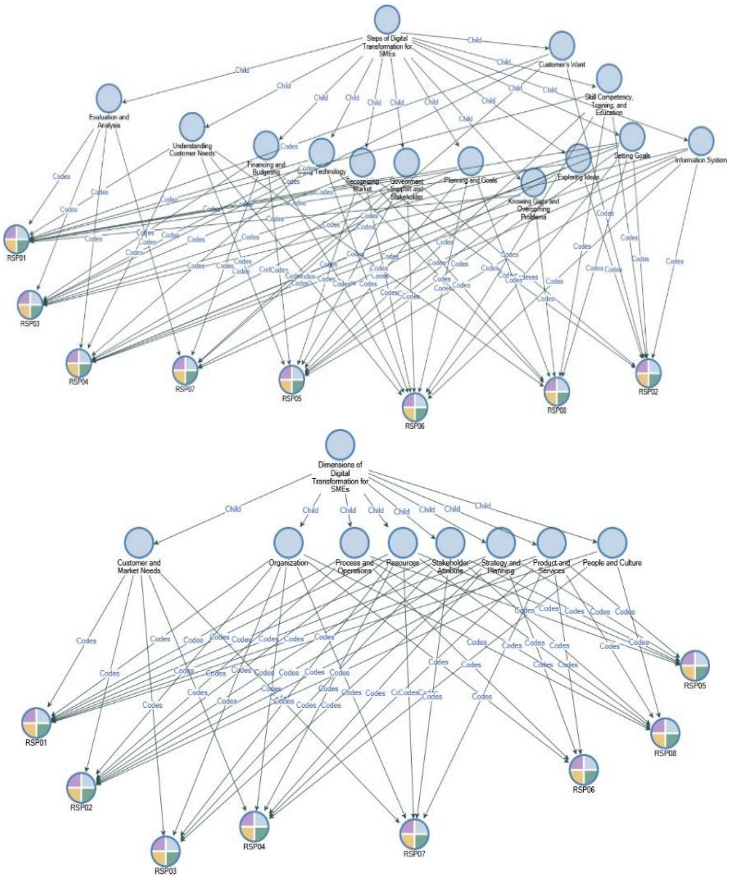

Fig. 1. Key points of steps and dimensions of digital transformation for SMEs

From Figure 1 above, eight respondents were asked in interviews to answer questions about the steps and dimensions of digital transformation for SMEs. From their answers, keywords that appeared significantly were analyzed using the NVivo interview recording data processing software. The results of the interview analysis above are slightly different from those of the literature review. Still, there are more similarities as analysis determined by the FGD in Tables 2 and 3 above, then confirmed by an evaluation survey consisting of 30 qualified respondents and stakeholders in digital transformation for SMEs, which includes the level of agreement on steps and dimensions of SME digital transformation. The questionnaire is formed the FGD team from interview results in Figure 1 and consists of respondents' perceptions of the importance of each proposed. The following Likert scale is used to represent each respondent's perception agreement for steps and dimensions of digital transformation for SMEs, such as:

- Very important = 6
- Important = 5
- Moderate Important = 4
- Less Important = 3
- Low Important = 2
- Very Unimportant = 1

The Likert scale above is used to convert qualitative data into numbers. It refers to ordinal data, representing a natural order of levels or hierarchy of importance. To summarize the data, it is investigated and interpreted through many visualization tools, including percentiles, medians, modes, and interquartile ranges. Table 5 summarizes the survey results using the median to analyze the Likert scale data because it follows non-parametric statistics. The test in this stage does not require any parameter assumptions for the population being tested, or this test is independent of the population. In non-parametric statistical tests, no parameters are used, and no specific distribution is required. It causes non-parametric statistical tests to be referred to as distribution-free methods. Besides, the median can be used for ordinal data and non-parametric analysis. Next, Table 6 shows the survey results.

Tab. 6. Result of evaluation survey

No	Digital Transformation Steps for SMEs	Approval rating			
		Med	Avg	Min	Max
1	Selecting appropriate technology	6,00	5,47	4,00	6,00
2	Defining customer's want	5,00	5,00	4,00	6,00
3	Knowing gaps (identifying problem)	5,00	5,37	5,00	6,00
4	Setting goals	5,00	5,37	5,00	6,00
5	Overcoming problem	5,00	5,20	4,00	6,00
6	Financing and budgeting	5,00	5,03	4,00	6,00
7	Evaluation and analysis	5,00	5,20	4,00	6,00
8	Skill and competency	4,50	4,47	3,00	6,00
9	Understanding customers and market	4,00	4,13	3,00	6,00
10	Exploring idea	4,00	4,33	3,00	6,00
11	Planning and strategy	4,00	4,60	4,00	6,00
12	Applying information system	4,00	4,27	3,00	6,00
13	Seeking government support	4,00	4,37	3,00	6,00
No	Digital Transformation Dimensions	Med	Avg	Min	Max
1	Technology	6,00	5,33	3,00	6,00
2	Process and Operation	5,00	5,13	4,00	6,00
3	People and Culture	5,00	4,63	3,00	6,00

4	Customer and market need	5,00	4,77	3,00	6,00
5	Resources	5,00	4,77	4,00	6,00
6	Financing	5,00	4,77	4,00	6,00
7	Product	4,50	4,57	3,00	6,00
8	Organization	4,50	4,57	4,00	6,00
9	Planning and strategy	4,00	4,17	3,00	6,00
10	Stakeholder attributes (age, ethnicity, education, etc)	4,00	4,17	3,00	5,00

The result from the evaluation survey in Table 6 shows the level of importance of each digital transformation step and
analysis) because these steps and dimensions are essential in the proximity level matrix.
This framework has been tested on dimension. The average, min, and max columns are references to accompanying the median, but just for comparison, they are not substantial objects in this data analysis. It parallelly follows the median, which is mostly the same pattern. The finding considered steps and dimensions of digital transformation through the level of importance of only "Very Important" (Median score = 5) and "Important" (Median score = 4) are selected. It doesn't mean that steps and dimensions with a median score < 4 are not crucial and against theory or literature review, but respondents probably considering simple business processes and practical needs in SMES conditions, especially in Wholesale and Retail Trade Sectors, with customers and supply chain is not so complicated like manufacturing or logistic industry. All eleven steps from Table 5 received scores of 4, indicating that all steps are deemed Important or Very Important in digital transformation. However, in the final Focus Group Discussion involving experts and stakeholders, Steps 8 to 11 were excluded from the framework for the following reasons:

1. Step 10, Applying Information Systems, is similar to Step 1, Selecting Appropriate Technology.
2. Step 8, Skills and Competencies, is encompassed within Step 6, Planning and Strategies.
3. Step 9, Exploring Ideas, is incompatible with digital transformation because this idea's characteristics come from leadership from top management, especially in the case of SMEs in Indonesia.
4. Step 11, Seeking Government Support, pertains to an external scope dependent on particular circumstances and falls outside the focus of this research.

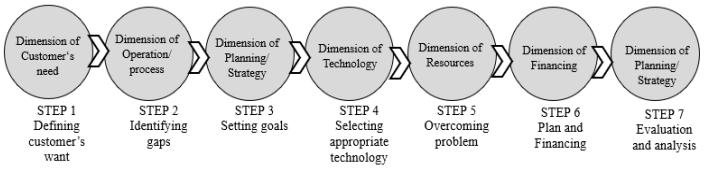

Fig. 2. Framework of digital transformation for SMEs

This framework as a platform was written based on an exploratory literature review, followed by further analysis through FGD and interviews with several experts and stakeholders, and finally confirmed by a survey. For the record, in the dimensions of digital transformation for SMEs, even though the evaluation survey obtained an approval value of "moderate importance" (median score=4) for the Planning and Strategy dimensions, in developing a framework for digital transformation steps, this dimension cannot be separated from the critical steps in step no. 3 (setting goals) and step no. 7 (evaluation and several SMEs in the Bekasi area of Indonesia. Digital transformation begins with the first step of clearly identifying customer desires, especially the most priority ones. In the case study, the subject of this research is the Wholesale and Retail Trade Sector in Indonesia, Bekasi regional.
Customers want certainty in the supply of goods where SMEs require a long time to access stock information that should be accessed in real-time, but this is done manually, which takes time. So, the next step is to create a goal in the form of a vision of digitalized business processes where incoming and outgoing goods are recorded through barcode scanning, and the data is stored and processed by a computer system that will make it easier to access information in real-time. The next step is to choose technology, taking into

account limited finance. So, a study was carried out using open-source technology, namely the application of a combination of Android, Appsheet, Gemini, Googlesheet, and WhatsApp Business, which carried out simulation studies and experiments to see whether it would solve the problem. The final step is planning and evaluation to ensure the results are convincing and successful.

5. Conclusion

From a managerial insight perspective, digital transformation is widely recognized as a critical driver for enhancing productivity, efficiency, and competitiveness. However, the process is recommended to begin by addressing the "point of pain", the specific challenges or bottlenecks experienced by stakeholders or processes that contribute to unresolved, acute, or chronic problems, particularly in SMEs. While the digital transformation approach should indeed focus on meeting customer needs and creating the added value customers expect, it is equally important to align with the most pressing operational issues currently faced by SMEs. Organizations should implement a prioritization strategy and evaluate the impact of each potential digital initiative when selecting the critical targets for transformation. By doing so, the digital changes made will be more relevant, focused on solving real-world problems, and are more likely to produce meaningful improvements in performance and competitiveness.

The study revealed seven steps in digital transformation: defining customer needs, identifying gaps, setting goals, selecting technology, addressing current problems, planning and financing, evaluation, and analysis. These steps would lead to the most relevant dimensions, such as Customer needs, Processes, Planning and Strategy, Technology, Resources, and Financing. Both the steps and dimensions are the main contributions academically and practically based on real-world problems, feedback, and validation from SME practitioners and stakeholders. The findings of this study set apart from previous research, which primarily focused on technology and project management methodologies.

Further research must explore other steps and dimensions to complement and increase the accuracy of implementing digital transformation for SMEs, especially with different business sectors, industries, fields, or cultures. There are many central issues in encouraging SME growth. Digital transformation is one crucial solution in accommodating customer values and desires in SME business processes. Still, breakthroughs need to be made in overcoming these issues, the most classic of which are financial problems and limited resources. Further research is also required, especially using open-source technology in digital transformation.

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