

Analysis of the Readiness of Dodol SMEs to Adopt a Digital-Based Supply Chain System

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ABSTRACT

Digital transformation has increasingly become an important issue for Small and Medium Enterprises (SMEs), particularly in improving supply chain efficiency and business competitiveness. In Garut Regency, Dodol SMEs play a significant role in the local food industry; however, many business owners still face difficulties in adopting digital-based Supply Chain Management (SCM) systems. Limited digital capabilities, infrastructure constraints, and concerns regarding the use of technology remain major challenges for SMEs in adapting to the digital era. This study aims to analyze the readiness of Dodol SMEs in Garut Regency to adopt digital SCM using the Technology Readiness Index (TRI) framework. This study employed a quantitative approach using a survey method involving 42 Dodol SMEs registered at the Department of Industry and Trade of Garut Regency. Data were collected through questionnaires based on the four TRI dimensions, namely optimism, innovativeness, discomfort, and insecurity. Descriptive statistical analysis was used to evaluate the level of technological readiness among SME owners. The findings indicate that most SMEs have positive perceptions toward digital technology and recognize its potential to improve operational effectiveness and market access. However, some respondents still experience concerns related to technical capability and data security. Overall, the readiness level of Dodol SMEs falls into the moderate category, indicating the need for improved digital literacy and institutional support to encourage broader implementation of digital SCM.

Keywords: *Digital Supply Chain, Dodol SMEs, Digital Transformation, Technology Readiness, Technology Readiness Index.*

1. INTRODUCTION

The rapid evolution of digital technologies has significantly transformed the way organizations operate and compete in contemporary business environments. Organizations are increasingly integrating digital solutions into their business processes to enhance efficiency, improve decision-making quality, and strengthen relationships with customers and stakeholders. In supply chain management, technologies such as the Internet of Things (IoT), cloud-based systems, big data analytics, artificial intelligence, and digital collaboration platforms have enabled higher levels of visibility, coordination, and responsiveness across supply chain networks. These developments have accelerated the emergence of Digital Supply Chain Management (DSCM) as a strategic approach for improving operational performance and maintaining long-term competitiveness in an increasingly digital economy (Bag et al., 2021; Queiroz et al., 2021; Frederico et al., 2021; Büyüközkan & Göçer, 2021; Ivanov & Dolgui, 2021).

In Indonesia, the digital transformation of Micro, Small, and Medium Enterprises (MSMEs) has become a critical issue, considering that this sector serves as a cornerstone of the national economy. The substantial contribution of MSMEs to gross domestic product (GDP), employment generation, and equitable economic development highlights the strategic importance of digitalization in strengthening business competitiveness. Nevertheless, the adoption of digital technologies among MSMEs continues to face numerous challenges, including inadequate technological infrastructure, limited digital competencies, restricted access to financial resources, and insufficient human resource readiness to effectively utilize digital technologies (AlNuaimi et al., 2022; Kraus et al., 2022; Troise et al., 2022). Previous studies have indicated that successful digital transformation is influenced not only by technological factors but also by the readiness of individuals and organizations to embrace technology-driven changes (Verhoef et al., 2021; Vial, 2021).

One MSME subsector with substantial potential to benefit from digitalization is the traditional food industry, particularly the dodol industry in Garut Regency, Indonesia. Garut dodol has long been recognized as one of the region's iconic traditional food products with both regional and national market reach. However, many dodol MSMEs still encounter operational challenges, including fragmented inventory management systems, manual transaction recording practices, limited utilization of digital platforms for marketing activities, and inadequate information

integration among supply chain actors. Such conditions may reduce operational efficiency and constrain business growth in the increasingly digital economy (Khin & Ho, 2023; Nuseir et al., 2023). The implementation of Digital Supply Chain Management is expected to support MSMEs in improving raw material procurement, inventory control, product distribution, and data-driven decision-making processes (Yadav et al., 2022; Kumar et al., 2023).

Although digital technologies offer numerous organizational benefits, their successful implementation largely depends on users' readiness to accept and utilize such technologies. The successful adoption of digital technologies depends not only on the availability of technological resources but also on the readiness of individuals to utilize them effectively. To assess such readiness, researchers frequently employ the Technology Readiness Index (TRI 2.0), which evaluates an individual's tendency to accept and use new technologies. The framework consists of four dimensions that collectively reflect technology readiness. Optimism and innovativeness represent positive drivers that encourage technology adoption, whereas discomfort and insecurity function as inhibiting factors that may reduce users' willingness to engage with digital systems. Together, these dimensions provide a comprehensive understanding of how individuals perceive and respond to technological innovations (Parasuraman & Colby, 2015). In recent years, TRI has gained renewed attention as an effective instrument for assessing digital readiness across various industries undergoing digital transformation (Chatterjee et al., 2023).

Numerous studies have highlighted the important role of technology readiness in shaping individuals' intentions to adopt and utilize digital technologies. Empirical evidence across various sectors indicates that positive readiness traits, particularly optimism and innovativeness, are associated with higher levels of technology acceptance and usage. Conversely, concerns related to technological complexity and security often discourage adoption. Organizations characterized by higher readiness levels are generally better positioned to implement digital innovations, improve operational effectiveness, and achieve stronger organizational performance. Consequently, evaluating technology readiness has become an essential step in planning successful digital transformation initiatives (Lin et al., 2021; Chao, 2022; Abbad, 2023; Bhatia & Srivastava, 2022; Sharma et al., 2023).

Despite the growing body of literature on Technology Readiness, existing studies have predominantly focused on consumer behavior, digital financial services, e-commerce, online learning, and technology-based healthcare services (Abbad, 2023; Chatterjee et al., 2023; Sharma et al., 2023; Suseno et al., 2020; Zahra et al., 2023; Indriyani et al., 2024). Research specifically examining the technology readiness of MSME owners in adopting Digital Supply Chain Management remains relatively limited, particularly within traditional food industries in developing countries. Moreover, most prior studies have employed TRI as an independent variable within causal research models, while its application as a baseline assessment tool for mapping MSMEs' digital readiness has received comparatively little attention (Kumar et al., 2023; Troise et al., 2022).

Based on the aforementioned discussion, a significant research gap exists regarding the limited empirical evidence on the technology readiness of traditional food MSMEs in preparing for Digital Supply Chain Management transformation. The dodol industry in Garut Regency presents an especially relevant research context because it represents a traditional business sector currently facing increasing demands for digitalization across business processes and supply chain activities. The novelty of this study lies in several aspects: the application of TRI 2.0 to assess Digital Supply Chain Management readiness among dodol MSMEs, the establishment of a baseline study for digital supply chain transformation in traditional food MSMEs, the utilization of empirical data collected from 42 dodol business owners in Garut Regency, and the development of a Digital SCM transformation roadmap based on technology readiness levels.

Therefore, this study aims to evaluate the technology readiness of dodol MSME owners in Garut Regency using the Technology Readiness Index (TRI 2.0) framework. The findings are expected to provide a comprehensive baseline assessment of MSMEs' digital readiness, identify readiness dimensions requiring further improvement, and offer practical insights for local governments, academics, and business practitioners in formulating more effective and sustainable digital supply chain transformation strategies.

2. RESEARCH METHODS

This research adopted a quantitative descriptive design to examine the level of readiness among Dodol MSMEs for implementing Digital Supply Chain Management (DSCM). A survey approach was utilized to capture respondents' perceptions regarding their preparedness to adopt digital technologies within supply chain activities. A descriptive approach was considered appropriate because the study aimed to portray the current state of technology readiness among MSMEs rather than examine causal relationships between variables (Creswell & Creswell, 2018; Sugiyono, 2023). The target population comprised all Dodol MSMEs officially registered with the Department of Industry of Garut Regency. The sample was selected through purposive sampling based on several criteria: the business must be

actively operating, officially registered with the Department of Industry of Garut Regency, and willing to participate in the study. Applying these criteria resulted in a final sample of 42 Dodol MSMEs (Sekaran & Bougie, 2020).

Data were collected through a structured questionnaire developed based on the Technology Readiness Index (TRI) 2.0 framework proposed by Parasuraman and Colby (2015). The instrument consisted of four dimensions: optimism, innovativeness, discomfort, and insecurity. The collected data were analyzed using descriptive statistical techniques. Mean scores were calculated for each indicator and TRI dimension to evaluate the level of technology readiness among Dodol MSMEs for the adoption of Digital Supply Chain Management. The interpretation of the findings followed the technology readiness classification adapted from Parasuraman and Colby (2015), which categorizes readiness into low, moderate, and high levels.

3. RESULTS AND DISCUSSIONS

3.1. Profile of Respondents

A total of 42 Dodol MSMEs registered with the Department of Industry of Garut Regency participated in this study. The demographic and business characteristics of the respondents are presented in Table 1.

Table 1. Respondent Profile

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	36 respondents	85.71
Gender	Female	6 respondents	14.29
Business Age	< 5 years	3 MSMEs	7.14
Business Age	5–10 years	27 MSMEs	64.29
Business Age	> 10 years	12 MSMEs	28.57
Number of Employees	1–5 employees	2 MSMEs	4.76
Number of Employees	6–10 employees	36 MSMEs	85.71
Number of Employees	> 10 employees	4 MSMEs	9.52
Level of Digital Technology Usage	Low	35 MSMEs	83.33
Level of Digital Technology Usage	Moderate	7 MSMEs	16.67
Level of Digital Technology Usage	High	0	0.00

Source: Survey data processed by the authors (2026).

The respondent profile indicates that most business owners have been operating their enterprises for a relatively long period, suggesting substantial experience in managing business operations and supply chain activities. Such experience is expected to enhance the reliability of their assessments regarding the readiness of their businesses to adopt digital technologies. Furthermore, the dominance of MSMEs with low levels of digital technology utilization highlights the ongoing challenges faced by traditional food enterprises in embracing digital transformation initiatives, particularly within supply chain management practices.

3.2. Technology Readiness Measurement

The research instrument consisted of 16 measurement items distributed across the four TRI dimensions. Each item was assessed using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The collected data were analyzed using descriptive statistical techniques, with the mean score calculated for each TRI dimension to determine the overall level of technology readiness among Dodol MSMEs. The mean score was computed using the following formula:

$$\bar{x} = \frac{\sum x_i}{n} \quad (1)$$

Subsequently, the level of technology readiness was interpreted based on the index classification adapted from Parasuraman and Colby (2015), as presented in Table 2.

Table 2. Technology Readiness Classification

Score Interval	Readiness Category
1.00 – 2.33	Low
2.34 – 3.66	Moderate
3.67 – 5.00	High

Source: Adapted from Parasuraman and Colby (2015).

3.3. Technology Readiness Index Results

The analysis of data collected from 42 respondents revealed the average scores for each Technology Readiness Index (TRI) dimension, as presented in Table 3.

Table 3. Technology Readiness Index (TRI) Measurement Results

Dimension	Mean	Category
Optimism	3.958	High
Innovativeness	3.734	High
Discomfort	1.979	Low
Insecurity	2.911	Moderate
Total TRI	3.701	High

Source: Survey data processed by the authors (2026).

To provide a more comprehensive overview of the technology readiness profile of Dodol MSMEs, the measurement results were further illustrated through a Technology Readiness Index Radar Chart, as shown in Figure 1. This visualization facilitates the identification of dimensions that serve as strengths and those requiring further improvement in the digital supply chain transformation process.

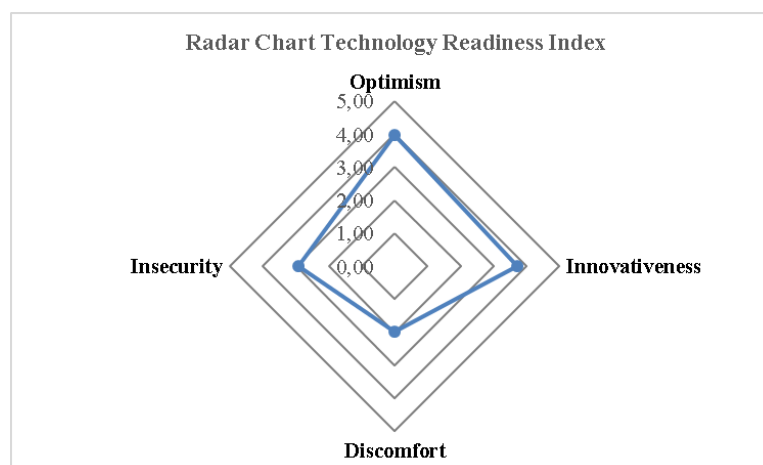


Figure 1. Technology Readiness Index Radar Chart of Dodol MSMEs in Garut Regency

Based on Table 3 and Figure 1, the overall TRI score was calculated at 3.701, which falls within the high readiness category. This finding indicates that Dodol MSMEs in Garut Regency generally possess a favorable level of preparedness to adopt Digital Supply Chain Management (DSCM). The high TRI score suggests that business owners hold positive perceptions regarding the role of digital technologies in supporting supply chain activities and enhancing operational performance.

Among the four dimensions, optimism achieved the highest mean score (3.958). This result reflects respondents' strong belief that technology can improve productivity, operational efficiency, and the quality of business decision-making. The high optimism score further suggests that MSME owners recognize the value of digital technologies in supporting procurement processes, inventory management, production activities, and product distribution.

The innovativeness dimension recorded an average score of 3.734, which is also categorized as high. This finding indicates that respondents demonstrate a willingness to embrace innovation and experiment with new technologies to

improve business performance. Such openness to innovation represents an important foundation for the successful implementation of Digital Supply Chain Management.

Conversely, discomfort received the lowest average score (1.979). A low score on this dimension implies that respondents generally do not experience significant difficulties when interacting with digital technologies. In other words, MSME owners appear relatively comfortable using technological tools and applications in their daily business operations.

Meanwhile, the insecurity dimension obtained a mean score of 2.911, placing it within the moderate category. This result suggests that concerns related to data security, information privacy, and digital transaction risks still exist among respondents. However, these concerns do not appear to constitute a major barrier to technology acceptance and utilization.

3.4. Discussion

The findings indicate that optimism is the most influential dimension shaping the technology readiness of Dodol MSMEs. This result is consistent with the work of Parasuraman and Colby (2015), who argued that individuals with higher levels of optimism tend to perceive technology as a valuable resource for improving productivity and work quality. The elevated optimism score observed in this study suggests that MSME owners have recognized the strategic importance of digital transformation in strengthening business competitiveness.

The high score for innovativeness further demonstrates that business owners are receptive to technological change and innovation. This finding supports the study by Artanto and Suryani (2022), which highlighted adaptability to digital technologies as a critical factor in enhancing MSME resilience and competitiveness in the digital era. A strong inclination toward innovation may facilitate the integration of digital tools into supply chain processes and organizational practices.

The relatively low discomfort score indicates that respondents do not encounter substantial challenges when using digital technologies. This finding differs from several previous studies that identified limited digital literacy as a major obstacle to MSME digital transformation. The result suggests that Dodol MSME owners have become sufficiently familiar with basic digital technologies, including social media platforms, digital communication applications, and online marketplaces, which are commonly used to support business activities.

On the other hand, the moderate insecurity score reveals that concerns regarding data protection and digital transaction risks remain relevant among respondents. This observation aligns with the findings of Queiroz et al. (2021), who emphasized that cybersecurity and data protection remain major challenges in implementing digital supply chains across industries. Therefore, addressing security-related concerns remains an essential component of successful digital transformation initiatives.

Overall, the TRI score of 3.701 indicates that Dodol MSMEs in Garut Regency possess a relatively strong level of readiness to implement Digital Supply Chain Management technologies, including digital procurement systems, inventory management platforms, digital production planning tools, distribution tracking systems, and customer relationship management applications. Consequently, future digital transformation programs should prioritize the enhancement of digital security literacy, the strengthening of technological infrastructure, and the provision of continuous support for digital supply chain implementation. These efforts are expected to maximize the long-term benefits of digital technologies and contribute to sustainable business development.

4. CONCLUSION

The present study evaluated the readiness of Dodol MSMEs in Garut Regency to implement Digital Supply Chain Management (DSCM) using the Technology Readiness Index (TRI 2.0) framework. The findings indicate that the overall readiness level is high, as reflected by a TRI score of 3.701. The dimensions of optimism and innovativeness emerged as the strongest contributors to readiness, suggesting that business owners generally recognize the benefits of digital technologies and demonstrate openness toward technological innovation. In contrast, discomfort was relatively low, indicating that technology usage is not perceived as a substantial obstacle among respondents.

The insecurity dimension was categorized as moderate, indicating that concerns related to data security and digital transaction risks still exist. However, these concerns do not appear to significantly hinder the willingness of MSMEs to adopt digital technologies. Overall, the findings suggest that Dodol MSMEs possess a solid foundation for implementing digital SCM. Therefore, efforts to strengthen digital security awareness, improve technological infrastructure, and provide continuous assistance are essential to support sustainable digital transformation.

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