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1 Determinants of SME performance: Evidence from Indonesia

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DETERMINANTS OF SME PERFORMANCE: EVIDENCE FROM INDONESIA

Abstract

1 The rapid development of information technology encourages small and medium enterprises (SMEs) to accelerate digital transformation to increase their sustainable competitiveness. However, improved entrepreneurial skills must also support technology readiness to adopt e-commerce. This study aims to analyze the influence of entrepreneurial skills and e-commerce, which mediate the factors of technology readiness, top management support, and competitive pressure, on SME performance. The partial least squares structural equation modeling (PLS-SEM) was applied to estimate the research model on data from 520 respondents who actively use e-commerce in their business activities in Jakarta, Indonesia. Data were obtained by distributing questionnaires directly to SME. The results showed that entrepreneurial skills and e-commerce adoption positively affect SME performance. Furthermore, technology readiness, top management support, and competitive pressure positively affect e-commerce adoption and have implications for improving SME performance. Finally, this paper provides recommendations for SME managers and practitioners to improve business performance: e.g., they should enhance their entrepreneurial skills and increase e-commerce adoption for operational efficiency.

Keywords

technology readiness, technology-organization-environment, top management, costs of adoption, Indonesia

JEL Classification L25, L26, O32

INTRODUCTION

Performance is essential to measure the company's success in achieving its goals (Akbar et al., 2022). Performance is the primary consideration in investment decisions (Endri et al., 2020). Both financial and non-financial factors affect company performance. Companies use performance indicators, including sales, market returns, investment growth, and return on investment, to evaluate their financial performance (Endri et al., 2020). Non-financial performance can be assessed through technological innovation, customer and employee satisfaction, perceived product value, and reduced production time (Alam & Noor, 2009; Nasuredin et al., 2016). Tighter competition and technological advances encourage companies to be more creative and innovative, looking for new opportunities to achieve a successful and sustainable business (Hailuddin et al., 2022).

The number of new SMEs in DKI Jakarta has increased during the COVID-19 pandemic: 200,000 new entrepreneurs are functioning, and 289,370 are registered and promoted, supported by the DKI Jakarta Provincial Government. E-commerce is an application that makes it easy to sell or buy goods using online payments. Internet users in Indonesia continue to increase, with 77% of Indonesia's population already using the internet. The pre-pandemic increase was only 175 million. The latest data from APJII estimate that in 2022 internet users will reach around 210 million in Indonesia.

The COVID-19 pandemic has encouraged SMEs to accelerate digital transformation by adopting e-commerce. Furthermore, the implementation of e-commerce within the technology, organization, and environment (TOE) is also supported by increasing entrepreneurial competence, which can enhance the performance of SMEs.

1. LITERATURE REVIEW

Performance is essential for business continuity and achieving company goals. It can be reviewed from both quantitative and qualitative perspectives. From a quantitative perspective, performance is measured through operating revenues, market share, operating efficiency, and profitability. From a qualitative perspective, performance is measured through customer satisfaction, organizational and marketing innovation, and product and process innovation. It is difficult for SMEs to achieve the best performance; many internal and external factors influence this aspect. This study examines internal and external effects on performance through entrepreneurial competence and the adoption of e-commerce. Besides that, the factors determining SMEs to adopt e-commerce are also worth investigating, as they indirectly influence performance.

To improve business performance, companies must increase their entrepreneurial competence and adopt e-commerce. Previous research on the effect of entrepreneurial competence, adoption of e-commerce, and other factors on the performance of SMEs provides varied findings. For example, Hussain et al. (2022) proved that using e-commerce can improve company performance, but the moderating role of entrepreneurial competence has no impact on e-commerce and SME performance. Akbar et al. (2022) noted that e-commerce can improve company performance. Lim et al. (2017) recommended adopting e-commerce to increase SME competitive advantage. Ramanathan et al. (2012) stated that the performance of SMEs can be improved through the operational and marketing aspects of e-commerce.

Hussain et al. (2022) and Sariwulan et al. (2020) found that entrepreneurial competence affects company performance. Tornatzky and Fleischer (1990) developed a technology, organization, and environment (TOE) framework to help SMEs prepare to adopt technological innovations. The

combination of IT infrastructure and human resources is a technology readiness to adopt e-commerce (Jafari-Sadeghi et al., 2021). This combination is essential if SMEs adopt e-commerce to support business operations (Wilson et al., 2008). Businesses can make different choices for adopting technology. Zhu et al. (2003) stated that adopting technology is determined by employees' IT infrastructure and human skills. Virgiawan et al. (2021) confirmed that IT infrastructure and IT skills affect company performance.

Technology readiness is the tendency for people to implement new technologies to achieve performance improvement goals (Parasuraman, 2000). Readiness for technology adoption is necessary because it can create opportunities to increase the number of customers and new product markets and rationalize the business (Astuti & Nasution, 2014). Therefore, the availability of IT infrastructure and human resource expertise is essential. Naor et al. (2008) described how IT infrastructure and skills affect performance. Hervas-Oliver et al. (2014) found a weak influence of innovation on performance.

Rahayu and Day (2015) prove that the owner's innovation, IT skills, and experience determine e-commerce in Indonesia to use e-commerce. Because of that, a study is required to test the effect of combined IT infrastructure on e-commerce. Therefore, technology has become a factor in the adoption of e-commerce. Context technology consists of several metrics: relative profit, compatibility, and complexity of e-commerce adoption. The relative benefit is the level of reception benefit a user feels. The better the management, the more power sources the company allocates. Compatibility means adapting e-commerce to the lifestyle of IT users and promoting its use. Finally, complexity is a difficulty users face when trying to understand and use the system. Hussain et al. (2022) show that internet-based ICT adoption is influenced by relative advantage, compatibility, and complexity.

Adopting e-commerce requires essential technological resources, including IT infrastructure, an internet network, soft and hard skills and devices, and IT staff. This is expensive, especially for small businesses. Besides, cost permanence is a primary barrier to using technology (Wymer & Regan, 2005). Although the costs of adopting a particular technological innovation also impede the speed at which technology is adopted, in this study, the cost of adoption includes the initial use of the technology and the cost of training to use this particular technology. Therefore, adoption costs are considered necessary for e-commerce (Domun & Bheemul, 2019). Furthermore, funding is needed to adopt technology that can accelerate its use, especially in SMEs (Mohtaramzadeh et al., 2018).

Technology adoption requires the full support of top management. Top management plays a vital role in making industry decisions effective (Kulkarni et al., 2017) and strengthening organizational innovation. For example, the Chinese government has initiated various programs to support SMEs (Lin & Luan, 2020). The government can also provide incentives and training programs to adopt new technologies (Rodrik, 2009). Organizational factors can influence e-commerce and organizational character or come from the organizational environment. Organizational context covers organizational readiness and management support. Organizational readiness is described as a perception of supporter decision and evaluation so far where the organization believes it has awareness, power sources, and commitment to adopting IT (Hussain et al., 2022). Top management support affects the user's confidence level in IT. Therefore, top management support plays the most crucial role in determining the sustainability of e-commerce.

The company's readiness to innovate technology determines its competitive advantage in the digitalization era. Digitalization in adopting e-commerce can transform operational business practices to be more effective and competitive (Sunayana & Parveen, 2019). Hussain et al. (2020) state that competitive pressures require SMEs to adopt e-commerce. Ocloo et al. (2018) also found that using information systems in SMEs faces competition. Ramanathan et al. (2012) and Wardoyo et al. (2018) proved that the performance of SMEs

is positively influenced by e-commerce. Mazzarol (2015) revealed that digital technology could improve SME products and services to enhance company performance.

Manager competence has two broad dimensions (Hussain et al., 2022). The first type refers to a person's behavior. The second comprises three aspects: nature, social role, and skills. Based on a specific type, managers have particular skills that influence performance. According to the definition, competence entrepreneurship is defined as the totality of entrepreneurship attributes, like belief, attitude, skills, knowledge, character, ability, and trend behavior required for maintaining and succeeding in entrepreneurship. Kuada (2015) shows that entrepreneurial competence directly affects business performance and enhances entrepreneurial performance. Riyanto et al. (2021) also proved that entrepreneurial competence significantly affects SME performance.

Technological resources determine the success of implementing technology readiness for e-commerce adoption, especially in the availability of human resources and IT infrastructure (Zhu et al., 2006; Zain et al., 2005). Therefore, companies developing their operational activities through e-business must update their IT infrastructure to adopt e-commerce (Teo & Ranganathan, 2004). Teo and Ranganathan (2004) found that firms with limited IT skills were less likely to adopt e-commerce. Sila (2010) asserted that using e-commerce does not directly affect company performance but can improve operational efficiency, making it better. It is, therefore, necessary to further study the adoption of the technology. The use of e-commerce is one form of implementing technological developments to market their products.

Hussain et al. (2022) showed that the higher the adoption of technology, the higher the SME performance. Besides that, applying technology like e-commerce without the government support is heavy duty, especially for small firms. Therefore, there is a positive correlation between government support and the use of technology, but the result is contradictory. Because of that, more empirical studies are required to evaluate the impact of the government supporting the adoption of technology – besides the government's impact on business performance.

The performance of small companies is influenced by strategic organizational factors such as entrepreneurial competence. The resource-based view (RBV) theory is a guideline for stating that entrepreneurial competence is the ability to gain competitiveness and improve performance (Kabir et al., 2017). The adoption of e-commerce affects performance, measured by four dimensions: efficiency, sales, productivity, and coordination (Kraemer et al., 2005). DeStefano et al. (2018) found no causal impact on technological innovation and productivity. Empirical evidence from previous studies provides an opportunity to use the role of entrepreneurial competence as a moderating variable of the relationship between e-commerce and company performance.

Research that examines the effect of entrepreneurial competence on the performance of SMEs by moderating the adoption of e-commerce is based on the RBV theory. The RBV theory states that a superior competitive company relates to technology readiness and cost adoption. It is required to get specific technology, like e-commerce, to increase the system's efficiency and benefit from technology and power sources, which is difficult to imitate. However, government support is a crucial factor that pushes businesses to use e-commerce to keep going and increase performance through entrepreneurship skills. However, the specific competence of businesspersons is vital for identifying a business opportunity. The diffusion of innovation (DOI) theory also describes innovation as an "idea, practice, or object that is believed to be new by individuals or entities." The theory has supported studies about the use of technology. E-commerce has been applied in the SME business sector to increase efficiency, giving companies a competitive advantage (Mohtaramzadeh et al., 2018).

In the TOE framework, three aspects can influence SMEs to adopt e-commerce: the technological context (technology readiness), organizational context (top management support), and environmental context (competitive pressure). In the technological context, innovation attributes are needed, which have experienced rapid development, especially after the commercialization of the internet. DOI includes the characteristics of individual leaders and internal characteristics of the organi-

zation that support the TOE theory. However, the DOI theory is widely referred to as a theoretical foundation in the study of e-commerce adoption (Akbar et al., 2021; Al-Qirim, 2007; Susanti et al., 2022). Meanwhile, research using the TOE model with the theory of DOI and RBV still needs to be completed.

2. AIM AND HYPOTHESES

This study aims to investigate the factors that determine the performance of SMEs in Indonesia. The estimated factors in the research model consist of entrepreneurial skills and e-commerce. In addition, e-commerce factors also mediate technology readiness, top management support, and competitive pressure on the performance of SMEs. In line with the research objectives, the research hypotheses are as follows:

- H1: *Technology readiness positively affects e-commerce adoption.*
- H2: *Cost of adoption positively affects e-commerce adoption.*
- H3: *Top management support positively affects e-commerce adoption.*
- H4: *E-commerce adoption positively affects company performance.*
- H5: *Entrepreneurial competence positively affects company performance.*
- H6: *E-commerce mediates the relationship between technology readiness and company performance.*
- H7: *E-commerce mediates the relationship between adoption costs and company performance.*
- H8: *E-commerce mediates the relationship between top management support and company performance.*
- H9: *Entrepreneurial competence moderates the relationship between e-commerce and company performance.*

3. METHODOLOGY

The study adopted a logical and efficient approach. The paper measures and analyzes data effectively, credible, and systematically so that the research problem gets the best solution through the answers to the questions posed. Furthermore, the research design ensures that the questions asked are answered clearly and supported by data collected from various sources. A cross-sectional quantitative approach and a descriptive research design are used to process primary data collected through questionnaires.

The population includes SMEs in Jakarta, Indonesia. Therefore, this study uses SMEs as the unit of analysis, and managers working in top positions are respondents. The number of SMEs in DKI Jakarta is 1,061,988 units. The purposive sampling method was used; the criteria were owners of businesses in Jakarta. Data were collected through a questionnaire submitted to SME owners and top managers. The questionnaire was developed with a five-scale Likert scale, anchored to “strongly disagree” (1) and “strongly agree” (5). Questions are structured to explore the mechanisms that affect the performance of Indonesian SMEs and their use of e-commerce.

Five hundred twenty questionnaires were distributed to prospective respondents. One hundred twenty responses were received, but only a hundred satisfied the selection criteria. The dominant business location of sample SMEs is South Jakarta, amounting to 70 businesses. In addition, 80 SMEs use Shopee, Lazada, Tokopedia, Whatsapp Business, GoFood, GrabFood, and Shopee Food e-commerce apps.

4. RESULTS

Table 1 shows the respondents’ descriptive analysis based on the business type in DKI Jakarta. X1.1 “Sufficient experience with network-based applications” shows the highest average for technology readiness, which is positive at 4.560. X2.1 “Competition” has the highest average for competitive pressure, which is positive at 4.500. X3.1 “Top management implements internet-based business-to-business applications strategically” shows the highest average, which is positive at 4.340. Y1.4 “Integrated web” is positive at 4.340; Y2.4 “Company profit has increased over the last three years” shows the highest average with 4.530. M1.1

Table 1. Descriptive analysis

		Outer	Loading		
X1.1	Sufficient experience with network-based applications	4.560	X1.1 ←	0.6850	> 0.5 4 valid
X1.2	Sufficient business resources for implementing e-commerce	4.540	X1.2 ←	0.6121	> 0.5 valid
X1.3	Flexible system	4.530	X1.3 ←	0.6580	> 0.5 valid
X1.4	System tailored to customer needs	4.430	X1.4 ←	0.6753	> 0.5 valid
X2.1	Competition	4.500	X2.1 ←	0.6483	> 0.5 valid
X2.2	Promotion war	4.370	X2.2 ←	0.7041	> 0.5 valid
X2.3	Price competition characteristic	4.360	X2.3 ←	0.8368	> 0.5 valid
X2.4	New competitive measures	4.450	X2.4 ←	0.6914	> 0.5 valid
X3.1	Top management invests funds in IT	4.280	X3.1 ←	0.7190	> 0.5 valid
X3.2	Top management is willing to risk internet adoption	4.270	X3.2 ←	0.6412	> 0.5 valid
X3.3	Top management is motivated to adopt internet-based business-to-business transactions to get an edge over competitors	4.230	X3.3 ←	0.8304	> 0.5 valid
X3.4	Top management strategy implements internet-based business-to-business applications	4.340	X3.4 ←	0.8352	> 0.5 valid
Y1.1	Static web	4.040	Y1.1 ←	0.8652	> 0.5 valid
Y1.2	Interactive web	4.220	Y1.2 ←	0.8111	> 0.5 valid
Y1.3	Transactive web	4.180	Y1.3 ←	0.8531	> 0.5 valid
Y1.4	Integrated web	4.340	Y1.4 ←	0.7933	> 0.5 valid
Y2.1	Overall performance depends on last year's major competitors	4.290	Y2.1 ←	0.7722	> 0.5 valid
Y2.2	Over the last three years, market share has increased	4.510	Y2.2 ←	0.7494	> 0.5 valid
Y2.3	Over the last three years, sales have increased	4.360	Y2.3 ←	0.7362	> 0.5 valid
Y2.4	Company profit has increased over the last three years	4.530	Y2.4 ←	0.7242	> 0.5 valid
M1.1	Creating new products for new customers	4.470	M1.1 ←	0.6682	> 0.5 valid
M1.2	Creating value for customers through partnerships	4.300	M1.2 ←	0.5885	> 0.5 valid
M1.3	Introducing new products or services before competitors	4.360	M1.3 ←	0.7244	> 0.5 valid
M1.4	Increasing value for customers	4.100	M1.4 ←	0.7053	> 0.5 valid
M1.5	Ways to avoid failure	4.430	M1.5 ←	0.7275	> 0.5 valid

Table 2. Quality criteria

Variable	AVE	Composite reliability	R ²	Cronbach's Alpha
E-commerce adoption	0.690	0.899	0.651	0.8503
E-commerce Entrepreneurial competence	0.403	0.925	–	0.937
Company performance	0.556	0.834	0.433	0.740
Entrepreneurial competence	0.506	0.859	–	0.803
Competitive pressure	0.579	0.845	–	0.757
Top management support	0.524	0.813	–	0.715
Technology readiness	0.433	0.753	–	0.563

“Creating new products for new customers” shows the highest entrepreneurial competence average, which is positive at 4.470.

The results of outer loading show that all variables for company performance, use of e-commerce, technology readiness, top management support, competitive pressure, and entrepreneurial competence have an outer loading greater than 0.5; thus, the data are valid.

The measurement of quality criteria shows that the value of AVE, composite reliability, Cronbach's alpha on company performance, e-commerce adoption, technology readiness, top management support, competitive pressure, and entrepreneurial competence is greater than 0.5 (Table 2). A value greater than 0.5 is valid and reliable. The coefficient of determination for the company's performance model is 0.433 because e-commerce adoption, technology readiness, top management support, e-commerce adoption, and entrepreneurial competence influence it.

Table 3 shows the statistical results of path analysis, both direct and indirect effects (mediation). Based on the T-value with a standard p-value (0.05), the eight research hypotheses, both direct and indirect effects, have a significant impact. The positive and significant direct effects of competitive pres-

sure, top management support, and technology readiness on e-commerce adoption with the coefficient of each beta (β) are as follows; 0.553, 0.282, and 0.067. Entrepreneurial competence and company performance are positively and significantly related to the coefficient $\beta = 0.557$. Entrepreneurial competence substantially moderates the relationship between e-commerce and MSME company performance with a coefficient of $\beta = 0.040$. Finally, competitive pressure, top management support, and technology readiness positively affect company performance mediated by e-commerce adoption with the coefficient of each β as follows; 0.075, 0.009, and 0.038.

5. DISCUSSION

Empirical findings prove that technical readiness has a positive impact on e-commerce adoption. The support of sufficient experience of network-based applications can increase e-commerce adoption. Technology readiness combines IT infrastructure and IT human resources to introduce e-commerce into business operations. Therefore, it requires the availability of technical resources, compatibility, and ICT complexity, which are the key factors driving e-commerce adoption. The findings of this study support Lertwongsatien and Wongpinunwatana (2003), who found that

Table 3. Statistical path analysis

Path	Original Sample (O)	T Statistics (O/STERR)	R-values
Competitive pressure → e-commerce adoption	0.553	3.544	0.000
Top management support → e-commerce adoption	0.282	0.000	0.000
Technology readiness → e-commerce adoption	0.067	0.672	0.049
Entrepreneurial competence → company performance	0.557	4.821	0.000
E-commerce adoption · entrepreneurial competence → company performance	0.040	2.209	0.071
Competitive pressure → e-commerce adoption → company performance	0.075	0.965	0.033
Top management support → e-commerce adoption → company performance	0.009	0.409	0.068
Technology readiness → e-commerce adoption → company performance	0.038	0.786	0.043

relative advantage, compatibility, and technology readiness positively affect e-commerce adoption. Furthermore, Molla and Licker (2005) also revealed that combining organizational e-readiness and perceived environmental readiness determines e-commerce adoption.

Competitive pressure, an environmental factor, positively affects e-commerce adoption. Competition is very dynamic for SMEs, encouraging the adoption of e-commerce in their business activities. Adopting technology like e-commerce needs several sources of power. For example, IT infrastructure, internet, soft devices, hard devices, and IT staff because commerce can increase the speed of technology use, especially for small and medium enterprises. The research results align with the findings of Sin et al. (2016), who state that SMEs adopt e-commerce because of intense competition from other businesses. Sánchez-Torres et al. (2021) also evidenced that environmental, technological, and internal factors drive e-commerce adoption.

Top management is committed to strategically implementing internet-based business-to-business applications to increase e-commerce use. In addition, top management support is critical in industrial policy effectiveness. Therefore, organizational readiness must represent trust in awareness, resource strength, and commitment to IT adoption. As a result, top management is the primary determinant of e-commerce adoption, as evidenced by Sutanonpaiboon and Pearson (2006) and Seyal and Rahman (2003).

Improving the performance of SMEs through an integrated web is part of the e-commerce adoption strategy. Technological innovation is a critical factor in winning the competition. The adoption of e-commerce has changed the way of doing business to be more efficient and superior in the digital technology era, positively impacting SMEs' business performance. These research findings support Daniel and Wilson (2002) and Ramanathan et al. (2012). Entrepreneurial competence also improves SME performance by creating new products for customers. It refers to the number of entrepreneurial attributes such as beliefs, attitudes, skills, knowledge, character, behavioral tendencies, and abilities needed to maintain an entrepre-

neurial spirit and improve business performance. Ibidunni et al. (2021) also revealed that entrepreneurial competence, primarily organizational, learning, conceptual, opportunity, strategic, and risk-taking competencies, can increase SME performance.

Determinants of e-commerce adoption on company performance will improve business performance, aligning with Zain et al. (2005), Zhu et al. (2006), Teo and Ranganathan (2004), Sila (2010), and Hussain et al. (2022). Furthermore, since technical maturity shows they have enough experience in application-based networks, pressure competition shows the industry's dynamic SME competition.

Top management support shows that top management should elaborate specific strategy for e-commerce. A website integrated with supplier, customer, and system back office allows extensive trading to occur electronically, increasing the business performance. Technical power is vital to information system success. Suppose a company wants to use e-business through IT staff and infrastructure. Then, e-commerce has no direct influence on company operations. However, operational efficiency could be improved, which increases operational performance. Because of that, more empirical studies are required to evaluate the government's impact on technology adoption. Besides, government support positively affects performance.

Moderation of entrepreneurial competence increases the effectiveness of e-commerce through an integrated web that can improve business performance. DeStefano et al. (2018) show that an organization's strategic likeability of entrepreneurship influences the performance of small businesses. Future research should investigate whether the resource-based view theory gives a base theory for the ability of an entrepreneur to reach competitive superiority and increase performance. Hussain et al. (2022), who state that e-commerce improves SME performance, support this empirical evidence. Other findings reveal that a positive relationship between technology readiness, adoption costs, and performance is mediated by e-commerce. However, entrepreneurial competence does not mediate the relationship between e-commerce and SME performance.

CONCLUSION

¹² This study aimed to analyze the performance of SMEs by using e-commerce adoption as a mediating factor for entrepreneurial skills, technology readiness, competition, and top management support. The study results show that competitive pressure, top management support, and technology readiness directly and significantly positively affect e-commerce. Furthermore, related to the indirect impact, competitive pressure, management support, and technology readiness positively affect the company performance of SMEs mediated by e-commerce adoption. Finally, entrepreneurial competence significantly moderates the relationship between e-commerce and SMEs company performance.

¹³ This paper contributes to the empirical literature by offering implications of e-commerce directly related to technological, organizational, and environmental (TOE) factors mediating the effect of entrepreneurial skills, technology readiness, competition, and top management support on SME performance. The study also opens up a progressive view of current e-commerce platforms that impact SME performance.

⁸ This study has several limitations. First, it targets manufacturing SMEs in Indonesia. However, similar research can be developed in other countries with a more significant number of SMEs. Besides that, future research can also sample SMEs in the service and trade sectors. Furthermore, future studies can use factors of innovation, resilience, and sustainability as determinants of e-commerce adoption. These factors can be mediators and improve business performance combining the theoretical basis of the TOE model and the theory of dynamic capabilities.

AUTHOR CONTRIBUTIONS

Conceptualization: Sri Harini, Diah Pranitasari.

Data curation: Diah Pranitasari, Meldasari Said.

Formal analysis: Sri Harini, Endri Endri.

Funding acquisition: Diah Pranitasari, Meldasari Said.

Investigation: Sri Harini, Endri Endri.

Methodology: Sri Harini, Diah Pranitasari, Endri Endri.

Project administration: Diah Pranitasari.

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Validation: Sri Harini, Diah Pranitasari, Endri Endri.

Visualization: Sri Harini, Diah Pranitasari.

Writing – original draft: Sri Harini, Diah Pranitasari.

Writing – review & editing: Meldasari Said, Endri Endri.

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