

Krzysztof Brzostek, Anna Michna

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Empirical Studies Concerning the Relationship between Knowledge Management and Effective Performance in Small- and Medium-Sized Enterprises: Selected Preliminary Results

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Krzysztof Brzostek*, **Anna Michna****

The article presents the preliminary results of empirical studies concerning the relationship between knowledge management and effective performance in small and medium enterprises. A total of 120 small- and medium-sized companies from the Lower Silesian Voivodeship [province] underwent study. Quantitative research was carried out. Detailed analysis of topical literature allowed the author to design a research tool for two groups – owners/managers and employees of small- and medium-sized companies. Pilot studies allowed further development of this tool. Relevant quantitative empirical studies have shown that knowledge management in terms of market orientation is a determinant of the growth and development of contemporary small- and medium-sized companies. Both market orientation and knowledge management place knowledge at the center of attention. The implementation by entrepreneurs of knowledge management with respect to market orientation allows them to achieve a competitive advantage and is an effective method of organization development. The presented results expand on previous studies carried out on large entities with respect to market orientation and knowledge management. The results of the studies are important for managers/owners of small and medium enterprises as they provide information and improve understanding of the mutual relationships among market orientation, knowledge management processes, and their impact on effective performance in companies.

Keywords: knowledge management; small and medium companies.

Empiryczne badanie zależności pomiędzy zarządzaniem wiedzą, efektywnością funkcjonowania w małych i średnich przedsiębiorstwach – wybrane wyniki wstępne

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W artykule zaprezentowano wstępne wyniki badań empirycznych dotyczących zależności pomiędzy zarządzaniem wiedzą, efektywnością funkcjonowania przedsiębiorstw małych i średnich (MŚP). Badaniami objęte zostało 120 przedsiębiorstw z terenu Dolnego Śląska. Wykorzystano badania ilościowe. Analiza

* **Krzysztof Brzostek** – mgr, KGHM Polska Miedź S.A.; orcid.org/0000-0003-3621-5081.

** **Anna Michna** – dr hab., inż., prof. PŚ, Silesian University of Technology Institute of the Economy and Informatics; orcid.org/0000-0002-4099-2943.

Correspondence address: Institute of the Economy and Informatics, Silesian University of Technology, Roosevelta 26, Zabrze; e-mail: kbrzostek@o2.pl; anna.michna@polsl.pl.



literatury pozwoliła na zbudowanie narzędzia badawczego dla dwóch grup – właścicieli/menedżerów oraz pracowników MSP. Badania pilotażowe pozwoliły dopracować skonstruowane narzędzie badawcze. Właściwe ilościowe badania empiryczne wykazały, że zarządzanie wiedzą w aspekcie orientacji rynkowej jest determinantą rozwoju i wzrostu współczesnych małych i średnich przedsiębiorstw. Zarówno zarządzanie wiedzą, jak i orientacja rynkowa stawiają w centrum uwagi wiedzę. Wdrażanie przez przedsiębiorców zarządzania wiedzą w aspekcie orientacji rynkowej pozwala na ukształtowanie przewagi konkurencyjnej i jest jedną ze skutecznych dróg rozwoju organizacji. Przeprowadzone badania rozszerzają wcześniejsze badania przeprowadzone wśród dużych podmiotów w obszarze orientacji rynkowej i zarządzania wiedzą. Wyniki badań mają znaczenie dla menedżerów/właścicieli MSP poprzez dostarczanie informacji i promowanie zrozumienia wzajemnych powiązań między orientacją rynkową, procesami zarządzania wiedzą oraz ich wpływem na efektywność funkcjonowania przedsiębiorstwa.

Słowa kluczowe: zarządzanie wiedzą, małe i średnie przedsiębiorstwa.

JEL: M14, O31

1. Introduction

The aim of this paper is to present selected results of empirical studies on the relationships existing among knowledge management, market orientation, and effective performance in small- and medium-sized companies. Special attention in this paper was devoted to the part of the study concerning the relationship between knowledge management and the effective performance of the company. Knowledge management is considered an important factor facilitating adaptation to market requirements and enhancing efficiency and innovativeness (Bosua and Venkitachalam, 2013). A substantial number of studies has shown that large enterprises successfully utilize knowledge management and that there is a positive correlation between knowledge management and enterprise growth and development rates (Zack, McKeen, and Singh, 2009). At the same time, however, studies reveal that small- and medium-sized companies do not fully exploit knowledge management tools (Durst and Edvardsson, 2012). As specific features of SMEs differ from those of large enterprises, it should not be assumed that the correlation between market orientation and knowledge management and their impact on an enterprise's operating efficiency are shaped in the same manner. Although studies suggest that SMEs do benefit from applying knowledge management mechanisms, the dependence between market orientation, knowledge management, and enterprise operating efficiency is not clear and requires further analysis. Therefore, a justified need arises to conduct comprehensive studies on the impact of knowledge management and the market orientation of SMEs on their operating efficiency. The study encompassed small- and medium-sized companies located in Lower Silesia Voivodeship [province]. A survey questionnaire addressed to the owners/managers and employees of SMEs was used as the research tool. Statistical methods and structural equation modeling were used in the study. As a result of the study, the empirical dimensions of the relationships among

knowledge management, market orientation, and effective performance in small and medium enterprises were identified.

2. Operating Characteristics of Small- And Medium-Sized Companies in the Context of Knowledge Management

Much attention is devoted to issues associated with the functioning of the small and medium enterprise (SME) sector in both domestic and foreign literature.¹ Issues concerning SMEs have been given special attention by the European Commission. This indicates that enterprises in this sector play a major role in the creation of jobs and are a factor in social stability and economic development.² The “SME Exchange in Emerging Market Economies: A Stocktaking of Development Practices” report published by the World Bank (Harwood and Konidaris, 2015) points out the important role of the SME sector in the economic life of individual countries. The authors of the report propose facilitating the attracting of capital by the SME sector, including through stock exchanges. The importance of SME financing through the stock exchange is also emphasized in the Report on the Newconnect Market.³ In terms of quantity, SMEs are predominant in the overwhelming majority of the economies of the developed and developing world. Approximately twenty million companies operate within the European Union, 99.8% of which are SME sector companies. Micro-enterprises definitely prevail in this community. There are about eighteen million of them, which constitutes 91.8% of all entities. According to the report of the PARP Polish Agency for Enterprise Development, SMEs are responsible for almost three-quarters of Poland’s GDP, where the share of small- and medium-sized companies is at 48.5%.⁴

There is no conclusive indication when it comes to the direction of the relationship between knowledge management and market orientation in the available literature. Studies carried out in large enterprises confirm that there is a significant and positive relationship between these concepts (Escher, 2013; Nofal, Surachman, Salim, and Djumahir, 2014, Michna and Kmiecziak, 2012). This is because an absence of appropriate mechanisms for knowledge management in enterprises significantly impairs the effective creation and dissemination of market knowledge. Effective knowledge management creates the conditions necessary for processing, interpreting, and using the knowledge about market trends. The specificity of knowledge management in SMEs involves:

- Mainly informal and unconscious in nature,
- Mostly an insufficient information system,
- A simpler organizational structure,
- A situation in which acquiring the knowledge of customers is more favorable,
- Forgetting knowledge,

- No demarcation of responsibility,
- An insufficient level of delegation of tasks and powers, and
- Fast applicability of new knowledge (contributing to the flexibility and agility).

For the purposes of this study, the following definitions of knowledge management and market orientation have been adopted: *Knowledge management* is an integrated set of actions aimed at shaping and utilizing those knowledge resources that are conducive to boosting an enterprise's operating efficiency. *Market orientation*, in turn, consists in the systematic observation of the activities of competitors, suppliers, customers, and other market actors, which is followed by the dissemination of knowledge about the needs of the business environment within the organization with a view to determining and satisfying customer needs. The concept of an enterprise's operating efficiency was derived from the work of J. Penc, who defined this term as follows (Penc, 1997): "(...) it is the ability of an enterprise to adapt, on an ongoing and strategic basis, to changes in its business environment, and to utilize its resources in a productive and cost-efficient manner in order to implement the adopted structure of goals."

Integration of knowledge management and market orientation may be a key element of competence as well as the improvement of a company's competitive position (Wang, Hult, and Ahmed, 2009). Moreover, both market orientation and knowledge management place knowledge at the center of attention. Both these concepts are perceived, along with a number of other aspects, as significant for the growth and development of an enterprise (Brzostek and Michna, 2014). An important factor inducing extensive research in the area of market orientation is the importance of the resources of knowledge for the economy and individual enterprises. Research in market orientation was carried out using quantitative research methods. However, some authors indicate (Van Raaij and Stoelhorst, 2008; Gebhardt, Carpenter, and Sherry, 2006) that qualitative methods may provide a source of new insights into the relationship between market orientation and knowledge management. Analysis of the research carried out by various authors indicates that there is a research and methodological gap in the field of knowledge management, market orientation, and effective performance. Research carried out by various authors concerning the relationship between market orientation and the growth and development of SMEs indicates an indirect and direct relationship between the orientation and measures of growth and development.

Based on the analysis of both foreign and domestic literature, it can be concluded that there have been no comprehensive studies so far concerning the relationships among knowledge management, market orientation, and effective performance in small- and medium-sized companies. Thus, there is a justified need to carry out a comprehensive study concerning the impact of knowledge management and market orientation of SMEs on their effective performance.

3. Characteristics of Performed Empirical Studies

The study covered 120 small and medium enterprises from the Lower Silesia Voivodeship. Micro-enterprises employing up to nine people were excluded from the study. Quantitative research was carried out in the first and second quarter of 2015. Survey questionnaires were used as the research tool for the quantitative analyses. Research conducted on topical literature was the source of the individual variables in the questionnaires. The questionnaires were designed using the papers of Zieba (2014), Zack, McKeen, and Singh (2009), and Narver and Slater (1990). The actual questions were prepared using a seven-point Likert scale. The survey questionnaires used in the quantitative studies were developed in paper and electronic versions using survey tools found at <https://www.google.com/intl/pl/drive/>. In addition to questions directly related to knowledge management, the questionnaire included several pertaining to aspects and processes exerting a major impact on an SME's ability to shape market orientation. After the most important, potential determinants of knowledge management and market orientation in SMEs were selected through an analysis of literature on the subject, questions were added to the questionnaire regarding issues such as formalization in an enterprise, decision-making centralization, social interactions in the enterprise, knowledge management, and market orientation. The following measures were used to assess SME operating efficiency: increase in revenue, increase in employee numbers, increase in return on sales, market share, customer satisfaction, quality of products/services offered, and the number of new products/services.

Enterprises covered by the study were affiliated with chambers of commerce and business associations from the Lower Silesia region. In the first stage of the study, the questionnaire was distributed via email by business organizations among their affiliated members (on behalf of survey authors). A response rate of 3% was recorded. In the second stage, the authors contacted each entrepreneur in person, providing them with hardcopy of the questionnaire. In this case, the response rate reached 38%.

Pilot studies were carried out in January and February of 2015. They covered managers/owners of small- and medium-sized companies as well as their employees. The pilot studies were carried out on the same groups that were covered by the main study, thereby ensuring methodological correctness. The pilot stage of the study covered ten managers and ten employees from the small- and medium-sized companies. Particular attention was paid at this pilot stage as to whether the respondents had any difficulties in understanding the questions. Those deemed not clear were reformulated or, in certain cases, deleted.

The studied enterprises were analyzed taking into consideration the type of business on the basis of the PKD Polish Classification of Economic Activities for 2007 and data from the research sample was compared with data presented by GUS Central Statistical Office of Poland (Table 1, Figure 1).

	Frequency	Percentage	Percentage of valid survey responses	Cumulative percentage
A. Agriculture, forestry, hunting, and fishing	2	1.7	1.7	1.7
B. Mining and quarrying	3	2.5	2.5	4.2
C. Industrial processing	12	10.0	10.0	14.2
D. Electricity, gas, steam, hot water, and air conditioning manufacturing and supply	1	0.8	0.8	15.0
E. Water supply, waste and waste water management, and remediation operations	1	0.8	0.8	15.8
F. Construction	8	6.7	6.7	22.5
G. Wholesale and retail trade, repair of motor vehicles, including motorcycles	17	14.2	14.2	36.7
I. Accommodation and food service operations	4	3.3	3.3	40.0
J. Information and communication	14	11.7	11.7	51.7
K. Financial and insurance operations	10	8.3	8.3	60.0
L. Real estate operations	4	3.3	3.3	63.3
M. Professional, scientific, and technical activities	8	6.7	6.7	70.0
Q. Human health and social work activities	2	1.7	1.7	71.7
R. Arts, entertainment, and recreation	2	1.7	1.7	73.3
S. Other personal service activities	31	25.8	25.8	99.2
T. Households as employers of domestic personnel, service-producing activities of private households for own use	1	0.8	0.8	100.0
Total	120	100.0	100.0	

Tab. 1. The SME sector, taking into account the PKD Polish Classification of Economic Activities and comparing the data from the research sample to the data presented by the GUS Central Statistical Office of Poland. Source: own study.

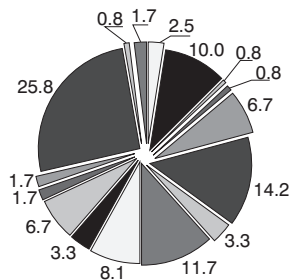


Fig. 1. The SME sector, taking into account the PKD Polish Classification of Economic Activities and comparing the data from the research sample to the data presented by GUS Central Statistical Office of Poland – Diagram. Source: own study.

The SMEs were subdivided on the basis of sector of activity. The most numerous group among the surveyed SMEs consists of service companies (86%), while the industrial sector represents 12% of respondents and the agricultural sector represents less than 2% of respondents.

The most numerous group consists of companies operating in the administrative district area (36.29%) and Lower Silesia Voivodeship (17.98%). A total of 15.2% of the surveyed companies operate all over the country and 9.3% exclusively within the *powiat* (county-level subdivision) in which they are registered. Only 8.36% of SMEs conduct export activities and 15.2% operate over several voivodeships (Figure 2).

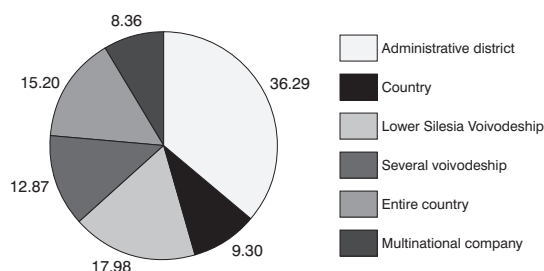


Fig. 2. Areas of business of the surveyed SMEs. Source: own study.

In the group of surveyed managers (business owners), most – a total of 75.8% – were male. A total of 37.5% of the people who completed the survey questionnaire were owners or co-owners of companies covered by the study.

Numbers of employees compared to the previous year have not changed in fifty entities among the surveyed companies. This represents 40% of all the surveyed companies (Tables 2 and 3).

Changes in the effective performance of the surveyed companies compared to the previous year indicate that most companies recorded an increase in revenue (60.8%) with a simultaneous decrease in profitability (40%).

Changes in revenues in relation to the previous year (N = 120)		
	Frequency	Percentage
Decreased	29	24.2
No change	18	15.0
Increased	73	60.8
Total	120	100.0

Tab. 2. Changes in revenues compared to the previous year. Source: own study.

Changes in net profitability compared to the previous year (N = 120)		
	Frequency	Percentage
Decreased	48	40.0
No change	26	21.7
Increased	46	38.3
Total	120	100.0

Tab. 3. Changes in revenues compared to the previous year. Source: own study.

Among the surveyed companies, forty-two indicated that the value of their total assets does not exceed two million euro. The second largest category consists of entities whose asset value ranges from two to ten million euro (forty-five of all surveyed companies). None of the surveyed companies declared ownership of assets worth over forty-three million euro (Tables 4 and 5).

Annual income (in million euro)	Rate of employment					Total
	From 10 to 26	From 26 to 50	From 51 to 100	From 101 to 200	From 201 to 249	
(0; 2>	34	7	0	1	0	42
(2; 10>	17	11	11	4	2	45
(10; 50>	8	6	8	8	3	33
Over 50	0	0	0	0	0	0
Total	59	24	19	13	5	120

Tab. 4. Structure of the sample with respect to rate of employment and the annual income. Source: own study.

Annual income (in million euro)	Rate of employment					Total
	From 10 to 26	From 26 to 50	From 51 to 100	From 101 to 200	From 201 to 249	
(0; 2>	36	6	0	4	0	46
(2; 10>	16	13	15	4	4	52
(10; 43>	7	5	4	5	1	22
Over 43	0	0	0	0	0	0
Total	59	24	19	13	5	120

Tab. 5. Structure of the sample with respect to rate of employment and the value of total assets. Source: own study.

4. Relationship between the Empirical Dimensions of Knowledge Management and the Effective Performance of Small and Medium Enterprises

The presented model (Figure 3) is a part of a wider analyses of the relationships among knowledge management, market orientation, and the effective performance of SMEs. The structural models were developed on the basis of the performed analyses of these relationships, including the analysis of literature, analysis of correlation, and analysis of regression. Most structural equation models can be expressed in the form of path diagrams. This program uses the PATH1 language, which is much like the path diagram itself. Individual models vary in the latent and exogenous variables adopted for the analysis as well as in proposed structure of mutual cause and effect relations.

The group of organizational impacts includes silent knowledge, whose occurrence may influence the effective performance of an organization. Silent knowledge is an individual form of knowledge that is difficult to formalize. Silent knowledge can also consist of intuition. Such knowledge is rooted in the expertise, values, and emotions of an individual. The study carried out by A. Rajan from the Center for Research in Employment and Technology in Europe on a group of 6,000 companies has shown that a key factor in knowledge management is the use of the hidden information and skills of employees (Gierszewska, 2003). In the presented model, manifest variables were taken as selected processes of knowledge management as resulting from the model adopted by that author. The proposed model uses latent variables consisting of contexts related to silent knowledge.

Taking into account the above dependencies, the model achieved convergence in the 12th iteration (the received discrepancy function is 0.000873). The ML estimation method was applied. In the case of maximum likelihood (ML), when this option is selected the program performs a Wishart maximum likelihood estimation for correlation or covariance analysis and the normal maximum likelihood estimation in the case of torque analysis. The analysis of the values of path parameters (Table 6) draws attention to the negative value of the relationship between “knowledge use” and “silent knowledge.” At the same time, a high value of the parameter (6.162) is noted between “silent knowledge” and “effective performance of the enterprise.” This confirms that the use of silent knowledge has significant meaning for the enterprise. The model reveals a more complex structure of the relationship as it allows the differentiation of the relationship between the assumed variables related to knowledge management and the corresponding silent knowledge. Literature indicates that developing employee knowledge through actions aimed at the development of creativity and social capacity is one of the most important directions of the research and development of the concept of knowledge management (Carleton, 2011).

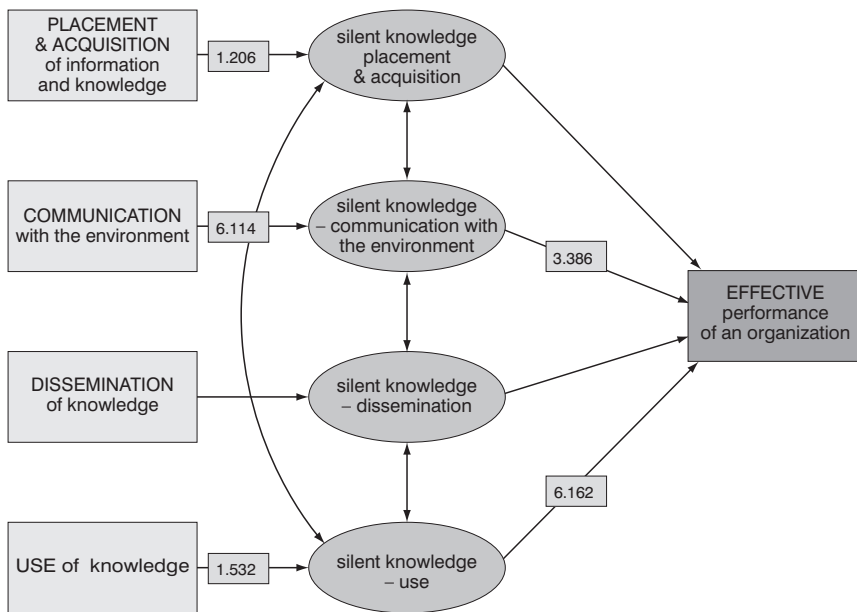


Fig. 3. Knowledge management and enterprise performance. Source: own study.

	Model assessment (Correlations: Managers, Management, and Effectiveness)			
	Parameter assessment	Standard error	Statistics T	Likelihood
[LOCATING]-1->(LOCAL _C)	1.206	0.000		
[COM]-2->(COM _C)	6.114	0.000	5,535990E+00	0.000
[SPREAD]-3->(SPREAD _C)	4.405	0.000		
[UTILI]-4->(UTILI _C)	-1.532	0.324	4,722401E+00	0.000
(LOCAL _C)-5->(WYKORZ _C)	0.866	0.000		
(COM _C)-6->(SPREAD _C)	-2.685	0.000		
(SPREAD _C)-7->(COM _C)	0.332	0.000		
(SPREAD _C)-8->(UTILI _C)				
(UTILI _C)-9->(LOCAL _C)	4.155	0.000		
(UTILI _C)-10->(SPREAD _C)				
(LOCAL _C)-11->[EFEKT]	0.114	0.040	2,870663E+00	0.004
(COM _C)-12->[EFEKT]	3.386	0.070	7,447363E+00	0.000
(SPREAD _C)-13->[EFEKT]	0.647	0.095	6,812749E+00	0.000
(UTILI _C)-14->[EFEKT]	6.162	0.763	-8,447363E+00	0.000

Tab. 6. Model assessment (Correlations: Managers, Management, and Effectiveness). Source: own study.

The model indicates important links between “communication with the environment” and “silent knowledge,” which, as a result, translates into the high value of the parameter connecting “silent knowledge” with “effective performance of the enterprise.” Communication with the environment includes both the growth of customer and supplier requirements, but also maintaining contact with them (both formal and informal), participation in training courses and conferences, and technological progress, which gives each employee opportunities to acquire information and knowledge in a virtually unlimited manner. G. P. Huber assumes that incidental, unintended acquisition of information and knowledge is a common way of learning in learning organizations. M. Huysman indicates that the organization learns on a case basis. An enterprise’s learning process is largely spontaneous (Malara, 2012). The calculated indicators of the fit of the model indicate a good fit to the data.

5. Conclusions

A conclusion that can be drawn from the study is that the key factor in knowledge management is to make effective use of employee latent information and skills. High scores obtained by relations connected with communicating with the business environment, localizing, and obtaining information and knowledge as well as disseminating knowledge show how important these knowledge management processes are for disseminating customer- and competition-related information, organization, and coordinated action aimed at utilizing knowledge resources available to the organization in this regard. Communicating with the business environment, maintaining contacts (both formal and informal) with customers and business partners, attending training courses and conferences, and technological progress provide every employee with almost endless possibilities when it comes to acquiring knowledge and information. By communicating with the business environment, each party can articulate its needs and expectations, and have its interests duly acknowledged. This, in turn, may translate into improved operating efficiency for the organization.

The conducted analyses open an interesting research perspective. The focus of further research should be directed at the need for research of a qualitative nature. An analysis conducted by Dwivedi shows that the use of qualitative and quantitative research methods is a common approach within the framework of the issues concerning knowledge management (Dwivedi, Venkitachalam, Sharif, Al-Karaghoul, and Weerakkody, 2011). This will allow the development of practical recommendations for SME owners/managers and facilitate moving forward in order to increase effective performance as well as opportunities for development.

Endnotes

- ¹ More on this topic: Katua, N. T. (2014), The Role of SMEs in Employment Creation and Economic Growth in Selected Countries, *International Journal of Education and Research*, 2(12), 461–472; The Role of SMEs and Entrepreneurship in a Globalised Economy, Lundström A. (Editor) (2009), *Expert Report Number 34 to Sweden's Globalisation Council*; Wymenga, P., Spanikova, V., Barker, A., Konings, J., and Canton, E. (2012), EU SMEs in 2012: At the Crossroads, *Annual Report on Small and Medium-Sized Enterprises in the EU*, 2011/12 Ecorys Nederland BV, Rotterdam; Nvárová, M. and Vrchota J. (2013), Strategic Management in Micro, Small and Medium-Sized Businesses in Relation to Financial Success of the Enterprise, *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, LXI (7), 2859–2866.
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