Investigating the role of Innovation Capabilities andthe Impact of Knowledge Transfer and Open Innovation Implementation on SME Performance in Yogyakarta

ABSTRACT

The study aims to examine the role of innovation capabilities and theimpact of knowledge transferand open innovation on the SMEs' performance in Yogyakarta, Indonesia. Although previous research on open innovation has been conducted in Indonesia, it has not been specific to this region, and there are variables that still need to be explored concerning improving SMEs' performance. Therefore, this study aims to fill this gap through research. An online questionnaire with a five-point Likert points was distributed to respondents who work actively and occupy functional positions in SMEs in Yogyakarta.A total of 202 respondents contributed to this study. Data were analyzed using SPSS and PLS-SEM with the SmartPLS tool. The results of this research reveal that the variables of knowledge transferandopen innovation positively influence SMEs performanceand Innovation capabilities have a role in this relationship.Openness to innovation triggered by innovation capabilities will later encourage business practitionersto continuously innovate in their business performance, such as innovation in improving product quality. In this case, businesses need to consider the critical role of knowledge transfer in improving business performance. This study contributes to enriching the literature related to the concept of open innovation and SME performance. Additionally, the results of this study provide valuable insights for business practitionersto implement these three variables to enhance of their business performance.

Keywords: Knowledge Transfer, Innovation Capabilities, Open Innovation, Performance.

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1. INTRODUCTION

Small and medium enterprises (SMEs) are business activities that are capable of expanding employment opportunities and providing broad economic services to the community. They can play a role in the process of equalization and improvement of public income, promoting economic growth, and contributing to the realization of national stability. In addition, SMEs are one of the main pillars of the national economy that should receive primary opportunities, support, protection, and extensive development as a manifestation of a clear preference for the people's economic enterprises [1].

The business world is experiencing heightened competition, evidenced by the increasing number of emerging new businesses. A SMEs should engage in continuous innovation to compete and provide added value to consumers, ensuring its sustainability in the competitive landscape. The implementation of innovation is not exclusive to large companies but can also be applied within the SMEs sector [2].

In the current modern era, various factors contribute to the success of SMEs, including innovation. Sustainable innovation undertaken by SMEs can drive a country's economic growth and directly enhance national and international competitiveness [3]. In innovation development, a company cannot solely rely on its internal strengths. Collaboration with external parties is highly needed and crucial to reduce innovation costs, technology development, time efficiency, minimize risks, unearth new ideas, and address common issues [4].

According to [5], the starting point for the concept of corporate openness is that "an organization cannot innovate in isolation," and therefore, companies must engage with different external partners to absorb knowledge and resources beyond the boundaries of the organization to win in competition [6, 7]. Open Innovation (OI) is defined as "the intentional use of inflows and outflows of knowledge to accelerate internal innovation and expand markets for external use of innovation" [6]. Open innovation requires openness from internal and external relevant parties of the company in creating innovation. Some benefits of knowledge obtained from within and outside the company include stimulating internal innovation, expanding market reach, and creating external innovation for other relevant parties [8]. Open innovation is divided into two parts: inbound open innovation and outbound open innovation. It is considered one of the factors for an organization to achieve optimal performance, especially in terms of financial and operational performance [9].

Organizational performance is a measure indicating the success of an organization and how effectively it achieves its goals [10]. Organizational performance is crucial for enhancing competitiveness and sustainability within the current competitive environment. [11] explain that a company's performance can significantly be influenced by the quality and ability of the company to manage innovation capabilities and the processes of open innovation itself. Therefore, it can be said that improving the quality of innovation capabilities and implementing the open innovation concept in SMEs are essential, thus providing a competitive advantage for the company [12].

[13] explain that knowledge transfer positively influences an individual's innovation capability. Knowledge transfer is an activity centered around knowledge, where individuals exchange knowledge to enrich the organization's or company's knowledge and create a competitive advantage for the company [14]. Furthermore, several studies suggest a relationship between knowledge transfer activities and open innovation. [15] explain that there is a positive impact resulting from knowledge transfer activities on open innovation, making it a crucial factor in the development of a company's innovation. Factors or activities related to knowledge sharing can also play a vital role in enhancing a company's performance. This statement is supported by [16], who state that knowledge transfer and a learning culture can improve the overall performance productivity of a company, demonstrated through improved business operations and the enhanced quality of the company's products and services.

Previous research on open innovation in Indonesia has primarily focused on SMEs and manufacturing companies. The majority of earlier open innovation studies concentrated on the relationship between open innovation and company performance [17], and the connection between open innovation, innovation obstacles, and company performance in the

manufacturing industry in Indonesia using secondary data [18, 19]. Meanwhile, research on open innovation specifically targeting SMEs in Yogyakarta still needs to be completed. More specifically, the research associating open innovation, innovation capability, knowledge transfer, and SME performance in Yogyakarta has yet to be conducted. Therefore, this research aims to address this research gap.

This research involves SMEs as research objects because the presence of SMEs in Indonesia is very rapid[20].In fluctuating economic conditions, SMEs are required to adapt to the existing environment, one of which is through continuous innovation to increase the company's competitiveness. Therefore, the sustainability of SMEs is attractive to discuss. The sustainability is influenced by optimal performance, in this case, influenced by several factors, including innovation capabilities and open innovation [11]. The impact of these variables on SMEs in Yogyakarta is interesting to study further. Thus, this research aims to examine the impact of knowledge transfer, innovation capabilities, and open innovation on the performance of SMEs in Yogyakarta. The author aims to investigate how the influence of knowledge and information transfer within a company can affect the performance level of SMEs. Furthermore, the author also evaluates the extent of the impact of openinnovation on the enhancement of SME's business performance and the role of innovation capabilities in these relationships. Finally, the results of this study can become a reference regarding the factors that influence the performance of SMEs in the city of Yogyakarta.

2. LITERATURE REVIEW

2.1 Open Innovation

Open innovation become one of the alternative approaches for companies to address innovation challenges. Open innovation has been implemented by many companies in developed countries. However, in Indonesia, the concept of open innovation still needs to be improved in terms of its implementation by the companies themselves [21]. Companies that adopt the open innovation concept can obtain ideas, technology, knowledge, and capabilities from external companies [22]. According to [23], open innovation is the effort of a company to acquire resources from other companies and share internal resources to develop new products or services for the company.

In the open innovation concept, there are two parts of innovation activities: inbound open innovation and outbound open innovation. Inbound open innovation is an innovation activity that includes technology exploration or acquisition. Inbound open innovation refers to activities to absorb and utilize knowledge from outside the company to complement, strengthen, or accelerate R&D activities within the company. Inbound open innovation includes technology scouting, customer involvement, external networking, R&D outsourcing, and inward intellectual property licensing[24].Meanwhile, outbound open innovation is innovation in terms of technological exploitation or commercialization. Outbound open innovation is associated with the commercialization phase of the innovation process, where companies outsource market expansion to external parties more suitable for commercializing existing technology [6].

2.2Open Innovation and Innovation Capabilities

In an organization or company, innovation capabilities can integrate a company's abilities and resources to stimulate innovation's success in an effort to enhance the optimal performance of the company [25]. Innovation capabilities refer to a company's ability to position itself in developing new products, new technologies, and other advancements, thereby generating a competitive advantage over rivals [26]. Therefore, innovation

capabilities have a positive relationship with the success of innovation. With innovation capabilities, a company can understand consumer preferences by providing valuable feedback and developing new products and services [27].

Innovation capabilities are crucial in supporting open innovation activities, significantly leveraging the roles and contributions of members or staff within the company for innovation [28]. The acquisition process of such new knowledge can enhance the effectiveness of implementing outbound open innovation in an organization [29]. The majority of previous research has discussed the existence of a positive relationship between open innovation and innovation capabilities in companies or organizations.

Consistent with those findings, [30] also empirically explains the positive relationship between innovation capabilities and open innovation in the context of SMEs in Chile. This research involved interviews with 194 executives of SMEs in the manufacturing sector. The results showed that innovation capabilities significantly impact and positively influence the practices of both inbound and outbound open innovation in SMEs in Chile.

Subsequently, [11] researched the relationship between innovation capability and open innovation in the performance of SMEs in Indonesia during the Covid-19 pandemic. This study surveyed 206 respondents who were owners of batik SMEs in various regions in Indonesia. The research results indicated that innovation capabilities have a positive relationship with the practice of open innovation in enhancing the performance of SMEs. Another study by [33] discusses the relationship between open innovation and individual innovation capability from the perspective of tacit knowledge in SMEs in Indonesia. The research results indicate a positive correlation between tacit knowledge and open innovation towards individual innovation capability in SMEs.

[32] explain the relationship between organizational performance, knowledge management, and innovation capability in open innovation practices. This study surveyed 182 technology companies in Vietnam. This research indicates that the open innovation culture within an organization, supported by commitment and trust among team members, effective collaboration across departments, and a commitment to learning facilitated by company leaders or managers, can enhance the efficiency of knowledge management practices. This condition, in turn, leads to improving organizational innovation capabilities. Therefore, open innovation practices positively impact an organization's innovation capability. Thus, the following hypothesis can be proposed:

H1: Innovation capabilities have a positive influence on open innovation activities.

2.3 Innovation Capabilities and Knowledge Transfer

The concept of knowledge transfer is introduced as a modern method of sharing knowledge from existing resources with the experiences of everyone involved in the company. [33] defines knowledge into two types: explicit and tacit knowledge. Explicit knowledge is easily practicable and communicable through straightforward means. In contrast, the application based on the concept of tacit knowledge tends to be more individual and contextual, focusing on the experiences of an individual. Avusgil et al. (2003) argue that organizations with innovation capabilities tend to employ learning by doing, which is difficult to imitate due to the culture built on tacit knowledge. Strategically, knowledge transfer is a crucial aspect for companies to innovate. Based on the resources available within a company, knowledge from an individual is considered crucial for achieving business success, primarily due to tacit knowledge [35].

Most previous research has focused on the relationship between knowledge transfer and innovation capabilities. A study by [34] explains the positive influence of knowledge transfer on innovation capabilities. The research results indicate that if a company's innovation capability adopts the learning-by-doing approach, it will likely generate a knowledge system that other companies cannot easily replicate. It is also influenced by the activities related to tacit knowledge (knowledge transfer).

Furthermore, a study conducted by [36] explains a positive relationship between knowledge-sharing/transfer activities and innovation capabilities within a company. The research results indicate that if a company encourages its employees to contribute to sharing knowledge within their teams or the organization, it has a better chance of maximizing the potential of its employees to generate new creative ideas and develop new business models. This condition, in turn, supports improving the company's innovation capability quality.

Consistent with the previous explanations, [37] also researched the relationship between knowledge sharing and innovation capability. Through a survey conducted on 125 employees in the telecommunications industry in Indonesia, their empirical research results showed that knowledge-sharing activities positively influence individual innovation capability. Additionally, [38] also researched the process of knowledge-sharing activities and their impact on innovation capability and performance. The study surveyed companies in Kahramanmaras. The results of this research supported the hypothesis regarding the positive influence of knowledge-sharing activities on companies' innovation capabilities.

Furthermore, this is reinforced by the research of [39], which investigated the relationship between knowledge-sharing activities and innovation capability at both individual and organizational levels. The study surveyed 392 employees in the telecommunications industry in Vietnam. The research results empirically showed that knowledge sharing, including knowledge donating and knowledge collecting processes, has a positive impact on enhancing individual innovation capability within the company. Based on these discussions of previous empirical studies regarding the relationship between Knowledge Transfer and the performance of SMEs, the following hypothesis can be proposed:

H2: Knowledge transfer has a positive influence on Innovation Capabilities.

2.4 Knowledge Transfer and Open Innovation

Open innovation is typically used to illustrate how an organization collaborates with innovation practices, specifically the relevance between the input and output flow of knowledge exchange in the innovation or development process of new products [40]. According to [41], engaging in reciprocal sharing activities that ultimately lead to acquiring new knowledge automatically drives the innovation process. Obtaining new knowledge requires a non-trivial procedure, and exchanging knowledge among organizations is an implicit part of this procedure [40].

Organizational environments based on the open innovation concept can provide access to knowledge transfer or knowledge-sharing processes within a company. Knowledge transfer activities are essential in the innovation process because they reinforce the commitment to the organization's development strategy or the company itself, which, in this case, also involves implementing the open innovation concept. This explanation is supported by the results of bibliometric analyses [42, 43], which discuss how the concept of knowledge has become a significant research topic in the scientific world and analyze various paradigms related to open innovation.

Previous studies have discussed the significant correlation between the impact of knowledge transfer activities and the concept of open innovation. Furthermore, a study by [44] explains the direct influence of knowledge transfer on open innovation. Since the core of innovation lies in knowledge, open innovation can open access for knowledge transfer with external parties. The results of this study indicate that positive knowledge transfer activities can enhance the quality of scientific publications from universities.

Consistent with that, a study by [15] explains the relationship between knowledge sharing and open innovation. This research conducted a survey with 140 CEOs of companies in Slovenia. The study's results suggest a positive influence of knowledge sharing on open innovation activities, especially in companies operating in the high-tech industry. Therefore, knowledge sharing is crucial in implementing open innovation activities in companies.

Furthermore, a study by [45] discusses the concept of open innovation with the pattern of University-Industry knowledge transfer. This research identifies how open innovation can be an intermediary in the academia-enterprise relationship. It is reinforced by research conducted by [1] on the role of social media networks and knowledge transfer as mediating variables or intermediate variables influencing companies' human capital in the implementation of open innovation activities. Thus, the following hypothesis can be proposed:

H3: Knowledge transfer has a positive influence on open innovation activities.

2.5 Organizational Performance

Organizational performance is a concept frequently discussed in management studies and is considered one of the most critical measures of success within a company [46]. According to [47], organizational performance is the ability of a company to achieve its goals by using its resources efficiently and effectively. Organizational performance is considered quite complex, not only in terms of definition but also in conceptual issues or its implementation.

Therefore, several concepts are used to measure companies' operational and financial performance [9, 48]. Operational performance is typically measured by various factors related to the internal operations within a company, including products, operational quality, efficiency, and company productivity.

Operational performance is typically measured by various factors related to the internal operations within a company, including products, operational quality, efficiency, and company productivity. Similarly, other studies mention that operational performance is measured through productivity, effectiveness, and efficiency of internal company operations, while financial performance is measured through profitability, return on investment (ROI), and stock sector [48, 49].

2.6 Organizational Performance and Knowledge Transfer

Knowledge transfer is an activity centered around knowledge, a method by which individuals can exchange knowledge to enrich organizational knowledge and create a competitive advantage for the company [14]. A study by [16] indicates that effective knowledge-sharing and learning behaviors can improve company performance, marked by enhancements in business processes, the delivery of quality products, and overall company services. Another perspective supports this statement; [50] demonstrates that knowledge sharing positively impacts organizational performance in the Nigerian oil and gas industry. Activities related to

knowledge-sharing processes enhance financial performance, improve marketing, receive better support from suppliers, and reduce costs.

Hence, several previous studies have discussed the positive relationship between knowledge transfer and company performance. Research by [51] also suggests a positive relationship between knowledge transfer and company performance. The study's results indicate that in a knowledge-based society, an organization's ability to develop, retain, and implement knowledge transfer positively impacts company performance.

Subsequent empirical findings also explain the positive impact of knowledge transfer on company performance. [52] demonstrate that knowledge transfer is crucial in a company's knowledge management process. The process of knowledge transfer activities here has a positive impact by enhancing employees' personal knowledge, thus improving organizational performance. It is reinforced by research conducted by [53], which reveals that knowledge transfer activities among colleagues are difficultchallenging to carry out. However, this difficulty results in cost-cutting in production, faster implementation of new plans, and improvements in company performance, particularly in sales growth for new products and services. Furthermore, Iyamah et al. (2015) also explain that knowledge sharing or knowledge transfer positively impacts company performance in Nigeria's oil and gas industry. Effective implementation of knowledge transfer leads to improved financial performance, marketing quality, and cost reduction. Thus, the following hypothesis can be proposed:

H4: Knowledge transfer have a positive influence on SMEs performance.

2.7 Organizational Performance and Open Innovation

Since "open innovation" gained popularity, it has received intensive attention in the global research community. While extensive research has been conducted previously, studies on open innovation in developing countries are relatively scarce [18]. Open innovation is an effective driving force for enhancing a company's performance. The evolution of open innovation activities can maintain the quality of a company's innovation level. If consistently implemented, it allows an organization or company to face increasingly competitive industry landscapes [54]. The outcomes of a company's open innovation process can improve the organizational system, involving improved collaboration, knowledge among employees, and market knowledge [55]. Open innovation requires openness both internally within a company and externally with relevant parties to create innovation. Several benefits resulting from the flow of knowledge within a company drive innovation internally, expand markets, and create external innovation for other parties [8].

Open innovation is divided into inbound open innovation and outbound open innovation [9]. Inbound open innovation is realized by exploring sources of innovation, such as new information and technologies from external parties, such as customers, suppliers, competitors, government, consultants, universities, or research organizations [56]. Outbound open innovation is manifested by developing internal innovation capabilities to provide the results to external organizations through licensing, patents, or contracts to gain financial and non-financial benefits [31].

The study by [5] indicates that "the more open, the better" is not always true. It depends on aligning the company's openness with its strategic context, the company itself, its management, and the balance between the benefits and costs incurred. Open innovation involving technology acquisition and user contributions positively impacts company performance [57]. However, literature discussing the positive relationship between outbound

open innovation processes and a company's financial performance is relatively limited [9, 58]. [58] explains that outbound open innovation positively impacts a company's performance. This explanation is reinforced by factors such as "the rate of technological change, market transactions concerning technology, and intensity of competition in the technology market."

A study on open innovation in Indonesia indicates that open innovation influences the innovation performance of a business [17]. Research on open innovation in the Indonesian logistics industry indicates a positive influence on supply chain performance. Collaboration with customers, suppliers, and external partners enhances incremental and radical innovation, leading to increased open innovation and a significant positive impact on supply chain performance [59].[57] also state that outbound open innovation plays a crucial role in enhancing company performance, even though it is observed that outbound open innovation activities rarely occur in companies due to implementation barriers. However, it can be overcome through knowledge sharing. It is supported by research conducted by [11] on the influence of open innovation on the performance of SMEs. This study empirically explains that open innovation significantly influences organizational performance, including financial and operational performance. Similar findings are also explained by [60] regarding the influence of the entry of external technology (inbound open innovation) and the exploitation of external technology by companies (outbound open innovation) on company performance. Thus, the following hypothesis can be proposed:

H5: open innovation activities have a positive influence on SME performance.

3. METHODOLOGY

3.1 Measurement

The research design tests the causal relationship of variables by testing the proposed hypothesis. Primary data was obtained from distributing online questionnaires to SMEs in Yogyakarta. The questionnaire is designed to be as simple as possible, logical, and structured, having clear definitions and instructions. The question type is divided into questions about respondent demographics and variables. Four variables are measured: open innovation, knowledge transfer, innovation capabilities, and organizational performance. The questionnaire was designed with a five-point Likert scale, including: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5).

3.2 Sampling and Data Collection

The population in this study was SMEs in Yogyakarta. Meanwhile, the sample is part of the population used in research, consisting of several selected sections [61]. Samples have specific characteristics that are suitable and can be used in research. The sample in this research was obtained using convenience sampling techniques. The convenience sampling technique is a technique for collecting data from parts of the population that are readily available. This method is used to make it easier for researchers to obtain samples quickly and efficiently in the best way. In this research, the sample requires respondents to meet the following criteria: work actively in SMEs or related business units in Yogyakartaand occupy a functional position (priority is manager, owner, manager, concurrently owner, or decision maker of the SME).Distribution of the questionnaire was carried out via business social media, email and WhatsApp. Finally, this research succeeded in collecting 202 data for further analysis.

3.3 Data Analysis Techniques

The research data analysis of this study uses descriptive statistics to obtain general conclusions from data descriptions and statistical analysis using PLS-SEM with SmartPLS version 3. Pilot tests were carried out to obtain reliable and valid questionnaire questionsusing SPSS. This analytical tool was used to test the validity and reliability of the pilot test data because it was considered capable of presenting the data quite accurately and easily understood by researchers. That way, this will make it easier for researchers to make decisions regarding item elimination if necessary. Through this pilot test, several variable measurement items were eliminated to increase the validity of the measurement items.

The PLS-SEM analysis technique is a statistical method with a confirmatory approach, such as hypothesis testing, to study related structural theories.The reason for choosing this analytical tool is because SEM analysis with SmartPLS is able to test the hypothesis as a whole and SmartPLS does not have to have a normal distribution, so this makes it easier for researchers in the data processing process.The PLS-SEM is divided into two stages: measurement model test (outer model) and structural model test (inner model). At the outer model testing stage, the validity and reliability of the data are tested. First, data reliability is determined from Cronbach alpha and composite reliability values, which are more than 0.7 [62]. Meanwhile, validity is seen from a convergent and discriminant perspective. Convergent validity can be seen from the factor loading values with a cut-off value of 0.708 [61] and AVE values of more than 0.5 [63]. Discriminant validity is seen through the FornelLarkert criteria and the Heterotrait-monotriate ratio of correlations (HTMT) value, which is less than 0.85 [64].

Furthermore, the inner model test includes the collinearity test, path coefficient, coefficient of determination, and predictive relevance coefficient. The collinearity test is seen from the VIF value of less than 5 [62]. The coefficient of the determination test is from the R-square value (R2). Meanwhile, the predictive relevance coefficient test is seen from the Q-square (Q2) value, which is more than zero. Finally, the path coefficient test shows the direction and results of the hypothesis test. The hypothesis is accepted if the t-value exceeds 1.96 (T value > 1.96). Next, the hypothesis is declared significant if the P value is less than .05 (P value < .05).

4. RESULTS AND DISCUSSION

4.1 Respondent Characteristics

In terms of demographic analysis, the respondents' characteristics are gender, age, education, current position, average income per month, total work experience, and number of employees. The respondents' profiles are summarized in the data below (Table 1).

Table 1. Respondents' Profile

Categories	Frequency	%
Gender		
Man	103	51.0
Woman	99	49.0
Age		
≤ 20 years	2	1.0
21–25 years	54	26.7
26–30 years	29	14.4
31–35 years	22	10.9

36–40 years	22	10.9
≥ 40 years	73	36.1
Last education		
High School/Equivalent	34	16.8
D3	18	8.9
S1	129	63.9
S2	14	6.9
Other	7	3.5
Current Position		
Owner	124	61.4
Manager	15	7.4
Senior Staff	24	11.9
Other	39	19.3
Average income per month		
IDR 2,000,000 - IDR 10,000,000	133	65.8
IDR 10,000,001 - IDR 50,000,000	41	20.3
IDR 50,000,001 - IDR 100,000,000	19	9.4
IDR 100,000,001 - IDR 500,000,000	6	3.0
IDR 500,000,001 - IDR 1,000,000,000	1	.5
≥ IDR 1,000,000,000	2	1.0
Total Work Experience		
< 1 Year	26	12.9
1 - 2 years old	38	18.8
2 - 5 years	52	25.7
5 - 10 Years	34	16.8
> 10 Years	52	25.7
Number of Employees		
1 - 5 people (Minimum)	105	52.0
6 - 19 people (Small)	45	22.3
20 - 99 people (medium)	52	25.7

Source: Primary data (2023).

Based on Table 1, it can be concluded that most respondents are men (51%). However, the percentages of both genders are almost equal. Furthermore, the majority of respondents involved were ≥ 40 years old (36.1%) and had a bachelor's degree (63.9%). Most of the respondents in this study were business owners (61.4%), and the average income ranged between 2 – 10 million per month (65.8%). In terms of work experience, the length of work experience of most respondents in this study was 2 – 5 years (25.7%) and more than ten years (25.7%). Finally, regarding the number of employees in the respondent's business units, most are business units with the minimum number of employees in the SME size category, namely 1-5 employees (52%).

4.2Measurement Model (Outer Model)

At the measurement model's analysis stage, the data's validity and reliability are evaluated. The validity of data in this case includes convergent and discriminant validity. Several items were invalid in the outer loading test, with outer loading values below 0.708. Therefore, invalid items must be eliminated gradually [61] to increase convergent validity. Finally, 12 items were eliminated. The results of convergent validity and reliability of the measurements are given below (Table 2).

Table 2. Data Convergent Validity and Reliability

Variables	Item	Loadings	CA	CR	AVE
Innovation Capabilities	IC1	0,739	.851	0,889	0.574
	IC2	0,766			
	IC3	0,708			
	IC4	0,709			
	IC5	0,827			
	IC6	0,787			
Open Innovation	OI5	0,762	.926	0,937	0.600
	IOI1	0,771			
	IOI3	0,725			
	IOOI2	0,786			
	IOOI3	0,804			
	IOOI4	0,847			
	IOOI5	0,706			
	IOOI7	0,805			
	IOOI8	0,802			
	IOOI9	0,728			
Knowledge Transfer	KT4	0,780	.805	0,872	0.631
	KT7	0,751			
	KT8	0,795			
	KT10	0,849			
Organizational Performance	OP1	0,807	.938	0,946	0.617
	OP2	0,805			
	OP3	0,757			
	OP5	0,847			
	OP7	0,806			
	OP8	0,762			
	OP9	0,751			
	OP10	0,850			
	OP11	0,762			
	OP12	0,738			
	OP13	0,743			

Source: Primary data (2023)
**Notes: Knowledge Transfer (KT); Innovation Capabilities (IC); Open Innovation (OI); Organizational Performance (OP).*

Table 2 shows that all variable items after elimination have met the loading value according to the criteria (loading factor ≥ 0.708) [61]. Therefore, it can increase the convergent validity of measurements in research. The results of the AVE value show that all variables in this study meet the standards with values above 0.50. For example, the innovation capability variable (0.574) has an AVE value above 0.50. Thus, all variables are declared convergently valid. Moreover, the results of the reliability test show that all variables have Cronbach's Alpha (CA) and Composite Reliability (CR) values of more than 0.7 or meet the criteria used in this research. It means that the results are accepted. The higher the Cronbach's Alpha and Composite Reliability values, the higher the level of reliability.

Furthermore, discriminant validity is seen from the Fornell-Larcker criterion and Heterotrait-monotrait (HTMT) test results. The Fornell Larcker test was carried out on the square root Ave value. The results of the Fornell-Larcker criterion are given below (Table 3).

Table 3. Disciminant Validity: Fornell-Larcker

Variables	IC	KT	OI	OP
IC	0,757			
KT	0,560	0,794		
OI	0,629	0,511	0,775	
OP	0,699	0,455	0,602	0,785

Source: Primary data (2023)
**Notes: KT: Knowledge Transfer; IC: Innovation Capabilities; OI: Open Innovation; OP: Organizational Performance.*

Table 3 shows that each variable's square root AVE values have more significant results than those below. It indicates good results based on the measurement criteria of Fornell & Lacker [65]. For example, the knowledge transfer variable (0.794) has a more excellent value than the open innovation variable (0.511) below it. Thus, all variables are declared discriminantly valid in the results of this test.

Furthermore, the HTMT test was also carried out to determine the discriminant validity of the data. For the HTMT value to be accepted and valid, the HTMT value must be less than 0.85 [64]. The HTMT test results are shown below (Table 4).

Table 4. Validity Disciminant: The HTMT Test

Variables	IC	KT	OI	OP
IC				
KT	0.667			
OI	0.686	0.579		
OP	0.772	0.517	0.626	

Source: Primary data (2023)
**Notes: Knowledge Transfer (KT); Innovation Capabilities (IC); Open Innovation (OI); Organizational Performance (OP).*

Table 4 shows that the HTMT value for all variables is acceptable because the HTMT value is less than 0.85 (<0.85) [64]. It shows that the variable has consistent and relevant indicators and is different from other variables in this study. Thus, all variables in this research can be considered discriminantly valid.

4.3Structural Model (Inner Model)

Structural model testing was carried out using collinearity, path coefficient, coefficient of determination, and Q square tests. First, the collinearity test is based on the results of the variance inflation factor (VIF) value [62]. The results of the collinearity test are given below (Table 5).

Table 5. The Collinearity Test

Variables	IC	KT	OI	OP
IC			1,457	
KT	1,000		1,457	1,353
OI				1,353
OP				

Source: Primary data (2023)
**Notes: Knowledge Transfer (KT); Innovation Capabilities (IC); Open Innovation (OI); Organizational Performance (OP).*

Based on Table 5, the results of this research's collinearity test do not indicate a critical multicollinearity problem. It is because the VIF value for all variables is no more than 5 (VIF < 5). Thus, the test results show no problematic multicollinearity between the research variables.

Second, the R-square and Q-square tests were performed. The R-square indicates how much the independent variable can explain the dependent variable. Meanwhile, the Q-square determines the predictive relevance of endogenous constructs predicted by the constructs that influence them. The R-square and Q-square test results are demonstrated below (Table 6).

Table 6. R-Square and Q-Square Results

Variables	R-square	Adjusted R-square	Q-square
Innovation Capabilities	0,314	0,310	0,300
Open Innovation	0,433	0,427	0,250
Organizational Performance	0,392	0,386	0,194

Source: Primary data (2023)

Table 6 shows that all variables' R square values are in the low to moderate category. It is because the R-Square value only ranges from 0.314 to 0.433. In this case, the independent variable of 42.7% can explain the open innovation variable, and the remaining 57.3% is explained by other factors outside this study. Furthermore, Table 6 also shows that the three endogenous variables (innovation capabilities, open innovation, and organizational performance) have a Q2 value that is higher than zero (Q2 ≥ 0). Thus, it can be concluded that the model is predictive and fits well with the data.

Finally, the path coefficient test was carried out to see the direction and results of hypothesis testing. The coefficient β indicates the direction of the hypothesis. The direction may be positive or negative. Meanwhile, the decision of hypothesis testing is seen from the T and P values. The results are shown in Table 7 and Figure 1.

Table 7. The Path Coefficient

Hypotheses		β	T value	*P* Value	Conclusion
IC →OI	H1	0,500	7,325	0,000	Supported
KT → IC	H2	0,560	8,531	0,000	Supported
KT→OI	H3	0,231	3,379	0,001	Supported
KT →OP	H4	0,200	2,785	0,006	Supported
OI →OP	H5	0,500	8,228	0,000	Supported

Source: Primary data (2023)
**Notes: Knowledge Transfer (KT); Innovation Capabilities (IC); Open Innovation (OI); Organizational Performance (OP).*

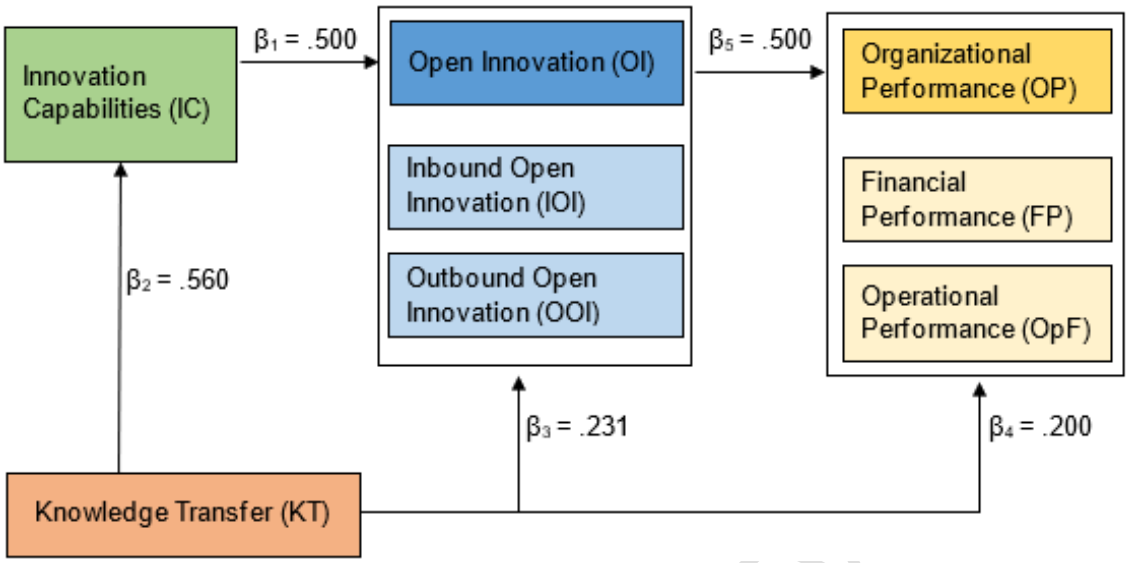

Fig. 1.Summary of the model results

β indicates the direction of the hypothesis (path coefficient).
The research framework was adopted from [11, 13].

Based on Table 7, the results of the hypothesis testing show that all the hypotheses tested are acceptable and significant. It is because the criteria for a T-value of more than 1.96 and a P-value of less than .05 are adequately met. As summarized in the research model, the path coefficient test shows a positive β value. This result shows that the overall hypothesis chooses a positive path direction. In addition, the research model used in this study was adapted from [11, 13].

4.3.1 Effect of Innovation Capabilities on Open Innovation

The hypothesis test results show that Innovation Capabilities positively and significantly affect open innovation (β = .500, P value = .00). Therefore, H1 is supported. This indicates that capable innovation capabilities will stimulate the implementation of openness to innovate or the concept of open innovation in SMEs. Generally, SMEs have difficulty identifying business capabilities outside their core competencies. This can occur due to a product portfolio that is too focused, a monotonous knowledge base, and limited financial resources [11]. For this reason, SMEs can strengthen their competitiveness by implementing the open innovation concept [66].

Furthermore, SMEs are more dependent on external knowledge than other large companies. Therefore, SMEs will benefit in terms of flexibility from collaborating with external parties to carry out an open innovation process [8]. With limited resources, SMEs must find ways to achieve economical production, market their products effectively, and offer the best possible service to meet customer needs.

4.3.2 Effect of Innovation Capabilities on Open Innovation

The analysis results reveal that knowledge transfer positively and significantly affects innovation capabilities (β = .560, P value = .00). Thus, H2 is supported. The knowledge transfer process by SMEs can increase their ability to continue to innovate. The existence of knowledge transfer carried out from one individual regarding information systems and

technology can provide a new perspective for organizations (SMEs). In the end, this will provide different characteristics to competitors and can further improve the performance of SMEs themselves. More specifically, [67] stated that tacit knowledge sharing positively affects individual innovation capability in a company. In this activity, individuals will combine their ideas, experiences, and expertise through team cooperation and collaboration. This process will encourage the ability of these individuals to produce product innovation. Also, [67] also stated that explicit knowledge sharing encourages individual innovation capability.

Research by [68] states that knowledge transfer and the quality of knowledge are positively related to organizational innovation capabilities. [37] also stated that knowledge transfer activities play a role in encouraging individual innovation capabilities. Thus, the more influential the implementation of knowledge transfer in SMEs, the more their quality and capability to innovate (innovation capabilities) will increase. In this case, the capabilities of existing employees are increasing, and their quality and readiness to innovate for the Company are increasing.

4.3.3 Effect of Knowledge Transfer on Open Innovation

This research reveals that knowledge transfer positively and significantly affects innovation capabilities (β = .231, P value = .001) and that H3 is supported. The knowledge transfer process by SMEs can provide encouragement and new perspectives in implementing the open innovation concept. Previous research shows that technology has played an essential role in supporting the innovation process in many companies over the years in the form of platforms for implementing the open innovation concept [69, 70], innovative technology [71], social media [71], or technology collaboration [72, 73]. All these sources have in common that knowledge sharing plays a vital role in open innovation activities [74]. Therefore, digital technology can support knowledge transfer in SMEs [71, 75]. The behavior of knowledge-sharing actors plays a role in the extent to which knowledge is shared [76]. Adapted technology can provide new insights, so it has great potential to support the practice and development of innovation processes [77] or to facilitate knowledge transfer [78].

Company owners play an important role in formulating knowledge-sharing strategies and motivating them to exchange knowledge so that employees are motivated to develop. Employee motivation is seen as an essential factor in the knowledge-sharing process [79]. A practical approach is needed since knowledge transfer is significant for implementing the open innovation concept in SMEs. This is because the realization of an innovation depends on acquiring and applying the knowledge itself [54]. Finally, knowledge sharing is challenging for SMEs to develop through enriching knowledge in their future business innovation processes. If SMEs want to implement the open innovation concept effectively and sustainably, knowledge transfer practices must be carried out effectively.

4.3.4 Effect of Knowledge Transfer on Organizational Performance

The results of this study suggest that knowledge transfer has a positive and significant effect on organizational performance (β = .200, P value = .006), so H4 is supported. Previous research is in line with the results of this research that organizational learning capabilities have a positive and significant effect on innovation and company performance [80]. The findings are strengthened by [81] showing that open innovation, both inbound and outbound, influences business performance. The application of knowledge transfer in SMEs (for example, employee training and the application of new technology) is considered capable of positively impacting the performance of SMEs in Yogyakarta. It is because new knowledge from these activities can impact a company's performance [82].

[83] stated that an organization's understanding of knowledge transfer can help organizations utilize their resources to influence their innovation capabilities. [84] also, a knowledge transfer culture will provide many benefits for businesses, such as enabling employees to generate new ideas and be inventive within their organization regarding organizational performance. [48] stated that innovation capability significantly influences the performance of an organization.

Previous research shows that the performance and success of corporate innovation are driven by the application of knowledge sharing [85]. Knowledge transfer is part of knowledge management that can increase business competitiveness [86, 87]. The application of knowledge transfer can be carried out at the individual level and the organizational level. Knowledge is one of the critical factors for developing company performance. Thus, knowledge transfer is essential in improving performance [88].

4.3.5 Effect of Knowledge Transfer on Organizational Performance

This research shows that open innovation has a positive and significant effect on organizational performance (β = .500, P value = .00). Thus, H5 is supported. The results of this research align with previous research that shows open innovation positively influences various organizational and financial performance measures [89]. However, considering the complexity and inadequate quality of resources, efforts to create efficiency and sound financial performance in SMEs have not been optimal [74]. However, implementing the open innovation concept is a strategic asset that encourages long-term competitive advantage for SMEs and improves company performance [90]. It means that if a company has a better level of open innovation, it can improve its performance.

Conversely, if open innovation is low, company performance will decline. It is because open innovation is also said to drive accelerating business performance [91, 92]. This result is strengthened by research [93] that a company's financial sustainability is determined by applying the open innovation concept.

4. CONCLUSION

The substance of the research can enhance understanding of the factors that can improve the performance of Small and Medium Enterprises (SMEs), particularly those located in Yogyakarta City. The research model is proposed to examine the role of innovation capability and therelationships between knowledge transferand open innovation on SME performance (financial and operational performance). The results show that all hypotheses are accepted. Open innovation is influenced by innovation capabilities and knowledge transfer (supporting H1 and H3). In this case, knowledge transfer also influences innovation capability and organizational performance in SMEs in Yogyakarta (supporting H2 and H4). Finally, open innovation successfully influences increased organizational performance in SMEs in Yogyakarta.In this case, knowledge transfer and innovation capabilities have the most vital relationship compared to other variables. It is because the transfer of knowledge makes organizational members of SME in Yogyakartaunderstand the steps that must be taken to innovate. Through this condition, innovation capabilities will increase and support the realization of business innovation strategiesof SME in Yogyakarta.

Furthermore, the relationship between open innovation and organizational performance is also classified as the strongest. It is because open innovation is known as a business performance accelerator [91, 92]. Open innovation has a strategic role in improving business performance, in this case, even the SME sectorin Yogakarta.

The results of this research offer theoretical and managerial implications for interested parties. Based on its theoretical implications, this research contributes to adding and completing intellectual references in the strategic field regarding the concept of applying open innovation to the performance of SMEs in Yogyakarta. Meanwhile, the managerial implications shown in this research relate to the benefits of practical research aimed at owners or employees to improve their business performance in operational and financial contexts. This research indicates that innovation capabilities can be a direct driving factor for open innovation. It can encourage business people to improve their quality to innovate (innovation capabilities).

This research has several limitations expected to be refined by future research. The respondents for this research only include representatives of some SMEs in Yogyakarta. Apart from that, several respondents were from the same UKM, making the respondents' answers similar. It happens due to limited time and access to SMEs or the company. In addition, measurement items were eliminated in this study because the loading values did not meet the criteria (factor loading ≥ 0.708). This problem is beyond the researcher's control because it did not cause problems in previous research.

With the stimulus from research regarding the concept of open innovation (inbound and outbound) in SMEs, the author hopes that this study can be developed in future research by increasing the number of business units in cities other than Yogyakarta. It is because the author assumes that most regions in Indonesia with different environments still consider it taboo or lacking to implement sustainable innovation. Even though openness to innovation has been empirically researched in this study, it can improve business performance from an operational and financial perspective. Furthermore, the author hopes to add different variables to broaden the discussion of open innovation and become a wealth of reference for business people. Finally, the author suggests that the sample of respondents be increased, and the classification of SMEs or Companies increased. For example, one respondent for one SME to provide more views and also to increase the validity of further research.

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APPENDIX

The item scale used to measure the construct of this study was adapted from [11, 13]. The following table is a description of the item scale of measurement in this study [Table A1].

Table A1. Item Scale

Construct		Item	Source
Innovation Capabilities	IC1	My SME business has developed or innovated the type or latest version of our flagship product in the last year.	[13]
	IC2	My SME business has developed or created a new "business plan" in the past year.	
	IC3	Some products from my SME business have been used to solve customer problems (in line with the target market).	
	IC4	The products of my SME business are able to meet market needs.	
	IC5	My SME business has used the latest technology in producing a product.	
	IC6	The business plan (business model) of my SME business has a fairly significant innovation concept.	
Open Innovation	OI1	External parties (e.g., competitors, suppliers) collaborate in innovation activities within my SME business.	[11]
	OI2	The government plays a role in supporting innovation activities within my SME business.	
	OI5	Research institutions (universities) provide assistance in innovation activities within my SME business.	
	IOI1	Universities or educational institutions contribute to innovation in my SME business.	
	IOI2	Suppliers contribute to innovation activities within my SME business.	
	IOI3	There are consulting services to provide assistance in innovation activities within my SME business.	
	IOI4	Innovation activities in my SME business depend on external assistance (e.g., consultants, competitors).	
	IOI5	I use the latest tools/devices (technology) to enhance innovation activities in my SME	

		business.	
	IOOI1	I use the latest development methods in the form of software or applications to support innovation activities in my SME business.	
	IOOI2	I purchase patents to support innovation in my SME business.	
	IOOI3	I purchase copyrights for use in innovation activities within my SME business.	
	IOOI4	I buy licenses from others for use in innovation activities within my SME business.	
	IOOI5	My SME business explores other benefits (uses) of a product derived from previous "internal innovation" processes.	
	IOOI6	My SME business creates new methods that are eventually used in other companies.	
	IOOI7	My SME business sells product patent rights to other parties or individuals.	
	IOOI8	My SME business sells product licenses to other companies.	
	IOOI9	My SME business collaborates with others to sell the latest technology/features (which can also be products) to increase the profitability of my SME business.	
	IOOI10	My SME business contributes to the development of the individual and professionalism of its employees.	
Organizational Performance	OP1	My SME business is capable of adapting earlier in terms of implementing and accepting new ideas compared to competitors.	[11]
	OP2	My SME business outperforms competitors in the development of new products.	
	OP3	My SME business is cautious in capturing new opportunities in the market.	
	OP5	The net profit of my SME business has consistently increased over the past few years.	
	OP7	The revenue of my SME business has consistently increased over the past few years.	
	OP8	I compare the investment expenditure costs of my SME business with the profits gained.	
	OP9	Customers are satisfied with the products and services provided by my SME business.	
	OP10	Productivity targets set by my SME business have always been achieved over the past year.	
	OP11	The quality of products produced by employees of my SME business is considered to meet the specified standards.	
	OP12	Products or services provided by my SME business to customers are delivered on time.	

	OP13	Inventory processes in my SME business are well-managed.	
Knowledge Transfer	KT1	I gain new knowledge from various external parties regarding the utilization of the latest technology, which can be beneficial for the development of my SME business.	[13]
	KT2	I acquire new knowledge from existing technology (such as applications or tools) for the advancement of my SME business.	
	KT3	I obtain new knowledge from the development of technology that has become a societal need, thereby benefiting my SME business references.	
	KT4	I have acquired new knowledge from a technology that is relatively common for the general public (e.g., the use of Artificial Intelligence).	
	KT5	I gain new insights from a technology created or developed previously, providing inspiration for the future development of my SME business.	
	KT7	I acquire new knowledge or information about developments from suppliers related to my business, enabling the future development of my SME.	
	KT8	I gain new knowledge from the manufacturing sector regarding raw materials relevant to my business, for the future development of my SME.	
	KT10	I gain experience in using a new and relatively unfamiliar technology (e.g., the utilization of Artificial Intelligence), serving as a reference for developing my business.	