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Abstract: This study involved 201 MSMEs collected through online survey. By using descriptive statistic, this study found that the main interest of MSMEs to engage with universities is to digitise. The most type of collaboration needed is market study, while the main objective of MSMEs to collaborate is to increase market share. Increasing profits through productivity become the main motivation of MSMEs to collaborate, business development is the outcome that MSMEs are willing to achieve the most from the partnership, while funding problem is the biggest barrier to realising university and MSMEs partnership. SmartPLS used to test the hypotheses, the study found that university to MSMEs knowledge transfer significantly affect competitive advantage and MSMEs performance, and the competitive advantage was significantly affected MSMEs performance. The study also found that the hypothesis testing the influence of university to MSMEs knowledge transfer mediated by competitive advantage was also supported.

Keywords: knowledge transfer; partnership; university; MSMEs; Indonesia.

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1 Introduction

In 2020, the Central Statistics Agency, the Ministry of Finance, and the Ministry of Information and Communication published data regarding the important role of MSMEs in the Indonesian economy based on the contribution to GDP, investment absorption, and employment. The contribution of MSMEs to Indonesia's GDP reached 59–61%, with the investment absorption rate reaching 50% and the absorption rate for domestic workers reaching 97%. Rahadi et al. (2023) also confirmed the data that MSMEs in Indonesia contributing around 61% of GDP and absorbs almost 97% of domestic workers. However, out of a total of 64.2 million MSMEs in Indonesia, only 17.1% of MSMEs

have utilised information and communication technology (ICT) to promote, market, and sell the products and services they produce. This condition shows that the level of digital literacy of MSMEs is still minimal due to the lack of mastery of the resources and expertise of MSMEs which must immediately find a solution to deal with these problems issued by the Ministry of Cooperatives and Small and Medium Enterprises of the Republic of Indonesia in 2020.

Facing the challenges of digital-based economic change that emerged because of the Industrial Revolution 4.0 and the COVID-19 pandemic, the digital literacy level of MSMEs is a determining factor for MSME's success in surviving and recovering from adversity due to unconducive economic conditions. The implementation of social distancing regulations and large-scale social restrictions to suppress the increase in the number of COVID-19 transmissions requires MSMEs to implement adaptive innovations by changing business models from high-touch business model to a low-touch business model so that they can adapt to changes. There is a necessity for transformation, to responses the challenges of Industrial Revolution 4.0 and COVID-19 pandemic especially for business (Zavyalova et al., 2022)

The low-touch business model emphasises minimising interaction and physical touch to ensure human health and safety in a pandemic situation by changing behaviour patterns in interacting and transitioning in the company's economic activities (De Mey and De Ridder, 2020). Transformation in business models is an important issue since business models provide a comprehensive understanding of the business by combining internal and external factors so that companies can create value for both the company itself and stakeholders in their business ecosystem (Teece, 2010).

The transformation is an opportunity and challenge for MSMEs considering there are many internal and external problems that must be resolved by MSMEs, such as the low level of MSMEs digital literacy as a key factor to succeed MSMEs in increasing resilience and competitiveness, especially in the digital era which triggered both by the Industrial Revolution 4.0 and the COVID-19 pandemic. Research on the Indonesian MSMEs readiness in facing the Industrial Revolution 4.0 is focus on identifying various problems faced by MSMEs, especially during the pandemic. The findings state that the MSMEs readiness to conduct digital-based business transformation is quite low, MSMEs are also facing various aspects including production, finance, marketing, human resources, and MSMEs business sustainability.

MSMEs encounter the challenges of fast technological development, an increasingly competitive business environment, and various problems, however, the resources they have are quite limited. This circumstance forces MSMEs to access resources, knowledge, and skills from outside the company so that collaboration or partnerships with other organisations such as universities as knowledge-producing institutions are needed. Even though not a new phenomenon, inter-organisational partnerships are still an important trend to discuss nowadays. It is motivated by the need for access to resources, core competencies, innovative skills, and specific knowledge, and become a strategic need for organisations to survive (Kogut and Zander, 1992; Kożuch and Sienkiewicz-Małyjurek, 2016).

Literature on inter-organisational partnerships explains the motivation of partnerships from several different theoretical perspectives such as the transaction cost economics (TCEs), resource-based view (RBV), knowledge-based view (KBV), and institutional theory (Anatan, 2022). Each theory explains the motivation for inter-organisational partnerships include to minimise operational costs (TCE); to acquire, assimilate, and

diffuse scarce resources (RBV) and knowledge (KBV) that are not owned by the company (KBV) and legitimacy (institutional theory). Considering that this study discusses knowledge transfer activities within universities and MSMEs partnership, KBV theory is used to analyse the issue. Based on this theory, knowledge is the most important and primary organisational resource (McEvily and Chakravarthy, 2002, Polanyi, 1967). According to KBV, university and MSMEs partnership is motivated by the necessity to acquire and have scarce resources within the partnership with other organisations is needed to improve internal competencies and capabilities.

Knowledge transfer activities from universities to MSMEs through university and MSMEs partnerships are expected to provide benefits not only for MSMEs as transferees but also for universities as transferors. For universities, partnerships with MSMEs enable them to provide benefits in increasing university knowledge regarding MSMEs which may provide added value to academic knowledge. Through partnerships with MSMEs, universities will understand practices in the work environment in the industrial sector (Eisenhardt and Martin, 2000; Ryan, 2009). Santoro and Chakrabarti (1999) identify several benefits that can be obtained through knowledge transfer activities for industry especially in this case MSMEs including: technology development, risk management, cooperation forums, human resource development, and access to experts and facilities that may lead to the increase in competitive advantage and performance.

This study aims to analyse knowledge transfer activities from university to MSMEs through university and MSMEs partnership to solve the lack of knowledge within MSMEs. The broad objective of this study is to analyse university to MSMEs knowledge transfer within universities and MSMEs partnerships, especially in the manufacturing sector from several aspects include area of interest, type, objective, motivation, outcomes and barriers. Previous studies on knowledge transfer from universities to MSMEs show that knowledge transfer has a significant impact on competitive advantage (Deschamps et al., 2013; Ratnawati, 2019; Apa et al., 2021), and improving performance (Ibidunni et al., 2020). The specific objective of this study are to investigate the impact of university to MSMEs competitive advantage and performance, the impact of competitive advantage on performance and the mediating effect of competitive advantage on the impact of university to MSMEs knowledge transfer on MSMEs performance, some hypotheses will be tested in this study.

This study is expected to contribute both to the theory and practice of strategic management, particularly within higher education and MSMEs. By addressing the previous objective of the study, both broad and specific objective, in term of theoretical significance this study intends to enrich upon existing literature and to develop intellectual capability and professional knowledge through the implementation of theories in business activities. While the practical contribution of this study is to develop practical guidelines to manage knowledge transfer activities from university to MSMEs through university and MSMEs partnership, this study findings are expected to be a consideration to make decisions to enhance the effectiveness of technology transfer between universities and MSMEs.

2 Literature review

2.1 Knowledge transfer issues within university and MSME partnership

To support knowledge transfer activities from universities to MSMEs, university and MSMEs partnerships need to be developed and become an important issue. The limited resources owned by MSMEs mean that MSMEs may not have the ability and capacity to develop in-house R&D independently since it requires a fairly large investment. In-house R&D development is urgently needed to support MSMEs innovation activities both related to product and process development, and MSMEs capacity development to understand, utilise, and implement the knowledge that has been acquired through the partnerships. On the other hand, through the development of partnerships, universities are also expected to benefit from obtaining patents and commercialising the results of the research carried out (Anatan, 2022).

The development of partnerships between universities and MSMEs in the digital era needs to focus on developing digital platforms to support the knowledge transfer process from universities to MSMEs. To achieve a successful partnership, both universities and MSMEs have important roles and responsibilities in identifying and determining the interest in a partnership, the form of partnership to be developed, determining the goals of the partnership, motivation for the partnership, and the expected outcomes of the partnership. In addition, both parties need to identify possible obstacles that may be faced, the support system, and the determinants of partnership success.

- *Area of interest:* areas of interest in partnership between university and MSMEs, especially in the digital era, were identified based on a study conducted by Lianu et al. (2020) includes digitalisation of marketing innovation, process innovation, and product or service innovation. Knowledge transfer mechanisms related to each of these interests can be conducted through mechanisms for transferring ideas and knowledge from universities, training programs for managers and employees, and research collaboration projects.
- *Type of partnership:* the type of partnership between university and MSMEs in this study adopted a study conducted by Lianu et al. (2020) identified as follows: market studies, training collaborations, assistance, seminars, consultants, and research and development (R&D). In this partnership, the university's concentration on patents and establishing spin-off companies is not a top priority, in contrast to when universities collaborate with large-scale companies (Lianu et al., 2020).
- *Objective of partnership:* the objectives of university and MSMEs partnership regarding the transfer of knowledge from universities to MSMEs can focus on several issues such as providing graduates according to MSMEs needs; access to training and development; access to physical facilities; access to research results; consultations and publication data; access technical knowledge; development of human resource quality; expansion of market share; and minimise the cost of research and development (Lianu et al., 2020). The objective that each MSMEs wants to achieve will be different depends on the specific problems faced by the MSMEs.

- *Motivation for partnership:* referring to studies conducted by Siegel et al. (2003) and Lee and Win (2004), the motivation for partnerships between universities and MSMEs through knowledge transfer activities can be identified in twenty motivations including those related to efforts to develop knowledge, technology, publications, patents, cooperation in several research projects, ease of gaining access to resources both tangible and intangible, and solving problems faced by the company.
- *Outcome of partnership:* several outcomes from knowledge transfer activities from universities to MSMEs within partnerships between universities and MSMEs were identified based on studies conducted by Lee and Win (2004) and Lianu et al. (2020) includes licenses, patents, royalties, start-up company development, performance improvement, and MSME business development.
- *Obstacle of partnership:* obstacles of partnerships between universities and MSMEs in knowledge transfer activities were identified based on studies conducted by Siegel et al. (2003) and Lee and Win (2004) including a lack of understanding of MSMEs regarding the university environment, lack of control over resources, lack of funding and rewards, bureaucratic problems, culture work and the low interest of MSMEs, especially in relation to basic research carried out by universities.

2.2 University to MSMEs knowledge transfer, competitive advantage, and performance

2.2.1 Knowledge transfer and knowledge-based view

Knowledge is the most important resource in the organisation and becomes a strategic resource to improve the competitiveness of the company. Knowledge is defined as the truth of justified beliefs, which is the core of KBV (Blumenberg et al., 2009) and the main resource needed to support the organisation's survival (Grant, 1996). The lack of mastery of knowledge will hurt the organisation and become a threat to the survival of the organisation. This argument is in line with Cohen and Levinthal (1990) who underlined the importance of knowledge transfer activities to increase the company's capability to respond appropriately to change, create innovation, and succeed in competition.

Abbasnejad et al. (2011) define knowledge transfer as a dynamic process involving acquisition, communication, application, acceptance, and assimilation. In the context of university and MSMEs partnerships, knowledge transfer is defined as the transfer of knowledge between academic institutions and MSMEs. Theoretically, knowledge transfer includes explicit and tacit dimensions. Explicit knowledge is knowledge that can be articulated in the form of words and numbers, while tacit knowledge resides in a person's thinking, making it difficult to articulate and requires observation, demonstration, and knowledge transfer experience. The success of knowledge transfer activities can be achieved if the organisation can learn and absorb the knowledge obtained from partners, reduce dependence on partners, and be able to assimilate knowledge for the development of organisational capabilities (Simonin, 1999, 2004).

To support knowledge transfer activities from universities to MSMEs, university and MSMEs partnerships need to be developed and become an important issue. According to KBV, knowledge is the most important organisational resource to achieve competitive

advantage and organisational performance (McEvily and Chakravarthy, 2002; Polanyi, 1967). Based on this theory, the main objective of MSMEs to develop partnership, is motivated by the necessity to acquire and have scarce resources that needed to improve internal competencies and capabilities, while the objective of university as source of knowledge is to transfer knowledg from university to MSMEs.

2.2.2 Competitive advantage

Previous studies on knowledge transfer from universities to MSMEs show that knowledge transfer has a significant impact on competitive advantage (Deschamps et al., 2013; Ratnawati, 2019). Deschamps et al. (2013) conducted a study to determine the role of intermediaries and management practices used in university and MSMEs partnerships. The study findings show that intellectual properties and capability improvement are not the focus of MSMEs. In the partnership between both parties, intermediaries are responsible for guiding MSMEs, however IP transfer and sharing tools they provide are still low so might be unable to support innovation activities in MSMEs. Research conducted by Ratnawati (2019) aims to examine the impact of partnerships on the performance of the creative industry and the competitive advantage of MSMEs in Malang City. The study findings prove that the partnership between universities and MSMEs has a significant impact on the MSMEs performance.

The concept of competitive advantage in this study refers to the definition put forward by Widjajanti (2009) cited in Yuliantari and Pramuki (2022), namely a series of differences that are difficult to duplicate as a result of a company's strategy that can help to maintain a profitable market position for the company. Referring to Porter (1985) and Grant (1991) cited in Yuliantari and Pramuki (2022), the concept of competitive advantage is measured by differentiation advantage and cost advantage. Differentiation advantage is measured by several indicators including the amount of brand access, the level of ability to provide superior service, the ability to generate reputation, and the ability to establish good relationships to develop networks. Cost advantage measured using indicators of ability to increase financial access and reduce costs.

2.2.3 MSMEs performance

Study on universities to MSMEs also shows that knowledge transfer has a significant impact on performance (Ibidunni et al., 2020; Apa et al., 2021). Ibidunni et al. (2020) conducted a study that aims to examine the relationship between knowledge transfer and the performance of MSMEs that have been involved in international business. By involving 370 owners and managers of MSMEs, the results of the study prove that knowledge transfer has a significant influence on the performance of innovation transfer. In particular, the dimension of knowledge transfer in this study emphasises research and development, as well as social networking. The study also concludes that knowledge transfer is a strategic tool that can be used by MSMEs if they want to be involved in international business cooperation although it may not significantly affect MSMEs performance. Another study conducted by Apa et al. (2021) aims to analyse the impact of university and MSMEs partnerships on performance in Veneto, Italy. The study also considered variations in the types of partnerships, both formal and informal. In addition, the aspect of the influence of absorption capacity MSMEs performance is also

considered. This study concludes that university and MSMEs partnerships will affect innovation performance.

In this study, MSME performance refers to the results of a process or output achieved by MSMEs and compared with predetermined target criteria. MSME performance measures can include several indicators such as sales growth, capital growth, increase in the number of employees each year, market and marketing growth, and profit growth. The performance of MSMEs can be influenced by internal and external factors. Internal factors include financial, production, human resources, marketing aspects, while external factors can include government policy aspects, socio-cultural aspects and economic aspects.

Through knowledge transfer activities from universities to MSMEs, it is expected that the internal and external problems faced by MSMEs due to lack of knowledge can be resolved so that MSMEs can increase their competitive advantage and performance. In a study conducted by Yuliantari and Pramuki (2022), competitive advantage becomes a mediating variable in explaining the influence of digital transformation on MSME performance. Based on logical arguments and study findings of research models in previous studies, the following hypothesis was developed:

H1 University to MSMEs knowledge transfer affects MSMEs competitive advantage.

H2 University to MSMEs knowledge transfer affects MSMEs performance.

H3 MSMEs' competitive advantage affects MSMEs performance.

H4 The effect of university to MSMEs knowledge transfer on MSME performance is mediated by MSMEs competitive advantage.

3 Methodology

3.1 Sample and data collection

The population in this study includes all MSMEs in Indonesia as classified in Law No. 20/2008 based on the criteria of turnover and assets. The convenience sampling method is used to determine the research sample. The target respondents are MSMEs owners considering that the owners are decision makers in business who understand the needs and strategies implemented by the company. The study used cross-sectional data collected through online surveys.

3.2 Measurement

The questionnaire development analyses through descriptive statistic included aspects of interest (four statements), types (six statements), objectives (nine statements), motivation (20 statements), outcomes (six statements), and barriers (seven statements) adopted from previous studies (Siegel et al., 2003; Lee and Win, 2004; Lianu et al., 2020). The statement items use a 5-point Likert scale, namely 1 for strongly disagree and 5 for strongly agree. Data analysis used descriptive statistics in SPSS.

Respondents also asked to fill out questionnaire related to knowledge transfer, competitive advantage, and MSMEs performance to test the hypotheses. The instrument for measuring the knowledge transfer includes six items adopted from Lianu et al. (2020). The competitive advantage consists of six items adopted from Widjajanti (2009). The MSME performance variable consists of five items adopted from Yuliantari and Pramuki (2022).

3.3 Data analysis

To analyse interest, type, motivation, outcome, a barrier of partnership, this study uses descriptive statistics and quantitative analysis using SMART PLS to test the outer model and inner model or structural model. Testing of the outer model includes validity and reliability tests. The validity value is said to be high if the loading factor value is more than 0.70, while reliability testing analysed by the Cronbach's alpha value and composite reliability. A construct is reliable if the composite reliability and Cronbach's alpha value of more than 0.70.

R-square is used to test the structural model. The dependent variable and the path coefficient value for the independent variable measured based on the t-statistic value for each path. R-square value of 0.67 is in the strong category, 0.33 in the moderate category, and 0.19 in the weak category. To determine the goodness of the model, the effect size value is used, the value of which is expected to be more than 0.15.

4 Results

4.1 Respondent profile

Data collection was carried out in the period from the end of July 2022 to the end of 21 September 2022, through an online survey to 500 prospective respondents with a return rate of 40.2%%. Table 1 summarises the characteristics of respondents and MSMEs based on several categories.

4.2 Interest in partnership

The findings show that the highest interest in the partnership is in the fields of marketing innovation (4.22), followed by product innovation (4.19), digitalisation (4.13), and production process innovation (4.12). Based on open questions delivered to respondents regarding the interest in cooperation needed by MSMEs, the answers included: business development, marketing, and branding, networking business expansion, procurement of suppliers, assistance or grants for facilities and equipment from universities, access to capital, promotion, training and human resource development, e-commerce, optimising the use of social media, time management, distribution access, digital marketing, and endorsement.

Table 1 Respondent and business profile

Dimension	*Categories*	*Number of respondents*	*Percentage*
Gender	Male	94	46.8
	Female	107	53.2
Status	Owner	169	84.1
	Manager/vice manager	11	5.5
	Staff	14	7
	Others	7	3.5
Type of business (producing and or marketing)	Culinary	105	52.2
	Fashion	26	12.9
	Agribusiness	8	4.0
	Education	9	4.5
	Automotives	16	8.0
	Tour and travel	4	2.0
	Creative	8	4.0
	Beauty	6	3.0
	Event organiser	1	0.5
	Cleaning services	10	5.0
	Trade	8	4.0
Company age	0–5 years	92	45.8
	>5–10 years	12	6.0
	>10–15 years	29	14.4
	>15–20 years	13	6.5
	>20 years	55	27’4
Number of permanent workers	0–10 workers	165	82.1
	>10–30 workers	19	9.5
	>30–300 workers	17	8.5
Performance by general during three years past end	Increase > 15%	87	43.3
	Increase <15%	74	36.8
	No changes	25	12.9
	Decrease < 15%	6	3.0
	Decrease > 15%	8	4.0
Asset	Less than or the same as 50 million	123	61.2
	>50million to 500 million	61	30.3
	>500million to 10 billion	17	8.5
Turnover	Max 300 million	151	75.1
	>300 million to 2.5 billion	43	21.9
	>2.5 billion to 50 billion	7	3.5

Source: Processed data

Table 2 Interest in partnership

	Minimum	*Maximum*	*Mean*	*Std. deviation*
Digitalisation	1	5	4.13	.940
Marketing innovation	1	5	4.22	.874
Product innovation	1	5	4.19	.908
Production process innovation	1	5	4.12	.964

4.3 Type of partnership

The results of descriptive statistics testing using the average respondents' answers sorted from the highest average to the lowest indicate that the type of partnership needed by MSMEs is research and development (4.11), market studies (4.09), consultation (4.06), training (4.05), mentoring (4.00), and seminars (3.73).

Table 3 Type of partnership

	Minimum	*Maximum*	*Mean*	*Std. deviation*
Market study	1	5	4.09	.949
Training collaboration	1	5	4.05	.918
Assistance	1	5	4.00	.949
Seminar	1	5	3.73	1.028
Consultation	1	5	4.06	.944
Research and development	1	5	4.11	1.004

Regarding another type of cooperation needed by MSMEs according to the open questions delivered to the respondent, the following answers were obtained: assistance in the procurement of MSMEs transportation, finance, and capital, development of a community involving universities and MSMEs, seminars, guidance and development of MSMEs products, marketing, cooperation for results or commissions, cooperation in the construction of online and physical stores to market MSMEs products, MSMEs performance appraisal training, product promotion, drop-shipper, sponsorship, and training for product development and product quality.

4.4 Objective of partnership

The objectives of the partnership executed by MSMEs are sorted according to the highest to lowest average answers using descriptive statistics include: expanding market share (4.31), improving the quality of human resources (4.20), saving research costs and developing innovative ideas (4.15), access various research results, consultations, and published data owned by universities that are useful for developing MSMEs competitiveness (4.14), obtaining technical knowledge (4.13), easy access to training and human resource development (4.07), providing graduates or human resources as needed (4.06), access to physical facilities, trained educational staff and competence from universities (4.03).

Table 4 The objective of partnership

	Minimum	*Maximum*	*Mean*	*Std. deviation*
Provision of graduates (human resources/HR) according to the needs of MSMEs	1	5	4.06	.963
Easy access to various training and HR development	1	5	4.07	.900
Easy access to various physical facilities and trained and competent educational personnel from the university	1	5	4.03	.902
Ease of access to various research results, consultations, and publication data owned by universities that are useful for developing the competitiveness of MSMEs	1	5	4.14	.784
To acquire technical knowledge	1	5	4.13	.796
To improve the quality of human resources and the competitiveness of MSMEs	1	5	4.20	.827
To expand market share	1	5	4.31	.766
To save costs associated with research and development of innovative ideas	1	5	4.15	.901

Source: Processed data

Regarding the open question on the objective of the partnership between MSMEs and universities delivered to the respondents, there were interesting answers considering that MSMEs not only had internal but also external goals for the benefit of partners or universities. Several answers state that the objective of MSMEs in cooperating with universities is to educate students to be ready to join the workforce, foster a business spirit in students, provide job vacancies for prospective university graduates, increase entrepreneurial skills and knowledge for prospective workers in MSMEs and form the identity for university students in business. Meanwhile, the internal objectives related to the objective of MSMEs include: expanding market share, digitising MSMEs, managing human resources properly, obtaining up-to-date knowledge and information regarding business management, opportunities to open food court stands at universities, branding MSMEs products, promoting MSMEs products, increasing the creativity and innovation of MSMEs products, getting the opportunity if there is a bazaar at the university, marketing products to students, obtaining capital assistance, and obtaining a platform to attract student consumers.

4.5 Motivation for partnership

The study concluded that the 5 highest motivations for MSMEs to collaborate with industry based on the highest average answers given by respondents were increasing profits through increased productivity (4.23), publications (4.13), training and human resource development, knowledge development, and technology development with the same average value of each answer, namely (4.14). About the open-ended questions delivered related to the motivation of cooperation, the following information was

obtained: improving the quality and competitiveness of MSMEs, maximising sales, increasing product promotions so that students and the general public are better known, and increasing knowledge on business management and development.

Table 5 Motivation for partnership

	Min	*Max*	*Mean*	*Std. dev.*
Technology development	1	5	4.14	.857
Knowledge development	1	5	4.14	.849
Publication	1	5	4.15	.906
Obtaining patents and licenses	1	5	4.03	.948
Employee training and development	1	5	4.14	.851
Increased profits through increased productivity	1	5	4.23	.835
MSMEs cooperation in terms of basic research	1	5	4.02	.959
Cooperation in application research	1	5	4.00	.941
Implementation of the ideas of MSMEs	1	5	4.09	.879
Investment in research and development	1	5	4.02	.922
Concrete problem solving	1	5	4.05	.887
Access to new knowledge and production processes that enable MSMEs to achieve a competitive advantage	1	5	4.01	.892
Easy access to new technology to help MSMEs become more innovative	1	5	4.04	.913
Ease of market access helps MSMEs in producing many innovative products	1	5	4.12	.886
Utilisation of university research results, such as market research, will be more efficient than if MSMEs develop their research	1	5	4.00	.925
Finding issues for future research and development	1	5	4.08	.880
Orientation to solve short-term problems	1	5	3.95	.918
Invest in technology development instead of buying a license	1	5	3.94	.941

Source: Processed data

4.6 Outcome of partnership

Test results with descriptive statistics for partnership outcomes based on the order of the average answers from highest to lowest include MSMEs business development (4.05), formation of start-up companies (4.03), MSMEs performance improvement and royalty earning 4.00 each, license acquisition (3.98) and the acquisition of a patent (3.97). The desired outcome of the partnership based on respondents' answers to open questions asked includes product innovation, better marketing, increased product competitiveness and performance of MSMEs, as well as obtaining financial assistance from universities.

Table 6 Outcome of partnership

	Minimum	*Maximum*	*Mean*	*Std. deviation*
License	1	5	3.98	.992
Patent	1	5	3.97	.974
Royalty	1	5	4.00	1.012
Start-up company development	1	5	4.03	.959
MSMEs performance improvement	1	5	4.00	.987
MSMEs business development	1	5	4.05	.955

Source: Processed data

4.7 Barrier of partnership

Barriers to cooperation that may be encountered by MSMEs in developing partnerships with universities are analysed based on the average results of respondents' answers from the highest to the lowest order including funding problems between the two parties (4.00), inflexibility in bureaucracy and administration (3.98), lack of understanding related to the university or university environment and the norms that apply at the university (3.97), the difference in work culture between universities and MSMEs and the lack of 'reward' offered each with an average answer of 3.95, lack of manpower with technical capabilities, marketing and negotiation (3.94), disinterest in basic research (3.92).

Table 7 Barriers of partnership

	Min	*Max*	*Mean*	*Std. dev.*
Lack of understanding related to the university or university environment and the norms that apply at the university	1	5	3.97	1.022
Not enough 'reward' offered	1	5	3.95	1.016
Lack of manpower with technical, marketing, and negotiation skills	1	5	3.94	1.042
Inflexibility (lack of flexibility) in bureaucracy and administration	1	5	3.98	1.032
Differences in work culture between universities and SMEs	1	5	3.95	1.031
Disinterest in basic research	1	5	3.92	1.076
Funding issues between the two parties	1	5	4.00	.995

Source: Processed data

Regarding the obstacles faced by MSMEs in establishing partnerships with universities, several obstacles can be identified including limited competence and knowledge of human resources, limited training, and development opportunities as well as technical guidance for MSMEs, as well as communication errors between the two collaborating parties.

Respondents were also requested to state what is the support system needed in cooperation with universities. Some of the answers identified include relationships and

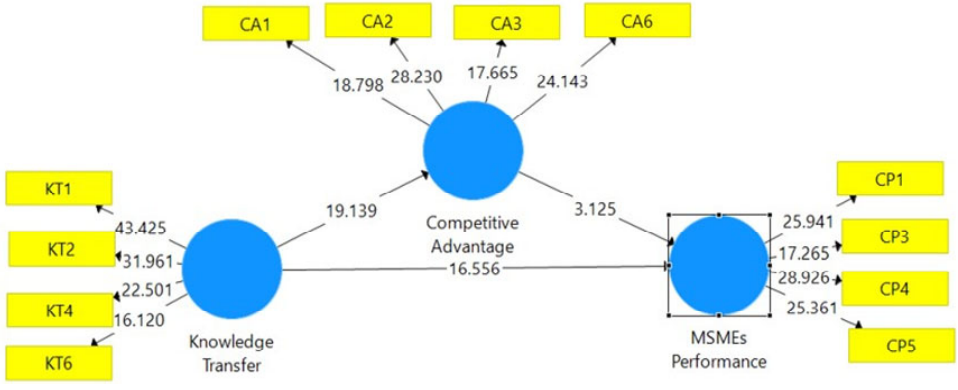
partnership, mutual support between the two collaborating parties, good relationship, trust, honesty, commitment, networking integrity, funding, mutual agreement, innovation, digitisation, family system, perseverance, skills, a good and obvious cooperation's vision and mission, competent human resources, social media, endorsement, teamwork, and a good management system.

Respondents were also asked to state the determinants of the success of partnerships with universities based on their arguments and perceptions. The results of the study show that several supporting factors include: trust, service, communication, flexibility, integrity, initiative, motivation, togetherness, consistency, honesty, understanding of business, commitment to cooperation, win-win negotiation, transparency, relationships, and innovation, strong bounding between universities and MSMEs, reliable partners, cohesiveness, wise attitude, good teamwork and involving people with different skills, conducive atmosphere, hard work, consistency, realisation of ideas, perseverance, and cohesiveness.

4.8 Measurement model evaluation

Outer model evaluation was conducted before the hypothesis testing to test the validity and reliability of the measurement. The results of validity testing using cross loading factors show that several indicators must be excluded from the analysis since values below the cross-loading factors of other latent variables and are below the value of 0.7. Several indicators and cross loading factor values were identified as follows KT3 (0.676), KT5 (0.654), CA4 (0.595), CA5 (0.123), and CP2 (0.699). After these indicators were removed, the results of validity testing are shown in Table 8 and the cross-loading factors depicted in Figure 1.

Figure 1 Loading factors of technology transfer, product innovation and MSME performance indicators (see online version for colours)



Source: Processed data

Table 7 summarised the results of reliability testing using Cronbach's alpha, composite reliability, and AVE. The results of validity testing show that the factor loading value of each latent variable is above 0.7, so it can be concluded that the indicators measuring knowledge transfer, competitive advantage, and MSME performance are valid (Ghozali

and Latan, 2015). Based on Cronbach's alpha and composite reliability for all indicators that are above 0.7, it can be concluded that all indicators are reliable (Hair et al., 2019).

Table 7 Loading factors, Cronbach's alpha, composite reliability and AVE

Item	*Loading factors*	*Cronbach's alpha*	*Composite reliability*	*AVE*
KT1	0.866	0.804	0.872	0.631
KT2	0.809			
KT5	0.751			
KT6	0.746			
CA1	0.767	0.765	0.804	0.581
CA2	0.807			
CA3	0.718			
CA6	0.755			
CP1	0.802	0.802	0.802	0.629
CP3	0.704			
CP4	0.847			
CP5	0.795			

Source: Processed data

4.9 Structural model evaluation

Evaluation of the goodness of the structural model is carried out by testing the R-square value and F-square value. The results of testing the R-square value are summarised in Table 8 and the F-square value in Table 9. Based on the results of testing the R-square value, it shows that the R-square value of MSME performance is quite high, namely 0.742, this figure shows that there is 74.2% diversity in the transfer of knowledge and excellence. Competitiveness can influence the performance of MSMEs.

Table 8 R-square criteria

	R-square	*R-square adjusted*
Competitive advantage	0.553	0.550
MSMEs performance	0.742	0.740

Source: Processed data

Table 9 F-square criteria

	CA	*KT*	*CP*
Competitive advantage (CA)			0.048
Knowledge transfer (KT)	1.235		0.929
MSMEs performance (CP)			

Source: Processed data

Based on the results of the F-square test which shows the effect size value, it can be concluded that the measurement value of knowledge transfer on MSMEs performance, knowledge transfer on competitive advantage, is good with respective F-square values of (1.235 and 0.929), while the F-square value for competitive advantage for MSMEs performance is still not good at 0.048.

4.10 Hypothesis testing

The results of hypothesis testing developed in this research are summarised in Table 10. The hypotheses include testing the effect of knowledge transfer on MSMEs performance, the effect of knowledge transfer on competitive advantage, the effect of competitive on MSME performance, and the role of competitive advantage in mediating the effect of knowledge transfer on MSME performance. The study found that all the hypotheses tested in this study are supported.

Table 10 Hypothesis testing result

Hypotheses	*Causal association*	*Original sample*	*Standard deviation*	*T-statistic*	*P-values*
H1	KT → CA	0.743	0.037	19.819	0.000
H2	KT → CP	0.731	0.043	16.819	0.000
H3	CA → CP	0.166	0.053	3.156	0.002
H4	KT → CA → CP	0.123	0.040	3.089	0.002

Source: Processed data

Hypothesis 1 stated that knowledge transfer affects competitive advantage was supported by a t-statistic value of 19.819 and a P value of 0.000. Hypothesis 2 stated that knowledge transfer affects MSME performance was supported by a t-statistical value of 16.819, P value 0.000. The hypothesis testing regarding the effect of competitive advantage on MSME performance was supported based on the t-statistical value of 3.156 and the p-value of 0.002. The results of hypothesis testing regarding the role of competitive advantage as mediating variable based on specific indirect effects show it was supported with a t-statistic value of 3.089 with a p-value of 0.002. It means competitive advantage was mediated the effect of knowledge transfer on MSMEs performance as partial mediation.

5 Discussion

The results of the study show that Indonesian MSMEs have obvious and aligned interests and main goals to develop partnerships with universities through knowledge transfer activities from universities to MSMEs. The study findings show that the three biggest interests of MSMEs in establishing partnerships with universities include marketing innovation, product innovation, and digitalisation. Regarding the type of partnerships, research and development, market studies, and consulting are the three types of partnerships that are most needed by MSMEs. Meanwhile, the two main objectives of engaging in partnerships with universities are to expand market share, and improve the

quality of human resources. Technology development and knowledge development are the main motivations for MSMEs to establish partnerships with universities.

Likewise, when delivered an open question on the interests and objectives of partnerships, digital marketing, business development, and human resource capacity development, were the most given responds by respondents. Regarding the type and motivation of partnerships, training and development for improving the quality of human resources and products as well as improving the quality and competitiveness of products are the types and motivation of partnerships that are most expressed by respondents in this study. It shows that in the era of the Industrial Revolution 4.0 and the occurrence of the COVID-19 pandemic, MSMEs actors are aware of the importance of transforming their business model from high touch to low touch business model which is identical to the application of digital technology for MSMEs.

It is undeniable that the problem of Indonesia's MSMEs digital literacy level which is quite low is a serious challenge not only for MSMEs actors but also for the government. To improve digital literacy, MSMEs need to focus on three important aspects as a foundation to prepare themselves for digital-based business transformation. These three aspects are adaptation, adoption, and agility, better known as the three A's of digital transformation. Adaptation focuses on company resources, namely by developing skills to adapt to the digital era needs through training and human resource development. Adoption focuses on human resources, consumers, and partners through the application of technology in the company's operational activities. Meanwhile, agility focuses on the organisation through increasing abilities and skills, especially those related to problem-solving and creativity in taking advantage of every opportunity.

To support the digital-based transformation process for MSMEs or the digitisation of MSMEs, the Indonesian Government has implemented several strategic plans that focus on increasing human resource capacity, community development and local applications, MSMEs digitisation programs, and marketing and promotion support for MSMEs. An example of a program that has been implemented to increase human resource capacity is the SPARC Campus Webinar Series facilitated by Smesco, an institution under the leadership of the Ministry of Cooperatives and MSMEs. The SPARC Campus Webinar series involves several collaborating parties, namely the government, academia, society, media, professionals, influencers, and the private sector. The purpose of this activity is as an incubator to prepare Indonesian MSMEs to face digital-based business transformation.

Indonesia Creative Store is an example of a local application and community development program to support digital-based MSMEs business transformation. This program is a creative product catalogue developed by the Indonesia Creative Cities Network (ICCN). In ICS, there are products from all MSMEs in Indonesia. An example of the MSMEs digitisation program is the development of the digital catalogue, which is a website to promote MSME products online via the internet. An example of marketing and promotional support that has been implemented is the PLUT (Pusat Layanan Usaha Terpadu or Integrated Business Service Center) which was developed to improve the performance of production, marketing, finance, and human resources. The focus of implementing the PLUT program at the micro-scale is on optimising e-catalogues and social media, at a small scale focusing on localisation and homogenisation of e-commerce, and on the medium scale focusing on global e-commerce and export of products.

Regarding the outcome of the collaboration, MSMEs business development is the focus of MSMEs in cooperating with universities. Likewise, in open-ended questions, most of the respondents answered that product innovation, digital marketing, increasing competitiveness and product performance were the biggest focus for MSMEs actors, which showed the importance of sustainability and business development for MSMEs actors. Regarding barriers to cooperation, both closed and open questions, the majority of MSMEs answered that funding was the main obstacle in cooperation with universities. Based on theoretical and empirical studies on studies related to the transfer of knowledge from universities to MSMEs, the issue of cultural differences is also an issue that has a significant role as an obstacle to cooperation between universities and MSMEs. Culture in the context of this study is related to the work culture and the orientation of the cooperation of the two parties. The university as a knowledge producer institution certainly has an orientation and a goal to disseminate all research findings for the public interest. On the other hand, business actors tend to want the research results produced to be stored and used for the company's internal interests.

The synergy between universities and MSMEs in developing partnerships is needed so that the knowledge transfer process can be conducted to overcome problems that arise due to cultural differences between universities and MSMEs such as miscommunication and gaps between universities and industry. It is undeniable that universities are often like being in the 'Ivory Tower' so that unable to understand the industrial needs, especially MSMEs. To overcome these problems, the Government of Indonesia through the Ministry of Education, Culture, Research, and Technology since January 2020, has launched the Merdeka Belajar Kampus Merdeka (MBKM). The MBKM program means for universities to improve the quality of higher education graduates, as well as to narrow the gap between universities and the industrial world.

The role of the government in minimising the gap between universities and industry, especially MSMEs is to collaborate with universities to work together in developing MSMEs. For example, in early 2022, the Surabaya City Government collaborated with Widya Mandala Catholic University Surabaya in developing MSMEs in the city of Surabaya. The purpose of the cooperation is to focus on business motivation, production training, marketing/export training, product design and packaging, product photography and videography training, training in financial calculations or financial management, business strategy with a look at market share, education and assistance related to product legality and licensing, and new product development business strategies.

The results of four hypotheses testing that test the effect of knowledge transfer on competitive advantage, the effect of knowledge transfer on MSMEs performance, the effect of competitive advantage on MSMEs performance, and the hypothesis that tests the mediating role of competitive advantage in explaining the effect of knowledge transfer on MSMEs performance are all supported. It means that the study results confirm the previous studies findings which were used as logical arguments to develop hypotheses in this study (Deschamps et al., 2013; Ratnawati, 2019; Apa et al., 2021; Ibidunni et al., 2020).

Through access to knowledge from universities regarding these matters, MSMEs can minimise and resolve the various internal problems they have been overcoming, in terms of human resources, operations, finance and marketing. For example, in the marketing aspect, the problem faced by MSMEs is the difficulty in marketing products, for this reason the transfer of knowledge related to understanding concepts and various marketing

strategies, especially digital marketing strategies, will really provide added value for MSMEs to increase their competitive advantage.

The hypothesis that tests the effect of knowledge transfer on MSME performance is supported and supports the previous studies findings, for example those conducted by Apa et al. (2021) and Ibidunni et al. (2020). The performance of MSMEs in this study is measured using several indicators such as sales growth, capital growth, annual increase in employees, market share growth and profit growth. Logically it can be explained as follows: MSMEs that collaborate with universities to gain access to knowledge and resources, such as experts or capital, will benefit more than MSMEs that have not collaborated with universities.

Like the example in the explanation of Hypothesis 1, access to knowledge possessed by MSMEs related to marketing, especially the transfer of knowledge regarding the implementation of digital marketing in MSMEs businesses will have a significant impact. For example, a comparison between MSMEs that market products conventionally in outlets or shops will only be able to reach the target market around the shop location. On the other hand, MSMEs that have adopted digital marketing and utilised e-commerce platforms will benefit in terms of expanding market share so that they can increase sales and sales capital which will ultimately increase the profitability of MSMEs and expand the business so that they can increase business opportunities.

The results of hypothesis testing the influence of competitive advantage on the performance of MSMEs are supported and confirmed the findings of previous studies conducted by Yuliantari and Pramuki (2022). It can be explained that MSMEs which have a competitive advantage, either through cost advantages or high differentiation advantages, will have a significant positive influence on their performance achievements. Competitive advantage in this case can be explained as the level of ability of an organisation or company to create a position in the long term through mastering competitive capabilities.

Competitive advantage is the main key to achieving better performance. For example, MSMEs have product advantages in terms of brand and quality which can make both a source of competitive advantage to strengthen competitiveness and increase the ability to survive in the long term through continuous performance improvement. The results of testing the fourth hypothesis regarding the mediating role of competitive advantage show that competitive advantage plays role as a partial mediating variable.

6 Conclusions

The results of this study indicate that digitisation, increasing market share, increasing profits through increasing productivity, business development, and funding issues are the aspects that receive the most important attention from respondents in this study related to interests, types, goals, motivations, outcomes, and obstacles in partnerships. universities and MSMEs. Mutual trust, commitment, and communication are the support systems that are considered the most important in developing partnerships between universities and MSMEs. Regarding the determinants of the success of the partnership between universities and MSMEs, most of the respondents answered that integrity, commitment, and trust were the most important factors.

Based on the results of hypothesis testing, it can be concluded that all hypotheses developed in this research were supported, including:

1 the effect of knowledge transfer on competitive advantage

2 the effect of knowledge transfer on MSME performance

3 the influence of competitive advantage on MSME performance

4 the mediating role of competitive advantage in explaining the influence of knowledge transfer on MSME performance.

7 Implications

7.1 Theoretical implication

1 This partnership is important to be developed as a platform to overcome problems that occur not only in the education also in universities as previously discussed so that the gap between education sector and the business sector can be minimised.

2 The results of this study enrich the strategic management literature in explaining the role of knowledge-based view theory to explain knowledge transfer activities from universities to industry in university-industry partnerships.

7.2 Practical implication

1 The results of the study on interests, types, goals, motivations, outcomes, and barriers to university and MSMEs partnerships in facilitating knowledge transfer activities from universities to MSMEs are expected to provide input for academics, MSMEs and the government as a basis for consideration in making decisions regarding the development of university and MSMEs partnerships.

2 Based on the results of the study, it shows that the transfer of knowledge from universities to MSMEs can increase the competitive advantage and performance of MSMEs, therefore MSMEs actors must be able to take advantage of opportunities to gain access to external knowledge to overcome the problem of limited resources and knowledge.

3 The results of the study show that competitive advantage plays a role as a partial mediation variable so that MSME actors must be aware and understand the importance of transferring knowledge and taking advantage of it through partnerships with universities to support competitive advantage and MSME performance.

7.3 Policy implication

1 Considering the importance of knowledge transfer from universities to MSMEs in solving MSMEs problems, the government is expected to further increase opportunities for collaboration between universities and MSMEs by providing grant funds both through research schemes and community service schemes.

2 To minimise the gap between higher education and MSMEs, the government can focus on increasing mastery of big data technology to overcome the competency gap between the higher education system and industry needs which still frequently occurs.

8 Limitations

The limitations of this study are: first, the research sample is quite small compared to the number of MSMEs in Indonesia due to difficulties in data collection, so the study results may not represent the overall characteristics of the MSMEs population in Indonesia. Second, the sample covers a variety of MSMEs business fields so the level of sample variability between industries is high and may result in bias in the study results.

Third, data collection and data analysis were only carried out from the MSMEs perspective, so the results did not cover the opinions of both parties involved in the research.

9 Suggestions

Future research should involve a larger sample size so that it can represent the characteristics of the MSMEs population in Indonesia. Considering that this research is a descriptive study and also testing some hypotheses can focus the study related to similar issues, for example, how the influence of knowledge transfer activities from universities to industry on the performance and competitiveness of MSMEs or what factors influence knowledge transfer activities from universities to MSMEs. Future research can also use age, size, or industry effects in testing knowledge transfer models from universities to MSMEs. Considering that this research only relies on the perspective of MSMEs without involving universities, in future research it is necessary to clarify each role so that research can be carried out to answer this question.

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