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The mediating role of knowledge sharing in the relationship between human capital, structural capital, spiritual capital, and MSMEs innovation

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ABSTRACT

Purpose — *This research aims to illuminate the influence of human capital, structural capital, and spiritual capital on innovation, mediated by knowledge sharing.*

Method — *This research employs a quantitative methodology. It involves gathering data through a questionnaire that utilizes convenience sampling, focusing on 200 MSME operators across Banyumas, Brebes, and Cilacap. The statistical analysis utilizes Partial Least Square Structural Equation Modeling (PLS-SEM).*

Result — *We found that human capital, structural capital, and spiritual capital directly impact innovation in MSMEs. Furthermore, we observe that knowledge sharing functions as a mediator in MSMEs innovation.*

Contribution — *The study extends previous research, adding knowledge sharing as a mediating variable to explore its role in the nexus among human capital, structural capital, spiritual capital, and MSMEs innovation.*

Keywords: *human capital, structural capital, knowledge sharing, MSMEs innovation*

INTRODUCTION

The onset of Industry 4.0 and the waves of globalization have ushered in a paradigm shift in market competition dynamics. Navigating the realm of competitive rivalry has prompted a heightened focus on human resource development among business entities. This is chiefly achieved through elevating employee skills and performance to cultivate optimal human resource quality. A superior human resource cadre catalyzes employee creativity and innovation (Pratama & Wibowo, 2017). In this context, robust and adequate human resource support underscores Indonesia's competitiveness in the global landscape. Faced with the challenges posed by global market dynamics within the national economy (Innayah et al., 2020), the government has unveiled strategic plans for navigating this landscape. These encompass institutional reforms, infrastructure enhancements, ACI (Aku Cinta Indonesia) programs, strengthening economic competitiveness, enhancing human resource quality, and bolstering the MSMEs sector. The Micro, Small, and Medium Enterprises (MSMEs) sector emerges as a pivotal player, contributing significantly to community economic advancement and national growth (Nengah et al., 2021). In 2022, according to data from ASEAN (2022), Indonesia boasts 65,465,500 MSMEs, constituting a remarkable 60.3% share of the country's Gross Domestic Product. Notably, these MSMEs presently account for 97% of the labor force, exemplifying their prowess in generating employment opportunities and raising societal standards (ASEAN, 2022).

In conclusion, the information presented about the three districts highlights the need for innovation among business operators to realize their existing business potential. Furthermore, local governments play a role in nurturing this potential by enhancing training and empowerment initiatives. These activities are designed to equip SME operators with the tools to improve their business quality. In a competitive business world, SMEs must create innovative products that distinguish them from their competitors. Achieving competitive advantages

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requires companies to deliver value and benefits to customers using available resources (Pratama et al., 2019). A company's innovation capacity relies on its intellectual resources, enabling adaptation to rapid market changes through new innovations. Integrating internal resources enhances an organization's innovation capabilities, contributing to its competitive advantage.

Hence, innovation stands as a pivotal and vital component for MSMEs to maintain and develop their businesses in a competitive environment. MSMEs implementing innovation strategies lead to innovative products or services, subsequently enhancing business quality and profitability (De Winne & Sels, 2010). To increase business productivity, MSMEs can make efforts in the form of investment in several factors that can affect the results of innovation. Factors influencing the dependent variable of innovation include human capital, structural capital, spiritual capital, and knowledge sharing.

The first factor influencing product innovation is human resources. Resource-Based Theory argues that how humans allocate their time to various activities will affect productivity (Mahoney & Pandian, 1992; Penrose, 1959). Human capital seeks to explain education, training, and skills acquisition as forms of investment in human resources (Pratama et al., 2022). Research conducted by Basri et al. (2021), De Winne & Sels (2010), Latifah et al. (2022), Leitner (2015), and van Uden et al. (2017) explains that human capital has a significant and positive influence on innovation because higher-quality human capital has a positive impact on the quality of innovation obtained. Employees with high-quality skills, knowledge, motivation, and experience tend to produce better innovation and creativity. However, research by Hayton (2005) presents contrasting results, stating that human capital has a negative influence on innovation. This may occur because experienced managerial-level employees are often reluctant to adopt new or unconventional strategies to avoid risks. Meanwhile, research conducted by Alpkan et al. (2010) concluded that human capital has no significant influence on innovation.

The second factor is structural capital. According to resource-based theory, resources may include non-human knowledge, such as databases, information systems, procedures, networks, patents, and intellectual property rights (Beltramino et al., 2020; Robert, 1980; Wernerfelt, 1984). To achieve good organizational performance and foster innovative practices, systems, databases, procedures, ethics, and integrity are essential (Khalique et al., 2018). Studies by Alqershi et al. (2019) and Beltramino et al. (2020) have found that structural capital has a positive impact on a company's innovation by enhancing company performance and competitiveness. Factors of structural capital, such as integrated knowledge management, internal and external information acquisition with advanced technology, can yield new insights that improve product or service design, drive new product innovations, enhance business reputation, and streamline internal processes. However, research by Leitner (2015) found that structural capital can have a negative influence on innovation. This negative impact can result from employee turnover not meeting expectations each period. Additionally, structural capital encompasses databases, patents, and accumulated knowledge stored by companies that may not directly affect innovation (Zhang & Lv, 2015).

The third factor influencing innovation is spiritual capital. Resource-Based Theory argues that unique resources within a company include the work attitudes of employees in performing their jobs (Verter, 2003; Wernerfelt, 1984). Applying spirituality in the work environment can enhance employees' understanding of honesty, respect, trust, integrity, and responsibility (Daniel, 2010). These spiritual components can improve the quality and motivation of employees at work, enabling them to generate new creativity and innovation as a contribution to their work (Campuzano & Seteroff, 2012). Research conducted by Neubert et al. (2017) and Yang (2022) found a positive influence of spiritual capital on innovation. Spiritual capital is considered one of the most vital components of intellectual capital, as it encompasses faith, inner strength, values, emotional energy, and self-learning (Bontis et al., 2020). Spirituality is linked to the work attitudes of employees who are sincere, honest, and have a positive relationship with their work based on their respective beliefs (Afsar & Rehman, 2015).

To optimize human capital, structural capital, and spiritual capital in enhancing MSMEs innovation, another crucial resource is needed: knowledge sharing. Knowledge sharing not only facilitates the transfer of information, experience, skills, and knowledge but also fosters efficiency and business solutions to achieve a competitive advantage (Reid, 2003; Wang et al., 2014). Knowledge sharing offers employees opportunities to access information by utilizing knowledge networks that can be applied on the job. Implementation at work can take the form of contributing knowledge to enhance product or service quality through continuous innovation or creativity (Lin, 2007). Integrating knowledge sharing into business operations promotes innovation, leading to new ideas and business opportunities (Leiponen, 2006).

This study builds on previous research by introducing knowledge sharing as a mediating variable to investigate the nexus among human capital, structural capital, spiritual capital, and MSMEs innovation. The research focuses on MSMEs located in Banyumas, Brebes, and Cilacap. The growth of MSMEs significantly contributes to Indonesia's economy. The Indonesian government, in collaboration with the Ministry of Cooperatives and SMEs, has taken steps to enhance MSMEs' financial literacy and human resources. This study is essential for addressing the challenges faced by MSMEs, such as human resource quality, employee ethics, and innovation strategies, to achieve internal stability.

METHOD

This research uses a quantitative approach which involves conducting a scientific study to examine phenomena, collect and analyze data, and present research results in the form of quantitative figures (Indriantoro et al., 2016). The research method employed is a survey, where we distributed a Google Form questionnaire to MSMEs operators in Banyumas, Brebes, and Cilacap. We gathered responses from a total of 200 MSMEs operators. We selected the sample from MSME operators in Central Java and categorized them based on annual income as defined in Article 6 of the MSMEs Law. Micro Enterprises have an income of less than IDR 50,000,000, Small Enterprises have an income of IDR 50,000,000 to IDR 500,000,000, and Medium Enterprises have an income of more than IDR 500,000,000 up to IDR 10,000,000,000. This study involved collecting primary data directly from respondents through the questionnaire, which served as our main source for data processing and analysis. Respondents indicated their level of agreement using a 5-point Likert scale, with a value of 5 for "Strongly Agree" (SA), 4 for "Agree" (A), 3 for "Neutral" (N), 2 for "Disagree" (D), and 1 for "Strongly Disagree" (SD). The sample size was determined using the Slovin technique, as outlined by Slovin (1960), resulting in the use of 100 samples.

The data analysis employs PLS-SEM (Partial Least Squares Structural Equation Modeling) using SmartPLS 3 to test a hypothesis (Rasoolimanesh et al., 2018). The PLS algorithm is executed through bootstrapping, which involves analyzing loading values, significance levels, and path coefficients to assess validity and reliability. The PLS-SEM analysis in SmartPLS 3 comprises stages such as assessing validity and reliability through the measurement model (outer model) and evaluating causality or hypothesis testing through the structural model (inner model).

Hypotheses development

Human capital on innovation

According to the Resource-Based Theory (RBT), the value and condition of a company are determined by resources that possess rarity, are difficult to imitate, and lack substitutability (Barney, 2001). High-quality and skilled human capital is a crucial factor in developing new knowledge and assisting companies in adopting that knowledge. Thus, human capital acts as a driving force for innovation and supports the company's ability to absorb new knowledge (van Uden et al., 2017). From the perspective of (Capozza & Divella, 2019), companies need to invest in human capital by hiring highly educated employees and experienced managers, and by implementing strategic human resource practices aimed at developing the skills and technical

competencies of employees to optimize innovation development. Impact of human capital on innovation, as superior human resource practices such as knowledge, experience, skills, and motivation can enhance creativity that leads to innovation in MSMEs.

Hypothesis H1: Human capital has a positive influence on innovation

Structural capital on innovation

According to the Resource-Based Theory, company resources encompass systems, structures, supervision, and control (Wernerfelt, 1984). In this context, structural capital is considered integrated knowledge within the information system, including databases, information technology, procedures, and systems used for the output of knowledge conversion and intellectual wealth (Pratama & Innayah, 2021). This knowledge and intellectual wealth are utilized by employees to enhance innovation and are integrated with the available database system. The resulting innovations have an impact on business sustainability (Asiaei et al., 2018). Structural capital enhances company performance and competitiveness, resulting in an influence on innovation. Achieving collective innovation necessitates the support of information systems to fulfill MSMEs goals.

H2: Structural capital has a positive influence on innovation

Spiritual capital on innovation

Within the Resource-Based Theory literature, spiritual resources involve diverse forms of resources within the company through a set of heterogeneous resources available in the organization (Robert, 1980; Wernerfelt, 1984). Workplace-developed spiritual values foster sincere intentions and work motivation (Pratama et al., 2022). Entrepreneurs utilize these values to cultivate employee mindsets, leading to sustainable innovation (Sholikhah et al., 2019). Sustainable innovations, which arise from the distinctive patterns of faith among employees, can enhance the quality of business innovation (Jufri et al., 2021). Spiritual values can generate emotional tranquility within individuals, enabling stable mental attitudes and behaviors that positively influence creativity for innovation.

H3: Spiritual capital has a positive influence on innovation

Knowledge sharing on innovation

The Resource-Based Theory is closely linked to a company's ability to process the development of resources, knowledge, and insights from individuals' experiences within the organization (Wernerfelt, 1984). Knowledge sharing is vital in knowledge management, recognized to enhance competitiveness and organizational performance (Yeşil & Hirlak, 2013). Through knowledge sharing, the quality of employee knowledge increases, leading to the creation of novel processes or products that drive sustainable innovation. Innovation stemming from knowledge sharing results in high-quality innovation, enhancing organizational or company performance (Azadehdel et al., 2013). Knowledge sharing assists entrepreneurs in addressing business issues and generating quality innovations.

H4: Knowledge sharing has a positive influence on innovation

Knowledge sharing as the mediator on the influence of human capital, structural capital, and spiritual capital on innovation

Individual behavior is influenced by social interactions and individual cognitive processes, so individuals who lack confidence in sharing knowledge are unlikely to share it (Chiu et al., 2006). Human capital factors play a crucial role in the knowledge-sharing process. Through knowledge

sharing, increased employee loyalty towards SMEs enhanced self-confidence, and intentions to share knowledge lead to increased creativity in generating innovation (Latifah et al., 2022). Higher levels of knowledge sharing correspond to greater levels of innovation. Employee knowledge is useless when retained within individuals; therefore, sharing knowledge allows employees to combine ideas, facts, perspectives, and information as sources for creating innovations. Thus, knowledge sharing mediates the influence of human capital on innovation.

Knowledge sharing primarily focuses on the process of gathering and disseminating knowledge, contributing to knowledge exchange, application, and creation (Wang et al., 2014). Various forms of knowledge provide benefits by speeding up project completion, reducing production costs, and enhancing decision-making coordination, and innovation capabilities (Chen et al., 2017). Data-based systems and information technology create strong reciprocal relationships between employees, facilitating the collection and sharing of knowledge and leading to diverse innovations. Therefore, knowledge sharing mediates the relationship between structural capital and innovation.

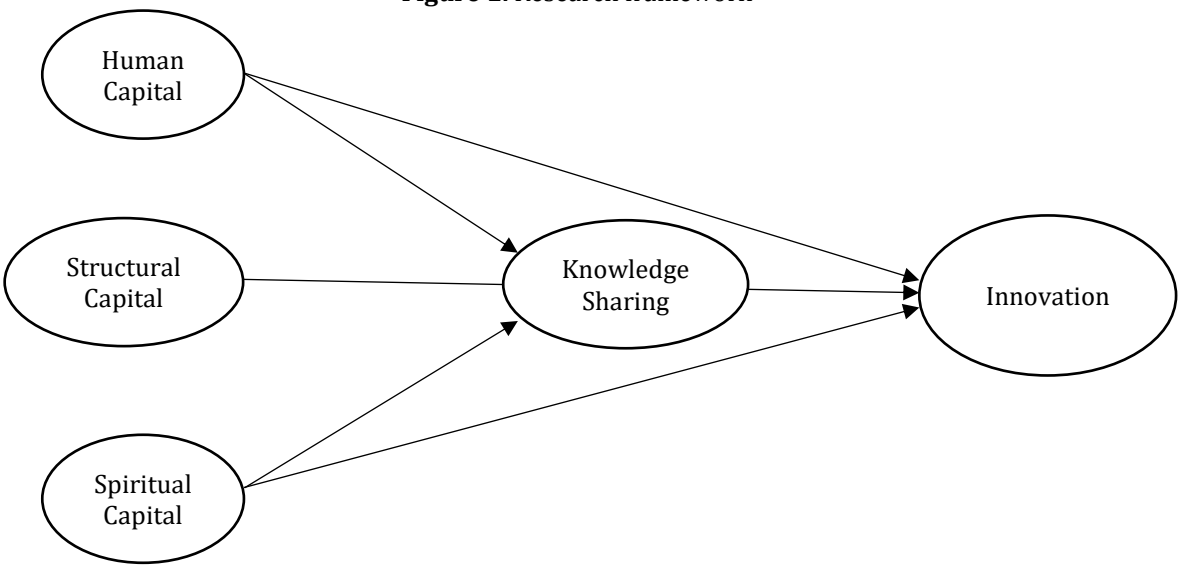
Knowledge sharing prompts individuals to share innovative ideas, enhancing organizational creativity (Ipe, 2003). Knowledge sharing has a positive impact on workplace spirituality, fostering a sense of togetherness and meaningfulness at work. Knowledge sharing influences spiritual capital due to improved employee relations and workplace connections, promoting employee creativity for innovation. In conclusion, knowledge sharing mediates the relationship between spiritual capital and innovation.

H5: Knowledge sharing mediates the influence of human capital on innovation

H6: Knowledge sharing mediates the influence of structural capital on innovation

H7: Knowledge sharing mediates the influence of spiritual capital on innovation

Figure 1. Research framework



Source: Modified by the authors (2023)

RESULT AND DISCUSSION

Demographic of respondents

The respondents in this study are entrepreneurs of Micro, Small, and Medium Enterprises (MSMEs) residing in Banyumas, Brebes, and Cilacap. A total of 200 questionnaires were successfully collected. The gathered data provide information about the characteristics of the respondents, including gender, age, religion, region, years of business seniority, criteria, ownership structure, and type of business. Descriptive statistics for the respondents can be found in Table 1.

Table 1. Demographic of respondents

Respondents	Categories	Frequency	Percentage
Gender	Male	104	52%
	Female	96	48%
Age	19-28	35	17,5%
	29-38	54	27%
	39-48	54	27%
	49-59	49	24,5%
	60-87	8	4%
Religion	Islam	198	99%
	Confucian	1	0,5%
	Christian Protestant	1	0,5%
Region	Banyumas	133	66,5%
	Brebes	34	17%
	Cilacap	33	16,5%
The Seniority of the business (year)	<2 Years	43	21,5%
	2-6 Years	94	47%
	7-11 Years	33	16,5%
	12-16 Years	11	5,5%
	18-23 Years	9	4,5%
	24-55 Years	10	5%
Criteria	Micro	124	62%
	Small	60	30%
	Medium	16	8%
Ownership types	Personal Business	170	85%
	Family Business	25	12,5%
	Limited Partnership	4	2%
	Limited Liability Company	1	0,5%
Type Of business	Food	88	44%
	Fashion	16	8%
	Service	29	14,5%
	Craft	5	2,5%
	Livestock Farming	1	0,5%
	Store	61	30,5%

Source: Processed data (2023)

Convergent validity

Convergent validity assesses the correlation between constructs and highly correlated latent variables. A convergent validity value, represented by the loading factor in latent variables, is considered ideal when it exceeds 0.7. In such cases, the indicators are valid (Hair et al., 2013). All

indicator variables in this study have correlation values greater than 0.7, supporting the conclusion that these indicators can be reliably used as measurement tools.

Discriminant validity

Discriminant validity pertains to the capacity to accurately differentiate one construct from another and assesses the degree of variation between constructs and their associated indicators. A threshold value of 0.5 for the Average Variance Extracted (AVE) is considered an indicator of reliability (Chin et al., 1998).

Table 2. AVE for discriminant validity

Latent constructs	AVE
Human Capital	0.791
Innovation Capability	0.791
Knowledge Sharing	0.819
Spiritual Capital	0.790
Structural Capital	0.789

Source: Processed data (2023)

Table 2 displays the values of composite reliability and average variance extracted (AVE). According to Ghozali et al. (2015), to satisfy the criteria for convergent validity, the average variance extracted (AVE) should be > 0.5 to meet the reliability requirements. From the table above, it can be concluded that the study's model has met these requirements.

Composite reliability

The composite reliability test is conducted to assess the extent to which research variables have reliable reliability. Composite reliability with a value above 0.7 is considered reliable. Based on the data in the table below, the values for human capital, structural capital, spiritual capital, knowledge sharing, and innovation are greater than 0.7, indicating that these variables are reliable.

Table 3. Composite reliability test

Latent constructs	Composite reliability
Human Capital	0.980
Innovation Capability	0.986
Knowledge Sharing	0.948
Spiritual Capital	0.976
Structural Capital	0.980

Source: Processed data (2023)

Model structure analysis

Bootstrapping is employed with 200 data points and 500 samples to standardize the data and examine the significance of the statistical coefficients of the path. The results of the significance test of path coefficients for each variable are presented in Table 4 & 5.

Table 4. Direct effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decision
Human Capital -> Innovation Capability (H1)	0.323	0.319	0.065	4.985	0.000	Accepted
Structural Capital -> Innovation Capability (H2)	0.233	0.235	0.058	4.050	0.000	Accepted
Spiritual Capital -> Innovation Capability (H3)	0.246	0.246	0.056	4.399	0.000	Accepted
Knowledge Sharing -> Innovation Capability (H4)	0.200	0.201	0.045	4.472	0.000	Accepted

Source: Processed data (2023)

Table 5. Indirect effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decision
Human Capital -> Knowledge Sharing -> Innovation Capability (H5)	0.085	0.085	0.030	2.826	0.005	Accepted
Structural Capital -> Knowledge Sharing -> Innovation Capability (H6)	0.047	0.046	0.023	2.090	0.037	Accepted
Spiritual Capital -> Knowledge Sharing -> Innovation Capability (H7)	0.062	0.065	0.028	2.252	0.025	Accepted

Source: Processed data (2023)

Hypotheses are considered significant if P-values < 0.05 (Ghozali et al., 2015). Positive directional relationships have positive original sample values (O), while negative directional hypotheses have negative original values (O).

Discussion

Influence of human capital, structural capital, spiritual capital, and knowledge sharing on innovation

Bootstrapping results in Table 4 provide insights into the influences of various forms of capital on innovation. For human capital, a P-value of 0.000 with an original sample (O) value of 0.323 suggests a positive and significant influence on innovation. This aligns with the resource-based theory (RBT), emphasizing the pivotal role of resources in achieving competitive advantage. Effective management of human capital is crucial for driving innovation and business sustainability, echoing the findings of previous studies by Latifah et al (2022), Basri et al. (2021), van Uden et al. (2017), and De Winne & Sels (2010).

Structural capital, with a P-value of 0.000 and an O-value of 0.233, similarly demonstrates a positive and significant influence on innovation, in line with RBT. Effective asset management can create a competitive edge, and well-developed structures and systems facilitate employee innovation, aligning with prior research by Beltramino et al. (2020) and Alqershi et al. (2019).

Spiritual capital, with a P-value of 0.000 and an O-value of 0.246, positively influences innovation. Implementing sustainable innovation is essential for market competitiveness. Spiritual capital practices motivate individuals, fostering self-confidence and creative insights, corroborating the work of Neubert et al. (2017) and Yang (2022).

Knowledge sharing, with a P-value of 0.000 and an O-value of 0.200, exhibits a positive and significant influence on innovation. According to RBT, resources are vital for enhancing organizational performance and maintaining a competitive advantage. Knowledge sharing enhances creativity, promoting the exploration of processes and products for continuous innovation, ultimately enhancing the competitive advantage and performance of MSMEs.

Knowledge sharing as the mediator on the influence of human capital, structural capital, and spiritual capital on innovation

In Table 5, the bootstrapping results reveal the impact of different capital types on innovation with knowledge sharing as a mediating variable. For human capital, the P-Value is 0.005, with an original sample (O) value of 0.085. The positive direction of the original sample (O) is determined through direct effects analysis using PLS. These findings suggest that knowledge sharing partially mediates the influence of human capital on innovation. Effective management of human capital can drive innovation through the sharing of knowledge among individuals.

For structural capital, the P-Value is 0.047, with an original sample (O) value of 0.047. Once again, the positive direction of the original sample (O) is determined through direct effects analysis using PLS. These results imply that knowledge sharing also partially mediates the influence of structural capital on innovation. Structural capital, serving as the engine behind a company's capabilities and resources, directly influences the innovative capacity of employees, thanks to the support provided by information systems used for sharing knowledge to achieve business goals.

Lastly, in the context of spiritual capital, the P-Value is 0.025, with an original sample (O) value of 0.062. The positive direction of the original sample (O) is determined by the direct effects analysis using PLS, leading to the conclusion that knowledge sharing partially mediates the influence of spiritual capital on innovation. The spiritual culture in the workplace can positively influence employees' attitudes and mindsets, fostering new creativity that supports innovation through existing knowledge and skills while adhering to existing spiritual values.

CONCLUSION

In summary, this study found that human capital, structural capital, spiritual capital, knowledge sharing, and innovation capability significantly contribute to the success of MSMEs in Banyumas, Brebes, and Cilacap. These factors play a crucial role in driving innovation, expanding market reach, and improving overall competitiveness. In essence, this research underscores the vital role of human, structural, and spiritual capital, along with effective knowledge sharing, in driving innovation and success for MSMEs. These findings offer valuable insights for MSMEs owners seeking to thrive in the dynamic landscape of modern business.

Regarding practical implications, MSMEs owners should focus on enhancing their human capital through skill development and knowledge-sharing initiatives. Optimizing structural resources and integrating spiritual values in the workplace can further bolster innovation. Strengthening knowledge-sharing practices among employees is essential for sustained innovation.

For future research, including control variables in the study design could provide a more comprehensive understanding of the relationships explored. Expanding the geographical scope of respondents and investigating a wider array of variables would enhance the study's applicability and depth.

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