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Social Media as a Tool to Facilitate Human Capital Relations to Open Innovation and Business Performance

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Abstract. *Companies increasingly leverage social media tools to access knowledge from external actors, particularly customers and other users, to facilitate innovation processes and corporate performance. Little empirical research has investigated the impact of external knowledge sourced through social media. This research aims to analyze the influence of human capital on open innovation and business performance through social media. This research was conducted on MSMEs in Padang City, West Sumatra, Indonesia. The sample was 200 MSMEs in Padang City. The sampling technique is purposive sampling. The quantitative method is then processed and analyzed using Structural Equation Modeling (SEM) data analysis techniques with smartPLS. This research examines how external knowledge flows of human capital sourced from social media influence open innovation and business performance. The findings in this research are that there is a positive and significant influence between human capital on business performance, human capital on open innovation, human capital on social media, and social media on open innovation. On the other hand, social media does not have a positive or significant influence on business performance. This research also shows the role of social media as a mediator of the positive and significant relationship between human capital and open innovation. Meanwhile, social media fails to mediate the relationship between human capital and company performance. Overall, these findings underscore the importance of human capital in enhancing open innovation through social media, thereby impacting firm performance.*

Keywords: *Human capital, social media, open innovation, business performance*

Abstrak. *Perusahaan semakin memanfaatkan alat media sosial untuk mengakses pengetahuan dari pelaku eksternal, khususnya pelanggan dan pengguna lainnya, untuk memfasilitasi proses inovasi dan kinerja perusahaan. Sedikit penelitian empiris yang menyelidiki dampak pengetahuan eksternal yang bersumber melalui media sosial. Penelitian ini bertujuan untuk menganalisis pengaruh modal manusia terhadap inovasi terbuka dan kinerja bisnis melalui media sosial. Penelitian ini dilakukan pada pelaku UMKM di Kota Padang, Sumatera Barat, Indonesia. Sampelnya adalah 200 pelaku UMKM di Kota Padang. Teknik penentuan sampel adalah purposive sampling. Metode yang digunakan adalah kuantitatif, kemudian diolah dan dianalisis menggunakan teknik analisis data Structural Equation Modeling (SEM) dengan smartPLS. Penelitian ini mengkaji bagaimana aliran pengetahuan eksternal dari modal manusia yang bersumber dari media sosial mempengaruhi inovasi terbuka dan kinerja bisnis. Temuan dalam penelitian ini adalah adanya pengaruh positif dan signifikan antara human capital terhadap kinerja bisnis, human capital terhadap open Innovation, human capital pada media sosial, dan media sosial terhadap open Innovation. Sebaliknya media sosial tidak mempunyai pengaruh positif atau signifikan terhadap kinerja bisnis. Penelitian ini juga menunjukkan peran media sosial sebagai mediator hubungan positif dan signifikan antara modal manusia dan inovasi terbuka. Sementara itu, media sosial gagal memediasi hubungan antara modal manusia dan kinerja perusahaan. Secara keseluruhan, temuan ini menggarisbawahi pentingnya modal manusia dalam meningkatkan inovasi terbuka melalui media sosial, sehingga berdampak pada kinerja perusahaan.*

Kata kunci: *Modal manusia, media sosial, inovasi terbuka, kinerja bisnis*

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Introduction

In recent years, social media has attracted significant attention, with its applications extending beyond personal use, as more and more companies and institutions in the public sector, educational sector, and commercial sectors adopt social media for a variety of purposes (Corral de Zubielqui et al., 2019). However, more empirical research is needed to investigate the impact of external knowledge sourced through social media (Corral de Zubielqui et al., 2019). A key trend in recent literature is the use of social media for internal and external organizational users to communicate and collaborate on innovation (Ooms et al., 2015). Social media refers to a group of Internet-based applications built on the ideological and technological foundations of Web 2.0 and the exchange of user-generated content (Kaplan & Haenlein, 2010).

Meanwhile, the social media phenomenon has recently attracted the attention of practitioners and academics (Papagiannidis & Bourlakis, 2015); there needs to be more research examining the impact of these new tools on innovation and business performance (Roberts & Candi, 2014). In the contemporary business environment, capturing, analyzing, and disseminating corporate knowledge is a knowledge management activity that has the potential to explain a large part of corporate performance. Using social media for business activities (i.e., outside of marketing) is a new corporate phenomenon, and understanding the field of Information Systems (IS) is at an early stage (Benitez et al., 2018). The use of social media is a necessity in searching for information systems today. Social media can provide additional customer and industry data for change digital information becomes knowledge for innovation. If companies manage social media appropriately, it can become a source of gold data integrated rationally and can provide a complement to the exploration and exploitation of knowledge to achieve better innovation (Benitez et al., 2018).

However, the reality is that the use of social media among MSMEs in Padang City is less effective because business people spend a lot of unproductive time on social media. Apart from that, many business people do not understand the existing social media features, so they do not understand marketing strategies on social media.

The innovation process requires the integration of internal and external knowledge obtained from inside and outside the organization (Papa et al., 2018). The open innovation approach makes MSMEs constrained by limited resources in searching, collecting and absorbing knowledge from the external environment '(Scuotto et al., 2017a). The development of information technology provides opportunities for business actors to use it to innovate, one of which is through social media networks. Business actors can establish reciprocal social relationships through social media to build relationships, trust, norms and networks (Pratono, 2018). Social media networks are open-source online platforms based on individual and collective dyadic ties (Latifah et al., 2022). In this way, business actors can search for and transfer knowledge by involving various users without geographic and organizational limitations. Open innovation has emerged recently '(Anshari, M.; Almunawar, 2021; Dahlander, L.; Wallin, 2020; Latifah et al., 2022). Open Innovation (OI) is seen as a paradigm shift emerging in many innovative organizations where the process of creating innovation occurs internally and from external knowledge access and integration (Rumanti, 2021). The field of open innovation (OI) has experienced a major increase in scholarly attention, leading to important insights into how firms use knowledge inflows to accelerate internal innovation and knowledge outflows to expand markets for external use of innovation (Chesbrough & Crowther, 2006).

Companies seek to adopt open innovation (OI) to improve company performance (Singh et al., 2021). Previous research argues for the importance of open innovation studies

(Anshari, M.; Almunawar, 2021; Usman, 2018; Yun et al., 2019). Open innovation models are most often studied in the case of large high-tech companies based on case studies and conceptual frameworks (Chabbouh & Boujelbene, 2020; Chesbrough & Crowther, 2006). However, this does not mean that micro, small and medium enterprises (MSMEs) do not carry out open innovation (Bogers et al., 2018; Chabbouh & Boujelbene, 2020; Radziwon & Bogers, 2019; West & Bogers, 2017). The level of openness of MSMEs, whose resources and capacities are different from those of large companies, still needs to be represented and receive more attention (Chabbouh & Boujelbene, 2020; Pop et al., 2018). The proximity of MSMEs to external resources has always been an important factor in the success of an effective and efficient innovation strategy, not only to overcome obstacles in the process but also to get inspiration from new ideas from external parties (Gama et al., 2019). It is concluded that OI is a successful strategy for MSMEs, considering their unique characteristics of insufficient resources and flexibility.

Based on the literature review, the relationship between open innovation activities and performance is considered important (Chabbouh & Boujelbene, 2020; Dahlander, L.; Wallin, 2020; Torchia, M., & Calabro, 2019). A study conducted by (Clauss et al., 2020) shows that companies achieve performance when implementing an entirely new business model reflected in a new configuration of three business model components: value creation, value proposition, and value capture (Bogers et al., 2018; West & Bogers, 2017). However, research investigating the relationship between open innovation models and performance in MSMEs still needs to be conducted (Chabbouh & Boujelbene, 2020; Ebersberger, 2021; Popa et al., 2017). Previous research results show that innovation has a significant effect on performance "–'(Rauter et al., 2018; Fonseca et al., 2019; Kijkasiwat & Phuensane, 2020; Latifah et al., 2021; Latifah, 2022). Companies with more innovation will have better performance levels. Thus, companies expend more resources to improve innovation capabilities and drive better performance. In line with the research results (Popa et al., 2017), most previous research on the effectiveness of open innovation shows the positive impact of open practices on company performance in various measures.

The Resource-Based View (RBV) theory states that unique and rare resources become a competitive advantage for companies (J. Barney, 1991; J. B. Barney, 2001). These resources include human capital, knowledge, skills, or abilities of employees in the organization (Schultz, 1961). Organizational knowledge comes from human capital, while the creation of innovation comes from that knowledge. If an organization develops its human capital, including knowledge, skills related to creativity, and the development of new ideas, innovation will be created (Ouedraogo & Koffi, 2018). In this digital era, social media in various forms has created a context for entrepreneurial activities and new businesses by providing a space for sharing information and knowledge as well as providing opportunities to increase innovation and economic growth and its impact on improving business performance.

In this digital era, social media in its various forms has created a context for entrepreneurial activities and new businesses by providing a space for sharing information and knowledge as well as opportunities to increase innovation and economic growth, especially in the creative industries '(Ebrahimi et al., 2021). Therefore, open innovation is a mechanism to support the growth of MSMEs in Indonesia. According to research findings conducted by (Corral de Zubielqui et al., 2019) when companies use social media to gain knowledge from market-based actors, they realize the full potential of interactions carried out in the form of innovation when human capital can be managed well. Social media does not replace traditional knowledge-sourcing methods, especially business actors' contact with customers or suppliers. But social media can complement these traditional channels at least

in cases where it is difficult to meet customers or suppliers in person or to maintain personal customer contact. Thus this research contributes to recent research that addresses the issue of under what circumstances social media contributes to corporate innovation and business performance (Corral de Zubielqui et al., 2019).

Based on the analysis above, this research focuses on the role of social media in mediating the relationship between human capital and open innovation and business performance in MSMEs in Padang City. This is interesting because developing countries face more challenges in the field of information technology than developed countries. However, social media users in developing countries spend more time than in developed countries. This provides an opportunity for companies to explore social media. Social media use in Indonesia has continued to grow over the past few years, and new platforms continue to emerge. Social media is having an increasing influence on communications between businesses, organizations and individuals. Therefore, it is not surprising that social media use is very prevalent in Indonesia, an archipelago consisting of hundreds of islands, each of which has its own distinct culture, language, traditions and dialects.

Based on data from Social Media Statistics of Indonesia in 2024 (theglobalstatistics.com, 2024) in Indonesia, the number of Internet users increased to 204.7 million. When compared to the previous year, there was an increase of 2.1 million (+1.0 per cent). Indonesian people have utilized social media in ways that have never been done before. The internet penetration rate in Indonesia is 73.7 per cent. The average Indonesian spends 3 hours 17 minutes every day on social media. As a result of widespread internet access, the number of social media users in Indonesia will increase to 191.4 million in 2024. In Indonesia, 68.9 per cent of the population uses social media. The number of active social media users will grow by 12.6 per cent in 2024, up 21 million compared to 2022.

In Indonesia, social media has now become one of the most important aspects of daily internet use. Social media functions as a platform for people to gather, discuss and express opinions. Therefore, social media can be put to good use by business people to absorb new information and knowledge from the external environment. Apart from that, MSMEs can also receive various input from partners, customers, suppliers and business partners via social media. Moreover, according to Business Insider, Indonesia has become one of the top 10 countries in 2024 that are most active on social media. Therefore, MSME players can use it for the progress of MSMEs, namely increasing innovation.

The Padang City Government is collaborating with MSME actors in Padang City in efforts to utilize digital media, especially social media through a series of trainings for MSME actors in Padang City. This is done to increase opportunities for extensive promotional interactions and increase the insight and knowledge of MSME players so that they can increase their creativity in using social media for innovation and promotion. Currently, Padang City has approximately 120,000 business actors operating in various sectors. Of this number, as many as 45,000 MSMEs are under the auspices of the Padang City Cooperatives and SMEs Service (Padang.go.id, 2024). Therefore, if business actors' knowledge management is utilized properly in utilizing social media effectively, it will increase the growth of MSMEs in Padang City in the future to innovate, and have an impact on improving business performance itself.

Literature Review and Hypothesis Development

Human Capital

The concept of human capital originated in the 1960s when economists (Schultz, 1961) And (Becker, 1962) formalized a theory called "human capital theory" in response to the great difficulty of accounting studies of economic growth to explain the thrust of the United States, they interpreted economic inequality in

terms of human capital as expertise, experience, knowledge and skills, which individuals have thanks to education and experience Work. The basic principle of human capital theory is that, in an organization, human capital is as valuable as all other resources used in the production process. The key component for business actors to survive and grow in a dynamic and competitive environment is innovation (Kim et al., 2021). The innovation process requires a lot of knowledge, experience, intelligence and education from human resources or human capital (Ali et al., 2021; Latifah et al., 2022). Generally, human capital is seen as the most fundamental knowledge asset in an organization. An organization will excel in innovation if it has a good understanding of the development of creativity in its resources. human resources and especially the role of human capital, as part of intellectual capital, to increase innovation (Ali et al., 2021; Chabbouh & Boujelbene, 2020; Fonseca et al., 2019; Latifah et al., 2022).

Meanwhile, the conflicting results are that there is no influence of human capital on innovation (Capozza & Divella, 2019). There are two types of knowledge, namely explicit knowledge and tacit knowledge. Explicit knowledge is knowledge that is easier to communicate, process, transmit, and store. Meanwhile, tacit knowledge is knowledge hidden within an individual that is more personal and difficult to communicate (AlQershi et al., 2021). Thus, this knowledge needs to be communicated to other employees so that it becomes company knowledge; thus, knowledge sharing plays an important role '(Latifah et al., 2022).

Social media

Kaplan and Haenlein '(Ahmad et al., 2019) define social media as a group of Internet-based applications built on the ideology and technological foundations of Web 2.0 that enable the creation and exchange of user-generated content. When used successfully, social media allows organizations to enhance several business activities. This can include, for example, relationships with trading partners, sharing information, and managing communications and logistics across the supply chain. Social media is considered more important for looking at the business and customer aspects of a business. Features of compatibility, relative advantage, entrepreneurial orientation, and ease of use of social media advertising have a positive impact on the use of social media by small and medium organizations, Chantinok et al. (Alraja et al., 2020).

Open Innovation

In a global and dynamic business environment, open innovation (OI) is expected to become one of the emerging paradigms for managing innovation activities in the future. This paradigm considers internal and external ideas and channels to be equally important for commercializing innovation activities (Sibhato, 2018). Many articles, special issues, books, and conferences have been devoted to this area (West & Bogers, 2017), proving the importance of a paradigm shift in managing the innovation process. Open innovation is defined as the systematic exploration, storage, and exploitation of knowledge within and outside organizational boundaries during the innovation process. Thus, open innovation is a broad concept that includes various dimensions.

Business Performance

Organizational performance is critical to the survival and success of a business (Rumanti et al., 2023). Every company tries to achieve good organizational performance to survive and compete with competitors. Performance measurement and analysis are very important to direct an organization to realize its strategic and operational goals. Organizational performance is information regarding the achievement of an organization's financial and non-financial goals (Taouab & Issor, 2019). The knowledge and abilities of a company's employees are included in its human capital. Increasing employee productivity will improve company performance. Increasing education provides a mitigating role in offering new and

innovative concepts to managers, thus having an impact on improving business performance, because a management team that masters scientific disciplines related to the company's business has a good and significant influence on the acquisition of business value and company development (Salehi & Zimon, 2021).

Hypothesis Development

Human Capital and Business Performance

Human capital is the tacit and explicit individual knowledge that employees possess and share with their organizations to create value. This includes an employee's experience, abilities, learning, or creative abilities, which can be enriched with formal training and education. This is useful in carrying out company activities, changing its actions, and improving business performance. Research findings (Chabbouh, 2021; Engelsberger et al., 2022; Sibhato, 2018) show that it is necessary to develop human capital to achieve business performance in MSMEs. The hypothesis developed is:

H1: Human capital has a positive and significant influence on business performance.

Human Capital and Open Innovation

Human capital is a set of knowledge, skills and abilities invested in the employees of a company (de Winne & Sels, 2010). Organizations can only create knowledge with individuals. Knowledge creation and innovation are processes by which tacit knowledge is internalized as part of organizational knowledge (Camelo-Ordaz et al., 2011). Research result (de Winne & Sels, 2010) shows that human capital is an important determinant of innovation. This is different from the results of Capozza and Divella's research (Capozza & Divella, 2019), (Hsu, 2007) shows that human capital has no direct effect on innovation. This shows the need for more consistency in research results regarding the influence of human capital on innovation. The hypothesis developed is:

H2: Human capital has a positive and significant influence on open innovation.

Human Capital And Social Media

Creative ideas and innovation are formed due to continuous interaction with the environment. Thus, social networks enable companies to exchange information, get problem-solving ideas, identify new opportunities, and discover new markets (Udimal et al., 2019). A lesson (Mosey & Wright, 2007) found that the owner's level of education and experience influenced the ability to develop a social network. A higher level of experience and education for entrepreneurs will lead to the development of more effective social networks. Current developments in information and technology provide opportunities for MSMEs to utilize social media to build networks. The open innovation trend supports more networking and ecosystem expansion through the Internet of Things, such as social media networks. The hypothesis developed is:

H3: Human capital has a positive and significant influence on social media.

Social Media and Business Performance

Social media, which emphasizes the importance of digital business strategy, is fundamentally changing the way we communicate, collaborate, consume and create. This medium has revolutionized the way organizations relate to markets and society, creating a new world of possibilities and challenges in all aspects of the company, from marketing and operations to finance and human resource management (Aral et al., 2013). Organizations are increasingly relying on social media to leverage knowledge resources beyond geographic boundaries and time constraints. However, more literature is needed that explains the systems and mechanisms through which social media can help organizations acquire, coordinate, and exploit internal and external knowledge resources to improve business performance. Research by (Corral de Zubielqui et al., 2019) shows that social media can improve business performance. The hypothesis developed is:

H4: Social media has a positive and significant influence on business performance.

Social Media and Open Innovation

The innovation process requires the integration of internal and external knowledge obtained from inside and outside the organization (Papa et al., 2018). The development of information technology provides opportunities for business actors to use it to innovate, one of which is through social media networks. MSME social media networks synthesize information and knowledge to create new knowledge and achieve innovation (Gubbins & Dooley, 2013).

The relevance of social media networks for innovation has been debated by several researchers previously (Papa et al., 2018). A study shows that social media has a positive effect on value creation, encouraging innovation. Meanwhile, other research (Scuotto et al., 2017b), which focuses more on social media networks, concludes that MSMEs that adopt social media networks can increase innovation and create new products. Previous research also shows the significant influence of social media on open innovation (Hitchen et al., 2017; Loukis et al., 2017). The hypothesis developed is:

H5: Social Media has a positive and significant influence on open innovation.

Human Capital, Social Media, Open Innovation and Business Performance

Social media encapsulates one of the most prominent human information behaviours that has rapidly evolved to create a new data-driven paradigm that uses data-intensive digital environments to communicate, assess collaboration, express opinions, and support decisions. Social media as an information asset is unique in the creation of shared value because it empowers individuals to actively express opinions in all aspects of interaction with external entities, regardless of recent research on the theoretical foundations of social media in open innovation. Networks enable SMEs to synthesize information and knowledge to create new knowledge and achieve innovation (Latifah et al., 2022).

A study conducted by (Clauss et al., 2020)shows that companies achieve performance when implementing an entirely new business model reflected in a new configuration of three business model components: value creation, value proposition, and value capture. Companies with more innovation will have better performance levels. Thus, companies expend more resources to improve innovation capabilities and drive better performance. In line with the research results (Popa et al., 2017), most previous research on the effectiveness of open innovation shows the positive impact of open practices on company performance in various measures. The hypothesis developed is:

H6: Social media mediates the relationship between human capital and business performance.

H7: Social media mediates the relationship between human capital and open innovation.

Research Methodology

This research analyzes the role of social media in mediating the relationship between human capital and open innovation and business performance with the research object being MSMEs in Padang City, West Sumatra. This research is aimed at MSMEs in Padang City. This research will use a quantitative approach with a questionnaire survey method. The questionnaire was addressed to MSMEs in Padang City. In this research, three analysis methods were carried out. First, all variables are searched for in existing literature. Some items were modified to fit the specific research context. All constructs were measured through responses on a five-point Likert scale (from 1 = strongly disagree to 5 = strongly agree); This scale is created in the questionnaire to measure respondents' responses"(Hair et al., 2019). Second, the suitability of the questionnaire (measuring instrument) with the measurement (reliability test) and the accuracy of the measuring instrument is tested with what is being measured (validity test). Third, for the needs of implementing the data processing process, this research uses data analysis techniques using the Partial Least Squares Structural Equations Modeling (PLS-SEM)

statistical technique, which is statistical software from the SmartPLS statistical tool. Finally, descriptive analysis was carried out to provide an overview of the increase in weight of the question items.

The population in this research is MSMEs in Padang City. Sampling was carried out using purposive sampling. Determination of the minimum size of SEM in research is based on (Hair et al., 2019)with the formula: (total indicators + total variables) x (5 to 10 times). The number of questionnaire items in this research was chosen to be multiplied by 10. So, the number of questionnaires for this research is 20 x 10, namely 200 respondents. Distributing questionnaires directly to business actors/UMKM owners with various types of business, namely food, beverage, fashion, automotive, agribusiness and beauty businesses. Statements from all the variables studied are included in this research questionnaire and are based on indicators that refer to previous research.

Results and Discussion

Results

Respondent Profile

Based on data from 200 respondents, it is summarized and presented in Table 1 below:

Table 1.
Respondent Characteristics

Respondent Characteristics	Frequency	Percentage (%)
Gender		
Man	78	39
Woman	122	61
Amount	200	100
Age of Business Owner		
< 20 years	8	4
21 – 30 years	92	46
31 – 40 years	64	32
41 – 50 years	27	13.5
> 50 years	9	4.5
Amount	200	100
Age of MSMEs		
< 2 years	59	29.5
25 years	91	45.5
> 5 years	50	25
Amount	200	100
Business Criteria		
Micro	85	42.5
Small	62	31
Medium	53	26.5
Amount	200	100

Table 1. Continued

Respondent Characteristics	Frequency	Percentage (%)
Type of business		
Food	79	39.5
Drink	42	21
Fashion	49	24.5
Automotive	17	8.5
Agribusiness	7	3.5
Beauty	6	3
Amount	200	100
Operating revenues		
≤ Rp. 500.000,-	12	6
Rp. 500.001 – Rp. 1.000.000,-	79	39.5
Rp. 1.000.001 – Rp. 2.000.000,-	72	36
≥ Rp. 2.000.000,-	37	18.5
Amount	200	100
Business Owner's Last Education		
Junior high school	13	6.5
High school seniors	140	70
Bachelor	47	23.5
Amount	200	100
Use of Social Media		
Instagram	100	50
WhatsApp	63	31.5
Facebook	23	11.5
TikTok	14	7
Amount	200	100

The majority of respondents in this study were women, namely 122 people (61%). The largest number of MSMEs in this study were aged 21 – 30 years, namely 92 people (46%); for MSMEs, the majority are aged 2 – 5 years, namely 91 people (45.5%). The criteria for MSMEs are dominated by micro-businesses with 85 people (42.5%), the largest number being food businesses with 79 people (39.7%).

Most of the respondents' business income was in the range of Rp. 500,000 – IDR 1,000,000,- as many as 79 people (39.5%), while the majority of MSME actors have high school education as many as 140 people (70%). As many as 100 MSMEs (50%) use Instagram social media the most.

Measurement Model

The following is a research framework model in the image figure 1.

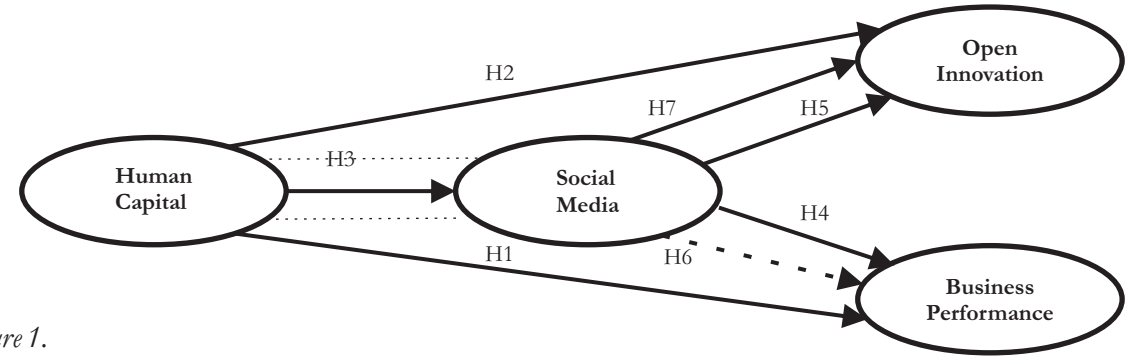

Figure 1.
Conceptual framework

Figure 1 shows a conceptual framework where human capital is (X), social media is the mediating variable (M), open innovation (Y1) and business performance (Y2).

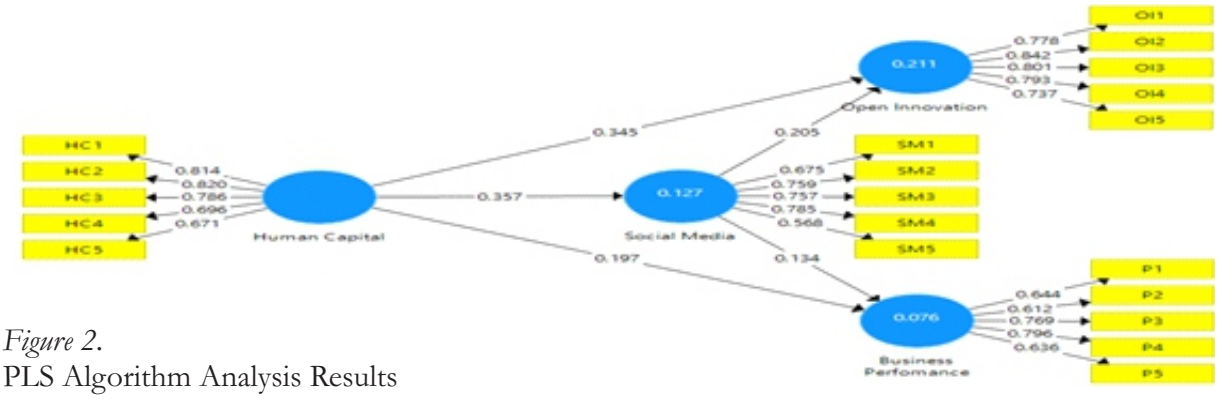

Figure 2.
PLS Algorithm Analysis Results

Table 2.
Convergent Validity Test Results

Variable	Instrument	Outer Loading	Information
Human Capital	HC1	0.814	Valid
	HC2	0.820	Valid
	HC3	0.786	Valid
	HC4	0.696	Valid
	HC5	0.671	Valid
Social Media	SM1	0.675	Valid
	SM2	0.759	Valid
	SM3	0.757	Valid
	SM4	0.785	Valid
	SM5	0.568	Valid
Open Innovation	OI1	0.778	Valid
	OI2	0.842	Valid
	OI3	0.801	Valid
	OI4	0.793	Valid
	OI5	0.737	Valid
Business Performance	BP1	0.644	Valid
	BP2	0.612	Valid
	BP3	0.769	Valid
	BP4	0.796	Valid
	BP5	0.636	Valid

Validity and reliability tests were carried out in this research. An individual indicator is said to be valid if the correlation value is greater than or equal to 0.50 (Ghozali, 2016). In Figure 2 and Table 2, it can be explained that many research variable indicators have outer loading values > 0.5. According to (Ghozali, 2016), an outer loading value > 0.5 is considered sufficient to meet the requirements for convergent validity so that all indicators are declared suitable or valid for use in research and can be used for further analysis.

Table 3.
Results of Item Discriminant Validity Test Based on Cross-Loading

	Human Capital	Social media	Open Innovation	Business Performance
HC1	0.814	0.341	0.450	0.180
HC2	0.820	0.251	0.355	0.089
HC3	0.786	0.210	0.313	0.116
HC4	0.696	0.232	0.058	0.152
HC5	0.671	0.183	0.130	0.204
SM1	0.191	0.675	0.114	0.054
SM2	0.204	0.759	0.144	0.093
SM3	0.219	0.757	0.143	0.013
SM4	0.264	0.785	0.231	0.051
SM5	0.227	0.568	0.359	0.161
OI1	0.324	0.271	0.778	0.190
OI2	0.369	0.329	0.842	0.299
OI3	0.325	0.152	0.801	0.227
OI4	0.236	0.286	0.793	0.178
OI5	0.382	0.291	0.737	0.218
BP1	0.040	0.166	0.105	0.644
BP2	0.013	0.048	0.106	0.612
BP3	0.175	0.136	0.282	0.769
BP4	0.203	0.088	0.254	0.796
BP5	0.018	0.003	0.115	0.636

Discriminant validity testing can be done by looking at the discriminant validity of measurement models with reflexive indicators, which are assessed based on the cross-loading of construct measurements. The results of the discriminant validity test are shown in Table 3.

From the results of the discriminant validity test, the correlation between the constructs of human capital, social media, open innovation and business performance with indicators is higher than the correlation between the indicators and other indicators. construction. These results show that each research variable that is built can predict indicators in its block better than in other blocks (Ghozali, 2016).

Table 4.
The Results Of The Discriminant Validity Test Using The Square Root Of Ave Can Be Seen In The Results Of The Fornell-larcker Criterion Test

Variable	Business Performance	Human Capital	Open Innovation	Social Media
Business Performance	0.695			
Human Capital	0.245	0.760		
Open Innovation	0.345	0.418	0.791	
Social media	0.204	0.357	0.328	0.713

Another way to assess discriminant validity is to compare the square root of the Average Variance Extracted (AVE) value of each construct with the correlation between one construct and other constructs in the model. The test results in Table 4 explain that the AVE value of the research variable is above 0.50.

Next, let's look at the AVE square root value of each construct, which consists of the AVE roots of the constructs of human capital, social media, open innovation, and business performance. This value was found to be greater than the correlation value between the construct and other constructs in the model, so the results have good discriminant validity (Ghozali, 2016).

Table 5.
Composite Reliability and Cronbach's Alpha

Variable	*Composite Reliability*	*Cronbach's Alpha*
Business Performance	0.822	0.745
Human Capital	0.872	0.822
Open Innovation	0.893	0.851
Social media	0.837	0.761

The results of research data processing for construct reliability were measured using composite reliability and Cronbach's alpha, seen in Table 5, where the results of data processing show that the composite reliability and Cronbach's alpha values for all constructs of business performance, human capital, open innovation and social media are more than 0.70.

These results show that all constructs in the research model that are estimated have met the reliability criteria. The construct is declared reliable if the Composite Reliability and Cronbach's alpha values are above 0.70 (Ghozali, 2016)

Table 6.
Results*Path Coefficient*

	Hypothesis	*Original Sample (O)*	*T statistics (|O/STDEV|)*	*P value*	*Information*
H1	Human Capital→Business Performance	0.197	2,459	0.014	Accepted
H2	Human Capital→Open Innovation	0.345	4,875	0,000	Accepted
H3	Human Capital→Social Media	0.357	5,189	0,000	Accepted
H4	Social Media→Business Performance	0.134	1,694	0.091	Rejected
H5	Social Media→Open Innovation	0.205	2,877	0.004	Accepted

The structural model in PLS is evaluated using R2 for the dependent variable and the path coefficient value for the independent variable, whose significance is then assessed based on the t-statistic value of each path. Table 6 presents the results of direct influence testing in the table above. It can be explained that the T-statistic value is > 1.96 and the level of significance is shown through P-valuesthe result is 0.000 < 0.0.5, then the results show that hypothesis 1, hypothesis 2, hypothesis 3 and H5 are accepted. Meanwhile, different results are found in hypothesis 4 with the results being rejected where the T-statistic value is <1.96 and the level of significance is shown through the results of the P-values.0.000 > 0.0.5.

Table 7.
Results Average, STDEV, T-value, P-value

	Hypothesis	*Sample Mean (M)*	*Standard Deviation (STDEV)*	*T statistics (|O/STDEV|)*	*P value*	**Information**
H6	Human Capital→Social media→Business Performance	0.049	0.029	1,649	0.100	Rejected
H7	Human Capital→Social media→Open Innovation	0.079	0.032	2,291	0.022	Accepted

Based on the results of the indirect influence test in Table 7, it can be explained that the T-statistic value is > 1.96, and the level of significance shown through the P-values is 0.000 < 0.0.5, so the results obtained show a significant influence. It can be explained that social media did not succeed in mediating the relationship between human capital and business performance, so hypothesis H6 was rejected. Meanwhile, social media succeeded in mediating the relationship between human capital and business performance so hypothesis H7 was accepted.

Hypothesis test

The results of testing hypothesis 1 (H1) show that human capital has a positive and significant influence on business performance in MSMEs in Padang City with a T-statistic test value > 1.96, namely 2.459 and the level of significance shown by the results of the P-value is 0.000 < 0, 05. The human capital path coefficient value is positive at 0.197. Thus, the human capital variable influences the performance of MSME businesses in Padang City. The better the human capital, the greater the performance of MSME businesses in Padang City. These results show that human capital is an important variable that is paid attention to by business actors and influences business performance for business actors in Padang City. MSMEs cannot create knowledge without individuals. Knowledge creation and innovation are processes by which tacit knowledge is internalized as part of organizational knowledge. Apart from that, companies with high human capital will find it easier to improve their business performance. Previous research shows the importance of intellectual capital in innovation and in particular the role of human capital as part of intellectual capital to improve business performance '(Corral de Zubielqui et al., 2019; Latifah et al., 2022).

The results of testing hypothesis 2 (H2) show that human capital has a positive and significant influence on open innovation in MSMEs in Padang City with a T-statistic test value > 1.96, namely 4.875 and a significance level indicated by P-values of 0.000 <0.05. The human capital path coefficient value has a positive sign of 0.345. Thus, the human capital variable influences openness to innovation among business actors in Padang City. The better the human resources, the more significant the increase in open innovation among MSMEs in Padang City. Innovation requires knowledge, experience, intelligence and education, human resources, or human capital. In general, human capital is viewed as an organization's most fundamental knowledge asset. An organization will excel in innovation if it has a good understanding of developing the creativity of its human resources. This research supports the results of previous research which shows that strategic human capital management has a significant effect on open innovation '(Engelsberger et al., 2022). Better human capital management practices provide a better environment for developing open innovation practices. strategic human capital, such as human capital, has a positive effect on open innovation.

In addition, top management knowledge as part of human capital has a positive effect on open innovation(Singh et al., 2021). The higher the knowledge, skills, experience and motivation of employees, the easier it will be for MSMEs owned by young entrepreneurs to foster creativity to produce innovation. The relationship between human capital and innovation can be seen from the perspective of the resource-based view theory which states that organizations must develop unique or rare organizational resources that cannot be imitated so that they become a valuable source of competitive advantage.

The results of testing hypothesis 3 (H3) show that human capital has a positive and significant influence on social media among Padang City business actors with a T-statistic test value > 1.96, namely 5.189 and a significance level indicated by P-values results of 0.000 < 0 .05. The human capital path coefficient value is positive at 0.357. Thus, the human capital variable influences the use of

social media among business actors in Padang City. The better the human resources, the greater the use of social media among MSMEs in Padang City. Human resources, namely business actors, if they have good knowledge and understanding of using social media, will make it easier for them to market products, innovate and interact with external parties to exchange information about various things, including business interests. This shows that MSMEs in Padang City use social networking sites to exchange information about various things, including business interests. More specifically, social media can be used to network with external parties such as customers, business partners and customers so they can absorb knowledge. human capital who have high knowledge and skills will be wise in utilizing social media networks to stimulate innovation through the processes of socialization, externalization and combination (Latifah, 2022).

In line with research (Corral de Zubielqui et al., 2019) stated that business actors who use social media for business purposes will make it easier for them to increase profits and high performance. Meanwhile, research results (Benitez et al., 2018)Using social media is a necessity today in the business world, because social media can provide additional customer and industry data to digitally transform information into knowledge for innovation.

The results of testing hypothesis 4 (H4) show that social media does not have a positive and significant influence on business performance in MSMEs in Padang City with a T-statistic test value < 1.96, namely 1.694, and the level of significance shown by the P-value is 0.000 > 0, 05. The knowledge-sharing path coefficient value is positive at 0.134. Thus, the variable use of social media by MSME actors does not affect the performance of MSMEs in Padang City. This indicates that MSMEs are less effective in utilizing social media for their business interests. Even though Indonesia is the country with the highest level of active use of social media in Asia (theglobalstatistics.com, 2024).

The lack of effective use of social media for MSMEs indicates that there are still many MSME actors who only use social media for personal interests and lack understanding of the features available on social media. Based on analysis Of the respondents in this study, many business people use Instagram social media, with a productive age range. Even though young entrepreneurs understand more about the use of social media, they only use social media as social media. Therefore, government efforts are needed to provide understanding and education to business actors so they can make maximum use of social media. This should provide opportunities for MSMEs to explore social media networks. MSME players tend not to use social media to collaborate in business relationships, communicate with partners and exchange information, which has an impact on business performance.

The results of testing hypothesis 5 (H5) show that social media has a positive and significant influence on open innovation in Padang City MSMEs with a T-statistics test value > 1.96, namely 2.877, and the level of significance is shown by the P-values results of 0.000 < 0 .05. The human capital path coefficient value is positive at 0.205. Thus, social media variables influence openness to innovation among business actors in Padang City. The better the use of social media, the more significant the increase in open innovation among MSMEs in Padang City. How business actors utilize information and technology, including social media, to share knowledge, exchange information and communicate with partners. Knowledge sharing allows knowledge possessed by individuals or groups from inside and outside the organization to be transferred to the organizational level to develop new products, services and processes to accelerate the innovation process.

Testing the indirect effect on hypotheses H6 and H7 shows different results. Where social media fails to mediate the relationship between human capital and business performance, hypothesis H6 is rejected, with T-statistic test values < 1.96, 1.649, and P-values 0.000 > 0.05.

Different results were obtained from hypothesis H7, where social media succeeded in mediating the relationship between human capital and open innovation, with a T-statistic value > 1.96, namely 2.291, and P-values 0.000 < 0.05, so hypothesis H7 was accepted. This shows that social media also provides a platform to interact more closely with customers and increase innovation capabilities. The role of social relations in conveying information through the media can cause changes in behaviour. Companies can use social media networks strategically to increase their capabilities and improve their business performance. More specifically, social media can be used to build relationships with external parties such as customers, suppliers and business partners so that they can absorb a lot of knowledge. Human capital who has good knowledge and skills will be wise in utilizing social media networks to stimulate innovation through socialization, externalization and combination processes.

Conclusion

This research examines the influence of human capital on open innovation and business performance. Furthermore, this research considers the role of social media as a mediating variable in the relationship between human capital on open innovation and business performance. Our research results show that human resources or human capital can improve open innovation and business performance. Apart from that, this research also found that social media does not affect business performance. Social media is also needed to mediate the relationship between human capital and business performance. The research results also contribute to understanding the role of human capital in innovation and the opportunities for using social media to improve business performance. The findings of this research indicate that MSMEs do not seize opportunities by using social media for their business because they mostly use social media for personal interests.

The implications of this research include: considering the importance of human capital in creating innovation to win competition, young entrepreneurs need to develop their human resources through various training. Thus, the limited amount of human capital can be overcome by improving the quality of human capital. Most of the respondents in this study were of productive age or young entrepreneurs, who were able to utilize social media networks to absorb new information and knowledge from the external environment. Apart from that, MSMEs can also receive input from partners, customers, suppliers and business partners via social media.

Moreover, the younger generation is very familiar with the use of social media. Therefore, young entrepreneurs can use it to help MSMEs progress in increasing innovation. The business world needs to consider training and motivating employees to overcome their obstacles so that they are willing to share knowledge. In addition to practical implications, this research also offers theoretical implications. In the last few decades, many studies have examined the determinants of innovation in SMEs). However, very few studies link human capital to innovation, especially the mediating role of social media networks and knowledge sharing regarding the influence of human capital on innovation. So, from a theoretical point of view, the results of this study provide a better understanding of how social media networks can mediate the influence of human capital resources on innovation.

The current study also has implications for managers regarding the relationship between human capital and innovation. It is recommended that managers pay more attention to human capital. Better quality of human capital directs companies to create innovation. This is expected to lead the company to better performance. Additionally, it is important to consider exploring social media networks to help companies achieve

better performance. Companies can provide social media platforms to build closer relationships with their customers, making it easier for them to increase innovation in business.

Declarations

Author contribution

All authors contributed equally as the main contributors of this paper. All authors read and approved the final paper.

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Competing interest

The authors declare that they have no conflicts of interest to report regarding the present study

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