

# Uncertain Supply Chain Management

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## Utilizing innovation and collective organizational engagement into SMEs' sustainable competitive advantage

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### ABSTRACT

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The present study centered on the mediation of innovation and the moderation of collective organizational engagement in affecting human capital (a combination of skill and knowledge) on sustainable competitive advantage and further examined human capital, innovation, and collective organizational engagement impacts on sustainable competitive advantage. Subsequently, this study utilized a quantitative approach, engaging 270 sample frame SME units in Indonesia using a Likert scale questionnaire and examining it using SEM-PLS. The findings demonstrate that human capital positively and significantly impacted innovation and sustainable competitive advantage, indicating that a high level of business skill, business orientation, perception of risk, and know-how management enhances the organization's innovation capability, creating distinctive, exceptional, and invaluable resources as core competencies of sustainable competitive advantage. This study confirms and advances the RBV theory and previous studies by examining intangible resources' mediating and moderating role, in which innovation contributes to mediating the effect of human capital on sustainable competitive advantage and collective organizational engagement reinforces (moderates) the impact of human capital on establishing sustainable competitive advantage. So, the results of this research illuminate the significance of human capital, innovation, and collective organizational engagement as the organization's superior resources in manifesting sustainable competitive advantage.

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### 1. Introduction

Despite the intense transformation in Industry 4.0 and the unpredictable business environment, sustainable competitive advantage lies in physical and also intangible resources (Hamadamin & Atan, 2019), including for SMEs (I. W. E. Arsawan et al., 2020; Korry et al., 2024; Samsir, 2018). Accordingly, optimizing SMEs' extensive knowledge and resource availability is intended to reinforce problem-solving strategies, as reflected through creativity and innovation capabilities (I. W. E. Arsawan et al., 2022; Elgarhy & Abou-Shouk, 2023; Martini et al., 2023; Qalati et al., 2021) and establish a sustainable competitive advantage in the long-term (Hitka et al., 2019). Sustainable competitive advantage is expressed in the distinctive and exclusive qualities of the product or service, allowing the organization to remain competitive over its competitors (Elidemir et al., 2020). A distinctive and exclusive quality is attained by innovation as it is a company-specific means to operate a distinguished business by harnessing the transformation into opportunities, presented as discipline, learning, and practiced (Drucker, 2002) and capabilities or resources in the form of knowledge, abilities, expertise of organizational members (Arsawan, Rajjani, et al., 2018; Baron & Armstrong, 2007). Innovation is an alteration performed in organizations, covering creativity in inventing new products, services, ideas, or processes within the organization and evolving from outside the organization (Sousa et al., 2012). With innovation, organizations are expected to partner with other companies in trade, competition, and cooperation, which require business actors' experiences, as reflected in human capital (Sun et al., 2020).

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Drawing on the Resource-Based View (RBV) theory, it is posited that organizations' intangible capitals, i.e., human capital, lead to sustainable performance and competitiveness through value creation, innovation, and robust network connections (Barney, 1991; Campbell & Park, 2016; Santarelli & Tran, 2013). Empirical studies on RBV suggest that HC, including the distinctive and valuable knowledge, skills, and capabilities of a company's human resources, especially SMEs, is one of the factors driving innovation and creativity (Dhar et al., 2020; Pradana et al., 2020; Sun et al., 2020) and the primary driver to explain the competitive advantage (CA) maintained by organizations in the long-term (Assensoh-Kodua, 2019; Barney et al., 2001; Dwikat et al., 2023). The formation of sustainable competitive advantage is derived from human capital (Hatch & Dyer, 2004; Hitka et al., 2019) and innovation (Arsawan, Sanjaya et al., 2018; Elidemir et al., 2020; Weerawardena & Mavondo, 2011), and other organizational capabilities, i.e., collective organizational engagement (Barrick et al., 2015; Eldor, 2019).

The study is designed to bridge the gaps of previous studies. First, several empirical studies reported that human capital insignificantly affects sustainable competitive advantage (Hidaya et al., 2020). Further, there is a weak linkage between human capital and the success of entrepreneurial activities to enhance sustainable competitive advantage (Unger et al., 2011), despite it being the primary driver of knowledge as an integral asset in establishing sustainable competitiveness (Campbell et al., 2012; Onkelinx et al., 2016). The inconsistency of these findings prompted the pressing need for follow-up investigation to refine the linkage between the two constructs while simultaneously adding to the existing relevant literature and enriching the body of knowledge. Second, although human capital and sustainable competitive advantage have been examined in various empirical studies, and sustainable competitive advantage construct is a multidimensional construct with multiple drivers that influence it, to our comprehension, there is a paucity of the study evaluating innovation's role as a mediating variable between the two constructs, considering that innovation is merely performed in major organizations and has yet to be explored extensively among SMEs (Börjesson et al., 2014; Hameed et al., 2021; Prajogo, 2016), it is crucial to examine the mediation mechanism to achieve literature comprehensibility.

Third, the existing literature describes that, while acknowledged as a critical organizational capability in determining sustainable competitive advantage, collective organizational engagement has yet become the foreground (Barrick et al., 2015; Lunn et al., 2021) since previous studies centered on employee engagement or work engagement (Friesenbichler & Selenko, 2017; Kumar & Pansari, 2015; Mamun et al., 2018; Rashmi & Singh, 2020). In a global work environment characterized by volatility and instability, attitudes toward the organization exhibited through collective organizational engagement could be more affected than an individual's specific work, leading to organizational implications (Saks et al., 2022)

Fourth, this study model is broadened by incorporating situational variables, i.e., collective organizational engagement, as moderators that have yet to be evaluated in previous studies with three considerations. First, employees and managers who collectively engage in work and proactively seek solutions will promote the attainment of organizational performance, impacting the establishment of competitive advantage (She et al., 2021). Second, managers with high levels of collective organizational engagement are inclined to focus on accomplishing their tasks and responsibilities, prioritize the interests of the organization, and are willing to perform work in addition to their responsibilities to attain sustainable competitive advantage (Eldor, 2019; Rajapaksha & Rajapakse, 2017). Third, we argue that collective engagement contributes to creating unique value that corresponds to achieving business vision and performance that fosters sustainable competitiveness (Eldor, 2020). Besides, the study of collective organizational engagement is still lacking in the SME sector, becoming a gap to be discussed further in this study (Harvey & Kou, 2013; Kleinaltenkamp et al., 2019).

Drawing from the knowledge and identified research gaps, this study explores human capital, innovation, and collective organizational engagement concerning sustainable competitive advantage. Considering several crucial aspects, we propose a structural equation model suited to Indonesia's SMEs. First, SMEs' role is significant for the nation's economic proliferation, with SMEs' contribution to the GDP covering 60.5% and occupation comprising 96.9% of the employees nationally (Kementerian Koordinator Bidang Perekonomian Republik Indonesia, 2022). The SME sector contributes substantially to addressing economic and social problems, i.e., deprivation, unemployment, disparity in income distribution, inadequate development process, and urbanization with its adverse impacts (Aisjah et al., 2023; Gunartin et al., 2023). Second, Indonesia continues to encounter significant problems in human capital readiness, ranking 111th from 189 countries adhering to the Human Development Index in 2019. Consequently, human capital readiness becomes a strategic issue, especially for SMEs, to possess sustainable competitive advantage in the international market if the prevailing human resource conditions remain as they are (Tjahjadi et al., 2022). Third, judging from the 2022 Global Innovation Index by the World Intellectual Property Organization, Indonesia ranks 75 out of 132 countries, which is comparatively lower than ASEAN nations, i.e., Singapore, Malaysia, Thailand, the Philippines, and Vietnam (Armanu et al., 2023), resulting in drawbacks in building sustainable competitiveness. Consequently, investigating the determinants of innovation and collective organizational engagement's role in impacting the human capital linkage to establish sustainable competitive advantage for Indonesian SMEs is crucial.

## 2. Theoretical Framework and Hypotheses Development

### 2.1 Resource Based-View

Adhering to RBV, organizations must possess invaluable, distinctive, and inimitable resources for superior performance and competitive advantage. Scholars (Hossain et al., 2022; Nandi et al., 2020) scrutinize tangible and intangible resources, i.e., information, knowledge, and reputation, to attain competitive advantage (Aisjah et al., 2023; Khan et al., 2019). Moreover,

some researchers posit that resources (e.g., employees and managers) are critical to leveraging engagement to attain organizational performance and drive sustainable competitive advantage (Lu et al., 2021; Suryantini et al., 2023). The view of human capital as an imperative source to attain superior organizational performance and promote engagement helps drive efficiency toward competitiveness (Hossain et al., 2022). Regarding intangible assets, the knowledge possessed by human capital is a unitary, distinctive, and invaluable asset, primarily fostering innovation and performance (Nieves & Quintana, 2018; Wang & Zatzick, 2017). Accordingly, RBV is enacted to evaluate the linkage between human capital, innovation, collective organizational engagement, and sustainable competitive advantage in SMEs.

## 2.2 Sustainable Competitive Advantage

Organizations, including SMEs, can attain sustainable competitive advantage by possessing invaluable, unique, incomparable, and irreplaceable resources (Barney, 1991). Sustainable competitive advantage provides a long-term benefit that a company possesses over its competitors, owing to the unique quality of its products, services, or image (Suryantini et al., 2023). Unlike the conventional competitive advantage, sustainable competitive advantage persists longer and generates a trustworthy reputation that attracts consumers to return. SMEs must recognize that to prevail and secure sustainable competitive advantage, they must be responsive and manage all the knowledge, skills, and capabilities of their human resources (Hamadamin & Atan, 2019; Hatch & Dyer, 2004), innovating in response to turbulent shifts in the business environment (Distanont & Khongmalai, 2020; Elidemir et al., 2020; Ramadan et al., 2020), and maintaining employees' intention to remaining as members of a particular organization which manifests in the form of willingness to conform to organizational values and deploy efforts for the overall betterment of the organization (Eldor, 2019; Kumar & Pansari, 2015).

## 2.3 Human Capital

Human capital embodies organizations' ability to collectively formulate beneficial solutions capitalizing on individuals' knowledge and capabilities. Sustainable competitive advantage establishment's role is indicated by developing the organization's human resource competencies, knowledge transfer from employees to the organization, and business orientation of the owners and management (Ruzzier et al., 2007). As the organizational resource, human capital comprises the intelligence, competencies, expertise, manners, performances, and proficiencies of employees in the organization as a critical operational element to underpin and foster the value establishment dynamism, resulting in performance and competitive advantage in organizations (AlQershi et al., 2022; Sadq et al., 2020). As a human factor in the organization, human capital is a combination of intelligence, skills, and expertise that provides a distinctive characteristic of the organization. The human element of the organization is individuals who learn, transform, innovate, and generate a creative impetus, which, if properly motivated, ensures the organization's long-term viability (Baron & Armstrong, 2007; Chabbouh & Boujelbene, 2020).

## 2.4 Innovation

Kahn (2018) asserts that innovation is derived from a novel idea, rather than merely manufacturing novel products, understanding how to manage all activities involving the progression of notion creation, tech advancement, production, and commercialization of novel products, invention procedure, and innovation utensils are mindset powered by the skills of connecting, inquiring, monitoring, investigating, and interacting (Dyer et al., 2009). Further, it is also a dynamic process encompassing three phases: discovering, developing, and delivering (PDMA, 2015). Besides, it is also defined as an outcome of manufactured goods, procedure, promotion, business pattern, supply chain, and organizational innovation (Alzoubi et al., 2024; Kahn, 2018; Wijaya, 2023). The innovation process is a configuration of the creative endeavor of individuals, operational functions, and organizational activities and organizational structure with the driving factors, i.e., scientific and technological advancement, social alteration, and market demand, where these elements simultaneously yield organizational attempts to cultivate knowledge, underpin processes, and eventually evolve novel products (Trott, 2017).

## 2.5 Collective Organizational Engagement

When individuals are more engaged and bonded physically, emotionally, and cognitively, it is assumed that they perform a series of behaviors that are rewarding and more effortful, demonstrating the extra contributions that they can contribute to the organization, leading to a positive impact on revenue, profitability, turnover, customer satisfaction, organizational performance, and the establishment of competitive advantage (Kahn, 1990). Collective Organizational engagement manifests as the organizational property, where employees share the perception that the members collectively and jointly invest themselves entirely in the organization and their performance. The sense of shared engagement emerges partially through affective and social processes within the organization, analogous to how engagement is highly "contagious" and transferable to other members. Awareness of collective engagement is subsequently retained when the organization's members cooperate and altercate signals about the expectations and values of the organization (Barrick et al., 2015; Kahn, 1990; Saks et al., 2022).

## 2.6 Hypothesis Development

### 2.6.1 Innovation and Sustainable Competitive Advantage in SMEs

Innovation promotes SMEs to continuously cogitate, progress, and encounter alterations in the business setting. It is performed to ensure that SMEs survive while simultaneously creating distinctive value to reflect sustainable competitive advantage (Distanont & Khongmalai, 2020; Elidemir et al., 2020). SMEs incapable of learning, managing knowledge in response to ever-evolving circumstances, and innovating do not possess the survival ability to attain competitive advantage (Wichitsathian & Nakruang, 2019). An innovation culture is imperative, especially for SMEs that stimulate organizations to foster good customer relations, optimize existing resources, and center on evolving their products to attain sustainable competitive advantage (Arsawan et al., 2020; Mustofa et al., 2023). By possessing reactive, flexible, and risky organizational structures, SMEs are inclined to be more innovative than major organizations when presenting novel products to the marketplace (Spithoven et al., 2013). To attain competitive advantage, SMEs must synchronize their internal and external resources, which can be accomplished by numerous organizations' practices to upgrade their innovation capabilities (Almrshed et al., 2023; Srivastava et al., 2013). Innovation indicates the establishment process of new and valuable manufactured goods, services, and work methods by SMEs consisting of manufactured goods, procedures, promotion, business patterns, supply chain, and organizational innovation (Kuncoro & Suriani, 2018; Quaye & Mensah, 2019). Accordingly, the formulated hypothesis is:

**H<sub>1</sub>:** *Innovation positively and significantly affects the establishment of sustainable competitive advantage.*

### 2.6.2 Human Capital, Innovation, and Sustainable Competitive Advantage

Attaining sustainable competitive advantage is successful for SMEs with competencies, i.e., knowledge, skills, and organizational qualities encompassing the actions, incentives, and sales required to perform business activities (Sinaga et al., 2022). It indicates that human capital is a pivotal organizational capability in attaining competitive advantage for organizations (Sadq et al., 2020), including SMEs (F-Jardon et al., 2013). The competitive advantage of SMEs is a function of their unique resources. This uniqueness is manifested through business orientation, perception of risk, and know-how management of SMEs acquired from their business experience (Ismail, 2014).

With all the knowledge, abilities, and skills its human resources possess, SMEs enhance their innovation capabilities to create products or services that are distinctive, high quality, and inimitable to their competitors (Ekayani et al., 2023; Timothy, 2022). Human Capital is also able to establish innovation capability, the ability of SMEs to enact novel ideas sustainably (Chabbouh & Boujelbene, 2020; Latifah et al., 2022), which later help SMEs formulate their competitive advantage (Lee & Yoo, 2019). Innovation reinforces SMEs' sustainable competitive advantage and the ability to retain better performance than competitors. Accordingly, sustainable competitive advantage is achievable by capitalizing on intangible resources, i.e., human capital (Hatch & Dyer, 2004; Hitka et al., 2019) and innovation (Quaye & Mensah, 2019). Consequently, the subsequent hypotheses are:

**H<sub>2</sub>:** *Human capital positively and significantly affects the sustainable competitive advantage of SMEs.*

**H<sub>3</sub>:** *Human capital positively and significantly influences the innovation of SMEs.*

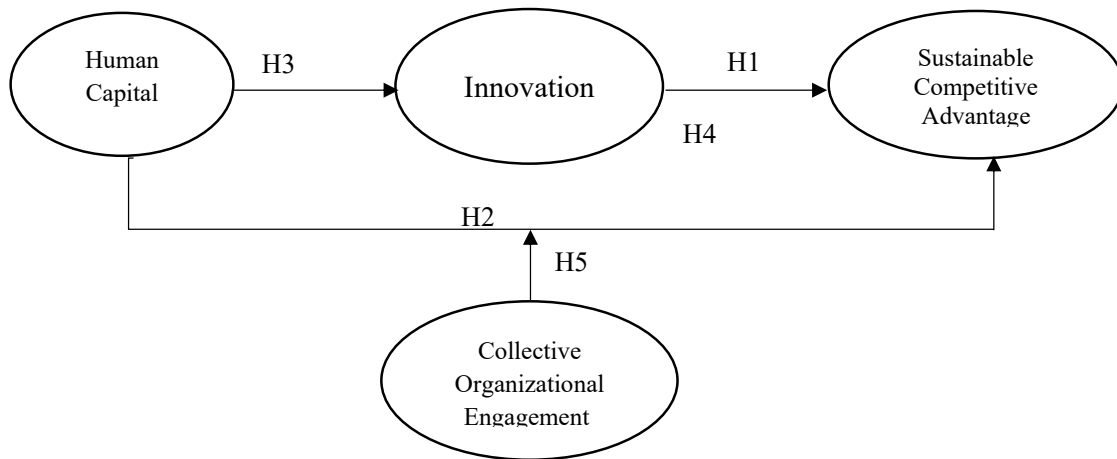
**H<sub>4</sub>:** *Innovation mediates the influence of human capital on sustainable competitive advantage of SMEs.*

### 2.6.3 Moderating Role of Collective Organizational Engagement

Organizational capability in RBV theory (Barney, 1991), indicated by the attachment of employees collectively as members of the organization, is an aspect that must be considered in the organization's attempt to attain sustainable competitive advantage (Eldor, 2019). Researchers are inclined to highlight that individual-level engagement is conceptually inadequate to cope with dynamic business transformation (Kleinaltenkamp et al., 2019). Consequently, it is more fitting to utilize collective organizational engagement, which significantly affects the organization's ability to produce superior quality, maintain customer loyalty, be flexible to alteration, and survive for sustainability (Eldor, 2019; Kumar & Pansari, 2015). While human capital is essential for long-term competitive advantage and resilience against competition, the effort to cultivate competitive advantage in a nonvalue-added differentiation for customers and the main threats are imitation, substitution, and slackness (Ghemawat & Rivkin, 2014). Collective organizational engagement helps moderate the linkage between human capital and sustainable competitive advantage (Anwar & Raharja, 2021). In SMEs with a significant level of collective organizational engagement, employees will prioritize the abilities to create and enhance sustainable competitive advantage. Consequently, it amplifies the influence of human capital on sustainable competitive advantage. Hence, the derived hypothesis is:

**H<sub>5</sub>:** *Collective organizational engagement moderates the effect of human capital on sustainable competitive advantage.*

Accordingly, this study evaluates the linkages between human capital, innovation, collective organizational engagement, and sustainable competitive advantage of SMEs (Fig. 1).



**Fig. 1.** Theoretical Framework

### 3. Materials and Methods

#### 3.1 Data Collection

The study was performed toward SMEs in Bali, Indonesia, considering that SMEs are critical in Bali's economic activities and have survived the COVID-19 pandemic. Bali was the region that experienced the most severe decline in regional income compared to other regions in Indonesia (Aisjah et al., 2023; W. E. Arsawan et al., 2023). The study population comprises all formal sector SMEs in Bali divided into four business sectors, i.e., trade, agriculture, non-agricultural industry, and diversified services. A sample of 270 SMEs was obtained using a cluster sampling technique. Respondents in this study were the owners or managers representing SMEs to obtain reliable information regarding the study variables. The data were obtained from primary sources collected directly from respondents utilizing questionnaires and interviews to obtain in-depth information about several SME phenomena relevant to this study.

#### 3.2 Measurement

Our model was measured by four latent variables: human capital, innovation, collective organizational engagement, and sustainable competitive advantage. Sustainable competitive advantage was measured with four indicators: superior quality, unique benefits of products or services, high customer loyalty, and highly engaged and flexible to alteration were adapted from (Distanont & Khongmalai, 2020; Elidemir et al., 2020). Further, human capital was measured with four indicators: business ability, business orientation, perception of risk, and know-how management were synthesized from (E. A. Khan & Quaddus, 2018; Ruzzier et al., 2007). Subsequently, innovation was measured by five indicators: new ideas, technology adaptation, research and development, interaction with partners, and openness to accepting new ideas were modified from (Kuncoro & Suriani, 2018; Samsir, 2018). Then, collective organizational engagement was measured by three indicators: physical, emotional, and cognitive attachment were modeled from (Barrick et al., 2015; Saks, 2006).

Data measurement of these variables utilized a Likert scale designed to examine the degree to which the study subject agrees or disagrees with the statements of the study, with scoring intervals from 1 (strongly disagree) to 5 (strongly agree) (Sekaran & Bougie 2016). Thirty respondents were piloted, employing the questionnaire to elucidate directions and statements. Accordingly, a minor adjustment was made to the phrasing of the questionnaire. Further, the partial least square-structural equation modeling (PLS-SEM) was enacted considering the formation of the RBV model-based and examining the direct and indirect influence between variables. Further, to govern validity and reliability, as per the recommendation of Hair et al. (2021), we evaluated model measurement, hypotheses, linkages between variables, and the structural model. Accordingly, PLS-SEM was convenient, considering the study's objective aimed to substantiate the formulated model.

### 4. Results

#### 4.1 SMEs Characteristics

Table 1 demonstrates the sample demographic, where most business sectors operated by SMEs were trading (52%), and only 6% were in the service sector. Observing the length of business, it showed that, on average, SMEs possessed a high level of business experience, with 53% experiencing 11-20 years in the business, and some SMEs had been in business for almost 50 years. Most SMEs (46%) enacted marketing innovations through digital marketing to publicize their manufactured goods globally and did not merely utilize conventional markets. Consequently, SME products were recognized in the global market, with 27% innovating their practices by incorporating a more efficient inventory management system, enhancing the quality of product delivery, and applying an efficient payment system (cashless). Further, 19% innovated their products by evolving

more modern product outputs (durable and more attractive packaging). However, only a few SMEs in Bali innovated their services (8%) and management (1%), and none innovated their organization.

**Table 1**  
SMEs Characteristics

Description		Number	Percentage (%)
<b>Business Sector</b>	Trade	140	52
	Agricultural	16	20
	Non-Agricultural	55	22
	Diversified Services	59	6
<b>Business Duration</b>	1 – 10	75	28
	11 – 20	144	53
	21 – 30	44	16
	31 – 40	2	1
	41 – 50	5	2
<b>Innovation Implementation</b>	Product	57	19
	Organization	0	0
	Management	2	1
	Process	80	27
	Marketing	136	46
	Service	23	8

Source: Primary, processed data (2023)

#### 4.2 Outer Model Measurement

The outer model was performed to examine the validity and reliability of the study constructs. The validity indicator was viewed from convergent validity, with the loading factor value  $\geq 0.7$  of each indicator. Construct reliability was measured by the composite reliability (CR), Average Variance Extracted (AVE), and Cronbach's Alpha (CA) values of each construct. Constructs were highly reliable if the CR and CA values were  $\geq 0.70$  and AVE  $\geq 0.50$  (Hair et al., 2021). Table 2 reports the examination of the outer model.

**Table 2**  
Outer Model Measurement

Variable	Indicator	Loading	CA	CR	AVE
<b>HC</b>	HC1	0.769	0.807	0.873	0.632
	HC2	0.798			
	HC3	0.811			
	HC4	0.800			
<b>COE</b>	COE1	0.929	0.895	0.934	0.826
	COE2	0.912			
	COE3	0.885			
<b>INOV</b>	INOV1	0.816	0.861	0.900	0.643
	INOV2	0.794			
	INOV3	0.824			
	INOV4	0.802			
	INOV5	0.772			
<b>SCA</b>	SCA1	0.730	0.706	0.818	0.529
	SCA2	0.711			
	SCA3	0.728			
	SCA4	0.739			

Source: Primary, processed data (2023)

Table 2 depicts that the loading factor value for all indicators exceeded 0.7, indicating that the indicators were valid to represent each construct. The four constructs, i.e., human capital, innovation, collective organizational engagement, and sustainable competitive advantage, scored CA above 0.7, CR above 0.7, and AVE above 0.5, indicating that all variables were reliable.

#### 4.3 Inner Model Measurement

Before running the hypothesis examination, it was necessary to view the predictive relevance model ( $Q^2$ ), which measured how fit the model generated value (Hair et al., 2017). The amount of  $Q^2$  value fell into a range of  $0 < Q^2 < 1$ , meaning that the closer to the value 1, the finer the model. The obtained  $Q^2$  calculation value was 0.726, closer to 1, signifying the exogenous

latent variables as explanatory variables (human capital and innovation) capable of predicting the endogenous variable, i.e., sustainable competitive advantage, verifying the model’s good predictive relevance.

4.4 Hypothesis Testing

The approximated parameters’ significance contributed helpful insights regarding the linkage between the variables. Table 2 highlights the hypothesis examination with the condition of p-value  $\leq 0.05$ .

**Table 3**  
Structural Estimate of the Variables Effect

Hypothesis	Direct Effect		Indirect Effect		Total Effect	
	$\beta$	p-value	$\beta$	p-value	B	p-value
INOV $\rightarrow$ SCA	0.369	0.000*	-	-	0.399	0.000*
HC $\rightarrow$ INOV	0.697	0.000*	-	-	0.697	0.000*
HC $\rightarrow$ SCA	0.222	0.005*	0.257	0.000*	0.479	0.000*
COE $\rightarrow$ SCA	0.133	0.019*	-	-	0.133	0.019*
<b>Moderating Effect HC*COE <math>\rightarrow</math> SCA</b>	<b>0.229</b>	<b>0.000*</b>	-	-	<b>0.229</b>	<b>0.000*</b>

Source: Primary, processed data (2023)

Table 3 presents that innovation positively and significantly affected sustainable competitive advantage ( $\beta = 0.369$ ; p-value = 0.000), supporting H1. Human capital’s effect on innovation reveals positive and significant findings ( $\beta = 0.697$ ; p-value = 0.000), supporting H2. Further, the effect of human capital on sustainable competitive advantage also demonstrates positive and significant findings ( $\beta = 0.222$ ; p-value = 0.005), supporting H3.

4.5 Mediation and Moderation Testing

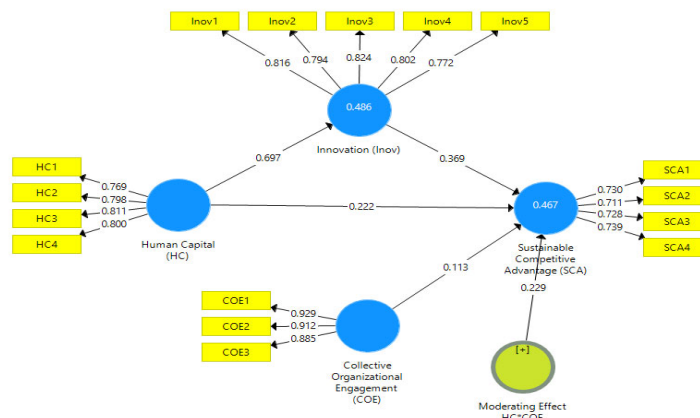
A significant examination of mediating variables in the model was observed from the indirect effect findings (Hair et al., 2017) by viewing human capital’s indirect effect on SMEs’ sustainable competitive advantage through innovation. Table 3 depicts that the effect of human capital on the SCA of SMEs through innovation was significant (indirect effect 0.257 and total effect 0.479; p-value = 0.000). The intervention level of the mediating variable, i.e., full, partial, or non-mediation, was referred to in the mediation examination proposed by Hair et al. (2017). Table 4 illuminates that innovation acts as a complementary mediator, supporting H4. Fig. 2 shows the structural analysis findings.

**Table 4**  
Determination of Mediation Effect

Variable	Effect			Result
	Exg. $\rightarrow$ Mediation	Mediation $\rightarrow$ Endg.	Exg. $\rightarrow$ Endg.	
HC $\rightarrow$ INOV $\rightarrow$ SCA	0,697 (Sig.)	0,369 (Sig.)	0,322 (Sig.)	Partial Mediation (Complementary)

Source: Primary, processed data (2023)

Table 3 illustrates the moderation of collective organizational engagement, where the interaction of human capital and collective organizational engagement indicated a value of  $\beta = 0.229$ , p-value = 0.000\* < 0.05. It signified that collective organizational engagement significantly acted as a moderating variable, supporting H5. The positive value of HC\*COE suggested that collective organization reinforced the impact of human capital on sustainable competitive advantage. Fig. 2 depicts the structural analysis.



**Fig. 2.** Structural Analysis

## 5. Discussion and Implications

The study examines the hypotheses and strengthens the theories and empirical studies regarding predictive variables of SMEs' sustainable competitive advantage in maintaining business continuity amidst the ever-evolving technology and volatile business environment. The findings indicate that innovation positively and significantly affects sustainable competitive advantage (H1), suggesting that the generation, advancement, and integration of innovation into the SMEs' business is the critical factor for sustainable competitive advantage. This finding is consistent with previous studies (Distanont & Khongmalai, 2020; Weerawardena & Mavondo, 2011), which reveal that innovation enhances competitive advantage through external factors and serves as an imperative strategic instrument in competition for the rectification, invention, and elevation of businesses to be equivalent or superior to their competitors. Innovation capability is pivotal in leveraging sustainable competitive advantage, where innovation demonstrates organizations' ability to identify and redefine novel ideas (Quaye & Mensah, 2019; Zhang et al., 2023) and to incorporate novel products or upgrade the former ones (Almrshed et al., 2023; Ramadan et al., 2020).

Subsequently, the study reveals that human capital positively and significantly impacted sustainable competitive advantage (H2), adhering to previous studies (F-Jardon et al., 2013; Hatch & Dyer, 2004; Sadq et al., 2020) stating that human capital as the competitive advantage source enables organizations to establish core competencies of core organizational capabilities that cause the company's position over its competitors (Campbell et al., 2012) and attain CA (Hitka et al., 2019). With all the business skills, business orientation, risk perception, and knowledge management held by owners, managers, and employees, it strengthens the findings on the ability of SMEs to retain or upgrade their performance (Aisjah et al., 2023; Suryantini et al., 2023) and presence over a long period (Hitka et al., 2019; Sinaga et al., 2022). Accordingly, human capital is regarded as an invaluable, rare, inimitable, and irreplaceable resource providing sustainable competitive advantage for SMEs (Maitra, 2016; Nieves & Quintana, 2018; Onkelinx et al., 2016).

Human capital also positively and significantly affect SME innovation (H3), confirming empirical findings (Sun et al., 2020; Timothy, 2022). The abilities, skills, and expertise acquired by SME leaders and employees enable them to explore and cultivate novel ideas creating new and unique inputs, processes, and outputs for SMEs (Nieves & Quintana, 2018; Wang & Zatzick, 2017). Comprehension and knowledge of market and technological developments stimulate SMEs to be creative in creating innovations in marketing systems, products, processes, services, and new management systems to maintain their existence (Sousa et al., 2012; Trott, 2017). Innovation is challenging to attain or retain, requiring a high level of HC, i.e., technical skills, creative thinking, problem-solving, and learning ability (Chabbouh & Boujelbene, 2020; Kianto et al., 2017).

Another crucial finding is that this study affirms that innovation mediates the influence of human capital on sustainable competitive advantage (H4). Innovation's role as a complementary mediation implies that innovation enhances the influence of human capital on sustainable competitive advantage in SMEs through innovation, confirming the findings of (Chabbouh & Boujelbene, 2020; Latifah et al., 2022). Accordingly, innovation enables SMEs to distinguish themselves from competitors, enhance market share and consumer loyalty, produce superior quality products, and be flexible to alteration (Lee & Yoo, 2019; Miroshnychenko et al., 2020). This notable finding augments the literature on innovation's role in driving the human capital and sustainable competitive advantage linkages.

Notably, this study finds that collective organizational engagement is predicted to moderate the effect of human capital on sustainable competitive advantage (H5). Consequently, organizations must consider all aspects that allow their business to survive, including encouraging employees to be engaged and satisfied and captivating their passions and minds at each work point (Rashmi & Singh, 2020). It signifies that human capital enhances relevant work expectations and resources for employees (I. W. E. Arsawan et al., 2022), requiring physical, cognitive, and emotional efforts from employees with organizational resources to stimulate progress and encourage employees to voluntarily dedicate their time, efforts, and business skills to help the organization attain sustainable competitive advantage (Kleinaltenkamp et al., 2019). Collective organizational engagement promotes an inimitable competitive advantage for attachment-oriented organizations (Eldor, 2019).

### 5.1 Theoretical Implications

Theoretically, there are four implications. First, innovation mediates the human capital's role in stimulating sustainable competitive advantage, crucially contributing to the strategic management literature that to establish sustainable competitive advantage, SMEs must prepare human capital with optimal knowledge as the pillar of innovation transformation (Aisjah et al., 2023; Allal-Chérif et al., 2023; Zhang et al., 2023).

Second, this study strengthens intangible resources' role as sustainable competitive advantage's core competencies (Barney, 1991). The present study further substantiates human capital's role as the organizational intangible resource that is unique and inimitable by its competitors, allowing the development of novel ideas to enhance the organization's potential to attain



sustainable competitive advantage (Hitka et al., 2019), underpinned by the organization's innovation capability to acquire and cultivate novel ideas and assist the organization in adjusting to the ever-evolving and unpredictable business setting (Aristana et al., 2022; Martini et al., 2023).

Third, as a distinct intangible resource, collective organizational engagement creates an inimitable sustainable competitive advantage for competitors, verifying the findings (Eldor, 2019). Accordingly, it is argued that human capital, innovation, and collective organizational engagement are the foundations for sustainable competitive advantage.

Fourth, the present study theoretically advances the RBV view (Barney, 1991) that human capital's role is pivotal in actualizing sustainable competitive advantage. The ability of organizations to recruit human resources with qualified knowledge allows organizations to be more agile (Aisjah et al., 2023), innovate sustainably (Allal-Chérif et al., 2023; Yang et al., 2021), and possess strategic flexibility in response to turbulence (Gorondutse et al., 2021; Miroshnychenko et al., 2020; Nassani & Aldakhil, 2023).

## 5.2 Practical Implications

There are several managerial implications that SME managers can consider to enhance sustainable competitive advantage. First, SME managers must manage HC by allowing high engagement with design, product characteristics, and innovation-related decision-making, fostering employees to be more motivated, and enhancing their contribution to organizational performance, resulting in sustainable competitive advantage. By granting job autonomy and adequate time, employees become more creative and allocate their potential to innovate sustainably. Second, SMEs must maintain collective engagement with all the knowledge and abilities to preserve the long-term viability of SMEs. Therefore, managers must manage the company's internal capabilities to collectively promote employee engagement by providing support and rewards and redesigning jobs that provide employee feedback and autonomy (Barrick et al., 2015). Third, considering that sustainable competitive advantage is constructed from unique characteristics that are invaluable and inimitable to competitors, managers can harness this potential by strengthening employees' physical, emotional, and cognitive engagement to ensure their focus and high engagement with organizational goals.

## 6. Conclusion and Future Study

The study illuminates the implication of human capital, innovation, and collective organizational engagement as essential organizational resources in attaining sustainable competitive advantage. Innovation is challenging to accomplish and sustain, requiring high levels of human capital, i.e., technical skills, creative thinking, problem-solving, and learning ability. Human capital is perceived as a valued, distinctive, and indispensable resource capable of creating innovation by developing innovative ideas and providing sustainable competitive advantage for SMEs. It is corroborated by the organization's ability to engage members and voluntarily perform collectively with their passion, knowledge, and resources to attain sustainable competitive advantage.

The study centers toward SMEs in Bali, Indonesia. Accordingly, future studies should be extended to other regions or countries to promote the generalization of the findings. Future studies are also suggested in a comparative analysis of the innovation process and sustainable competitive advantage between developed and developing countries. Besides, exploring the proposed model across industries will allow for a comprehensive grasp of the sustainable competitive advantage and its determinants. The findings do not describe detailed types of innovations employed. Meanwhile, innovation has a complementary partial mediation role, suggesting that innovation is the primary mediator of sustainable competitive advantage and its determinants. Future studies should include strategic agility mediating the effect of human capital on sustainable competitive advantage since organizations must maintain flexibility and agility, adhere to alterations, and persevere for sustainability.

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