



The Impact of Human Capital and Knowledge Creation on Sustaining Competitive Advantage and Innovation in Medium-Sized Companies in Bali



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ABSTRACT

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human capital, knowledge creation, innovation, competitive advantages

This investigation explores the impacts of human capital and knowledge creation on sustaining innovation and competitive advantages among medium-sized companies in Bali, Indonesia. Data collection was conducted through an online questionnaire, distributed to 286 managerial personnel, with 187 complete responses received. Structural Equation Modeling-Partial Least Squares (SEM-PLS) analysis, utilizing WarpsPLS 7.0, was employed to analyze the data. The findings reveal significant relationships in several areas: human capital substantially influences knowledge creation; both human capital and knowledge creation exert a positive and significant impact on innovation and competitive advantages. Notably, innovation was found to significantly enhance competitive advantages. However, the mediating role of innovation in the relationship between human capital and competitive advantages, as well as between knowledge creation and competitive advantages, was minimal. In contrast, knowledge creation effectively mediated the impact of human capital on competitive advantages. These results underscore the pivotal role of human capital and knowledge creation in fostering innovation that supports the sustained competitive advantages of companies. This study contributes to the understanding of strategic resource management within the context of Indonesian business, highlighting the integral role of innovation in leveraging human and knowledge-based resources for competitive positioning.

1. INTRODUCTION

Companies manage their resources to establish competitive advantages in increasingly intense competition [1]. Companies gain those advantages by maximizing their resources to innovate more quickly than their competitors with a dynamic process [2, 3]. The dynamics of competitive advantages should be established and sustained over time [4, 5]. The resource-based view (RBV) justifies competitive advantages as a framework for maximizing the companies' resources [6, 7]. Companies implement their competitive strategies to establish a higher value position than their competitors and generate sustainable self-differentiation, thereby obtaining competitive advantages.

Nonetheless, different points of view suggest that the RBV is not a theory [8]. A different perspective proposed by Bacharach [9] indicates that the RBV is an analytical statement rather than a set of propositions and hypotheses. It is difficult to translate RBV for management applications [10]. Therefore, the RBV is regarded as having difficulties responding to changes and cannot be used to establish a competitive advantage. This could have a conflicting effect on the companies' attempts to sustain a competitive advantage. This different viewpoint is supported by Priem and Butler [11], who argued that the RBV could not meet the

generalization requirements because it was only an analysis instead of a synthesis representing the research result. In addition, it was found that it was challenging for practitioners to use the RBV in real-world settings. As a result, the RBV still needs to be improved to accomplish the requirements as a theory.

Even though attempts to demonstrate the significance of developing a competitive advantage have received a lot of criticism, the competitive advantage is still considered highly relevant to enhancing companies' competitiveness [12-14]. Companies can build a competitive advantage by engaging in a variety of innovative activities [3]. Innovation [15] refers to the creative capabilities of new resource management [16], encouraged by continuous efforts to enhance human capital [17, 18]. Human capital plays an important role in creating innovation [19]. It is a dynamic intangible asset that is simple to change and difficult to measure [20], requiring constant updating [21]. The process of knowledge creation may also be utilized for developing innovation capabilities [13]. Knowledge creation is a useful instrument for creating innovation needed by companies [22].

Previous research on competitive advantages has never studied the relationship between human capital, knowledge creation and innovation. Therefore, this study contributes to sustaining competitive advantages to fill the research gap by

examining the relationship. The novelty of this study lies in its first attempt to build an empirical model of sustaining competitive advantages through the linkage roles of human capital, knowledge creation and innovation.

2. LITERATURE REVIEW AND HYPOTHESES

The emergence of the RBV is considered a new perspective in strategic management that places more emphasis on the superiority of companies' internal resources as their competitive advantages [4, 6, 14, 23]. The resources act as a unique source of competitive advantages [5]. The ability to continually generate value that is superior to competitors essentially gives a competitive advantage [24]. When a company has superior resources and capabilities, it can successfully execute its competitive advantage strategies [25], which are valuable, unique and difficult to duplicate without any substitute [7]. Therefore, it is important to understand that competitive advantages should be a dynamic process of optimizing all available resources that are better than competitors in all aspects [26].

The concept of human capital first appeared in the field of classical economics in 1776 [27], and this term was introduced in 1955 by Becker [28] as a stock of competence, knowledge, personality and creativity in the form of abilities that exist in individuals to generate value in economics [29]. According to the theory of human capital [30], people are a type of capital made up of a variety of human resource competencies that help a company create additional value. The power of human capital as an intangible asset that is dynamic and not easy to measure can be a competitive strategy to create and increase company value [31]. It is critical to make human capital investments as a knowledge resource to sustain creativity and encourage innovation [17, 18, 32].

The RBV [6] and the knowledge-based view [7, 33] contribute significantly to the knowledge management process and an organization's intangible resources to establish a knowledge-based competitive advantage strategy that is sustainable [34]. Knowledge management consists of knowledge creation, sharing, acquisition, codification and retention. Knowledge creation is an organization's ability to create new knowledge that is useful in continuous organizational processes [35, 36]. Knowledge creation intends to create new knowledge by managing the innovation capability of the organization's human resources [2, 37]. It is socialization, externalization, combination and internalization (SECI) [38].

The process of generating and utilizing knowledge significantly improves an organization's social and economic value, which is known as innovation [39]. It is demonstrated that innovation is the discovery of ideas for continuous development and improvement [40]. The business environment is changing faster than ever, making innovation important. Product, process, and market innovation are the three categories of innovation management, which is an organizational framework for adapting to a dynamic environment [41]. The competitive capability of an organization relies on its ability to manage innovation [42] and depends heavily on the organizational environment's acceptance of innovation characteristics such as relative advantage, compatibility, complexity, triability, and observability. Furthermore, innovation is not only related to knowledge but also involves the values of the organization's

perspective on social changes [43]. Good innovation helps organizations achieve better performance to achieve a sustainable competitive advantage [44].

According to the study of Edvinsson and Sullivan [45], human capital is a pivotal element that encapsulates knowledge, fundamentally driving creativity [31] and innovation within companies [46]. A key determinant of an organization's future competitive advantage is the process of integrating knowledge into continuous innovation [47]. The innovation process produces new value and contributes to the organization's new knowledge [38]. Furthermore, the process of interconnecting human capital from the individual level to the business environment is known as knowledge creation [48, 49]. The capability of human capital to adapt dynamically to changes in the business environment [50] turns into a difficult-to-measure intangible asset [20]. A strategy of human capital management is required [51], which enables knowledge creation to positively affect innovation and the competitive advantage of companies [52, 53]. The following hypotheses were formulated from the above statement:

H1: Human capital has an impact on knowledge creation.

H2: Human capital has an impact on innovation.

H3: Human capital has an impact on competitive advantage.

The ability to integrate knowledge creation systematically is necessary for generating a resource-based competitive advantage [2, 34]. Knowledge creation based on a knowledge-based view is an essential component of identifying a broad range of intangible resource competencies for sustaining company innovation [17, 54, 55]. Thus, the contribution of this view becomes an essential innovation for establishing a knowledge-based competitive advantage [7, 33]. Knowledge creation is a key component in sustaining innovative performance [56, 57]. Innovation, as defined by Iyer et al. [58], is the process of knowledge creation activities associated with the systematic integration of resource advantages to offer a competitive advantage for a company [13, 34]. The following hypotheses were formulated from the above statement:

H4: Knowledge creation has an impact on innovation.

H5: Knowledge creation has an impact on competitive advantage.

H6: Innovation has an impact on competitive advantage.

As economic competition intensifies, it becomes necessary to develop strategies for gaining a competitive advantage [1, 59]. Competitive advantages are created by implementing organizational knowledge resource management strategies [6, 60]. Human capital is the owner of scarce and imperfectly imitable knowledge resources [12, 61]. Therefore, human capital's contribution significantly impacts competitive advantages [14]. Furthermore, it is demonstrated that human capital can stimulate innovation, contribute to knowledge creation, and sustain a company's competitive advantage [62]. Innovation has a mediating role in the relationship between human capital and competitive advantages [26, 63]. Companies realize that encouraging knowledge creation can provide a competitive advantage [64]. Knowledge creation may increase the potential and opportunities to encourage creativity and innovation [65], because a company requires effective knowledge creation to obtain a competitive advantage in a turbulent and continuously changing environment [66-68]. It is demonstrated that innovation acts as a mediator between knowledge creation and competitive advantages [13]. The following hypotheses were formulated from the above statement:

H7: Innovation can mediate the impact of human capital on competitive advantages.

H8: Innovation can mediate the impact of knowledge creation on competitive advantages.

H9: Knowledge creation can mediate the impact of human capital on competitive advantages.

This study was predesigned to consider the direct and indirect impact of human capital and knowledge creation on innovation and competitive advantages. According to this study, human capital directly affects knowledge creation, innovation, and competitive advantages. Knowledge creation directly affects innovation and competitive advantages, and innovation directly affects competitive advantages. Aside from their direct effect, human capital and knowledge creation have an indirect impact on competitive advantages. In addition, human capital indirectly affects competitive advantages through knowledge creation and innovation, and knowledge creation indirectly affects competitive advantages through innovation. In this study, human capital and knowledge creation were used as independent variables, with competitive advantages as the dependent variable and innovation as a mediator.

3. METHODS

This study was conducted for 286 medium-sized companies in Bali Province, Indonesia [69]. The sample size is 167, which was determined using the Slovin formula with a sampling error of 5%. Data were collected from managers representing medium-sized companies as research respondents. Due to the COVID-19 pandemic, this study was conducted using an online questionnaire with the Google Forms application. Questionnaire links were sent to respondents via email. With an anticipated response rate of 80%, 209 questionnaires were returned and fully completed by respondents, resulting in a usable response rate of 89.47%.

Prior to the main data collection process, a pilot test was conducted using 20 participants from medium-sized companies and five academic scholars from three universities with deep knowledge of organizational behavior. During the process, respondents were given 286 questionnaires, of the responses 187 were returned and confirmed valid, with an 89.47% validity rate. The nonresponse bias test technique [70] was employed to evaluate the possibility of nonresponse bias. To compare the first and last 30 respondents based on demographic data including gender, working period, and bachelor's degree, chi-square and independent sample t-tests were employed. The findings demonstrated that there was no statistically significant difference in the responses from the

two groups ($p > 0.05$), suggesting that common method bias was not an issue.

Data analysis was carried out using variance-based SEM-PLS [70] with WarpPLS 7.0 [71]. According to the demographic analysis, 65.80% of the respondents are male with a working period of more than five years (64.60%) and a bachelor's degree (77.20%). The variables were measured using items developed and employed in previous studies to ensure the study's validity and reliability. Multiple items were used to test each construct, and each item was evaluated using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Human capital was measured using two dimensions of human capital value and uniqueness adapted from the research by Kock [72]. Knowledge creation was measured using SECI, and innovation using process and product innovation capability. Competitive advantages were measured using six dimensions: (a) the quality of the products or services is better compared with the competitors; (b) the company is more capable of research and development (R&D) than its competitors; (c) the company has better managerial capability than its competitors; (d) the company's profitability is better; (e) the corporate image is better than that of the competitors; (f) it is difficult for the competitors to take the place of the competitive advantage. All those dimensions were adopted from the research by Yu et al. [13].

Table 1 shows the descriptive statistical results using Statistical Package for the Social Sciences (SPSS) 23, with agreeable answers indicated by mean values of 4.24 (human capital), 4.15 (knowledge creation), 4.11 (innovation), and 4.14 (competitive advantages). These mean values, closely aligning with the neutral benchmark of 4.00, indicate that respondents generally agreed with the statements posed in the survey. This proximity to the neutral value suggests minimal deviation in the perceptions of the respondents regarding the queried dimensions. Standard deviation values represent the data distribution of the variables of human capital, knowledge creation, innovation, and competitive advantages. The standard deviation values mean that the differences in values from the mean values are 0.53 (human capital), 0.44 (knowledge creation), 0.48 (innovation) and 0.53 (competitive advantages). Those values are smaller than the mean values of human capital (4.24), knowledge creation (4.15), innovation (4.11) and competitive advantages (4.14), indicating that the data distribution does not vary and those standard deviation values tend to be close to the mean values. Therefore, the mean values can be used as a good representation of the overall data on human capital, knowledge creation, innovation and competitive advantage variables.

Table 1. Descriptive statistics of variables studied

| Variable | Theoretical Score | | Actual score | | Mean | SD |
|------------------------|-------------------|-----|--------------|------|------|------|
| | Min | Max | Min | Max | | |
| Human capital | 1 | 5 | 3.13 | 5.00 | 4.24 | 0.53 |
| Knowledge creation | 1 | 5 | 3.13 | 4.88 | 4.15 | 0.44 |
| Innovation | 1 | 5 | 3.20 | 4.80 | 4.11 | 0.48 |
| Competitive advantages | 1 | 5 | 3.00 | 4.83 | 4.14 | 0.53 |

4. RESULTS

4.1 Measurement model analysis

Table 2 shows the results of the goodness-of-fit evaluation

[70]. The Average Path Coefficient (APC) was determined to be 0.449 with a statistically significant p-value of less than 0.001. Additionally, the Average R-Squared (ARS) was calculated at 0.759 and the Average Adjusted R-Squared (AARS) at 0.756, both demonstrating statistical significance

with p-values of less than 0.001. The Average Variance Inflation Factor (AVIF) recorded was 4.887, indicating an absence of vertical and lateral multicollinearity, and confirming that the goodness-of-fit criteria were substantially met.

Table 2. Results of goodness-of-fit research model

| Evaluation | Value | Criterion |
|------------|--------|-----------------------|
| APC | 0.449* | Significant if < 0.05 |
| ARS | 0.759* | Significant if < 0.05 |
| AARS | 0.756* | |
| AVIF | 4.887 | Acceptable if <= 5 |

*All significant at $p < 0.001$.

Table 3 shows the evaluation of validity measurement instruments [73]. As for convergent validity, the average variance extracted (AVE) value is greater than 0.5, indicating the validity of the indicator variables, namely, human capital of 0.519, knowledge creation of 0.565, innovation of 0.509 and competitive advantages of 0.506. The table presents the discriminant validity criterion in the square root AVE (Sq.r AVE) column. This criterion can be met when the latent variable value is higher than the correlation between the variables, i.e., human capital of 0.721, knowledge creation of 0.704, innovation of 0.740 and competitive advantages of 0.711. For predictive validity, all research variables were measured from the q-square value of the endogenous

variables of the research model, namely, knowledge creation of 0.605, innovation of 0.798 and competitive advantages of 0.850, which is greater than 0, thus fulfilling the predictive validity criteria. The reliability criteria [73] were measured by the value of composite reliability and the value of Cronbach's alpha greater than 0.7. The reliability of the measurement instruments was confirmed, as shown by the composite reliability value (human capital of 0.896, knowledge creation of 0.814, innovation of 0.871 and competitive advantages of 0.859), and Cronbach's alpha value (human capital of 0.867, knowledge creation of 0.737, innovation of 0.835 and competitive advantages of 0.802). The evaluation of multicollinearity measurements between indicators as measured by the full collinearity VIP also has a value that meets the criteria with a full collinearity VIP value < 3.3 (human capital of 2.132, knowledge creation of 2.630, innovation of 3.159 and competitive advantages of 3.243).

Meanwhile, the table also shows that convergent validity was assessed by examining factor loadings and cross-loadings. Reflective constructs with a value above 0.70 and a significant p-value (<0.05) meet convergent validity [70]. The outer loading value for human capital, knowledge creation, innovation and competitive advantages is above 0.70, which is significant ($p < 0.001$). The convergent validity of the reflective construct in this study was met. Therefore, the data analysis process was followed by the evaluation of the structural model.

Table 3. Validity and reliability test results

| Variables | | Factor Loading | AVE > 0.5 | Q-square > 0 | Sq.r AVE | Composite Reliability > 0.7 | Cronbach's alpha > 0.7 | Full Collinearity VIP < 3.3 |
|------------------------|------|----------------|-----------|--------------|----------|-----------------------------|------------------------|-----------------------------|
| Human capital | Hc1 | 0.826 | 0.519 | 0.605 | 0.721 | 0.896 | 0.867 | 2.132 |
| | Hc2 | 0.730 | | | | | | |
| | Hc3 | 0.747 | | | | | | |
| | Hc4 | 0.808 | | | | | | |
| | Hc5 | 0.778 | | | | | | |
| | Hc6 | 0.753 | | | | | | |
| | Hc7 | 0.835 | | | | | | |
| | Hc8 | 0.774 | | | | | | |
| Knowledge creation | Kc1 | 0.799 | 0.565 | 0.704 | 0.814 | 0.737 | 2.630 | |
| | Kc2 | 0.781 | | | | | | |
| | Kc3 | 0.784 | | | | | | |
| | Kc4 | 0.797 | | | | | | |
| | Kc5 | 0.843 | | | | | | |
| | Kc6 | 0.801 | | | | | | |
| | Kc7 | 0.831 | | | | | | |
| | Kc8 | 0.778 | | | | | | |
| Innovation | In1 | 0.807 | 0.509 | 0.798 | 0.740 | 0.871 | 0.835 | 3.159 |
| | In2 | 0.824 | | | | | | |
| | In3 | 0.814 | | | | | | |
| | In4 | 0.757 | | | | | | |
| | In5 | 0.789 | | | | | | |
| | In6 | 0.754 | | | | | | |
| | In7 | 0.767 | | | | | | |
| | In8 | 0.757 | | | | | | |
| | In9 | 0.783 | | | | | | |
| | In10 | 0.777 | | | | | | |
| Competitive advantages | Ca1 | 0.811 | 0.506 | 0.850 | 0.711 | 0.859 | 0.802 | 3.243 |
| | Ca2 | 0.777 | | | | | | |
| | Ca3 | 0.766 | | | | | | |
| | Ca4 | 0.835 | | | | | | |
| | Ca5 | 0.793 | | | | | | |
| | Ca6 | 0.766 | | | | | | |

*All significant at $p < 0.001$.

4.2 Structural model analysis

The results of testing the structural model can be seen in Figure 1.

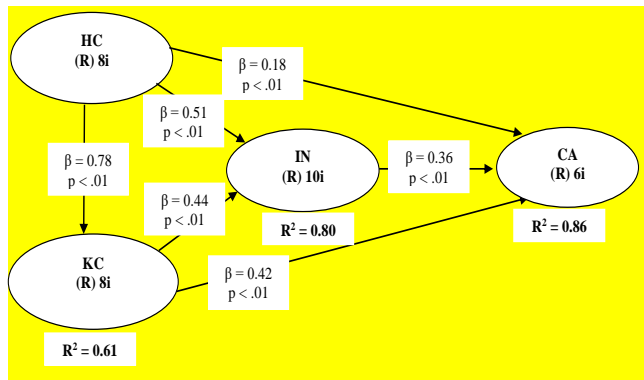


Figure 1. Testing results of the structural model

Table 4 delineates the path coefficients within the structural model, facilitating the hypothesis testing process.

Table 4. Path coefficient

| Variable | Human Capital | Knowledge Creation | Innovation |
|------------------------|---------------|--------------------|------------|
| Knowledge creation | 0.784* | | |
| Innovation | 0.506* | 0.437* | |
| Competitive advantages | 0.182* | 0.424* | 0.364* |

*All significant at p < 0.001.

The testing results in Figure 1 and Table 4 show that human capital significantly affects knowledge creation (β=0.784; p<0.001) and human capital has a positive and significant impact on innovation (β=0.506; p<0.001), which can prove H1 and H2. Human capital has a positive and significant impact on competitive advantages (β=0.182; p<0.001), which can prove H3. Knowledge creation has a significant positive impact on innovation (β=0.437; p<0.001), which can prove H4. Knowledge creation has a positive impact on competitive advantages (β=0.424; p<0.001), which can prove H5. In addition, the positive effect of innovation on competitive advantages (β=0.364; p<0.001) provides evidence in favor of H6.

Table 5. Mediation analysis

| No | Variable Relationship | P → D Without M | P → M | M → D | P → D with M | VAF Value | Result |
|----|---|-----------------|--------|--------|--------------|-----------|----------------------------|
| 1 | Human capital → Innovation → Competitive advantages | 0.858* | 0.506* | 0.364* | 0.182* | 0.177 | Almost no mediating effect |
| 2 | Knowledge creation → Innovation → Competitive advantages | 0.885* | 0.437* | 0.364* | 0.424* | 0.152 | Almost no mediating effect |
| 3 | Human capital → Knowledge creation → Competitive advantages | 0.858* | 0.784* | 0.424* | 0.182* | 0.279 | Partial mediation |

Notes: P means predictor; D means dependent; M means mediator variable; and * means p < 0.001.

The Variance Accounted For (VAF) was used to measure the mediating variable of the research model [70]. VAF can be calculated as follows:

$$(Ppm \times Pmd) / (Ppm \times Pmd + Ppd \text{ w/o } m) \quad (1)$$

where, *Ppm* is the effect of the predictor on the mediator variable, *Pmd* is the effect of the mediator variable on the dependent variable, and *Ppd w/o m* is the effect of the predictor on the dependent variable without the mediator variable.

The value of VAF 1 for H7 is 0.177. If the VAF is less than 20%, it is categorized as almost having no mediating effect [70]. Therefore, innovation almost has no mediating effect between human capital and competitive advantages in this study. The value of VAF 2 for H8 is 0.152. If the VAF is less than 20%, it is categorized as almost having no mediating effect [70]. Therefore, innovation almost has no mediating effect between human capital and competitive advantages. Meanwhile, the value of VAF 3 for H9 is 0.279. If the VAF is between 20% and 80%, it is categorized as a partial mediator [70]. This finding was further substantiated by the path coefficient analysis. When the mediating variable (Table 5) was included, the path coefficient from human capital to competitive advantages decreased from 0.858 to 0.182 but remained significant [74], indicating that the presence of the mediating variable modified but did not completely nullify the direct effect. Therefore, knowledge creation has a partial mediation between human capital and competitive advantages.

Effect size is used to measure the effect of latent predictor variables on the structural research model, with values of 0.02, 0.15, and 0.35 being weak, moderate, and large, respectively

[70]. Table 6 shows that the effect size value of human capital on knowledge creation and innovation is large and that of human capital on competitive advantages is moderate. The effect size of knowledge creation on innovation and competitive advantages is large, while that of innovation on competitive advantages is moderate. The effect size values show the important role of human capital, knowledge creation and innovation from a practical perspective in increasing competitive advantages. Furthermore, the percentage of variance in the endogenous latent variables explained by the exogenous variables was measured by R-squared values, with thresholds of 0.67 indicating substantial influence, 0.33 indicating moderate influence, and 0.19 indicating weak influence [75]. In the research model in Table 6, the knowledge creation variable of 0.615 indicates moderate explanatory power, innovation of 0.803 and competitive advantages of 0.857 indicate the fulfillment of the criteria at a substantial level. The results of this study align with the findings of Chin [76], which indicate that the R-squared value should at least show a substantial level if the endogenous latent variable depends on several exogenous latent variables.

Table 6. Effect size and R-squared

| Effect Size | Human Capital | Knowledge Creation | Innovation | Competitive Advantages |
|------------------------|---------------|--------------------|------------|------------------------|
| Knowledge creation | 0.615 | | | |
| Innovation | 0.434 | 0.369 | | |
| Competitive advantages | 0.156 | 0.375 | 0.326 | |
| R-squared | | 0.615 | 0.803 | 0.857 |

5. DISCUSSIONS

This study proves H1 and supports the findings of Huang and Wu [46], which indicate that human capital has an effect on knowledge creation. Medium-sized companies in Bali support the management of human capital as the basis for forming new knowledge. Human capital is required to collect and share knowledge, which is then used in collaborative processes for creating new knowledge. The tacit knowledge that makes up human capital has a significant function in fostering knowledge creation. Organization capital manifests as implicit knowledge, whereas human capital is easily codified and manifests as explicit knowledge. Because either the approach or the result may make their knowledge less valuable, human capital may be encouraged to discontinue the creation of knowledge. The challenge of human capital in knowledge-based competition is to guarantee the contribution of knowledge creation in creating a company's competitive advantage [51, 77]. Consequently, companies that offer human capital and generate knowledge at the company level need management. Human capital management practices in the knowledge creation process are instrumental for innovation and process improvements. Therefore, the knowledge created for the company becomes unique and distinguishes it from its competition. The results of this study align with the findings of Shih et al. [34], which indicate that human capital as a collective ability in knowledge creation produces the company's sustainable competitiveness [13]. Human capital is also the collective attitudes, skills, abilities, and knowledge of the employees of a company which drive the organization's sustained growth and development. Human capital competence in building knowledge-based intangible assets involves a commitment to the knowledge creation process [49, 78]. Companies allocate resources to ensure that human capital has the competencies, knowledge, and skills needed to succeed in a complex, rapid-changing work environment.

This study proves that the competence of human capital is instrumental for innovation [72]. Human capital in a medium-sized company in Bali has valuable competence for innovating processes and systems for the company. In this study, the significant influence of human capital on innovation proves H2. Innovation is positively impacted by human capital which makes a company more capable of identifying technology opportunities and obtaining and using significant knowledge. Companies can encourage these capabilities by investing in human capital, which is the knowledge, skills, and abilities. Moreover, the impact of human capital on innovation emphasizes the importance of improving human capital for companies to generate the ability to produce new goods. Innovation represents a new dimension of the company's system [15, 16], indicating that the determination of human capital competence as a significant indicator affects process improvements and activities to integrate innovation capabilities efficiently. The results of this study support the findings of Gloet and Terziovski [18], which indicate that a simultaneous approach to human capital management can increase creativity and create innovation performance. An individual's knowledge, experiences, capabilities, skills, creativity, and innovativeness are all regarded as parts of human capital. Human capital can sustain innovation because employees with some knowledge may assimilate new information more readily in the company. As an intangible asset of the company, the competitiveness of human capital should be developed continuously so that it can create superior

innovations compared to its competitors [17, 31, 79]. The knowledge of employees is strongly linked to the products and services of a company because the company's human capital plays a crucial role in its capability to produce new products.

This study confirms the findings of Hitka et al. [80], which indicate that competitive advantages are influenced by human capital [81]. In almost every company, human capital is regarded as the most significant aspect of competitive advantage. Human capital is all of the competencies of individuals in a company and is one of its intangible assets. A company may utilize intangible assets to acquire the diverse resources needed for developing new competitive products, maintenance, and service. This finding proves H3 that medium-sized companies in Bali have been developing human capital competencies, including a range of skills, potential, capacity, education, and experience, to create competitive advantages. It is suggested that a company can assess and manage competitive advantages more effectively if it understands the contributions of human capital. Human capital, long ignored in corporate strategies, has become significant recently, and companies have started to understand that human capital is essential to establishing and maintaining a competitive advantage. The company's human capital strategies aim to make it difficult for its competitors to undermine its competitive advantage. This result demonstrates that a company's potential for a competitive advantage increases when human capital competence becomes the foundation of competition [82, 83]. A company's competitive advantage can be shown in the higher quality of human capital delivered compared to its competitors, as well as in its more successful managerial capability and profitability. Companies should allocate resources to guarantee that human capital holds the competencies, knowledge, and skills required to perform successfully in a complex and rapidly changing work environment. Human capital plays a major role in the process of gaining a competitive advantage [61]. However, developing a company's human capital is the primary challenge to establishing a competitive advantage in the future. When a company uses human capital to gain a competitive advantage, it should ensure that every person has the necessary skills, values, training, and knowledge. Thus, it is challenging to obtain the highest-level performance, thereby achieving the strategic goals of the company. Moreover, a particular strategy to create a competitive advantage regarding future knowledge-based competition is to manage human capital [13]. Companies need comprehensive development programs for optimizing human capital to accomplish business strategies and, most importantly, to ensure their long-term survival and sustainability.

For medium-sized companies in Bali, knowledge significantly enhances innovation. As for innovation, it is essential to expand and improve the capabilities to create knowledge. This study proves H4 that knowledge creation has a significant effect on innovation. Medium-sized companies in Bali always innovate in the knowledge creation process of capturing and transferring knowledge, adopting repositories of information, and learning lessons from on-the-job training. Knowledge creation activities enable companies to obtain valuable knowledge for the best innovating manufacturing and technological processes and innovative work systems. This is consistent with the findings of Nonaka and Takeuchi [38] and Matthews [84], which indicate that knowledge creation is a process that keeps evolving in order for new companies to innovate. A company's ability to create knowledge originates

from its pursuit of creativity and innovation, which motivates individuals to produce new ideas and solutions, facilitates knowledge sharing within and between team members, and increases heterogeneous knowledge resources that support innovation. Therefore, companies should pay more attention to the knowledge creation process today because knowledge creation can create valuable innovations for their future competitiveness [13]. Companies become increasingly competitive, which means that they exchange and integrate knowledge more often, are better at creating new knowledge and are more efficient, and innovate more successfully. The results of this study also align with the findings of Suci and Bratescu [85] and Popadiuk and Choo [57], which indicate that systematic integration in the knowledge creation process, as a comprehensive development mechanism for innovation competitiveness, is an important corporate strategy. This implies that knowledge cannot improve a company's innovation unless a suitable mechanism is set up to make use of knowledge creation.

This study proves H5 that knowledge creation has an effect on competitive advantages. A company can obtain new capabilities by integrating existing knowledge and creating new knowledge, thereby obtaining and increasing its competitive advantage. The ability to create knowledge becomes a determinant in the process of creating a company's competitive advantage in the future [34]. This finding shows that medium-sized companies in Bali effectively support knowledge creation as part of their process of creating competitive advantages. Therefore, with the knowledge creation process carried out, a company has clear fundamentals in determining the competitive advantage structure design, such as better quality of products or services and managerial capability, thereby obtaining profitability, a better image and a competitive advantage. The process of creating new knowledge leads to changes that encourage companies to develop competitive advantage strategies [12]. The strategy to build a company's competitive advantage is carried out through knowledge creation process activities, which usually capture and create knowledge and always adopt a problem-solving system based on knowledge. This is similar to the findings of Yu et al. [13], which demonstrate that the knowledge creation process is an important offering of competitive advantages for companies. Competitive advantages play a crucial role in a company's success over its competitors in identifying and responding to market changes more quickly, solving knowledge resource constraints, and creating knowledge more easily and effectively. Furthermore, the knowledge creation process is carried out in an integrated manner into a strategy to create a company's competitive advantage [34, 35]. The process of continuously sharing and integrating knowledge across organizations and individuals, which is known as knowledge creation, can also be regarded as the constant conversion of implicit and explicit knowledge. A company's commitment to the knowledge creation process is the basis for forming new knowledge in the context of reconstructing competitive advantage [49]. Both individual and organizational knowledge creation contribute significantly to the development of more effective and efficient structures and policies that increase a company's competitive advantage.

This study shows that medium-sized companies in Bali develop innovation capacity in an effort to create a competitive advantage. This result confirms H6, which aligns with the findings of Knight [86] that the implementation of each

company's unique creative ideas becomes the task of the innovation strategy. Generating innovation, with the primary goal of maintaining a strategic position in the market and keeping a lead over competitors, can be utilized by a company as a competitive advantage. Innovation is an investment to get new concepts in building a company's advantage over its competitors. In order to increase a company's competitive advantage, support for the study's findings indicates the significance of sustainable innovation strategies [18]. Competitive advantages are the application of competitive strategies that aim to build a profitable and sustainable position created by the company to differentiate itself from its competitors and determine industry competition. Furthermore, innovation is a gradual process to increase the effectiveness and efficiency of sustaining a company's competitive advantage [87, 88]. Innovation transforms old ideas into new ones that are original, which can be generated internally when a company is said to have a sustained competitive advantage. Sustainable innovation management is a key performance indicator of competitive advantage in winning knowledge-based competition [25, 89]. Innovation management essentially sets out the ways that a company generates and delivers value, but its competitors can readily imitate a successful company's innovation if it produces less value overall. Consequently, if innovation is sufficiently differentiated within the company, it can be a substantial competitive advantage. Similarly, a company's competitive advantage is created by innovation in response to the changing dynamics of the business environment and the speed of competition [90, 91]. If a company does not match the competitive environment, innovation simply cannot be enough to establish a sustainable competitive advantage.

This result demonstrates that innovation has no effect as a mediator between human capital and the competitive advantages of medium-sized companies in Bali. The study's findings cannot support H7, which holds that innovation mediates the relationship between human capital and competitive advantages. In this study, only human capital is the determinant, even though there are actually two other types of intellectual capital that play a role, i.e., customer and structural capital, as shown in research conducted by Zerenler et al. [62]. It is demonstrated that intellectual capital has a significant effect on competitive advantages when innovation plays the role of a mediator [26]. Therefore, other capital, which is included in intellectual capital, is needed if human capital does not have a significant impact on competitive advantages through innovation. Human capital is the key factor for business success in creating a positive organizational environment for innovation and competitive advantage [92]. Although everything can be duplicated, human capital which is seen as a competitive advantage is unique since it is a competent and innovative resource. This suggests that innovation cannot mediate only human capital for competitive advantage, but innovation has a significant impact when it acts as a mediator of all elements of intellectual capital, namely, structural, customer and human capital, for competitive advantages. However, when organizational learning capabilities are used as a mediator, human capital has a significant effect on competitive advantage, as shown by the findings of Sachitra [14].

This study has not demonstrated the mediation effect of innovation on the influence of knowledge creation on competitive advantages. This study cannot demonstrate H8 that innovation has almost no mediating role between the

efforts of medium-sized companies in Bali to sustain competitive advantages and knowledge creation. This finding contradicts the finding of Yu et al. [13], which indicates that knowledge creation requires the mediation of innovation in generating competitive advantages because it does not have a significant and direct effect on sustainable competitive advantages. A company's main responsibility is knowledge creation, and an important source of competitive advantages is knowledge creation through social interaction, particularly tacit knowledge, which is difficult to explain, replicate, and disseminate. A stronger competitive advantage is always the result of knowledge creation, and knowledge creation also has an impact on competitive advantages through the mediating role of innovation. Innovation is successful in mediating knowledge creation on competitive advantages when knowledge creation does not have a significant and direct effect on competitive advantages. However, although knowledge creation has a significant and direct effect for competitive advantages, innovation has almost no mediating effect between knowledge creation and the efforts to develop competitive advantages. The results also do not align with the findings of Jyoti et al. [65], which indicate that innovation can mediate knowledge management by facilitating appropriate knowledge sharing and distribution to generate competitive advantages and suggest that a company cannot sustain a competitive advantage without its innovative capacity. According to these results, companies not only use knowledge creation as a determinant of competitive advantage but also cultivate knowledge management in areas like knowledge acquisition, creation, codification, sharing, and retention at all organizational levels, thereby boosting innovation and gaining competitive advantages. Consequently, when other elements of knowledge management are included simultaneously, it turns into a factor that impacts competitive advantages rather than just knowledge creation in future research. Therefore, knowledge management can foster the development of innovation, which ultimately can sustain competitive advantages. Innovation may have an almost mediating role in the relationship between knowledge creation and company performance [93]. Different results in the relationship between knowledge management and competitive advantages are also demonstrated by the findings of Salmador and Florín [66], which indicate that organizational learning mediation is required.

The study supports H9 that knowledge creation can mediate the impact of human capital on competitive advantages, which aligns with the findings of Bontis et al. [51], which indicate that a company's human capital creates knowledge as an asset for its competitive advantages. These results suggest that human capital can be partially mediated by the knowledge creation process in Bali's medium-sized companies when they attempt to develop a competitive advantage. Every company needs human capital, and is aware of how human capital creates knowledge. One of the main challenges to creating a competitive advantage is developing human capital. Human capital is more important than ever for gaining a competitive advantage because it is a primary source of knowledge creation. This finding demonstrates how companies are pressured by global economies to establish sustainable competitive advantages to survive in the global market. This requires a higher level of human capital to effectively create knowledge and sustain long-term competitive advantages [94]. Additionally, the most potent, valuable, and influential resource is human capital, which significantly impacts

knowledge creation to produce value as a competitive advantage that is not owned and cannot be imitated by competitors [95, 96]. This result underlines that it is essential for companies to develop human capital as a source of competitive advantage. This study shows the significance of predictors to grow human capital for enhancing knowledge creation and competitive advantages successfully, which aligns with the findings of Zerenler et al. [62] and Kusumawijaya and Astuti [97], which present how human capital can foster innovation, contribute to knowledge creation and sustain competitive advantages.

6. CONCLUSIONS

It was found in this study that human capital significantly affected knowledge creation; human capital had a positive and significant effect on innovation and competitive advantages; knowledge creation had a significant and positive effect on innovation and competitive advantages; innovation was shown to positively impact competitive advantages significantly. It was also found in this study that innovation had almost no mediating effect between human capital and competitive advantages as well as between knowledge creation and competitive advantages; and knowledge creation mediated the influence of human capital on competitive advantages.

This study makes contributions by providing an understanding that, on the basis of intangible resources, a knowledge creation process related to training and education increases the level of knowledge, skills, abilities, and the value of human capital, thereby sustaining a company's competitive advantage. Education and training have different forms concerning their type, content, degree of formality and resources invested. Education means learning programs with general objectives concerning personal development and knowledge creation. Training can occur both on and off the job, which is usually organized as programs that offer a series of courses to apply the knowledge creation process. The preparation of individuals for existing or new jobs is more closely linked to training. Examples of training include applied learning, problem-solving techniques, work ethics, general employability capabilities, and the occupationally specialized talents required by a company. This study shows the importance of human capital as the most valuable asset when business competition enters a knowledge-based competition ecosystem. Human capital is the only company asset that has the competence to create knowledge for sustaining competitive advantage. This study also shows that efforts to sustain a company's competitive advantage do not rule out the important role of innovation as a process of creating new ideas and concepts for knowledge creation. Therefore, the knowledge creation process is a driver of innovation. Human capital with knowledge, creativity, skills and abilities to generate new innovative ideas helps companies to sustain competitive advantage.

The findings of this study have implications for companies whose future business practices always regard human capital as a set of human resource competencies that play a role in building their added value. A company's human capital is often shown by the skills, abilities and knowledge inherent in its human resources. Therefore, it should be developed to increase creativity and innovation capacity for sustaining future competitive advantages. The company's investment in human capital on an ongoing basis encourages the knowledge

creation process to develop and maintain innovation. Human capital is the most crucial element that creates knowledge to assist the company by sharing information and knowledge through communication. Knowledge creation requires some processes to ensure the proper natural flow of information. Social interactions enable individual and collective knowledge acquisition as well as individual engagement and are integrated into the company's knowledge creation activities. Furthermore, experience constitutes a platform for transitional knowledge, which is essential for understanding, classifying, and eventually producing private and new knowledge. The competitiveness of human capital can be assessed through the systematic integration of the ability to create company knowledge. Human capital is the most valuable resource, which provides the solid foundation needed to build long-term profitability and the ongoing success of a company. Companies can continue to sustain competitive advantages if they always focus on rewarding the knowledge possessed by human capital because innovation continues to develop following the development of existing knowledge in the company. Company knowledge cannot appear suddenly, and there is a process to create knowledge as a core competitive advantage.

This study has limitations in its generalization because it was only carried out for medium-sized companies. Therefore, further research could include companies of other sizes or in other developing business ecosystems. Medium-sized companies are often disregarded simply because their production results are on a small scale and they cannot compete with larger companies. In addition, most medium-sized companies grow traditionally and it is very difficult for them to develop optimally. This is caused by their low-quality human capital, which affects their innovation and competitive advantages. Therefore, conducting research for a single company type is not feasible. All types and sizes of companies could be integrated to enhance a broader spectrum of generalizability and applicability of the findings. This study only examines human capital and does not examine intellectual capital as a whole. In fact, intellectual capital includes human, structural and customer capital, which have a significant relationship with innovation performance. Therefore, future research could involve intellectual capital testing to obtain more comprehensive findings. In addition, this study only tests knowledge creation. However, other stages of knowledge management include knowledge sharing, acquisition, codification and retention. Therefore, further research could involve other dimensions of knowledge management to support a sustainable company's competitive advantage strategies. If research on knowledge management uses other dimensions, it can produce a more complete form of knowledge that is the main driver of a company's competitive advantage. The concept of knowledge management originates from a process-based view of performing company activities. This means that all techniques, instruments, and approaches should use comprehensive dimensions to support knowledge management processes such as knowledge acquisition, creation, codification, sharing, and retention at all organizational levels and areas. Future research could build and sustain competitive advantage strategies with dynamic capabilities, i.e., a company's ability to transform itself proactively in response to a changing environment. Dynamic capabilities enable companies to obtain a broader business environment framework to develop sustainable, long-term competitive advantages.

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