
The role of strategic innovation in achieving sustainable competitive advantage in Ethiopian hotels: mediating effects of human capital

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Abstract

In the context of Ethiopian hotels, this study investigates the effect of strategic innovation on sustainable competitive advantage, with the mediating role of human capital. The investigators employed both primary and secondary data along with a quantitative research approach. Both descriptive and explanatory research designs were used to examine causal association among the variables. The target population of the present investigation comprised hotels. Non-probability sampling, particularly convenience sampling, was employed. Structural equation modeling, along with exploratory and confirmatory factor analysis, was employed to analyze data. The finding of the study indicated that understanding how these factors interact is essential for enhancing operational effectiveness as well as sustainability as the tourism industry is expanding. With a direct effect of 0.309 and an indirect effect mediated by human capital of 0.230, the results revealed strategic innovation has a significant impact on sustained competitive advantage, with a total effect of 0.540. This suggests that hotels that implement cutting-edge procedures not only set themselves out in a crowded market but also enhance the abilities and involvement of their staff members. Moreover, human capital partially mediates the association between strategic innovation and sustainable competitive advantage. The study highlights how vital it is to fund staff training and development to promote a sustainable culture, which in turn boosts customer happiness and effectiveness of operation. To achieve long-term sustainability as well as competitiveness, hotels should prioritize strategic innovation and human capital development.

Keywords: Innovation in strategy, human capital, competitiveness, hospitality

Introduction

The association of strategic innovation as well as sustainable competitive advantage is highly recognized as vital for companies operating in emerging markets. As these markets experience rapid transformation, organizations must adapt innovation in their strategies to leverage unique resources as well as capabilities. Strategic innovation relies on creating new products and improvements of processes as well as business models that enable organizations to differentiate them in competitive business environments (Kant and Niguse, 2025). In this context, human capital, which incorporates know-how, skills as well as the experience of members of staff, plays a significant mediating role. Skilled staff members are essential for implementing novel strategies effectively, enhancing creativity, and promoting adaptability of companies. Understanding the mediating role of human capital in the correlation between sustainable competitive advantage and strategic innovation is significant for organizations aiming to grow in the dynamic business environment of emerging markets (Niguse, 2025).

Firms in different businesses are now needed to have sustainable competitiveness in a global prudence. In the hospitality sector, where hotels are starting to show promise in response to rising customer demand for ecologically conscious operations, this need is especially apparent (Batoool et al., 2022). The ability of a company to sustain its market position over time through distinctive resources and competencies is known as sustainable competitive advantage, and it has attracted a lot of attention recently (Abel et al., 2022). The hotels industry must adapt innovation to make them unique and ensure long-term success as environmental concerns grow and consumers place a higher value on sustainability (AlQershshi et al., 2019).

The previous research on innovation management highlighted the importance of new methods in improving business performance and supported the idea of strategic innovation as a base for competitive advantage. In order to promote innovation, researchers like Miller (2011) and Covin and Slevin (1989) emphasized strategic alignment, strategic foresight and technology competence. Strategic innovation in the context of hotels includes integrating sustainable practices for consumers who focus on the sustainability of the environment in addition to creating new services and technologies. Hotels that want to gain a competitive edge while also promoting environmental conservation must prioritize both innovation and sustainability (Aboelmaged, 2018).

There have been significant changes in the eco hotels in Ethiopia in order to meet the rules of eco-friendliness established in COP 29. COP 29 took place in Baku, Azerbaijan, and established the guidelines on more finance as well as the development of an efficient carbon market, and the technical body under Article 6.4 should be appropriately executing the agreed standards. The central outcome of the conference was an agreement to be more ambitious and deliver emissions reduction through high standards, as a global move towards no longer using fossil fuels was mentioned in the first COP document (Kant and Niguse, 2025).

The association between innovation in strategy and sustainable competitiveness is becoming more widely acknowledged in empirical investigation in the hotel business (Zhou et al., 2023). According to studies, hotels that implement cutting-edge procedures can boost operational effectiveness, increase customer happiness, and cultivate brand loyalty (YuSheng and Ibrahim, 2019; Mahmoud et al., 2018; Nieves and Quintana, 2018). Additionally, it has been determined that a key mediator in this relationship is human capital, which is the competencies and skills as well as knowledge of employees. A strong base of human capital helps hotels to efficiently employ creative strategies, enhancing sustainability and competitiveness (Zhou et al., 2023; Horng et al., 2017).

There are still practical challenges despite expanding literature in this context. Hotels frequently struggle to be successful in business because of resource limitations, limited access to technology, and challenges in hiring well-trained members of staff (Hussain et al., 2025; Senbeto, 2024). Moreover, one of the primary obstacles to the adoption of sustainability is the stakeholders' unawareness of the benefits that novel approaches bring. Due to these difficulties, more comprehensive studies are necessary to understand the extent to which hotels can address obstacles and deploy strategic innovation to achieve and maintain a sustainable competitive advantage (Patwary et al., 2024).

Also, hotel companies are compelled to differentiate themselves from the traditional hotels due to the increasing competitive nature of the hospitality industry. Besides attracting eco-sensitive consumers, as the exploration by Chan and Wong (2006) points out, sustainable practices encourage positioning of market and brand loyalty (Sharma et al., 2020). By implementing new strategies into their production processes, hotels can create special propositions of value to attract consumers and provide them with sustainable competitiveness (Ahmed et al., 2023).

The necessity to introduce green practices and the increasing understanding of the sustainability of the environment in recent years resulted in radical changes in the hospitality businesses (Sharma et al., 2020). This paradigm shift has brought even the creation of the hotels that are unique by their commitment to reduce the impact on the environment as well as offer high-quality services (Abel et al., 2022). Hotels are transforming the business of hospitality and banking on the worth of innovative strategies as a significant means of competitiveness as buyers shift their preference to services that are socially friendly (Hussain et al., 2025). This setting makes the exploration of the interrelation between innovative strategy and sustainable competitiveness in the hotel business more interesting (Gelagay and Werke, 2024).

Within the hotel sphere, few questions are posed about the mediation of human capital in the interdependence of the innovation in the strategy and the long-term competitiveness. Even though past studies have suggested the significance of both innovative strategies and human capital, there is minimal empirical evidence, especially on the relationship between the two factors, to generate a competitive advantage in the eco-hotels in Ethiopia (Tilahun et al., 2024; Lin et al., 2023). To seal these gaps, this research offered an inquiry of the development of human capital and innovation in strategies as a source of a long-term competitive advantage. The assessment of the interaction between these factors in the investigation will be of great benefit to future researchers and policymakers. The findings will not only facilitate theoretical understandings but also provide practical recommendations to the hotels that attempt to respond to the environmental sustainability requirements.

The current studies have indicated the importance of strategic innovation in enhancing sustainable competitiveness. According to such investigators as Horng et al. (2017), strategic innovation involves the creation of new business models that meet the requirements of customers on top of the introduction of new solutions (Patwary et al., 2024). This broadened perspective on innovation is particularly relevant to hotels that have to adapt to the evolving needs of customers and governmental regulations (Kuo et al., 2022; Aboelmaged, 2018). Incorporating innovative business practices, such as resorting to renewable energy, implementing waste management systems, and employing sustainable sourcing, is something that allows hotels to attain significant operational efficacy and increase consumer satisfaction (Batool et al., 2022).

Even though the previous works on innovation in strategy in the hospitality context are expanding, there is still a knowledge gap on different aspects that influence these dynamics,

particularly in hospitality (Haldorai and Garcia, 2022; Leonidou, 2015). The function of human capital in mediating the interrelation between sustainable competitiveness and innovative strategies has often been overlooked in prior investigation. Although it is commonly known that skilled staff members and employee engagement are important, investigation has mostly focused on procedures in operation and impressions of customers without specifically addressing the role played by human capital in the adoption of innovative strategies (Hotessa et al., 2024).

Previous investigations on strategic innovation and sustainable competitive advantage have mostly focused on developed markets, which have left out information about developing nations. The current study provides insights into how Ethiopian hotels might use creative approaches to increase sustainability and competitiveness by analyzing the mediation of human capital in this situation. Ultimately, this input contributes to sustainable tourism and economic development in a region that is increasingly becoming interested in environmental management through strengthening the theoretical foundation of the strategic management in the hotel sector and providing practical implications to the stakeholders in the developing economies.

Literature review and theoretical framework

Related theories

Resource-based view (RBV) theory

There is how this theory shows how firms achieve conservationist competitiveness by using distinctive internal capabilities. Innovative strategies are a resource of imperative importance in the Ethiopian hospitality industry. The human capital, which contains the know-how and also skills of the staff members, is a powerful asset that facilitates the adoption of innovative strategies (Ahmed et al., 2023). Through better-informed employees, hospitality organizations are able to develop distinctive services and experiences that they offer to their customers to make them stand out among their competitors. Therefore, the RBV directs the role of the human capital in mediating the role in exploiting innovation in strategy to ensure eventual competitiveness in developing economies (YuSheng and Ibrahim, 2019).

Diffusion of innovation theory

This theory reveals how new ideas, as well as technologies, are circulated within a system of society. The strategic innovation of hospitality businesses in Ethiopia is often associated with the introduction of new practices and technologies and service patterns. It is a process that requires the significant effect of human capital; professional personnel are supposed to embrace the new strategies in an efficient way (Zaragoza-Sáez et al., 2020). According to the theory, the rate of adoption is influenced by such variables as observability, compatibility, and relative advantage. Through these dynamics, hospitality organizations can increase their capacity to spread innovation that will result in improved service delivery and competitive positioning in a competitive business (Aman-Ullah et al., 2022).

Michael Porter's competitive forces model

According to the model of competitive forces developed by Michael Porter, the competitive landscape in the industry is influenced by five forces: threat of new entrants, supplier power, buyer power, substitute threat, and rivalry amongst existing participants (Zhou et al., 2023). In the Ethiopian hospitality industry, strategic innovation can mitigate these competitive pressures. By leveraging human capital, firms can develop unique value propositions that enhance customer experiences and build loyalty. This differentiation reduces buyer power and the threat of substitutes. Also, new practices may facilitate the workflow, reduce expenses, and enhance profitability, thereby helping companies to overcome competition pressures better and maintain the competitive edge (Senbeto, 2024).

Empirical literature and hypothesis development

Strategic innovation and human capital

Innovation is creation as well as the adoption of new solutions, procedures, or practices. The investigators state that the innovation must be considered with regards to its capacity to deliver customer value as opposed to just being something new (Abel et al., 2022). Innovation in the service industry is mainly strategic innovation that involves altering the attributes of a service that defines a strategic innovation of the company through using existing or emerging technology. In other words, the business provides its services, which are not similar to those that clients have encountered previously (Hussain et al., 2025).

Similarly, strategic innovation can be defined as the ability of a business to collect information concerning its buyers, comprehend the relevance of the information, and leverage that information for the creation and enhancement of a new system of delivery (Gelagay and Werke, 2024). Other researchers argue that externally focused and market-oriented strategic innovation may result in differentiation of output of an organization by its customers. The study by Kuan et al. (2022) aimed at exploring the links of human capital, strategic innovation and competitiveness in the hospitality industry in Ethiopia. The researchers reached the conclusion that strategic innovation is the factor of the possibility to acquire the competitive advantage of a company. As Mahmoud et al. (2018) argue, strategic innovation is favorable and significantly affects service delivery quality, which in its turn enhances human capital. Successful strategic innovation, which is aimed at human capital, will meet the demands of customers (Tilahun et al., 2024).

An investigation conducted on the relationship among orientation of market, innovation, and the performance of firms in Albanian firms confirms that the firms that are committed to the learning and understanding of the inventiveness necessity are in a stronger position to monitor as well as satisfy requirements of consumers that result in human capital as well as better performance (Patwary et al., 2024). Strategic innovation positively affects the judgment of consumers on the service performance (Gelagay and Werke, 2024). The competitive advantage and human capital are enhanced by innovation in strategy, which is consistent with the research above (Hussain et al., 2025).

Strategic innovation enables companies to build more purposeful and nearer value of employees regardless of their location through new interfaces, self-service, and new modes of doing things as well as new models of delivering services, and all will enhance human capital (Abel et al., 2022). Human capital is the set of skills, intelligence, experience, and other characteristics that an individual has and will help him or her to work and generate economic value (Haldorai et al., 2022). The aforementioned is related to strategic innovation directly. Human capital is also related to new products and services directly (Kuo et al., 2022).

H1: Strategic innovation has a statistically significant impact on human capital.

Strategic innovation and competitive advantage

Wang et al. (2023) highlight that; innovation of strategy is an essential element that helps businesses in gaining and sustaining a competitive advantage. Studies have shown that providing clients with knowledge-based goods or services can increase the value and image of an organization, as well as give it competitiveness (Lin et al., 2023). Innovation in strategy indirectly influenced competitiveness by human capital (Nawi et al., 2020). The quality of services is enhanced through strategic innovation, and it has a direct impact on competitiveness (Haldorai et al., 2022). There is a favorable relationship between the intentions of the consumers to repurchase and the quality of the service; this relies on the level of strategic innovation. This has been proven by other investigators who have shown that quality of service is favorably related to willingness to recommend anyone (Senbeto, 2024). Moreover, Mahmoud et al. (2018) established that competitive advantage and strategic innovation have a significant positive relationship in the banking sector. However, as Nieves and Quintana (2018) note, strategic innovation does not affect competitiveness.

H2: Strategic innovation has a statistically significant impact on competitive advantage.

Human capital and competitive advantage

One of the modern strategies of quality in business organizations is the human capital of the customers, which helps to foster authentic employee confidence (Gelagay and Werke, 2024). Concerning human capital, scholars have defined it as the specialized knowledge and skills of workers that enable organizations to be innovative and outsmart rivals, hence obtaining a considerable competitive edge (AlQershi, 2021). Human capital refers to the pool of know-how that staff members have and which makes them able to do work and bring about economic worth. The ability to promote innovativeness as well as performance of the organisation by hiring a trained and informed workforce and consequently enhancing the productivity and competitive advantage is called human capital (Batoool et al., 2022). Human capital influences the experiences of staff members at their workplaces (Tilahun et al., 2024) and explains how employees experience the company in general. According to Chi and George (2020), human capital means the assessment of the performance of staff members in the two dimensions of quality and benefits should be evaluated, both the cost and effort put into them. Human capital is

the measure of how people rate their jobs and the degree of satisfaction, which directly impacts organizational effectiveness and performance (Patwary et al., 2024).

With everything said, human capital is a collection of the capacities, experience, and information of people to accomplish their tasks (Hotessa et al., 2024). Past empirical studies have shown that human capital has a big impact on determining the competitiveness of a company. The human capital contributes greatly to competitive advantage. To validate these findings, Lin et al. (2023) have argued that the returns on investments in people are more efficient for the company and increased levels of human capital lead to increased competitive advantage. The same was also confirmed by Hotessa et al. (2024), who found human capital to have a serious favorable influence on competitiveness in the tourism industry. When you retain skilled employees, this will provide you with a competitive advantage (Hussain et al., 2025). Tactical plans enhance employee retention (Haldorai et al., 2022). Another study found that competitiveness was influenced by human capital and service quality (Nieves and Quintana, 2018).

H3: Human capital has a favorable effect on competitive advantage.

Mediation effect of human capital between strategic innovation and sustainable competitive advantage

Human capital playing a mediation role in the link of innovative strategy and sustainable competitiveness is vital, especially in the hospitality sector (Bhatiasavi and Naglis, 2020). Human capital, which is a set of skills as well as the experience of the employees, enables success in implementing innovative strategies (Hotessa et al., 2024). Employees that undergo training and development are better equipped to embrace new technologies and practices, making operations more efficient and quality services better when firms invest in training and development (Batool et al., 2022). This enhanced ability enables organizations to be differentiated within a competitive market, which will finally translate to a sustainable competitive advantage. Accordingly, human capital is an intermediary that makes strategic innovation come to life, whereby innovations are properly managed in the operations of the organization and customer satisfaction (AlQershi, 2021).

H4. Human capital statistically mediates the link of strategic innovation and sustainable competitive advantage.

Apparently, the company's competitiveness is the unique disadvantage that a firm possesses over its rivals, which helps it deliver better value to its customers and sell more or make more profits, as described in this study. In this way, after the discussion of the relationships in human capital, competitiveness and strategic innovation, the research resulted in the creation of the conceptual model presented in Figure 1.

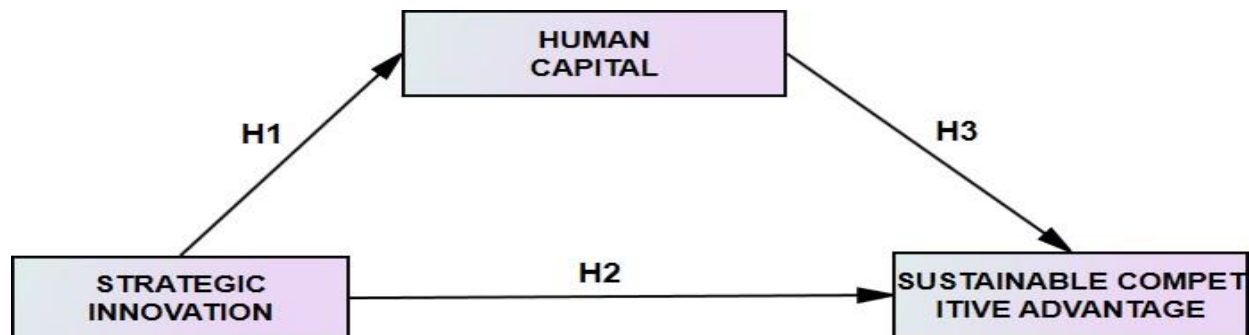


Figure 1. Conceptual framework

Methods and materials

Research approach and design

Creswell (2009) notes that in any research study, the research strategy must be very specific to the requirements of the problem under research. The investigators used quantitative research method in order to evaluate the relationship among human capital, strategic innovation, and competitiveness using specific hotels as a case. The key benefit of this method is that calculations are simple; it is not difficult to collect data, code, summarize, and analyze data. Since the research was qualitative and targeted to address specific objectives and objectives of the study, the research design adopted both descriptive as well as explanatory research design where multivariate statistics were used to test the association among innovation in strategy, competitiveness and human capital. As a matter of fact, the aims and hypotheses of the study, among others, define whether research design was adequate.

Sampling procedure

Saunders et al. (2012) stated that the sample is dependent on the size of the entire population, margin of error that can be tolerated, confidence range that we believe with the data as well as the nature of the study. The population of present investigation comprised of hotel workers who rendered any form of services was selected as sample respondents. Since the number of hotel employees who are working in different hotels is increasing, the researcher calculated sample size using a precision rate. Non-probability sampling, namely convenience sampling, was employed by the researcher. To find the representative number of samples, Cochran, (2007) formula of determining the sample size of a finite population was used and is as follows:

$$n = \frac{z^2 \cdot p \cdot q}{e^2}, \quad n = \frac{1.96 \times 1.96 \times 0.5(1-0.5)}{0.05 \times 0.05} \quad n = 384$$

The characteristics of n, p, q, e and z used in this case are as follows: n is the size of the sample which has to be established; p is the percentage or existence of the study characteristics (p = 0.5, maximum variability); q = 1-p; e is the accepted margin of error (15% of the accuracy); and z = 1.96 (95% of the confidence level).

Methods of data collection

Credible sources were used for primary and secondary data to assist the inquiry in achieving its objectives. A structured questionnaire was administered to hotel staff members of Hawassa city via a self-administered questionnaire. In order to ensure responders would be in a position to understand the questionnaire, it was initially written in English and translated to Sidama and Amharic. This enabled respondents to read the content comfortably, which resulted in more precise responses. The survey was also administered and collected during the final week of May 2025 to enable the data to be analyzed in time. This contributed to the validity of the results and also enabled the inclusion of the various linguistic backgrounds of the subjects and finally contributed to ensuring the quality and relevance of the inquiry. Various articles, books, and papers to examine the current findings available on the internet were used to prepare secondary data.

To examine the validity and assess questionnaire effectiveness, pretesting and cognitive interviews were conducted by the researcher on a group of shortlisted participants. Back translation was used to minimize individual translator bias of translation that translated the

questionnaire back into English. The questionnaire was also checked by a language expert to establish cultural appropriateness and use of the right terminology for the population of interest. This rigorous process increased the research instrument's reliability, contributing to the study's overall quality.

Measurement of instrument

The questionnaire is founded on the aspects that have been confirmed in the previous studies, and it has been refined and tailored to the topic of the study. In order to have a competitive advantage, 7 items were borrowed in the work of Seesaiprai (2016). To include strategic innovation, 7 items were chosen based on Derrick and Kaplan (2017), and human capital (7 items) was chosen based on Grigorescu and Ion (2021). Each item of the questionnaire was rated using Likert scales ranging between five points (strongly disagree to strongly agree). Two items of the strategic innovation (SI4 and SI5) and one of human capital (HC6) were dropped and not used in confirmatory factor analysis because of their low loading in factor analysis. The analysis section was done on the basis of the findings recorded using 21 proxies, which contained demographic data of the respondents.

Data processing and analysis

The first step in data analysis is to edit the raw data to make sure it is accurate, consistent, and complete for further processing (Chen et al., 2023). In order to preserve the integrity of the data, questionnaires that were judged inappropriate, inaccurate, or disagreeable were not included in the analysis. Inferential as well as descriptive analysis was used to evaluate the information after it had been updated and coded. Factor analysis was carried out in conjunction with an SEM to test the research hypotheses and assess the relationship between strategic innovation, competitiveness, and human capital. Descriptive analysis was done using SPSS v26, and AMOS 26 facilitated the use of SEM. This detailed method allowed considering the direct and indirect impacts of the central concepts under investigation, which made it possible to clear up the relationships between them.

Results

Response rate

The investigators distributed 384 questionnaires to the respondents, of whom 377 returned the questionnaires immediately. Sixteen questionnaires were omitted in the analysis because of non-response of the respondent as well as poor responses. Because of this, 98 percent of the respondents provided detailed responses, which ensured that a good amount of data will be collected to analyze. This high response rate showed that there was a high level of engagement of the selected sample, and it also showed the reliability of the outcome. The reliability of the research values was ensured by the meticulous management of the data mining process, which made it possible to comprehend the investigation's goals.

Data adequacy test

Table 1. KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.890
Bartlett's Test of Sphericity	Approx. Chi-Square	1139.533
	Df	66
	Sig.	0.000

Based on table 1 above, the KMO measure of sampling adequacy is a measure of how well data may be used for factor analysis. Better appropriateness is indicated by higher numbers; the range is 0 to 1. A respectable KMO score of 0.890 indicates that the data can be subjected to factor analysis. This suggests that since there is sufficient common variation among the variables, factor analysis is justified. Bartlett's test of sphericity is used to test the null hypothesis, which holds that there is no association between the variables. An identity matrix for the variables is produced by this test. Approximately the test statistic is chi-square with $(p(p-1)/2)$ degrees of freedom, where p is the number of variables. Chi-square is 1139.533, with 66 degrees of freedom in this case, and the significance value is 0.000. We may therefore state that the null hypothesis is dismissed and that there is a favorable association among the variables. According to the

outcome of the KMO and Bartlett test, the data can be analyzed through the factor analysis. There is a good amount of shared variance and a significant degree of correlation between the variables. This suggests that factor analysis may be used to extract important elements from the data.

Table 2. Scale communalities

Constructs	Item	Extraction	Average loading extracted
		> 0.50	>More than 0.50
Strategic innovation	SI1	0.700	0.74
	SI2	0.693	
	SI3	0.749	
	SI6	0.604	
	SI7	0.612	
Human capital	HC1	0.696	0.73
	HC2	0.706	
	HC3	0.721	
	HC4	0.801	
	HC5	0.672	
	HC7	0.685	
Eco-hotel competitive advantage	CA1	0.748	0.74
	CA2	0.771	
	CA3	0.756	
	CA4	0.755	
	CA5	0.634	
	CA6	0.705	
	CA7	0.746	

The scale communalities Table 2 shows the communalities of each item on a scale. The communality of an item is a measure of how well the factors extracted through factor analysis explain its variation. On a scale of 0 to 1, higher values mean that the factors account for more variation. Every item in this case has a communality greater than 0.50, which is deemed suitable.

This suggests that since the items assess the same fundamental notion, they should be included in the scale. The test value is more or less distributed as chi-square with $(p(p-1)/2)$ degrees of freedom, n being the number of variables. The chi-square value of the case is 1139.533 which have 66 degrees of freedom, and the significance value is 0.000. So, it can be concluded that the null hypothesis is rejected and there is an important association among the variables. According to the findings of the KMO and the test offered by Bartlett, the data can be subject to factor analysis. In this case, the average loadings for every item are either outstanding or greater than 0.60. This implies that there is an intimate connection between each item and the things it is considering. The items in each scale usually involve evaluating the same underlying construct, indicating that they are appropriate for inclusion in the scales based on the scale's shared characteristics and median loading gathered values. Extraction sums for squared rotation loadings and squared loadings for an element's initial eigenvalues.

Total variance explained analysis

Table 3. Total variance explained

Component	initial eigenvalues				Extraction sums of squared loadings		
	Total	% of Variance	cumulative %	Total	% of Variance	Cumulative %	
1	3.703	30.858	30.858	3.703	30.858	30.858	
2	1.495	12.458	43.317	1.495	12.458	43.317	
3	1.154	9.614	52.931	1.154	9.614	52.931	
4	1.037	8.640	61.571				
5	0.889	7.412	68.983				
6	0.775	6.460	75.443				
7	0.699	5.827	81.271				
8	0.546	4.552	85.823				
9	0.499	4.157	89.980				
10	0.433	3.607	93.587				
11	0.410	3.415	97.002				
12	0.360	2.998	100.000				

The total variance explained in Table 3 shows how much of the data variation is explained by each component that was recovered during factor analysis. In this case, 30.858% of the variation in the data can be explained by the first component, 12.458% by the second, and so on. The cumulative percentage column shows the total amount of variance explained by each component and all of the factors that preceded it. The total variance explained table might help you identify how many factors to extract for your factor analysis. In general, relevant factors have eigenvalues greater than one. The eigenvalues of the first three items in this example are more than one, indicating that they have relevance and should be retained. The overall proportion of variance that the first three components can account for is 52.931%. In other words, these three factors may account for over half of the data's volatility. Based on the total variance explained table, three components should be extracted for factor analysis. These three factors, which are also the simplest to comprehend, will account for the largest variance in the data.

Table 4. Factor analysis by using component matrix

	Component		
	1	2	3
HC1	0.895		
HC2	0.889		
HC3	0.804		
HC4	0.774		
HC5	0.769		
HC7	0.714		
SI1		0.833	
SI2		0.826	
SI3		0.812	
SI6		0.747	
SI7		0.682	
CA1			0.890
CA2			0.873
CA3			0.848
CA4			0.723
CA5			0.653
CA6			0.747
CA7			0.781

The SEM results for the route diagram and the path coefficients shown in the AMOS 26 output were displayed in Figure 2 and Table 8. The pattern matrix shows the loadings of each item on each component that was obtained during factor analysis. A stronger relationship is indicated by higher loadings. The association between an item and a factor is measured by loadings. In this case, the pattern matrix is rotated using the Promax with Kaiser Normalization technique. This rotation approach tends to produce factors that are easier to grasp by raising the loadings of items on their principal factor and decreasing their loadings on other factors.

The pattern matrix can be used to interpret the factors that were obtained through factor analysis. If an item has significant loadings on a factor, it is considered representative of that factor. Since it has large loadings on all human capital (HC) items, the first element in this case represents human capital. The second factor showed substantial loadings for all of the Strategic Innovation (SI) components, indicating that this component is typical of SI. Every item associated with eco-hotel sustainable competitive advantage (CA) has a high loading on the third component, which represents eco-hotel sustainable competitive advantage. The pattern matrix verifies the explanation of human capital, strategic innovation, and persistent hotel competitive advantage as factor evaluation components. Various features may be used to better understand the interactions amongst various structures, and these aspects are all relevant to the study of the hotel industry.

Analysis of path estimates in the model

Table 5. Hypothesis testing

Path			Estimate	S.E	C.R	P	Hypothesis
Human capital	< —	Strategic innovation	0.462	0.036	13.105	Sig	H1 Supported
Competitive advantage	< —	Human capital	0.212	0.050	4.168	Sig	H3 Supported
Competitive advantage	< —	Strategic innovation	0.482	0.069	7.206	Sig	H2 Supported

Important insights into the links among innovation in strategy, human capital and competitiveness in the eco-hotel setting are revealed by the investigation of the relationships within the model, which is shown by Table 5. With a standard error (S.E.) of 0.036, the path from strategic innovation to human capital has a significant positive estimate of 0.462. This association has a very significant ($p < 0.001$) critical ratio (C.R.) of 13.105. This supports

Hypothesis 1 (H1) by showing that strategic innovation is vital to improving human capital in hotels. According to the reliable estimate, hotels improve the knowledge and abilities of their employees while implementing a new technique, which puts them in a better position to accomplish sustainability targets.

Additionally, the estimate of 0.212 with a S.E. of 0.050 and a C.R. of 4.168 on the path from human capital to competitive advantage is statistically significant ($p < 0.001$). This demonstrates that human capital has a beneficial effect on competitive advantage, supporting Hypothesis 3 (H3). The outcome shows that well-trained staff members in hotels promote happiness of customers and operational effectiveness, which in turn strengthens the position of the hotel.

In addition to this, the direct interrelation of innovation in strategy as well as hotel competitiveness is striking; with a significant ($p < 0.001$) estimate of 0.482, S.E. of 0.069, and C.R. of 7.206. This outcome supports Hypothesis 2 (H2) and shows that competitive advantage in hotels is directly influenced by strategic innovation. According to the high estimate, using new techniques helps hotels stand out from the competition and provide distinctive value propositions that appeal to eco-aware guests. It also strengthens sustainability initiatives.

Indices for model fit analysis

Table 6 lists the indices that are used to assess the overall model fit in the structural equation modeling (SEM) study.

Table 6. Measurements of goodness of model fit

Types of measurements	Criteria	Value obtained	Level of acceptance
Chi-square	CMIN	33.650	-
	Degree of freedom	18	-
	CMIN/DEF	1.869	<3
	P value	0.161	>0.5
Absolute measurement of fit	RMSEA	0.050	<0.08
Incremental fit instruments	CFI	0.990	>0.9
	IFI	0.992	>0.9
	RFI	0.949	>0.9
	TLI	0.980	>0.9
Parsimony fit measure	PNFI	0.500	>0.50
	PCFI	0.620	>0.50

Table 6 shows an all-inclusive evaluation of the model fit, which employs different measurements to judge the structural equation modeling outcomes. The chi-square value of 33.650 and its degree of freedom of 18 point to the fact points that the model fits well, especially with the CMIN/DEF ratio of 1.869 that is lower than the acceptable value of 3. The P-value of 0.161 is higher than the 0.05 threshold, which once again proves the sufficiency of the model. The value of RMSEA is 0.050, which is much less than the 0.08 cutoff, indicating a close fit. All of these measures of absolute fits reveal that the model was able to capture the latent relationships between the constructs being tested, which give it a strong basis for further analysis.

Besides the absolute measures of fit, the incremental fit measures also help to support the model. The values of the Comparative Fit Index are 0.990, and the Incremental Fit Index is 0.992, which are substantially more than the acceptable value of 0.9, which reflects a good fit to a baseline model. The Relative Fit Index (RFI) of 0.949 and the Tucker-Lewis Index (TLI) of 0.980 also show good performance of the model. Additionally, the measures of parsimony fit, such as the Parsimony Normed Fit Index (PNFI) at 0.500 and the Parsimony Comparative Fit Index (PCFI) at 0.620, are satisfactory, thus indicating that the model has a good balance between complexity and fit. On the whole, these results confirm that the model can be useful to describe the connection between brand capital, marketing analytics, and competitive advantage when applied to Ethiopian manufacturing companies.

Validation

Table 7. Validity concern

	CR	AVE	MSV	MaxR(H)	SI	HC	SCA
SI	0.730	0.641	0.230	0.850	0.648		
HC	0.7590	0.660	0.128	0.766	0.169	0.659	
SCA	0.788	0.611	0.269	0.795	0.384	0.188	0.679

Note: SI = strategic innovation; HC = Human capital; SCA = sustainable competitive advantage

Table 7 indicates the validity concerns of the constructs of Strategic Innovation (SI), Human Capital (HC) and Sustainable Competitive Advantage (SCA) in the different metrics (Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Reliability (MaxR(H)) and inter-construct correlations). All of the CR values of the constructs are above the recommended

cut-off of 0.70, which shows that these constructs exhibit a high internal consistency. The AVE values of SI (0.641), HC (0.660) and SCA (0.611) indicate that the percentage of the variance in each construct is high, supporting their validity. In addition, the maximum reliability values reveal high reliability of the constructs. The inter-construct correlations are sufficiently low, as they support the discriminant validity and make sure that every construct is unique. In general, the results of this research support the strength of the measurement model and prove the constructs to be used in further investigation.

Structural equation model

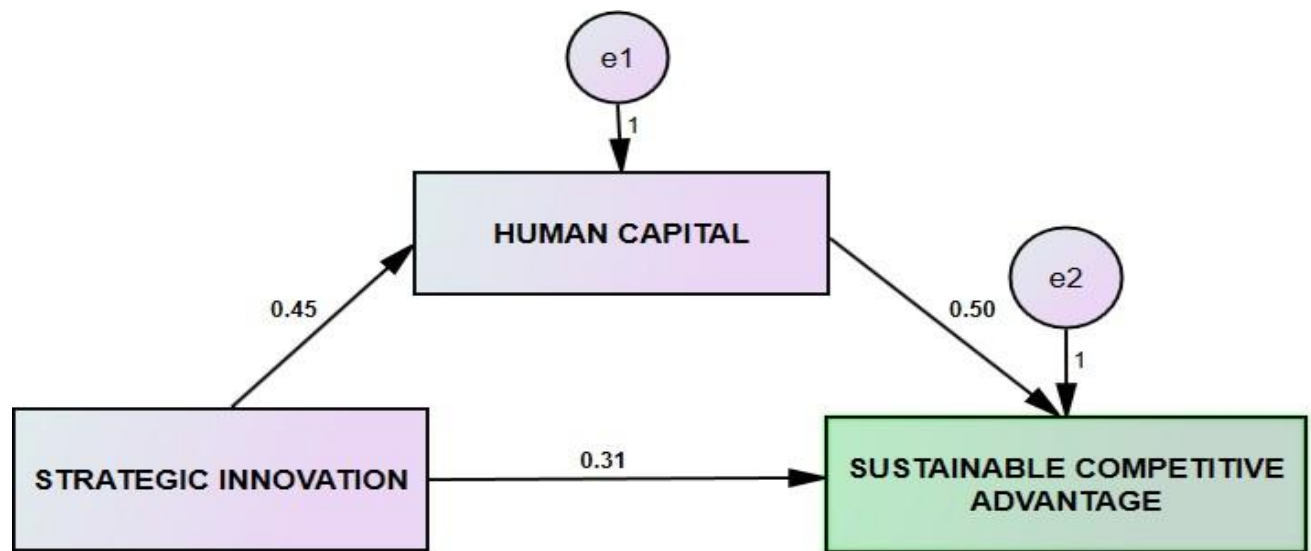


Figure 2. Structural Equation Model result

Analysis of path effects on eco-hotel sustainable competitive advantage

Table 8. Mediation effect

Path	Effect	Result
Strategic innovation → Sustainable competitive advantage	Direct influence	0.309
Innovation in strategy → Human capital → Hotels sustainable competitive advantage	In-direct Effect	0.23
	Total Effect	0.54

Important new information about how strategic innovation affects sustained competitive advantage in hotels is revealed by the examination of path effects as Table 8. The quantitative

value of the direct impact of strategic innovation on the sustained competitive advantage of hotels is 0.309. This shows a strong positive correlation, indicating that hotels' competitive stance is directly improved by implementing innovative methods. The direct ramification of this is to highlight the importance of hotels distinguishing themselves in a competitive environment through the adoption of new technologies, sustainability and unique-service provision. This will improve their capacity to draw in and keep eco-aware customers.

The direct benefit is also accompanied by the indirect influence of strategic innovation through human capital, of 0.230. This research claims that strategic innovation enhances human capital in hotels besides its direct effect on competitive advantage. Essentially, hotels invest in the skills and knowledge of their personnel simultaneously as they put up innovative strategies which enhance the competitive advantage of the hotel. This layer of mediation emphasizes the importance of a knowledgeable and motivated workforce in terms of turning creative activities into real benefits in the market.

In the event that both of these are multiplied together, the resulting effect is 0.540 when the effect of innovative strategy on the sustainable competitive advantage of the hotels is considered. This overall analysis shows that the strategic innovation has a significant overall impact that involves both direct and indirect channels. The strong total influence enhances the suggestion that the hotels will be able to maintain the sustainable competitive edge when relying on two strategies: investing in the development of human capital and directly implementing novel methods.

Discussion

An effective paradigm to understand the interaction of innovation in strategy, human capital and sustainable competitive advantage in hotels provides an idea on how these issues contribute to the general well-being of the Ethiopian hotel industry. The findings indicate that strategic innovation is one of the key drivers of competitive advantage, and hotels should implement the latest processes that would meet the needs of clients and ensure environmental sustainability. This confirms the concepts of Batool et al. (2022). The hotels can also make a difference in a competitive market by going green and incorporating new technology, which will attract environmentally conscious tourists who value sustainability highly when choosing the venue to

spend their time. The study result indicated that human capital mediates the relationship between strategic innovation and sustainable competitive advantage, partially. This observation affirms the observation of Lin et al. (2023). Nevertheless, this was not the same as Gelagay and Werke (2024) who found that there was complete mediation of human capital between strategic innovation and competitive advantage.

Moreover, the role of human capital as a mediator in this relationship is quite important. The result of the study is that hotels enhance employee competencies and skills that can embrace strategic innovations. Besides enhancing performance in the operations, this dual focus assists the firm in building a sustainable culture. Highly trained and motivated employees have a higher chance of coming up with valuable contributions to sustainability projects which transform the innovative ways of doing things into practical benefits to the hotel. This highlights the importance of investing in the development of the staff, as they need to be motivated and informed to effectively execute sustainability practices. The results are consistent with the results of Haldorai and Garcia (2022) and Aman-Ullah (2022).

It is also observed in the discourse that there is the need to have a holistic approach, which encompasses strategic innovation and developing human capital. Ethiopian hotels must understand that the ability of their employees to implement and market innovations can also offer them a competitive edge in addition to innovations. With sustainability initiatives, the employees will be more satisfied with their jobs and thus retain them, aiding in ensuring a stable and informed workforce. Such a symbiosis of strategy innovation and the human resource warrants the concept that sustainability is an element of organizational culture within the hotel.

The results also have a number of practice and policy implications. Hotels must be given a priority of the first rank of training programs that aim at sustainability and innovative practices such that the staff members are equipped to meet the requirements of the dynamic market. Additionally, sustainability programs can be strengthened by the partnership with certain local stakeholders, such as the government and local communities. These kinds of partnerships will have the capacity to deliver the hotels with both resources and support that helps in a more holistic approach to sustainability that will help the hotels as well as the local communities they serve.

Conclusion

The study emphasizes the vital connection between human capital, strategic innovation, and sustainable competitive advantage in the eco-hotel industry. Strategic innovation is a major source of competitive advantage, underscoring the significance of implementing creative strategies that meet the rising demand for sustainability among consumers. In addition to improving their operational efficiency, hotels that adopt such innovations also successfully position themselves in a competitive market, drawing in eco-aware tourists. The analysis also highlights how important human capital is as a mediator in this relationship. Hotels can establish a knowledgeable and driven team that can carry out and advance sustainability programs by investing in employee training and development. In order to convert strategic ideas into real benefits for the hotel and its visitors, this interaction cultivates a culture of creativity and accountability. In order to optimize their competitive posture, hotels have to give equal weight to innovation and the development of human resources. Overall, the total effect analysis shows that establishing a sustained competitive advantage in hotels requires the interaction of strategic innovation and human capital. Hotels need to have a comprehensive approach that incorporates these components into their operating strategies as the hospitality sector develops further. In order to give practitioners a stronger competitive edge in a market that is becoming more environmentally sensitive, future study might examine particular innovations and training initiatives that have the biggest effects on sustainability outcomes. The studies on how human capital mediates the impact of strategic innovation on sustainable competitive advantage in Ethiopian hotels should concentrate on a few important aspects. Investigating the kinds of strategic innovations that work best in the particular Ethiopian setting is essential first. Hotels looking to improve their competitive positioning can get important insights by identifying region-specific sustainable practices, technology, and services that complement local cultural values and foreign tourists' expectations. This investigation can assist in identifying improvements that not only appeal to visitors but also significantly advance sustainability objectives. It would also be advantageous to do longitudinal research evaluating the long-term effects of investments in human capital and strategic innovation on sustainable competitive advantage. Such studies could provide a fuller knowledge of the changing ecotourism scene in Ethiopia by revealing trends in consumer preferences as well as changes in employee

involvement and operational efficiencies over time. Research could be further enhanced by comparing Ethiopian hotels with those in other developing nations, shedding light on common issues and best practices. Researchers can find solutions that might be applicable in various circumstances by looking at how various legal frameworks and cultural contexts impact the relationship between strategic innovation, human capital, and competitive advantage.

Competing interest

The authors state that they do not have any competing interest.

Data availability

The information on this research is present and will be supplied by the reasonable request from the corresponding author.

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