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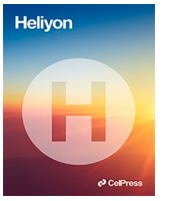

Research article

Assessing the mediating role of knowledge management in the relationship between technological innovation and sustainable competitive advantage

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ABSTRACT

This study employed the resource-based view theory to investigate the relationships between technological innovation, knowledge management, and sustainable competitive advantage in the hospitality sector, focusing explicitly on hotels in the Yaounde and Douala regions of Cameroon. Cluster sampling was employed to identify 370 respondents from of 35 hotels. Structural equation modelling (SEM) was utilized to analyze the data. The study found that technological innovation had a positive and significant influence on sustainable competitive advantage and knowledge management. It was observed that knowledge management had a positive and significant influence on sustainable competitive advantage. The investigation discovered that knowledge management partially mediates the relationship between technological innovation and sustainable competitive advantage. Cameroonian hotels can improve their competitive advantage by innovating technology and promoting efficient knowledge management techniques. Adopting cutting-edge technologies and fostering a culture of knowledge exchange can result in increased operational efficiency, enhanced service delivery, and differentiation from rivals, ultimately bolstering long-term competitiveness in the hospitality sector.

1. Introduction

Hotels and other businesses in the hospitality industry strive to establish sustainable competitive advantages to achieve long-term success [1]. They do this by providing distinctive attributes, customized services, and new experiences that differentiate them from competitors. Developing a strong and distinct brand image and reputation enables hotels to charge higher prices and foster client loyalty, which are essential for long-term competitive advantages [2,3].

Technological innovation plays a crucial role in achieving sustainable competitive advantages in hotels. Implementing mobile check-in and check-out, keyless entry systems, and personalized recommendations enhance guest experiences, attracting and retaining customers [4,5]. Technology simplifies operational procedures through property management systems and CRM software, reducing costs, minimizing errors, and improving resource allocation for increased competitiveness [6]. Hotels also use technology to collect and analyze data about visitor preferences, booking patterns, and industry changes, enabling them to make strategic decisions and quickly adapt to market changes [7].

Technology not only facilitates the implementation of sustainable practices, such as energy-efficient systems, waste reduction

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measures, and eco-friendly amenities [8], but also underscores their significance in the hotel industry. By demonstrating sustainability through technology, hotels can attract environmentally conscious guests and differentiate themselves from competitors. Technology provides hotels with diverse marketing and distribution channels, allowing them to reach a wider audience and maximize revenue sources [9]. This includes online travel agencies (OTAs), social media platforms, and direct booking channels supported by user-friendly websites and mobile applications.

Knowledge management plays a pivotal role in enabling hotels to leverage their experience and insights to drive technological innovation and gain sustained competitive advantages [10]. Knowledge management systems facilitate the exchange of expertise, experiences, and creative ideas among hotel staff, fostering a culture of collaboration and open communication that promotes innovation. Hotels can establish a repository of effective approaches, procedures, and methods by documenting successful strategies, which can be utilized to attain operational excellence and guide technological advancement [11].

Knowledge management also enables continuous learning and adjustment by granting access to industry knowledge, market patterns, and developing technologies [12]. Hotels can use knowledge management solutions to stay current on improvements in hospitality technology, consumer preferences, and rival strategies, allowing them to identify opportunities for innovation and adjust their operations accordingly to stay ahead of competitors [13].

Furthermore, knowledge management systems are instrumental in enabling data-driven decision-making by providing access to analytics and performance measures [14]. Hotels can leverage data on guest preferences, booking patterns, and satisfaction levels to steer technological innovation, strategically allocating resources to technologies that enhance the visitor experience and drive revenue growth [15]. This strategic use of data ensures that technological advancements align with the hotel's business goals, contributing to enduring competitive advantages.

There is a significant knowledge gap in understanding how technological innovations can sustainably enhance hotels' competitive edge, particularly in the unique context of Cameroon. The hospitality industry in Cameroon exerts a substantial influence on the nation's economy, as seen from the consistent growth in tourist arrivals and the subsequent rise in revenue generated. Based on data from the World Tourism Organization, the tourist influx to Cameroon witnessed a substantial rise, surging from 783,000 in 2012 to 1 million in 2019. During this period, there was substantial growth in tourism revenues, with an increase from $377 million to $681 million. These revenues accounted for approximately 1.3 %–1.8 % of the nation's Gross National Product (GNP). The continuous growth of the hospitality industry highlights its significance in enhancing economic performance and showcases its potential as a pivotal sector for fostering sustainable development. Nevertheless, this study is necessary to sustain and enhance the hospitality industry's progress. By conducting this study, the hospitality industry in Cameroon could improve its ability to adjust to shifting market conditions, improve service provision, and strengthen its role as a significant driver of economic growth.

While numerous studies have explored the impact of technological innovation on sustainable advantages in sectors such as banking, local government institutions, and the service industry [16.17], the specific dynamics and market conditions in Cameroon's hospitality industry may require further investigation. This research aims to fill this gap and provide valuable insights into the potential of technological innovation to enhance sustainable competitive advantages in this distinct setting.

Furthermore, despite some research on the direct relationship between technological innovation and sustainable competitive advantages, the mediating role of knowledge management in this relationship, particularly in the hotel industry, has not received thorough investigation. Knowledge management is crucial in facilitating technological innovation adoption, implementation, and optimization [18]. However, a thorough examination of its impact on the connection between technological innovation and sustainable competitive advantages remains lacking.

This study aims to address the gaps in the existing literature by examining the relationship between technological innovation, knowledge management, and sustainable competitive advantages in the hotel industry, specifically in Cameroon. In order to accomplish this goal, the study seeks to address the following research questions: What is the impact of technological innovation in the hotel business on sustainable competitive advantages? What is the impact of technological innovation on hotels' knowledge management practices? What is the correlation between knowledge management practices and the ability to maintain a sustainable competitive advantage in the hotel industry? What is the role of knowledge management in mediating the relationship between technical innovation and sustainable competitive advantages in the hotel sector?

The study seeks to enhance theoretical, empirical, and practical insights by investigating the following research issues, making a valuable contribution to the existing literature. Firstly, the study examines how technological innovation impacts hotels' sustainable competitive advantages, offering insights into the specific technologies and techniques that create sustainable competitive advantages in this setting. Furthermore, the study enhances our comprehension of how hotels utilize their internal knowledge resources to optimize the advantages of technological breakthroughs by analyzing the influence of technological innovation on knowledge management practices within hotels.

The study examined the relationship between knowledge management practices and sustainable competitive advantages in the hotel industry. It highlighted the importance of effectively utilizing information for long-term success. Finally, this study provides valuable insights into the translation of technological gains by examining the role of knowledge management in mediating the connection between technological innovation and sustained competitive advantages.

Understanding how technology innovation enhances sustainable competitive advantages in the hotel industry, specifically Cameroon, is crucial for guiding strategic decision-making and achieving organizational success. Furthermore, investigating the intermediary function of knowledge management can offer valuable insights into how hotels can efficiently utilize their internal knowledge resources to optimize the influence of technological innovation on competitiveness. By addressing these unexplored research areas, experts and professionals can enhance their knowledge in hospitality management and contribute significantly to developing strategies that enhance hotels' long-term sustainability and prosperity in diverse and constantly evolving contexts.

2. Literature review and hypothesis development

2.1. Theoretical framework

Resource-Based View (RBV) theory provides a comprehensive framework for understanding the role of knowledge management in the relationship between technological innovation and sustainable competitive advantage [19] and is presented in Fig. 1. According to RBV theory, a company's competitive advantage is derived from its unique combination of resources and skills that are valuable, rare, difficult to imitate, and irreplaceable [19].

Effective knowledge management is an internal asset that enhances the value and efficiency of technological advancements, leading to long-term competitive advantages [20]. RBV theory emphasizes the importance of internal resources and capabilities in creating a competitive advantage and positions knowledge management as a fundamental resource that enables companies to effectively leverage and benefit from technological breakthroughs [21].

Research indicates that companies with effective knowledge management practices are able to incorporate and utilize technological advancements in their operations and strategies [22,23]. In the hospitality industry, hotels with effective knowledge management systems are proficient in utilizing advanced technologies such as mobile check-in and check-out systems and personalized guest services, leading to improved guest experiences and operational efficiency [24].

Studies have shown a direct relationship between knowledge management and company success, including increased levels of innovation, productivity, and profitability [25,26]. Efficient knowledge management supports the identification, acquisition, sharing, and utilization of new knowledge, enabling companies to outperform competitors and maintain their position as market leaders [27].

Knowledge management plays a crucial role in identifying and assessing the potential for technological advancements by gathering valuable information from internal and external sources [28]. Through knowledge-sharing platforms and collaboration tools, companies can gain valuable insights on emerging technologies, market trends, and customer preferences, thereby shaping their innovation strategies.

By facilitating the effective integration and assimilation of technological advancements into existing corporate operations and systems, knowledge management helps companies overcome implementation barriers and ensure alignment with long-term goals, resulting in improved performance and a competitive edge [29,30].

Furthermore, knowledge management enables organizational learning and adaptation to effectively respond to technological advancements and market fluctuations [31]. By implementing continuous learning and feedback systems, companies can leverage knowledge gained from past experiences, allowing them to adapt quickly and effectively, and maintain their competitive edge in the long run.

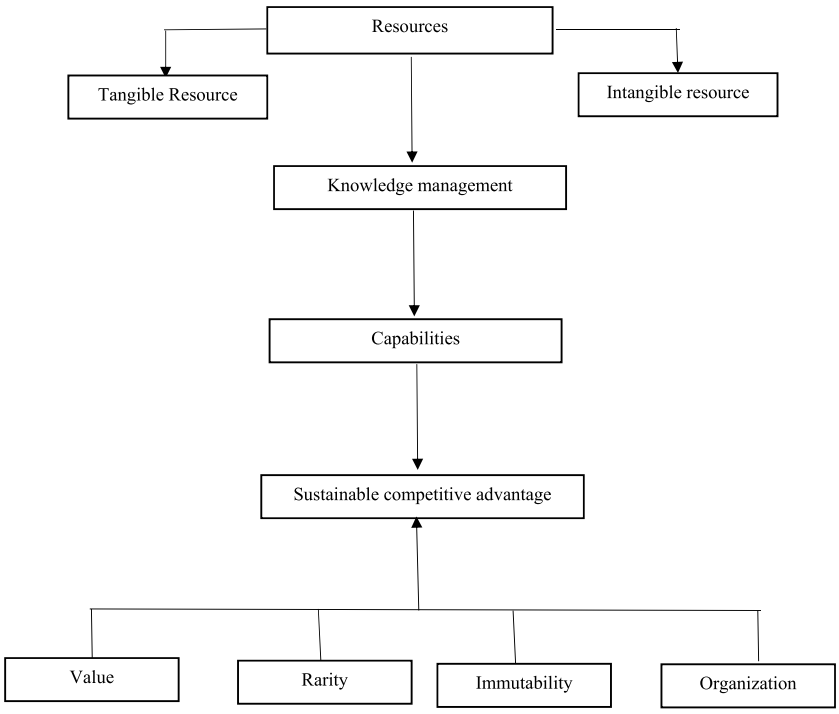

Figure 1. Resource-Based View (RBV) theory.
Source: Author's own work

2.2. Hypothesis

The conceptual model is presented in Fig. 2

2.3. The influence of technological innovation on sustainable competitive advantage

Technological innovation is crucial in creating long-lasting competitive advantages for organizations in all industries, including the hospitality sector (see Fig. 3). Innovations enable firms to create distinctive products or services, distinguishing them from their competition [32]. Hotels may enhance guest experiences and differentiate themselves in the market by implementing smart room controls or AI-driven concierge services. These advancements optimize internal processes, enhancing productivity and reducing expenses. Automation tools and data analytics improve efficiency and quality in inventory management and customer service, resulting in increased production and service excellence [33].

Furthermore, technology allows organizations to deliver customized experiences, promoting consumer loyalty [34]. Mobile applications for making reservations, artificial intelligence chatbots for assisting, and digital platforms improve convenience, resulting in higher client satisfaction and recommendations. Firms can broaden their market reach and enhance their brand's exposure through strategic use of technology in marketing and distribution. Social media and digital marketing technologies enable precise targeting of certain client segments, leading to increased growth and market penetration [35].

Technological innovation enables quick and efficient adjustments to evolving market conditions. Companies that adopt innovation can promptly adapt to new trends and changing] consumer preferences, thereby staying ahead of their competitors [36]. Agile firms maintain a competitive edge in changeable market settings by embracing new communication channels and using sustainable practices.

Technology fosters sustainability, yielding environmental advantages and economic competitiveness [37]. Utilizing renewable energy solutions, implementing waste reduction measures, and offering eco-friendly products indicate a dedication to sustainability, which appeals to environmentally aware clients. By adopting sustainable practices, firms improve their reputation and distinguish themselves in the market, leading to long-term success [38].

In their study, Haseeb [17] investigated the impact of social and technological obstacles on attaining a sustainable competitive advantage and sustainable company performance. The study utilized a sample of 500 managerial staff members from small and medium-sized enterprises (SMEs) and discovered that technological challenges significantly enhanced both sustainable competitive advantage and sustainable business performance.

Feng [16] determined that enhancing the competitiveness of high-tech industries leads to improved competitive advantage for firms and enables sustainable management of those enterprises.

Amesho [39] examined how managing sustainable competitive advantage through technology and innovation systems impacts service delivery and firm survival in an unavoidably competitive business environment. According to the study, the management of technology and innovation for SCA is not simply a means to achieve an objective but rather a collection of instruments and methods to ensure the effective provision of services to individuals and communities.

H1. Sustainable competitive advantage is significantly influenced by technological innovation.

2.4. The influence of technological innovation on knowledge management

Technological innovation has had a profound impact on knowledge management strategies in businesses, providing effective tools and platforms for creating, capturing, and sharing information [30]. Collaborative software, cloud-based platforms, and digital repositories enable real-time documentation of employees' skills and insights, ensuring the preservation and accessibility of critical knowledge. AI and machine learning technologies automate the process of capturing knowledge from various sources, enhancing efficiency and accessibility [40].

Technology facilitates seamless communication and collaboration among employees, overcoming geographical limitations. Video conferencing, instant messaging, and virtual collaboration tools enable real-time knowledge exchange, fostering a culture of continuous learning [41]. Social networking tools and online communities facilitate knowledge sharing and collaboration within the organization.

Advancements in technology optimize the efficiency of storing and accessing information. Knowledge management systems,

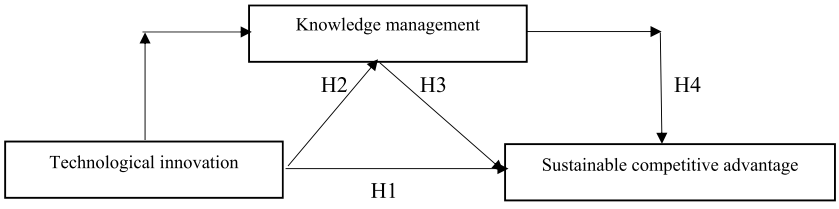

Fig. 2. Conceptual framework.
Source: Author's own work

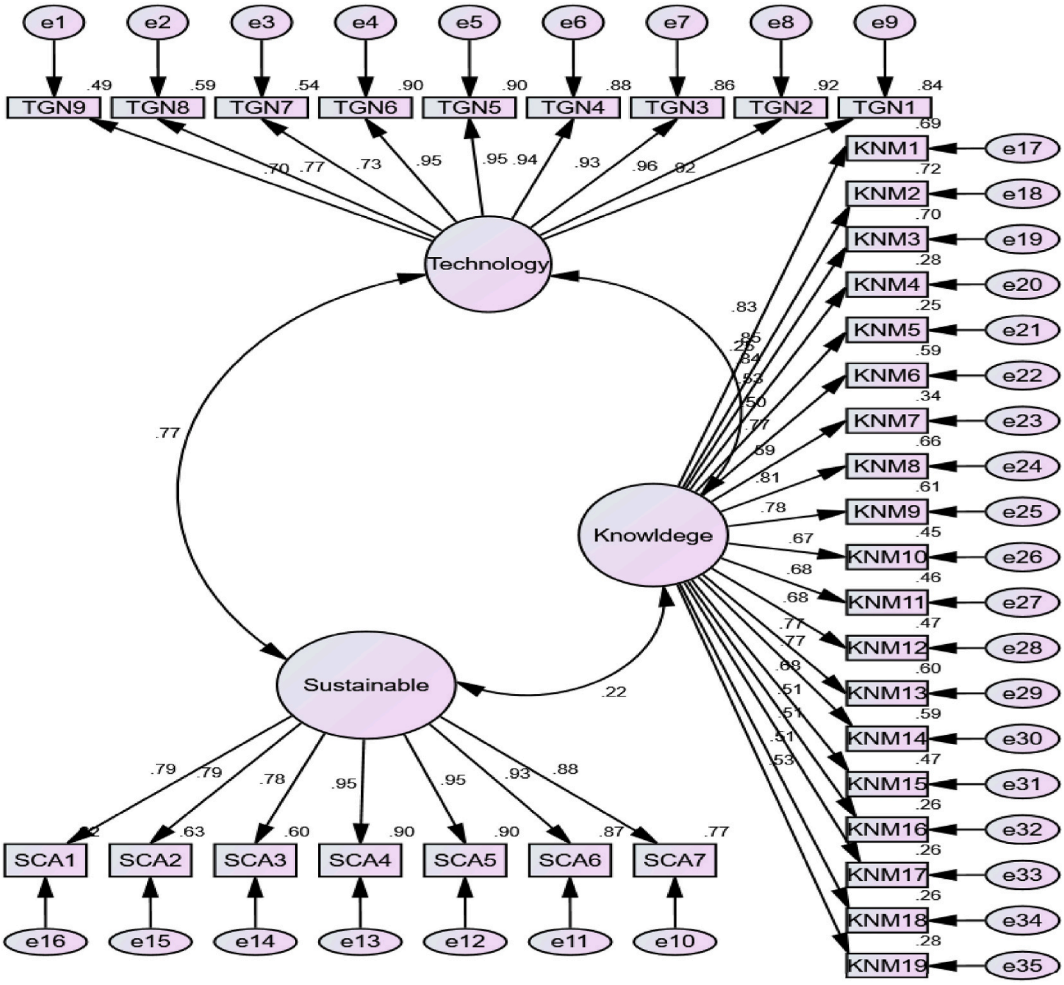

Fig. 3. Measurement model.

document software, and business search tools enable staff to retrieve relevant information efficiently [42]. Advanced search engines and metadata tagging improve organization and information accessibility, ensuring that employees can effectively retrieve valuable insights.

Technology also facilitates knowledge dissemination and the implementation of training programs through online learning platforms and virtual classrooms [43]. Interactive simulations and gamification strategies engage employees in immersive learning experiences, enhancing their ability to retain knowledge and acquire new skills. Augmented and virtual reality technologies provide immersive training experiences, facilitating rapid learning and knowledge transfer [44].

Furthermore, technological advancements enable firms to evaluate and extract valuable information from large volumes of data and knowledge assets [45]. Data analytics tools and predictive algorithms reveal hidden patterns and connections, enabling informed decision-making and strategic planning. By leveraging technology in knowledge analysis, firms can identify areas for development and actively pursue programs for continuous innovation [46].

A study conducted by Mardani [47] investigated the impact of knowledge management on innovation using a sample of 120 enterprises from the Iranian Power Syndicate. The study found that knowledge management activities have a direct influence on innovation, highlighting the importance of effectively managing knowledge for fostering innovation within organizations.

H2. Knowledge management performance is significantly influenced by technological innovation.

2.5. The influence of knowledge management on sustainable competitive advantage

Knowledge management plays a critical role in creating long-lasting competitive advantages for firms, as it promotes innovation, improves employee growth and retention, and mitigates risks [48,49]. By gathering valuable insights, implementing best practices, and learning from past experiences, organizations can gain a competitive edge and adapt more efficiently, setting themselves apart from competitors.

Efficient knowledge management allows firms to leverage their existing knowledge resources and experiences, enhancing operational efficiency and reducing costs [50]. By optimizing processes, eliminating unnecessary work, and fostering a culture of ongoing education and information exchange, businesses can improve their efficiency and output.

Knowledge management also promotes employee growth and retention by providing learning opportunities, skill development initiatives, and clear career promotion pathways [51]. An informed and skilled workforce enhances the capabilities of an organization, leading to innovation and exceptional performance. Implementing knowledge management enables firms to adopt a customer-focused strategy, delivering tailored and high-quality products and services, resulting in higher levels of customer satisfaction, loyalty, and reduced customer turnover [52].

Furthermore, knowledge management enhances risk management and resilience by empowering businesses to effectively anticipate, mitigate, and respond to hazards [53]. By identifying risks in advance and adapting to market changes, firms can improve their ability to withstand challenges and gain a competitive edge. Knowledge management facilitates organizational learning and continuous improvement by documenting and sharing valuable insights gained from both successful and unsuccessful experiences [54]. This fosters a culture of self-reflection, experimentation, and constructive criticism, leading to the generation of new ideas and long-term competitiveness in rapidly changing markets [55].

However, a study conducted by Yu [56] examining 315 Chinese industrial enterprises found that the knowledge creation process does not have a substantial influence on sustainable competitive advantage. It is important to consider that the impact of the knowledge creation process on competitive advantage may vary across different contexts and industries, and further research is needed to explore this relationship in depth.

H3. Sustainable competitive advantage is significantly influenced by Knowledge management performance.

2.6. The mediating role of knowledge management in the relationship between technological innovation and sustainable competitive advantage

Knowledge management plays an essential role in bridging the gap between technological innovation and sustained competitive advantage by enabling firms to effectively utilize and leverage their knowledge resources [57]. Technological innovation generates new knowledge within an organization, and knowledge management helps acquire, organize, and share this knowledge, ensuring that valuable insights are captured and utilized to enhance the capabilities and competitiveness of the organization [12,29].

Technological advancements generate diverse knowledge, and knowledge management facilitates the promotion and sharing of this knowledge across multiple departments or domains within the organization [58,59]. By combining and integrating insights and knowledge from various sources, organizations can gain sustained competitive advantages and develop comprehensive solutions [60].

Knowledge management also plays a crucial role in facilitating the implementation and usage of knowledge by providing structures and databases that enable employees to efficiently access and utilize knowledge resources [30]. By effectively translating knowledge into practical actions, organizations can derive tangible benefits from technological advancements and achieve lasting competitive advantages [57].

Furthermore, knowledge management facilitates organizational learning and adaptation by capturing insights from past experiences and supporting processes of reflection and feedback [61]. Continuous learning enhances the ability of firms to adapt and remain competitive in fast-changing environments, thereby enhancing their resilience and agility [62].

Knowledge management also helps preserve and maintain knowledge assets in the face of technological changes or disruptions, mitigating risks and ensuring efficient utilization of knowledge resources over time [63]. By protecting important knowledge assets, organizations can maintain their competitive edge against technological advancements [64].

H4. Knowledge management performance significantly mediates the relationship between technological innovation and sustainable competitive advantage.

3. Methodology

3.1. Sample and data

The study context is Cameroon's advantageous position in Central Africa and the thriving hospitality industry. Given hotels' significant role in promoting tourism and economic development, examining the impact of innovation and knowledge management on competitiveness was critical. The country's heterogeneous market entices domestic and global tourists, providing abundant prospects for this [65]. Cameroon's context are of worldwide importance despite facing constraints such as infrastructure and legislation [66]. Therefore, due to its advantageous location and vibrant hotel industry, it is an ideal environment to analyze the relationship between innovation, knowledge management, and competitive advantage.

The study focused on hotel staff in Yaounde and Douala, Cameroon's capital and economic capital regions, respectively—emphasizing personnel yields valuable insights into the internal workings and strategic approaches of organizations in the hospitality industry. Their viewpoints provide insight into innovation, knowledge management, and competitive advantage. By analyzing hotel employees, the study thoroughly comprehends the factors influencing Cameroon's hospitality sector dynamics through the viewpoint of those that can directly observe the issues.

To guarantee sufficient sample size, the study employed the Cochran method formula to calculate the necessary sample size, given that the precise number of hotel employees within these regions was unknown. By employing this method, the researchers were able to

determine the necessary sample size for the study accurately, guaranteeing that the results would be statistically sound and reflective of the intended population. The formulae are quoted below.

$$n = \frac{Z^2}{4e^2}$$

"n" is the required sample size,
"Z" is the Z-score corresponding to the desired confidence level.
"e" is the desired margin of error.

The Z-score of 1.96 and the margin of error of .05 are crucial factors in determining the sample size in calculations. A Z-score of 1.96 corresponds to a confidence level of 95 %, meaning that the predicted confidence interval will contain the true population parameter with a probability of 95 %. This level was selected because it can achieve a favorable equilibrium between certainty and practicality without requiring a large sample size.

The margin of error, which is .05, suggests that the true population parameter is likely to fall within 5 % of the estimated value obtained from the sample. This statistic is considered a benchmark in research due to its ability to offer precise results while maintaining a manageable sample size. Reducing the margin would enhance accuracy but necessitate a bigger and costlier sample, whereas increasing the margin would diminish the reliability of the findings. Consequently, these variables are extensively utilized to ensure reliable and portable results while circumventing impractical data-gathering requirements.

$$n = \frac{1.96^2}{4(0.05)^2}$$

$$n = \frac{3.8416}{0.01}$$

$$n = 384$$

Although the calculated sample size was 384, our total useable final sample was 370. Since some questionnaires were not returned, and some had large ratio of missing values, making them unsuitable for analysis, they were dropped from the analysis leaving us with 370 useable responses. The achieved response rate was 96.33 %, showing a significant level of participation among the respondents.

3.2. Sampling technique

The study employed cluster sampling to select hotels in Yaounde and Douala, grouping them based on their geographical proximity. From each cluster, hotels were randomly chosen to form a representative sample for the study. This approach resulted in the selection of 35 hotels from regions combined, ensuring effective data collection while encompassing a variety of hotel attributes and procedures. The selected hotels represented a range of star ratings, from one to five stars, which enhances the sample's representativeness and enables a comprehensive investigation of technological innovation and knowledge management practices in the hospitality sector.

Due to their advantageous positions and distinctive attributes, the 35 hotels selected for the study in Yaoundé and Douala can represent the broader hotel market in Cameroon. Yaoundé and Douala are the country's most populous and economically significant cities, offering a diverse selection of hotels that appeal to various market segments, ranging from luxury to budget accommodations. The study examines the operational protocols, difficulties, and consumer behaviour of the hotel industry in urban areas of Cameroon, which are considered to be indicative of the entire sector. Moreover, the cluster sampling approach guarantees that the sample appropriately represents the variety of these locations, thus making the findings relevant to hotels in other places with similar characteristics. This methodology establishes a strong basis for extrapolating the study's conclusions to the broader hotel industry in the country.

After selecting the hotels, a judgmental sampling procedure was used to select the employees who were presented with the questionnaire. Printed questionnaires were given to the employees who met the inclusion criteria of each hotel in their premises. Some employees responded to the questionnaire on the same day it was given to them. Those who were busy took it and returned it the next day. These processes were repeated in all the selected hotels until the final sample size was reached, ensuring a thorough data collection process.

The study specifically targeted personnel directly involved in utilizing technical equipment and gadgets within the hotels, aligning with its focus on technology utilization. This included individuals engaged in various aspects of hotel operations, such as reservation systems, check-in and check-out procedures, room key systems, guest services, payment processing, housekeeping management, maintenance and facilities management, customer relationship management, revenue management, and data analytics. Employees in other departments of the hotels, such as food and beverage service, culinary operations, and recreational facilities, were excluded from the study as their level of interaction with technology was minimal.

3.3. Measurement

The study utilized a structured questionnaire to collect data, which was categorized into four components. The first component focused on technological innovation and consisted of questions extracted from Jahanmir and Lages [67]. This segment addressed three

distinct aspects: the rate of adoption (2 questions), opposition to new ideas (4 questions), and doubt or disbelief (3 questions).

The second component centered on knowledge management and included questions derived from Mafabi [68]. This part was divided into four subheadings: information acquisition (5 questions), knowledge creation (4 questions), knowledge sharing (5 questions), and knowledge storage (5 questions), resulting in a total of 19 questions.

The third component focused on sustainable competitive advantages and incorporated seven questions from Çağlıyan [69] The survey questions were rated on a five-point Likert scale, where "strongly agree" (5) represented the highest rating and "strongly disagree" (1) represented the lowest. This scale allowed employees to express their opinions on each issue. The final section of the questionnaire gathered personal data from employees, including their gender, age, years of professional experience, and organizational role.

3.4. Statistical tool

The study utilized the AMOS software for conducting structural equation modeling (SEM) analysis, which allowed for the examination of direct and indirect correlations between variables. AMOS was chosen due to its suitability for managing SEM, particularly in effectively handling complex interactions among multiple variables. It is well-equipped to handle the representation of latent concepts, explore intricate theoretical frameworks, and test hypotheses involving both observed and latent variables [70].

The software's graphical interface facilitated the visualization of path diagrams and structural models, enhancing the ease of understanding and communication of the analytical results. Additionally, AMOS provided advanced statistical methods for assessing the goodness of fit of models, estimating parameters, and testing hypotheses, thereby enhancing the precision and credibility of SEM studies [71].

4. Results and discussion

Table 1 presents the descriptive statistics and correlation matrix findings for the variables related to sustainable competitive advantage, technological innovation, and knowledge management. The high average score for sustained competitive advantage suggests that employees in the selected hotels in Cameroon perceive a strong competitive advantage. This indicates successful market positioning, leveraging advantages, and capitalizing on favorable circumstances to outperform competitors [72]. Such a perspective can lead to increased customer satisfaction, expanded market share, and improved financial performance.

The elevated mean score for technological innovation indicates that employees hold a positive view of the organization's ability to innovate. This underscores the importance of investing in technology and developing creative solutions to enhance customer satisfaction and gain a competitive edge in the dynamic hospitality industry [73].

The average score for knowledge management suggests a significant emphasis on knowledge sharing within the organization. However, there is room for further development of a culture that promotes learning and collaboration [74]. Initiatives focused on knowledge management can enhance decision-making and foster innovation, ultimately enhancing overall performance.

The correlation matrix analysis reveals strong positive correlations between sustained competitive advantage and technological innovation ($r = .860$, $p < .01$), as well as between technological innovation and knowledge management ($r = .266$, $p < .01$). However, the relationship between sustained competitive advantage and knowledge management is somewhat weaker ($r = .227$, $p < .01$). These findings indicate that allocating resources to technological innovation can improve both long-term competitive advantage and knowledge management practices within the selected hotels (Mao et al., 2016).

Table 2 provides a comprehensive assessment of the model's fit, which is a crucial step in evaluating how well the model aligns with the actual data. We employed eight different techniques to thoroughly examine the model's level of fit, each offering unique insights into various aspects of its performance.

For instance, the PCLOSE value of .063 surpasses the suggested threshold (>.05) [75], indicating a satisfactory match between the model and the data. Similarly, the CMIN/df ratio of 3.331 falls within the recommended range of 3–5 [76], indicating a good fit without excessive complexity. The SRMR value of .02 suggests a highly satisfactory fit, as it is below the recommended threshold of .08 [77], indicating minimal differences between the observed and predicted values.

Likewise, the RMSEA value of .01 demonstrates a satisfactory fit, below the recommended criterion of .08 [78]. The Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) values, both exceeding the recommended threshold of .90 [76,79], indicate good fits compared to a baseline model. Moreover, the GFI (.924) and AGFI (.933) values surpass the recommended criteria of .90 and .80, respectively, indicating excellent matches.

These findings highlight the robustness and reliability of the model in accurately representing the underlying relationships within

Table 1
Descriptive statistics and matrix correlation.

	Descriptive statistics			Matrix correlation		
	N	Mean	Std. Deviation	1	2	3
(1) Sustainable competitive advantage	370	4.7008	.43806	1		
(2) Technological innovation	370	4.6700	.45547	.860***	1	
(3) Knowledge management	370	4.0640	.68210	.227***	.266***	1

***p < .01, **p < .05, *p < .10.

Table 2
Assessment of the model fitness.

Measure	Recommended value	Obtained value	Recommendations
PCLOSE	>.05	.063	Acceptable fit.
CMIN/df	3–5	3.331	Good fit
SRMR	<.08	.02	Excellent fit
RMSEA	<.08	.01	Good fit
CFI	>.90	.901	Good fit
TLI	>.90	.909	Excellent fit
GFI	>.90	.924	Excellent fit
AGFI	>.80	.933	Excellent fit

Minimum Discrepancy Function by Degrees of Freedom divided (CMIN/df), Goodness of fit index (GFI), Tucker-Lewis index (TLI), Comparative fit index (CFI), Root mean square error estimation (RMSEA), Standardized root mean square residual (SRMR), Adjusted Goodness of Fit Index (AGFI).

the data. The model's strong fit suggests its potential utility for further research and interpretation, bolstering confidence in the validity of the study findings.

Table 3 presents the findings of the discriminant validity analysis, which examines whether the constructs in the study are distinct from one another. Discriminant validity ensures that the measures employed in the study effectively capture unique concepts and are not redundant or overlapping [80]. We employed the Fornell & Larcker criterion to assess the discriminant validity of our constructs. According to this criterion, the square root of the average variance extracted (AVE) for each construct should exceed its correlation with other constructs [81].

Our analysis reveals that the square root of the AVE for sustainable competitive advantage is .869, which surpasses its correlations with technical innovation (.768) and knowledge management (.254). Similarly, the square root of the AVE for technological innovation is .877, exceeding its correlation with knowledge management (.221). These results provide evidence of discriminant validity, indicating that each construct captures a distinct aspect of the phenomenon under investigation. This ensures that the study accurately captures the unique contributions of each construct, thereby enhancing the credibility and robustness of the findings.

Table 4 presents the normality tests results, convergent validity and reliability of the constructs. The standardized loadings of all the questions are presented graphically in Fig. 3.

4.1. Normality tests

The normality of the data was assessed by examining the skewness and kurtosis values. Evaluating skewness and kurtosis is important to determine whether the data adheres to a normal distribution, which is a prerequisite for many statistical analyses. Typically, if the skewness and kurtosis values fall within the range of ±1.96 [82,83] it indicates conformity to a normal distribution.

For all the questions within each construct analyzed, the obtained skewness and kurtosis values are within the established threshold of ±1.96. This suggests that the data follows a normal distribution, ensuring the accuracy of subsequent statistical analyses and interpretations.

4.2. Convergent validity

Convergent validity is essential to ensure that different measures of the same concept yield consistent and reliable results, indicating that they are conceptually aligned and tap into the same underlying idea. Validating constructs and ensuring measurement precision are crucial aspects of research.

In our study, we assessed convergent validity using standardized loadings, AVE, and MSV. Ideally, standardized loadings should exceed .50 to demonstrate a strong relationship between each item and its corresponding construct [77,84]. The standardized loadings for each question within the constructs of technical innovation, sustainable competitive advantage, and knowledge management exceeded this threshold, indicating robust convergent validity.

To establish convergent validity, the AVE should be higher than .50, and the MSV should be lower than the AVE [85,86]. For technological innovation, the AVE was .769, and the MSV was .459. In the case of sustainable competitive advantage, the AVE was .755, and the MSV was .401. Lastly, for knowledge management, the AVE was .50, and the MSV was .231.

By meeting the criteria of satisfactory standardized loadings, as well as the AVE and MSV thresholds, convergent validity was established. This confirms a strong association between the items within each construct and their measurement of the same underlying

Table 3
Fornell & Larcker criterion (Discriminant validity).

Variables	1	2	3
(1) Sustainable competitive advantage	**.869**		
(2) Technological innovation	.768	**.877**	
(3) Knowledge management	.254	.221	**.686**

Table 4
Normality tests, Convergent validity and reliability.

Variable	Items	Skewness	Kurtosis	Standardized loadings	AVE	MSV	CR	CA
Technological innovation	TGN1	−1.090	.047	.919	.769	.459	.967	.968
	TGN2	−1.119	.121	.959				
	TGN3	−1.175	.334	.929				
	TGN4	−1.104	.084	.941				
	TGN5	−1.046	−.057	.948				
	TGN6	−1.104	.084	.948				
	TGN7	−1.145	−.006	.733				
	TGN8	−1.129	−.047	.768				
	TGN9	−1.609	1.894	.698				
Sustainable competitive advantage	SCA1	−1.114	−.087	.787	.755	.401	.955	.958
	SCA2	−1.145	−.006	.792				
	SCA3	−1.156	.103	.776				
	SCA4	−1.286	.471	.950				
	SCA5	−1.226	.216	.948				
	SCA6	−1.286	.471	.930				
	SCA7	−1.716	1.318	.877				
Knowledge management	KNM1	−.936	.781	.831	.50	.0231	.942	.943
	KNM2	−1.015	.920	.849				
	KNM3	−.930	.890	.837				
	KNM4	−1.597	1.686	.531				
	KNM5	−1.670	1.954	.504				
	KNM6	−.998	.668	.769				
	KNM7	−.811	−.247	.586				
	KNM8	−1.001	.674	.809				
	KNM9	−1.047	.711	.782				
	KNM10	−1.112	.653	.672				
	KNM11	−.929	.042	.682				
	KNM12	−1.068	.490	.684				
	KNM13	−.997	.695	.772				
	KNM14	−.929	.660	.770				
	KNM15	−.957	.597	.682				
	KNM16	−1.538	1.352	.513				
	KNM17	−1.765	1.346	.509				
	KNM18	−1.792	1.575	.506				
	KNM19	−1.850	1.754	.528				

CR = composite reliability, CA= Cronbach alpha, AVE = average variance extracted, MSV = maximum shared variance.

concept. Consequently, it enhances the reliability and accuracy of the assessment conducted in the study.

4.3. Reliability

The reliability of the constructs was evaluated through composite reliability and Cronbach's alpha. Reliability is considered satisfactory when both composite reliability and Cronbach's alpha exceed the threshold of .70 [87–89]. In our study, all constructs surpassed this threshold, indicating reliability. This means that the items within each construct consistently measure the same underlying concept, enhancing confidence in the precision and consistency of the measurement. Meeting the reliability criteria ensures that the constructs yield dependable and consistent findings, facilitating accurate interpretations and robust conclusions.

Table 5 displays the results of the direct relationships between variables. The graphical representation of these results can be found in Fig. 4. Technological innovation demonstrated a significant and positive relationship with sustainable competitive advantage ($\beta = .946$, $t = 13.002$, $P < .01$). Based on these findings, we accept hypothesis H1.

Furthermore, technological innovation exhibited a significant and positive relationship with knowledge management ($\beta = .529$, $t = 4.663$, $P < .01$). Therefore, hypothesis H2 is accepted. Additionally, knowledge management was found to have a significant and positive impact on sustainable competitive advantage ($\beta = .016$, $t = 2.286$, $P < .01$), providing support for hypothesis H3, which is accepted.

Table 6 presents the results of the investigation into the indirect association, specifically examining the mediating role of

Table 5
The direct effect relationship and hypothesis testing.

Relationship	Hypothesis	β	S.E.	t-value	Beta	p-value	Decision
SCA < — TNI	H1	.946	.073	13.002	.761	.000	Accepted
KNM < – TNI	H2	.529	.113	4.663	.254	.000	Accepted
SCA < – KNM	H3	.016	.007	2.286	.027	.000	Accepted

***p < .01, **p < .05, *p < .10.

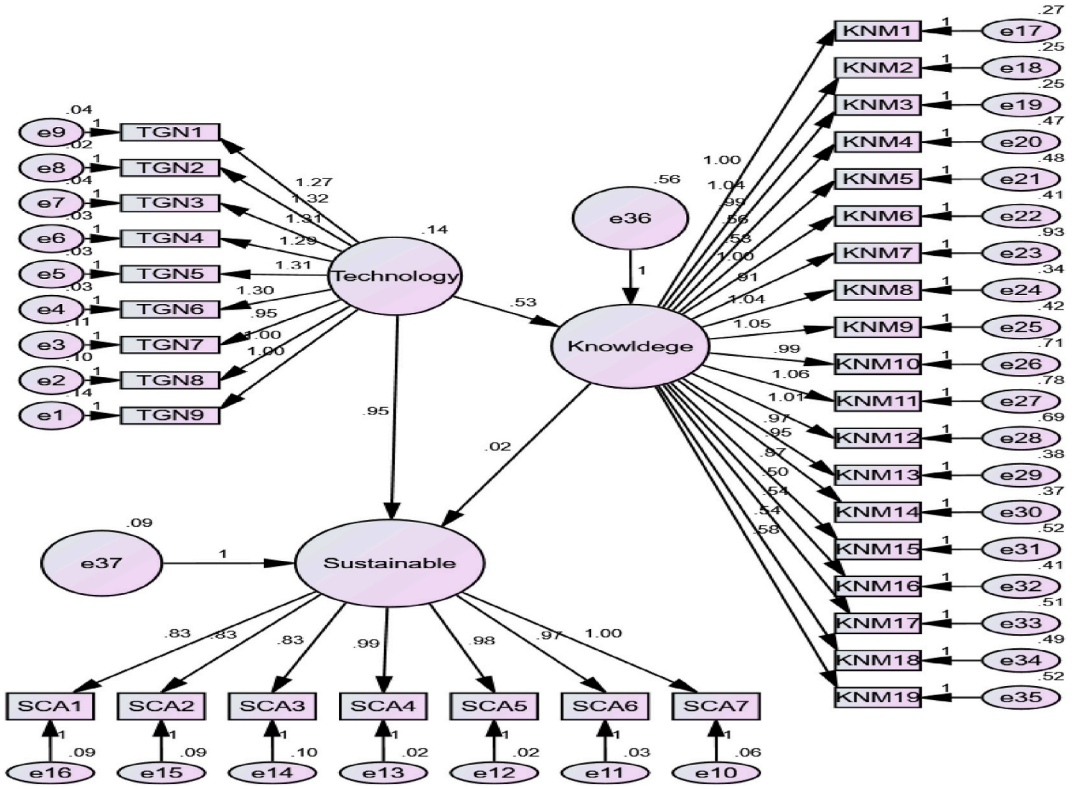

Fig. 4. Structure model.

knowledge management in the relationship between technical innovation and sustainable competitive advantage. The bootstrapping technique was employed to analyze this indirect association. The analysis was conducted with a 95 % confidence interval and a bootstrapping sample size of 5000 [90,91].

The study revealed that knowledge management partially mediates the relationship between technical innovation and sustainable competitive advantage. This partial mediation arises from the significant influence of technical innovation on sustainable competitive advantage, as indicated by the direct effects presented in Table 5.

5. Discussion of the findings

The study underscores the significant positive impact of technological innovation on the sustainable competitive advantage of hotels in Cameroon. This finding resonates with prior research by Chiou [92] and Zameer [93], indicating that investment in cutting-edge technologies enhances a hotel's market position. By embracing advanced tools like property management software and automated processes [94], hotels can streamline operations, reduce costs, and elevate service quality, thereby delivering exceptional guest experiences and differentiating themselves from competitors. Furthermore, technology enables hotels to stay abreast of industry trends and cater to guest preferences through data analytics and artificial intelligence [95]. Features like smart rooms and digital concierge services not only enhance customer experiences but also foster loyalty and attract new clientele [96]. Embracing technology positions hotels as industry leaders, setting new standards for innovation and service excellence, consequently enhancing brand reputation and attracting discerning guests and partners [97]. Thus, technological innovation emerges as a critical driver of competitiveness and market dominance in Cameroon's hospitality sector.

In addition to the above, the study highlights the substantial positive influence of technological innovation on knowledge management within the hotel industry. This finding suggests that technology can optimize knowledge-related processes, enhancing overall

Table 6
Indirect relationship.

Relationship	β	Std. Error	Beta	t-value	Confidence interval		Sig.	Conclusion
					Lower bounds	Upper bounds		
SCA < — KNM < — TNI	.009	.001	.012	9.00	−.018	.041	.000	Partial mediation

Unstandardized Coefficients (B), Standardised Coefficients (Beta), Confidence interval of 95 % and bootstrap sample of 5000.

organizational performance [98]. Consistent with findings by Mardani [47] and Vaccaro [99], leveraging cloud-based platforms and collaboration tools enables effective information gathering, storage, access, and dissemination across hotel operations, fostering a culture of continuous learning and innovation [100]. Investments in technology-enabled learning empower staff to acquire new skills and drive innovation in service delivery and guest experiences. Leadership commitment, employee engagement, and a supportive work environment are essential for maximizing the positive impact of technological innovation on knowledge management [101,102]. Leadership endorsement, clear objectives, and adequate resources facilitate technology adoption while involving employees ensures alignment with their needs, thereby enhancing acceptance and implementation. Moreover, organizational culture, communication channels, and reward systems play pivotal roles in optimizing the effectiveness of technological innovation in knowledge management [48]. A knowledge-sharing culture and transparent communication channels encourage idea exchange, while recognition and incentives for innovation motivate active employee participation, ultimately contributing to organizational success [103].

Furthermore, the study reveals the significant positive impact of knowledge management on sustainable competitive advantage, highlighting hotels' opportunity to leverage their intellectual assets for competitive positioning. Effective knowledge management enables hotels to capitalize on their intellectual resources as strategic assets [104]. By implementing processes, systems, and cultural norms that facilitate knowledge development, sharing, and utilization, hotels enhance organizational agility and adaptability, thereby achieving sustainable competitive advantage. A robust knowledge management framework enables hotels to access relevant information swiftly, learn from past experiences, and adjust strategies accordingly, enabling them to anticipate market trends, seize opportunities, and maintain a competitive edge over time [15]. Furthermore, efficient knowledge management systems drive operational efficiency and effectiveness, leading to cost reductions and improved performance [105]. Standardized best practices and procedures optimize processes, reduce errors, and optimize resource allocation, ultimately enhancing customer satisfaction and providing enduring cost advantages over competitors [106]. However, the extent to which knowledge management contributes to sustained competitive advantage hinges on organizational factors such as leadership commitment, employee empowerment, and a culture that values continuous learning and innovation [107]. Strong leadership support is vital for championing knowledge management initiatives, allocating resources effectively, and nurturing a culture of information sharing and collaboration. Encouraging active employee participation fosters ownership and commitment, ultimately driving the success of knowledge management initiatives [108].

Lastly, the study clarifies that knowledge management partially mediates the relationship between technological innovation and sustainable competitive advantage, underscoring the intricate dynamics within Cameroonian hotels and the importance of knowledge-related processes in organizational success [109]. While technological innovations accelerate knowledge creation within organizations, knowledge management plays a crucial role in capturing, codifying, and disseminating this knowledge throughout the company [110]. Platforms for knowledge sharing, communities of practice, and training initiatives enable employees to collaborate, share insights, and address challenges collectively, facilitating the full utilization of technological innovations and enhancing organizational performance [111]. Effective information management techniques enable organizations to incorporate newly acquired knowledge into various functional areas, promoting collaboration and maximizing the impact of technological advancements on long-term competitive advantage [74]. By leveraging insights from technological advances, organizations can inform strategic decision-making, enhance operational efficiency, and improve consumer value propositions, thereby optimizing their knowledge assets and sustaining competitive advantage [112,113].

6. Conclusion

An effective strategy for hotels to attain a sustainable competitive edge involves embracing technological innovations intertwined with knowledge. This study aimed to explore this correlation. Utilizing cluster sampling, 35 hotels in the Yaounde and Douala regions of Cameroon were selected, while judgmental sampling identified 370 employees actively engaged in technological operations. Structural Equation Modeling (SEM) was then applied to analyze the collected data.

Results indicated a substantial and positive impact of technological innovation on both sustainable competitive advantage and knowledge management. Additionally, the study revealed that knowledge management plays a partial mediating role in the link between technological innovation and long-term competitive advantage.

6.1. Managerial implication

Investing strategically in technological innovation can give Cameroonian hotels a competitive edge. In light of the particular conditions in the region, where the implementation of new technologies may be hindered by scarce resources or infrastructure, hotels should opt for technologies that offer the greatest advantages in terms of cost. By investing in affordable property management systems (PMS) and online booking platforms, businesses may optimize operations, enhance customer service, and minimize operational inefficiencies.

Overcoming the challenges of adopting new technology is not a solitary journey. Hotels can find reassurance in the potential of partnerships with local technology providers or startups. These alliances, built on a shared understanding of the market's specific requirements, can facilitate the acquisition of customized solutions and offer continuous assistance, ensuring a smooth transition to the future of hospitality.

Efficient knowledge management is crucial for enhancing organizational performance and utilizing technology. To cater to employees' varying degrees of proficiency, it is imperative to introduce user-friendly and easily accessible knowledge-sharing solutions. Providing tailored training and development programs that correspond to employees' specific roles and duties could enhance their

capacity to generate and exchange valuable insights.

Hotels have the opportunity to inspire a new era of collaboration and innovation by fostering a cooperative culture. By forming cross-functional teams that bridge departmental barriers, hotels can create an environment that encourages the sharing of best practices and novel ideas, leading to the development of more unified and streamlined solutions.

Incorporating knowledge management strategies into the innovation process is crucial. Hotels can motivate employees to engage in corporate learning by setting explicit performance expectations that stimulate knowledge sharing. Moreover, allocating resources to technology-based knowledge management systems will enhance the capacity to store, retrieve, and transmit vital information, guaranteeing that crucial insights are preserved and can be utilized efficiently to foster innovation.

6.2. Theoretical implication

The study's findings have significant theoretical implications that contribute to the understanding of strategic management and organizational theory. They highlight the positive impact of technological innovation on sustainable competitive advantage and knowledge management, emphasizing the crucial role these factors play in organizational performance. These findings align with existing theories that emphasize the importance of innovation in gaining a competitive edge and improving overall organizational performance.

Moreover, the study underscores the profound influence of knowledge management on long-term competitive advantage, highlighting the strategic importance of effectively managing knowledge assets within businesses. This finding supports existing theories that recognize the significance of knowledge assets and the impact of knowledge management strategies in fostering sustainable competitive advantage.

Furthermore, by recognizing knowledge management as a mediator in the relationship between technological innovation and sustainable competitive advantage, the study provides insights into how innovation translates into organizational outcomes. This finding supports existing theories that suggest organizational competencies, such as knowledge management, play a crucial role in leveraging the benefits of technological innovation and driving sustained competitive advantage.

6.3. Limitation and future direction studies

The study faced a limitation caused by invalid responses, leading to a decrease in the anticipated number of employees from 384 to 370. The decrease in sample size could diminish the study's statistical power, weakening the results' robustness and generalizability to a broader population. Decreasing the sample size might diminish the capacity to detect significant effects and introduce bias into the sampling procedure, compromising the reliability of the findings.

In addition, cluster sampling, although effective in allocating resources and targeting specific locations, presents an additional limitation. This methodology specifically targets hotels located in distinct clusters, specifically Yaoundé and Douala, and may not comprehensively represent the wide range of variations observed in Cameroon. Consequently, the conclusions may not accurately represent the characteristics of hotels in distant or economically disadvantaged regions, which may have distinct operational protocols and customer bases.

Future research should incorporate a broader and more heterogeneous sample to overcome the constraints of inaccurate responses and insufficient sample size. Researchers should employ stratified sample techniques to guarantee a comprehensive regional representation throughout Cameroon, encompassing urban and rural regions. Moreover, enhancing data collection techniques to minimize the number of erroneous responses and improve the precision of sample size estimates will lead to more dependable and applicable findings.

CRediT authorship contribution statement

Gerald Nyuga: Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Cem Tanova:** Writing – review & editing, Visualization, Validation, Supervision.

Ethics and consent section

This study was approved by the ethical committee of Cyprus International University on October 15, 2023, with reference number EKK22-23/013/012.

Data and code availability statement

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Section I: Technological innovation Please indicate your disagreement or agreement with each statement by crossing the number best represents your preference.	Strongly disagreed	Disagreed	Neutral	Agreed	Strongly agreed
Slowness of Adoption					
(1) Our hotel is a very late adopter of the product.	1	2	3	4	5
(2) Our hotel is one of the last to adopt a product.	1	2	3	4	5
Resistance to Innovation					
(3) Our hotel is suspicious of agents of change (e.g. people who like change, speak with you about change, try to promote change)	1	2	3	4	5
(4) Our hotel is sure that a new idea will succeed before we adopt it.	1	2	3	4	5
(5) Our hotel believes resistance to innovation is entirely rational.	1	2	3	4	5
(6) Our hotel innovation-decision process is relatively long.	1	2	3	4	5
Skepticism					
(7) Our hotel approaches innovations with a skeptical and cautious air.	1	2	3	4	5
(8) Our hotel often fears high-tech a little bit.	1	2	3	4	5
(9) Our hotel can be stubborn in resistance to buying new products	1	2	3	4	5

Section II: Competitive sustainable advantage Please indicate your disagreement or agreement with each statement by crossing the number best represents your preference.	Strongly disagreed	Disagreed	Neutral	Agreed	Strongly agreed
(1) Compared with our competitors, we have higher profit growth rate	1	2	3	4	5
(2) Compared with our competitors, we have higher sales revenue growth rate	1	2	3	4	5
(3) Compared with our competitors, we have lower operating costs	1	2	3	4	5
(4) Compared with our competitors, we have better product and service quality	1	2	3	4	5
(5) Compared with our competitors, we have increasingly higher market share	1	2	3	4	5
(6) Compared with our competitors, we have more profitable old customers	1	2	3	4	5
(7) Compared with our competitors, we have more profitable new customers	1	2	3	4	5

Section II: Knowledge management Please indicate your disagreement or agreement with each statement by crossing the number best represents your preference.	Strongly disagreed	Disagreed	Neutral	Agreed	Strongly agreed
Knowledge acquisition					
(1) We acquire knowledge through team work	1	2	3	4	5
(2) We can locate the source of information that we need	1	2	3	4	5
(3) We do not learn from our successes for future reference	1	2	3	4	5
(4) We gain knowledge from consultancy reports	1	2	3	4	5
(5) We employ people deemed to have the expertise we need	1	2	3	4	5
Knowledge creation					
(6) We train our staff	1	2	3	4	5
(7) Our staff do not generate useful ideas out of performance mistakes	1	2	3	4	5
(8) We brainstorm to generate useful ideas for our organization	1	2	3	4	5
(9) We do research for our organization	1	2	3	4	5
Knowledge sharing					
(10) We do conduct regular meetings to exchange experiences	1	2	3	4	5
(11) Some of our staff discuss issues with professional associations	1	2	3	4	5
(12) We use newsletters to disseminate information	1	2	3	4	5
(13) We exchange information with stakeholders	1	2	3	4	5
(14) Knowledgeable staff share their ideas with other staff	1	2	3	4	5
Knowledge storage					
(15) We have a system for keeping information.	1	2	3	4	5
(16) We have a system for retrieving information.	1	2	3	4	5
(17) Our staff have access to information required.	1	2	3	4	5
(18) Staff can access information on-line	1	2	3	4	5
(19) We update our knowledge databases	1	2	3	4	5

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