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Effect of Technological Innovations on Restaurant Sustainability in Nairobi County, Kenya

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The hospitality industry, which is defined by social interaction and gathering, was seriously threatened by the coronavirus disease 2019. The pandemic exacerbated risk in several ways, putting sustainability as a critical objective at a crossroads. The management of restaurants needed to reorganise and innovate to survive and thrive during and after the pandemic. Technological innovations created opportunities to lower health hazards for guests and staff while maintaining operations in an unpredictable business environment. A review of the literature revealed a paucity of technological innovations and sustainability in restaurants in Nairobi County. The study sought to evaluate the effects of technological innovations and the sustainability of restaurants in Nairobi County, Kenya. Schumpeter's theory of innovation served as the study's theoretical foundation. To explain the relationships between technological innovation and sustainability, the study employed a descriptive research design with Likert scale ratings. A census of restaurant managers from the 81 full-service restaurants housed in 54 classified hotels in Nairobi County was the unit of observation. Using self-administered questionnaires, the studies obtained a 70 per cent response rate (57 responses). SPSS version 25 was used to analyse the data and findings presented using descriptive and inferential statistics. Restaurants used innovations in technology to mitigate dangers as well as to improve cleanliness and sanitation. The relationship between technological innovations and sustainability was positive, moderate, and significant at the $p = 0.05$ level of significance; the Pearson correlation value was $r = 0.473$. Furthermore, the adjusted correlation coefficient (R²) indicated that technological innovations predict 21% of the variance in sustainability. Restaurant sustainability increased moderately due to technological innovations. As a result, the study recommends that the Ministry of Tourism and Wildlife prioritise hospitality technologies to increase restaurant sustainability. Restaurant management should promote technological innovation, acquisition, and training. Finally, academia should lead the discourse about the implementation and spread of technological innovation.

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INTRODUCTION

In recent years the service experience, service systems, customer engagement tactics, and customers' expectations have all been altered by technological innovations (Helkkula et al.). Putting innovative ideas into effect through the development of new products, processes, and technological innovation is essential to the expansion of trade and the economy (Murimi, Kithinj, & Njeru, 2017). According to Türkes et al. (2021), technological innovation is the inclusion of new activities to generate new goods and/or procedures in addition to enhancing the existing ones. To enable a vibrant return to a strong tourism economy in the face of the pandemic, restaurant rearrangement will increase dependence on automation technologies (Ivanov, Webster, Stoilova, & Slobodskoy, 2020). During the pandemic technology was crucial for assisting creative firms in a rapidly evolving business climate (Tuomi, Tussyadiah, & Ashton, 2021).

The sustainability of a business is pegged on the three interrelated, interdependent, and conflicting goals; economic development, social development, and environmental protection (Hakovirta & Denuwara, 2020). The scale and impacts of the tourism and hospitality industries globally, obligate the sector to underscore sustainability and its

significance (Rezapouraghdam, Alipour, & Arasli, 2019). As discussed by Kim & Hall (2020), the food service industry has been dubbed the least sustainable in the service sector, because the industry has a significant impact on the environment in terms of greenhouse gas emissions, solid waste, and water and energy use. It is worth noting, the sustainable development goal on sustainable production and consumption refers to the production and service of food and beverages (Barbier & Burgess, 2017). Notably, hospitality businesses were gradually incorporating sustainability principles as the sustainability concept gained traction (Koch, Gerdt, & Schewe, 2020). However, in the face of Covid-19 fears emerged that businesses' commitment to sustainability projects might be compromised as they struggled to survive and recover from the unforeseen Covid 19 crisis (Jones & Comfort, 2020; Kim et al., 2019).

The hospitality industry played a role in the services sector before COVID-19. Travel and tourism accounted for 10.4% of global GDP and 10.6% of all jobs. Currently, the value of restaurants and food service businesses is estimated to be 34.25 billion U.S. dollars and is expected to increase to 56.3 billion dollars by 2027 (Lock, 2022). Health-related emergencies, such as the COVID-19 pandemic,

disrupt routine company operations by increasing people's perceived risk and dread of uncertainty and ultimately diminishing consumer demand (Li et al., 2021). The COVID-19 pandemic had a negative impact on the tourism and hospitality industry (Shapoval et al., 2021). The global contribution to GDP dropped by 49.1%, while employment decreased by 18.5%. Africa suffered significantly more than other regions, with 7.2 million jobs lost, accounting for 29.3% of employment (World Travel & Tourism Council, 2021). The pandemic had a significant impact on the hospitality sector (Sharma & Nicolau, ; as a result, hotels and restaurants operated in an unprecedented environment (Sharma & Bhat, 2020; Yang et al., 2020). Organisations faced service reorganisation due to the pandemic, prompting managers to consider practical strategies for restaurants to withstand, adapt, innovate, and recover from such disasters, which is crucial for the industry's future survival (Heinonen & Strandvik, 2021).

Due to the COVID-19 pandemic's novelty, complexity, and magnitude as well as the resulting global restrictions, the economy suffered severely in most industries. According to (Sharma et al. 2021), the Covid-19 outbreak, an unprecedented and uncharted crisis, forced restaurants to reevaluate their conventional operational procedures and restructure their operations, which resulted in the development of new business models. Understanding how the innovations may contribute to improve sustainability is crucial for maintaining and promoting successful innovation. Food service businesses adjusted their business strategies to the changing market conditions in response to the health crisis, pushing sustainability initiatives to the back burner. The Covid -19 pandemic negatively impacted Kenya's accommodation and food service sector. Given the significance of restaurants in Kenya's economy and society, there are significant questions about how the sector addressed the problem using technological innovation for long-term sustainability. The analysis of the literature finds a paucity of studies on technological

innovation and sustainability in Nairobi County eateries. The objective of this study is to fill the gap in knowledge by exploring the effect of technological innovations on the sustainability (economic, social, and environment) of restaurants in Nairobi County. This is in response to calls for research to shift toward providing accurate knowledge of the effects of service innovations on customers, employees, businesses, ecosystems, and society.

THEORETICAL REVIEW

Early in the 1930s, ideas of innovation started to emerge, and have since developed. Schumpeter's theory of innovation, which was created in 1934, serves as the foundation for this study. The Schumpeterian theory posits that companies may innovate or form new combinations in response to a health crisis, thereby establishing a new normal and altering the environment subsequently (Callegari & Feder, 2021). In the contexts of hospitality, Schumpeterian theory advocates for entrepreneurial capacities to satisfy new demands, generate and exploit economic opportunities, and engage in institutional restructuring to support new development trajectories. In consonance, Callegari and Feder (2021) claim that the socioeconomic disturbance brought on by a health crisis and the responses that follow create an environment in which entrepreneurs can establish the parameters of the new normal. The term innovation, coined by Schumpeter, refers to the creation of new combinations in processes, products, and organisational activities. The framework is still applicable today and to this study since it addresses concepts like technological innovation for sustainability, which relates to the study's dependent variables. More recently, it was categorised into product, process, marketing, and organisational innovation by OECD/Eurostat (2018).

LITERATURE REVIEW.

Restaurants have been credited with being a pull factor for tourist, as well as promoting the image,

brand, and identity of a destination (**Daries-Ramon, Marine-Roig, Ferrer-Rosell, & Cristobal, 2020**). The value of the world's restaurants and foodservice businesses is currently estimated to be 34.25 U.S. billion dollars, up from 23.13 billion in 2020, and are expected to increase to 56.3 billion dollars by 2027 (Lock, 2022). Restaurants contribute to the tourism economic activities of a country, create jobs, and improve the Gross Domestic Product. In 2019, Travel and Tourism accounted for 10.4% of global GDP (USD 9.2 trillion) and 10.6% of all jobs that is 334 million jobs, this translated to travel and tourism creating 1 in 4 of all new jobs worldwide. Thus, making it one of the world's largest sectors (World Travel & Tourism Council, 2021). According to the Central Bank of Kenya, (2022), the sector formally employed over 82,900 people and, together with trade services, engaged over 9 million people in 2019. Notably, the hotel industry is one of the segments of the tourism sector that is expected to contribute to Kenya Vision 2030, predicted to contribute 10% annual economic development (Kenya Institute for Public Policy Research and Analysis, 2021). Indeed, in 2017 the hotel industry contributed over 10% of the Gross County Products (GCP) for counties such as Kwale, Mombasa, and Nairobi, making it an important sector for both the national and county governments (KIPPRA, 2021).

Natural disasters, financial crises, violent attacks, and public health crises have occurred in various nations around the world, the latter being less researched (Shapoval, et al., 2021). The service industry is characterized by human interaction and gatherings, making it remarkably vulnerable to epidemic crises (Yang, Liu, & Chen, 2020). Health-related emergencies like the Zika Virus, Ebola, and severe acute respiratory syndrome (SARS) have previously had a negative impact on the restaurant business. However, Corona Virus Disease, which was declared a pandemic on March 11th, 2020, by World Health Organisation resulted in broad and profound impacts (Jones & Comfort, 2020; Li et al., 2021). Health related crises including the COVID-19 pandemic halt the normal operation of business

through heightening people's perceived risk and fear of uncertainty and curtailing consumer demands (Li et al., 2021). Worldwide, the sudden onset and accelerated spread of Covid -19 pandemic, the waves and variants are affected the people and organizations. To curb the spread of coronavirus COVID-19 and save lives, governments across the world imposed a raft of containment measures. Globally, these measures despite slowing the spread of Covid 19 threatened the survival of firms across sectors and industries (Wenzel, Stanske, & Lieberman, 2020) . The Covid -19 pandemic greatly impinged the performance of the tourism and travel industry, the global contribution to GDP dropped by 49.1% to 4.7 trillion USD in 2020 while across the sector decreased by 18.5% as 62 million jobs were lost. According to the World Travel and Tourism Council, (2021) in Africa the contribution of Travel and Tourism to GDP dropped by 49.2% in 2020. Moreover, with 7.2 million jobs lost accounting for 29.3% of employment, Africa suffered significantly more than other regions. In Kenya it is estimated most of the 1.72 million jobs lost due to the COVID-19 outbreak were from the hotel industry (KIPPRA, 2021). The Covid -19 pandemic had a significant impact on the hospitality sector (Sharma & Nicolau, 2020), as a result, hotels and restaurants operated in an unprecedented environment. As discussed by Yang et al. (2020), the pandemic had significant impact on restaurant demand, compelling managers to adopt new, innovative methods for sourcing, establishing food delivery systems, and developing new revenue streams to remain competitive. Organizations were forced to reconsider and reorganize service (Heinonen & Strandvik, 2021; Cankurtaran & Beverland, 2020).

EMPIRICAL REVIEW

According to Kariuki et al. (2022), innovation involves creating novel concepts for goods, procedures, services, and markets, while technology innovation includes new activities to produce new commodities and methods. The pandemic prompted

the adoption of technological innovations in the restaurant industry, enhancing sustainability. Li et al., (2021), evaluated 153 textual information sources to examine the innovative activities of Chinese restaurant firms before, during, and after COVID. The findings showed Chinese restaurants implemented preventative health and safety measures, innovative products, and creative marketing techniques (Li et al., 2021). Türkeş et al (2021), investigated modifications in Romanian businesses' methods for delivering meals to customers via food order & delivery platforms during the COVID 19 crisis. 402 restaurant managers participated in the survey that showed that Romanian businesses adopted 5G networks, artificial intelligence (AI), applications, cryptocurrencies, blockchain, Radio frequency identification (RFID), and wearables, impacting customer behaviour (Türkeş et al., 2021). Sufi and Ahmed (2021), carried out a case study of thirty-three companies to explore the Indian restaurant industry recovery from the devastation of Covid-19 pandemic. The findings revealed that restaurants used cloud kitchen delivery, zero-contact meal delivery, and improved mobile applications (Sufi & Ahmed, 2021). In the Italian restaurant industry Esposito, Sessa, Sica and Malandrino (2022), used a survey to explore how digital technologies were employed as a strategy for resilience and safety. The restaurants used digital technologies to enhance safety and resilience, using creative cleaning procedures and technology to reduce risk perceptions (Esposito et al., 2022). Despite the findings above, notable drawbacks of technological innovations included job loss and increased operating costs (Esposito et al., 2022). A paucity of literature on technological innovations and sustainability in restaurants in Nairobi County was noted. This study sought to fill the gap by evaluating the effects of technological innovations and sustainability of restaurants in Nairobi County, Kenya.

MATERIAL AND METHODS

Descriptive research was used to investigate the link between technological innovations and sustainability in full-service restaurants in Nairobi County. A cross-sectional study to investigate the effects of technological innovations on restaurant sustainability was carried out in full-service restaurants within Tourism Regulatory Authority classified and graded hotels in Nairobi County, Kenya, between November 2022 and April 2023. A census was conducted informed by the small population. The study population was a restaurant manager from each restaurant purposively selected, giving a sample size of 81 restaurant managers. Primary data was collected by survey; the questions were developed following a comprehensive literature review.

Measures were taken to ensure the standard of validity and reliability; for instance, the survey tool was subjected to a Cronbach alpha test, and sustainability recorded good internal consistency (0.813), while technological innovations indicated minimally adequate reliability (0.675). To enhance content validity, a pilot study was done on 10 % of the study sample (81) in Kiambu county to evaluate the time taken to complete, clarity of instructions, questions and the layout and coverage of the topic (Belli & Waters, 2014).

The researcher obtained a research permit from the National Commission for Science, Technology, and Innovation (NACOSTI) with clearance from the postgraduate school at Dedan Kimathi University of Technology. The researcher contacted restaurant managers by phone or email to introduce the study. Managers were invited to participate by emailing a link to a questionnaire. They signed a consent form, took the survey, and submitted it within two weeks. One to three reminder emails were sent every other week to enhance the response rate.

The Statistical analysis of data was done using SPSS version 25. The data was tested for normality, linearity, homoscedasticity, and multicollinearity.

Descriptive and inferential statistics were used to show correlations between technological innovation and sustainability. Statistical significance was determined through regression and ANOVA tests.

RESULTS

The sample size for the study was 81 respondents comprising all 81 full-service restaurants in the 54 classified hotels in Nairobi County. Of the 81 questionnaires administered, 57 were filled in and returned and 24 were not returned, as shown in *Table 1*. This represented a response rate of 70%, which is above the average response rate in hospitality studies at 54.44% (Ali, Ciftci, Nanu, Cobanoglu, & Ryu, 2020). And within the acceptable response rates across different specialties of 40% to 75% (Sataloff & Vontela, 2021).

Section one of the survey collected data regarding the respondents' sociodemographic characteristics, such as gender, age, education, and work experience. According to the findings in *Table 1*, 66.7% of the managers were male, while 33.3% were female. In terms of age, the majority of restaurant managers 32 (56.1%) were between the ages of 35 and 44, with 16 (28.1%) between the ages of 25 and 34, 8 (14%) between the ages of 45 and 54, and 1 (1.8%) above the age of 55. In terms of education, the statistics indicate that more than half of respondents (57.9%) had a college diploma, while 42.1% had a university degree. Over 85% of the restaurant managers surveyed had more than six years of experience, with 49.1% having more than eleven years of experience. These findings are shown in *Table 1* below.

Table 1: Demographic characteristics of respondents

		Frequency	Percent
Gender	Male	38	66.7
	Female	19	33.3
Age	25-34 years	16	28.1
	35-44 years	32	56.1
	45-54 years	8	14.0
	over 55 years	1	1.8
Education	Diploma	33	57.9
	Degree	24	42.1
Experience	2-5 years	8	14.1
	6-10 years	21	36.8
	Over 11 years	28	49.1

On gender, the findings in *Table 1* show that most (66.7%) restaurant managers were male; the observation is in line with empirical evidence from the hospitality sector, including studies from the US (Molintas, 2020), Jordan (Al-Sabi et al., 2023; Sharma & Nicolau, 2020), Cyprus (Marneros et al., 2020), and Kenya (Kooome et al., 2013). Notably on age 84% of restaurant managers were aged 25-44, agreeing with Kamau and Kalui (2020) findings that 77% of respondents were middle-aged. According to the World Health Organization's (WHO) updated age guidelines of 2015, a person is considered young if they are under the age of 44

(Dyussenbayev, 2017). The finding is significant to the research because younger managers are more likely to implement technological innovations as age influences decision-making in innovation (Ivkov et al., 2016). The distribution of educational attainment in the workforce is important for workforce capabilities (OECD/Eurostat, 2018). All restaurant managers had tertiary degrees, indicating knowledge about service innovation; this is a notable finding because growing incremental innovation and diversity in higher education are positively correlated (Mohammadi et al., 2017). Due to their experience in restaurant management,

the managers were familiar with restaurant service operations prior to the pandemic's changes and technological innovations adopted during the crisis. The findings on restaurant management education level and experience are relevant to this research since prior studies show that managers with higher education and broader experience have a higher esteem for innovation areas (Ivkov et al., 2016).

Sustainability of Full-Service Restaurants

The study investigated the effect of technological innovations on the sustainability of full-service restaurants in Nairobi County, Kenya. The dependent variable sustainability was conceptualised in three sub-constructs: economic, social, and environmental. The indicators of sustainability were adapted and modified to

operationalise the dependent variable. Respondents provided opinions on a five-point Likert scale regarding innovations that led to more sales, cost savings, and new revenue sources for economic sustainability. For social sustainability, opinions on increased knowledge of risk aversion, guest and staff retention, and initiating community support were sought. Regarding environmental sustainability, the study sought responses on innovations that led to reduced energy, water consumption, and solid waste generation. Restaurant sustainability had an overall mean score of 4.20 out of 5 for sustainability, with 4.24 for economic sustainability, 4.16 for social sustainability, and 4.21 for environmental sustainability, as shown in *Table 2*.

Table 2: Descriptive statistics for sustainability construct

	Mean	Std. Deviation
Economic sustainability	4.24	0.661
Social sustainability	4.16	0.754
Environmental sustainability	4.21	0.626
Sustainability	4.20	0.599

Technological Innovations

Respondents rated technological innovations on a five-point scale covering the use of digital temperature monitoring, off-premises dining, drive-

thru, takeaway, and contactless service. *Table 3* shows technological innovations in full-service restaurants in Nairobi County.

Table 3: Descriptive statistics for technological innovations construct

Technological Innovations of Restaurants	SA	A	U	D	SD	Mean	Std
The restaurant introduced digital temperature monitoring devices.	79	18	0	3	0	4.72	0.648
The restaurant required digital temperature monitoring for guests and staff.	81	12	3	4	0	4.70	0.706
The restaurant adopted new technological solutions for customers without direct physical contact, such as off-premises dining, drive-thru, delivery, and takeout.	61	33	6	0	0	4.56	0.598
The restaurant adopted contactless ordering by use of tablets or scanning the QR codes of menus.	67	26	3	2	2	4.54	0.803
The restaurant adopted technologies for hygiene.	61	30	7	2	0	4.51	0.710
The restaurant adopted technologies for sanitation.	70	26	4	0	0	4.67	0.546
Technological innovations						4.61	0.416

The findings in *Table 3* indicate that 96% of restaurant managers agreed on the use of digital temperature monitoring for personnel and visitors.

Further, 95% of managers acknowledged the use of new technological options for customers, such as off-premises dining, drive-thru, delivery, and

takeaway. While 92% concurred on embracing contactless ordering using tablets or the scanning of menu QR codes. Finally, 91% and 96% of respondents agreed that restaurants embraced technology for hygiene and sanitation, respectively. The descriptive statistics show that restaurant managers viewed technological innovations favourably in ensuring restaurant sustainability.

Inferential Findings

Evaluating the effect of technological innovations on restaurant sustainability in Nairobi County

Table 4: Model of fitness for technological innovations

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.473 ^a	0.224	0.210	0.53307

a. Predictors: (Constant) Technological innovations
b. Dependent Variable: Sustainability

Kenya was the objective of the study. The findings in *Table 4* show the correlation coefficient (R) of technological innovations is 0.473 ($R^2=0.224$), and the adjusted R^2 is 0.210. The findings indicate that innovation in technology and sustainability had a statistically significant, moderate positive association ($r=0.473$). Additionally, this implies that 21% of the variance in sustainability can be predicted by technological innovations.

An analysis of variance (ANOVA) test was used to determine if the study findings on technological innovation and sustainability were statistically significant. The findings indicate that technological

innovations and sustainability were statistically significant at $F=15.890$, $p < .05$ in predicting the sustainability of restaurants in Nairobi County. The findings are displayed in *Table 5*.

Table 5: ANOVA for Technological Innovations

Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	4.515	1	4.515	15.890	.000 ^b
	Residual	15.629	55	.284		
	Total	20.144	56			

a. Dependent Variable: Sustainability
b. Predictors: (Constant) Technological innovations

Linear regression was used to establish the linear relationship between technological innovations and sustainability for restaurants in Nairobi County. The regression coefficients indicate that technological innovations have a positive and significant effect on the sustainability of full-service restaurants in Nairobi County ($B=0.682$, $p=0.000$). The resultant model technological innovations $Y = 1.060 + 0.682 X$. The model means that 1.060, the constant, is the

expected value of sustainability(Y) when the independent variable technological innovations are zero, and every unit of change in technological innovations results in an increase of 0.682 units in the sustainability of full-service restaurants. The regression coefficients of technological innovations and sustainability of restaurants are shown in *Table 6*.

Table 6: Regression coefficients for technological innovations

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.060	0.793		1.337	0.187
Technological innovations	0.682	0.171	0.473	3.986	0.000

DISCUSSION

The findings in *Table 2* on strong economic sustainability are in line with empirical data showing it is the most widely used corporate approach for sustainability (Nyamogosa & Obonyo, 2022). Regarding social sustainability, the study shows it was driven by health and safety, welfare, and support for local communities. However, staff retention was affected by COVID-19, as seen in the loss of 1.72 million jobs in the hotel industry (Kenya Institute for Public Policy Research and Analysis, 2021). The findings on social sustainability concur with empirical studies: Health and safety, welfare, equitable working conditions, and support for local communities are components of social sustainability (Correia, 2019). Additionally, safety, security, and sanitisation were deemed to be the main drivers of social sustainability by Turker and Ozdemir (2019). In the study, risk aversion can be attributed to management's efforts to maintain safety and confirm government-imposed protocols (Ministry of Health, Government of Kenya, 2020). On environmental sustainability, the findings indicate that restaurant managers used disposable, environmentally friendly equipment, which concurs with the reviewed literature (Criscione-Naylor & Bokunewicz, 2021). From the findings, it is evident restaurants used the three sustainability constructs, but not evenly. This allays fears that sustainability initiatives may have been compromised during the crisis (Jones & Comfort, 2020). The findings correspond to previous studies that state that sustainability aims to balance businesses' economic, social, and environmental aims (Lopez-Cabrales & DeNisi, 2021). The findings show an interaction between sustainability variables but not the nested structure proposed by Sandhu et al. (2014).

Regarding technological innovations, the findings in *Table 4* show an adjusted correlation coefficient R^2 of 0.210, implying that 21% of the variance in sustainability can be predicted by technological innovations. From *Table 3*, it is evident that technological innovations were used to increase risk

aversion and decrease risk to patrons, employees, and suppliers. Moreover, the findings indicate that the introduction of digital temperature monitoring devices was highly used; this could be attributed to the strict guidelines for managing restaurants and eateries (Ministry of Health, Government of Kenya, 2020). The findings are consistent with earlier studies that confirm digital technologies as tools for service innovation (Esposito et al., 2022; Li et al., 2021). Technological innovations in hygiene and sanitation, such as contactless ordering and utilisation of service innovative technology, align with empirical studies by Li et al. (2021) (Buhalis et al., 2019), and Esposito et al. (2022). The technological innovations embraced by full-service restaurants in Nairobi County conform to empirical studies for instance, Li et al. (2021) and Buhalis et al. (2019), who delineated the utilisation of innovative technology, contactless ordering, and digital temperature monitoring. On the adoption of technologies for hygiene and sanitation, the findings complement Esposito et al. (2022) on the use of technology to eliminate contact between customers and employees while raising the level of cleanliness through the application of innovative cleaning techniques.

CONCLUSION

The study found that full-service restaurants in Nairobi County, Kenya, adopted technological innovations. Moreover, technological innovations and sustainability had a statistically significant, moderate, and positive relationship. In addition, the study indicates that restaurant sustainability rose moderately because of technological innovations in Nairobi County, Kenya. Therefore, the study accentuates the value of technological innovations in enhancing the sustainability of restaurants in Nairobi County. The research findings will add to the body of knowledge on technological innovation and sustainability in restaurants in Nairobi County, Kenya, and will serve as a resource for those looking to conduct similar studies in the future. The study indicates that technological innovations

contributed to restaurant sustainability in times of crisis, therefore the findings will benefit hospitality and restaurant management by revealing the types technological innovations and their effect on restaurant sustainability. In addition, the findings will help policy makers in the Ministry of Tourism, Wildlife and Heritage by shading light on technological innovation for sustainability. This knowledge will be helpful in decision and policy making to guide the hospitality industry, manage the prevailing business environment. Given the significance of the hospitality sector in Kenya, the research findings will contribute to restaurants' economic, social, and environmental sustainability while working to realize domestic goals namely the Big Four Agenda and Vision 2030. As well as international and multilateral goals like the Sustainable Development Goals (SDGs) for instance goal No. 12 on responsible production, and consumption, as well as African Agenda 2063 priority areas like sustainable and inclusive economic growth, economic diversification, and sustainable hospitality.

Suggestions for Further Studies

The study suggests research on other types of hospitality businesses, such as restaurants, hotels, travel, and events. Additionally, further research in other counties besides Nairobi would be beneficial in advancing findings on technological innovations and sustainability and presenting findings from different geographic areas.

Recommendations

Due to the moderate effect of technological innovations on sustainability, the study recommends that policymakers in the Ministry of Tourism and Wildlife earmark hospitality technologies to facilitate research, development, dissemination, and operationalisation. For practice, this study emphasizes the need for restaurant management to strengthen and maintain the gains made in technology innovation by enhancing technology innovation, acquisition, and training.

The study recommends that restaurant operators consistently implement new technologies and increase service employees' performance through training. The study suggests purposes new technologies like the employment of robots in service, cleanliness, and sanitation, artificial intelligence (AI), using food aggregator firms, cloud kitchens, and autonomous vending machines for food and beverages, among others. Furthermore, the study reiterates that apart from fostering innovation, acquisition, and training in hospitality technology, academia has an important role to play in technological innovations. This entails offering leadership, cultivating confidence, and motivating trainees to embark on the journey to ignite initiatives and integrate and sustain innovation.

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