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The Future of Luxury Hospitality: Industry Experts' Perspectives on Technology Integration in Restaurants towards Vision 2035

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Abstract—The restaurant sector is undergoing significant technological changes with Artificial Intelligence (AI), automation and robotics, cloud kitchens, Internet of Things (IoT) and digital ordering. The present study aims to explore the perception of the industry experts about the current level of technology in restaurants in Chandigarh Tricity and the expected change in technology by 2035. The study was designed using the "Quantitative Method" approach in which the primary data was gathered from 385 restaurant personnel by means of questionnaires. The analysis of data was done with descriptive statistics, reliability analysis, Factor analysis and regression analysis with SPSS program. The outcomes showed that digital payment systems, online food orders, point-of-sale and QR code menus were all very high in use. The reaction to how AI, smart kitchens, automation, robotics and data analysis will effect the restaurant industry in the future was equally high. The study also identified that operational efficiency and technology benefits were good predictors of future use of technology, as well as the cost of implementing the technology and lack of technical knowledge as barriers. The results will provide owner and professionals of restaurants with interesting insights into technological preparedness and digitalisation of the future.

Keywords— Artificial Intelligence, Smart Restaurants, Technology Adoption, Automation, Future Restaurants.

I. Introduction

The restaurant industry is a highly dynamic and rapidly changing part of the hospitality industry. It has a significant impact on employment, economic growth, entrepreneurship and tourism development. Although preparation of food and serving it to customers was the core of the traditional business of restaurants, the fast-paced technological revolution and the expectations of the customers have changed, and restaurants are becoming service ecosystems with digital tools.

The way restaurant businesses work and the customer experience has transformed with technological advancements such as Artificial Intelligence (AI), the Internet of Things (IoT), cloud kitchen concepts, digital ordering platforms, data analytics, and automation. Consumers today are increasingly demanding convenience, speed, customization, contactless service and a dining experience that is even more digitized. As a result, restaurants are pouring significant resources into the technology that enhances the operations, customer engagement and competitiveness.[1]

Technological advancements have also been responsible for changes in the Indian restaurant industry, as online food delivery services such as Zomato and Swiggy have become

increasingly popular. Other technologies have also revolutionised the Indian restaurant industry with online food delivery apps such as Zomato and Swiggy. Cloud kitchens and restaurant platform models are changing the face of the restaurant industry by shifting the emphasis to minimizing the need for physical stores and expanding the digital presence.[2]

The Tricity of Chandigarh, Mohali and Panchkula is one of the fastest growing hospitality hubs in North India. In the past ten years, restaurants and cafes, quick-service restaurants, and cloud kitchens have proliferated in the area. With the rise of digital literacy, mobile phones, and consumer lifestyles, restaurants in the area have embraced digital technology: POS system, QR code menus, online ordering system, and automated operational system.

Although there has been a rise in the use of technology in the hospitality sector, there is a limited amount of research for long term technological transformation and future restaurant ecosystems in emerging urban area like Chandigarh Tricity. The studies that are undertaken are mostly on the current trends in technology adoption, rather than on the technological preparedness and strategic transformation towards 2035. Therefore, the current study attempts to find out the perceptions of the industry experts regarding the technology integration and future of restaurants in the Tricity of Chandigarh.

II. Review of Literature

Technology has become a crucial ingredient in the restaurant management and hospitality business. Buhalis and Leung [3] defined smart hospitality as the integration of inter-connected digital systems in service environments that transform them to make them “smart”, more efficient and user friendly.

In the field of hospitality and restaurant management, there has been one technology that has proved to be one of the most transformative, namely, Artificial Intelligence (AI). They use AI to create predictive analytics, tailor recommendations, anticipate customer needs, drive customer engagement, and optimize inventory management. In the hospitality industry, AI-driven personalization has been shown to greatly enhance customer satisfaction and improve operational efficiency, as reported by Chen and Wei [4].

In addition to this, robotics and automation technologies have also gained importance in the restaurant industry. Ivanov and Webster [5] claimed that robotics can bring operational consistency, decrease dependency on manpower and increase the efficiency of service delivery. The restaurant industry is slowly changing, and the use of automated cooking systems, robotic servers, and self-ordering kiosks is on the rise.

The restaurant industry has been revolutionized by online food delivery services. As mentioned by Yang and Hu [6,7] digital delivery platforms are not only capable of providing operational scalability, customer convenience and market access but also they are good for increasing the competition in the market.

The theory of Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) and Diffusion of Innovation (DOI) Theory are highly valid theories that can be used to gain a better understanding of technology adoption behavior in the hospitality environment. These frameworks explain the linkage between perceived usefulness, ease of use, social influences, and facilitating conditions in the acceptance of technology.

The Technology Acceptance Model (TAM) [8] was proposed, suggesting the two important factors in the technology use decision – perceived usefulness and perceived ease of use. The convenience and ease of use of technologies such as digital ordering, QR code menus, self-service kiosks, and mobile payment systems are making them increasingly popular in restaurants.

Venkatesh et al. [9] also built on the research on technology adoption by introducing the Unified Theory of Acceptance and Use of Technology (UTAUT). The theory highlights the importance of performance expectancy, effort expectancy, social influence, and facilitating conditions on behavioral intentions for technology adoption. The success of implementation of advanced technologies in the restaurant sector depends on organizational support, employee readiness and technological infrastructure.

Rogers' Diffusion of Innovation (DOI) Theory [10] is also an important theory for understanding the process of innovations in an organization. In theory, the diffusion of technological innovation should unfold over time and through different groups or categories of people who use the technology—innovators, early adopters, the early majority, the late majority, and the laggards. The integration of emerging technologies such as AI-powered analytics, robotics, and smart kitchens can provide a competitive advantage for restaurants in terms of operation efficiency [11]. Having a new technology is a plus for restaurants to gain a competitive advantage in running the business, especially when it comes to AI-powered analytical tools, robotics, and smart kitchens.

In recent times, data analysis, automation, and personalization have become more critical in the hospitality sector for enhancing restaurant performance and customer satisfaction [12]. Over the last few years, data analytics, automation, and personalisation have become increasingly significant in the hospitality industry, shaping restaurant performance and customer engagement. As mentioned by Zhao and Qu [7] Big data analytics can enhance the understanding, prediction and decision making of customers in hospitality organizations. Similarly, Sigala [13, 14] pointed out that social media marketing and digital customers engagement have become essentials to the branding and relationship management of a restaurant.

While there is a significant amount of research on hospitality technology, there is few studies that has explored future-oriented technological transformation in restaurants in emerging Indian urban areas. Furthermore, there is a lack of research regarding the technology adoption in restaurants in the long-term, namely for 2035.

III. Research Objectives

The present study was conducted with the following objectives:

1. To evaluate the current level of technology adoption in restaurants of Chandigarh Tricity.
2. To examine industry experts' perceptions regarding the future role of emerging technologies in restaurants by 2035.
3. To analyze the major challenges and opportunities associated with technological integration in restaurants.
4. To identify the major factors influencing future technology adoption in restaurants.

IV. Research Methodology

The study used quantitative, descriptive and predictive research design. The study was carried out in Chandigarh Tricity which includes Chandigarh, Mohali and Panchkula.

Primary data was gathered by using a structured questionnaire with the restaurant industry professionals such as restaurant owners, restaurant operations managers, general managers, chefs, restaurant consultants and IT professionals.

The respondents were selected through purposive sampling technique because they had adequate knowledge and experience of the restaurant industry in relation to the technologies used with restaurants.

The population size of restaurant professionals was unknown so Cochran's formula for infinite population was used to determine the sample size. The sample size of 385 respondents was determined. A total of 403 questionnaires were sent out and 385 were deemed valid and were used for statistical analysis.

The questionnaire was divided into four sections: Demographic Profile, Current Technology Adoption, Future Technology Trends and Challenges and Opportunities. A five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5) was used for measuring respondents' perceptions.

Data collected were processed by SPSS software. The following statistical analysis was used: descriptive statistics, reliability analysis, factor analysis, regression analysis.

Cronbach's Alpha was used to measure the reliability of the instrument. Overall reliability value obtained was 0.865, which showed that there is a good internal consistency and the instrument is suitable for final analysis.

V. Results and Discussion

A. Demographic Profile of Respondents

Table I shows that among the respondents, 64.4% were male and 35.6% were female. Most respondents were in the 25-35 age group (45.7%), reflecting the involvement of young working professionals in the restaurant sector, which is technologically changing.

Professionally, the majority of the respondents held managerial and operational roles such as restaurant owner, operations manager, general manager, and chef, which further ensured the relevance and reliability of the responses. Also, a large percentage of respondents had undergraduate and postgraduate qualifications with a good amount of industry experience, indicating that they had sufficient professional exposure to technology in restaurants.

TABLE I. DEMOGRAPHIC PROFILE OF RESPONDENTS

Demographic Variable	Category	Frequency (n=385)	(%)
Gender	Male	248	64.4
	Female	137	35.6
Age Group	18–24 Years	52	13.5
	25–35 Years	176	45.7
	36–45 Years	103	26.8
	Above 45 Years	54	14.0
Educational Qualification	Diploma	61	15.8
	Undergraduate	118	30.6
	Postgraduate	167	43.4

	Others	39	10.2
Professional Designation	Restaurant Owner	92	23.9
	General Manager	71	18.4
	Operations Manager	84	21.8
	Chef/Kitchen Professional	76	19.7
	Consultant/IT Professional	62	16.1
Work Experience	Less than 3 Years	73	19
	3–5 Years	121	31.4
	6–10 Years	126	32.7
	More than 10 Years	65	16.9

B. Current Technology Adoption in Restaurants

The findings revealed substantial adoption of digital technologies in restaurants across Chandigarh Tricity.

TABLE II. CURRENT TECHNOLOGY ADOPTION

Technology Adoption Variable	Mean Score
Online Food Delivery Platforms	4.42
Digital Payment Systems	4.31
POS Systems	4.28
QR-code Menus	4.08
Investment in Automation	3.87
Future Technological Preparedness	3.79

The mean scores for the online food delivery platforms came out to 4.42, making this their most important in restaurant operations as presented in Table II. Other payment systems such as digital payment, POS systems and QR code menus were also widely adopted by the restaurants in Chandigarh Tricity. Restaurants are, however, still slowly moving towards higher-tech systems of operation as supported by relatively lower mean scores for investment in automation (3.87) and future technological preparedness (3.79).

C. Future Technology Trends Towards 2035

The respondents demonstrated highly positive perceptions regarding future technology integration in restaurants.

TABLE III. FUTURE TECHNOLOGY TRENDS TOWARDS 2035

Future Technology Trend	Mean Score
Technology essential for survival	4.52
Artificial Intelligence transformation	4.45
Automation improving efficiency	4.39
Data analytics and personalization	4.34
Smart kitchens	4.27

IoT integration	4.11
Robotics reducing labor dependency	4.03

As shown in Table III, The highest mean score (4.52) was for technology as a critical tool to survive in the restaurant world by 2035. Respondents also overwhelmingly agreed that AI transformation (4.45), automation to improve efficiency (4.39) and data analysis and personalisation (4.34) would have a strong impact on the future of restaurants. Likewise, smart kitchens (4.27), integration of IoT (4.11), and robotics, which reduces human labor (4.03) were also seen positively.

These findings indicate that restaurant professionals consider technological transformation a strategic necessity for long-term competitiveness and operational efficiency.

D. Challenges Associated with Technology Adoption

The study revealed that the primary problem with the implementation of technology is its high cost, while the other problems are lack of technical expertise and resistance from employees.

TABLE IV. CHALLENGES ASSOCIATED WITH TECHNOLOGY ADOPTION

Challenge/Opportunity	**Mean Score**
High implementation cost	4.36
Employee training necessity	4.38
Technology improves efficiency	4.41
Technology enhances customer engagement	4.33
Lack of technical skills	4.18
Employee resistance	3.94

Nevertheless, respondents were overwhelmingly certain that the use of technology is beneficial for operational efficiency, customer engagement and restaurant competitiveness.

The results indicate that restaurant owners acknowledge the value of technology, but there are financial and infrastructural constraints.

E. Reliability Analysis

The instrument used for this research was based on reliability analysis by using Cronbach's Alpha to measure the internal consistency of the research instruments.

TABLE V. RELIABILITY ANALYSIS

Construct	**No. of Items**	**Cronbach's Alpha**
Technology Benefits	6	0.842
Operational Efficiency	5	0.817
Adoption Challenges	5	0.789
Future Readiness	4	0.834
Overall Reliability	20	0.865

The overall Cronbach's Alpha value of 0.865 indicates high internal consistency and reliability of the questionnaire for statistical analysis.

F. Correlation Analysis

Pearson Correlation analysis was conducted to examine the relationship among the major study variables.

TABLE VI. CORRELATION ANALYSIS

Variables	Technology Benefits	Operational Efficiency	Adoption Challenges	Future Readiness
Technology Benefits	1	0.621**	-0.338**	0.684**
Operational Efficiency	0.621**	1	-0.291**	0.643**
Adoption Challenges	-0.338**	-0.291**	1	-0.412**
Future Readiness	0.684**	0.643**	-0.412**	1

**Correlation is significant at the 0.01 level.

The analysis indicates strong positive relationships between Technology Benefits, Operational Efficiency, and Future Readiness, while Adoption Challenges showed a negative relationship with future technology preparedness.

G. Factor Analysis

Factor analysis was conducted to identify the major dimensions influencing future technology adoption.

TABLE VII. KMO AND BARTLETT'S TEST

KMO and Bartlett's Test	Value
Kaiser-Meyer-Olkin Measure	0.842
Bartlett's Test Chi-Square	2416.532
Degrees of Freedom	190
Significance	0.000

Factor analysis was conducted to identify the major dimensions influencing future technology adoption in restaurants. As shown in Table VII, the Kaiser-Meyer-Olkin (KMO) value of 0.842 and significant Bartlett's Test value (χ^2 = 2416.532, p = 0.000) confirmed the suitability of the data for factor analysis.

TABLE VIII. VARIANCE EXPLAINED

Extracted Factors	Variance Explained (%)
Technology Benefits	24.18
Operational Efficiency	18.64
Adoption Challenges	14.07
Future Readiness	12.32
Total Variance Explained	69.21

Further, Table VIII indicates that four major factors were extracted, namely Technology Benefits (24.18%), Operational Efficiency (18.64%), Adoption Challenges (14.07%), and Future Readiness (12.32%). Collectively, these factors explained 69.21% of the total variance, indicating strong explanatory power and substantial contribution of the identified dimensions towards future technology adoption in restaurants.

H. Regression Analysis

Regression analysis was conducted to examine the influence of independent variables on future technology adoption.

TABLE IX. MODEL SUMMARY

Model Summary	Value
R	0.781
R Square	0.610
Adjusted R Square	0.603
Std. Error of Estimate	0.418

As presented in Table IX, the model summary showed an R value of 0.781 and an R Square value of 0.610, indicating that approximately 61% of the variation in future technology adoption was explained by the selected independent variables. The Adjusted R Square value was 0.603 with a standard error of estimate of 0.418.

TABLE X. COEFFICIENTS OF REGRESSION ANALYSIS

Variable	Beta Value	t-value	Significance
Technology Benefits	0.421	7.842	0.000
Operational Efficiency	0.337	6.411	0.000
Adoption Challenges	-0.184	-3.516	0.001
Future Readiness	0.289	5.387	0.000

As shown in Table X, Technology Benefits had the greatest positive beta value of 0.421 and t value of 7.842 ($p = 0.000$), indicating that it had the greatest influence on future technology adoption. Future technology adoption was also strongly positively correlated with Operational Efficiency ($\beta = 0.337$, $t = 6.411$, $p = 0.000$).

Conversely, Adoption Challenges had a negative relationship ($\beta = -0.184$, $t = -3.516$, $p = 0.001$), meaning that when the technological barriers increased, the willingness towards technology integration decreased. In addition, Future Readiness had a positive beta value of 0.289 and t value of 5.387 ($p = 0.000$) for future technology adoption.

The results also indicated that Technology Benefits and Operational Efficiency had positive and statistically significant relationships with future technology adoption; while Adoption Challenges had a negative relationship. The outcome suggests that perceived strategic and operational advantages, positively affect future technological preparedness for restaurant businesses.

VI. Conclusion

By 2035, a significant technological shift is expected in the restaurant industry, with the growing adoption of Artificial Intelligence, automation, robotics, IoT, smart kitchens, cloud kitchens and data analytics.

The results of the present study show that restaurants in Chandigarh Tricity are slowly moving towards technology based operational ecosystems. Digital payment systems, POS technologies, online delivery platforms and QR-code menus are already part and parcel of restaurant business.

The research also indicated that restaurant industry professionals feel that technology adoption will be crucial for the long-term survival and competitiveness of their restaurants. The technology benefits and operational efficiency were found to be major predictors of

future technology adoption, while the high implementation cost and lack of technical expertise were found to be major barriers.

For restaurants, the key to success will lie in finding the right balance between technology and customer-focused hospitality experiences. As a result, restaurant owners need to invest in their technological infrastructure, employee training, digital skills, and innovative strategies to stay competitive in the changing landscape of the hospitality industry.

The study adds to the existing literature on hospitality technology and also offers implications for restaurant businesses, policy makers, hospitality educators, and hospitality technology vendors in the future of technological readiness in emerging urban areas.

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