

The Role of Artificial Intelligence in Enhancing Personalized Menus and Guest Experience in Jaipur.

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Abstract

In today's time and age, the hospitality sector has been swept up by Artificial Intelligence (AI). Personalizing menus by Artificial Intelligence (AI) is being explored with regard to the impact this has on the customer satisfaction in the City of Jaipur. The study's three research aims will be examined for customer satisfaction scores/extent of engagement and the restaurant return business impact of the AI dining menus. Some restaurants were chosen in the city of Jaipur and a fixed format research survey was carried out in these restaurants on 200 customers. A series of tests was conducted using statistical procedures, to test the hypotheses that were suggested. The results highlight the potential of AI in the restaurant sector of Jaipur to create a better customer experience and boost restaurant engagement, while simultaneously enhancing customer loyalty. Overall, the research is a valuable addition to the existing literature on the use of AI in the hospitality industry, and it provides a fascinating insight into how AI systems can influence the future of dining...

Keywords: Personalized Menus, Artificial Intelligence in Food, AI Menus, Customer Satisfaction In Restaurants, Customer Engagement In Restaurants.

Introduction

Artificial intelligence (AI) has completely transformed the operational paradigms of industries in different parts with hospitality being one of them with the greatest benefit. Personal menus are one of the most promising uses of such a game-changer technology and it's based on data analytics and machine learning that it generates customized menus for all, regardless of preferences and restrictions. As consumers are looking for personalized experiences and the expectations in the restaurant sector around the globe have changed, the demand for hidden experiences (Buhalis & Law, 2008) has been impacted. As consumers demand increasingly more relevance, convenience and engagement, AI-powered personalized menus are a dynamic alternative to the legacy (static) menu in general and a delightful way of enriching the dining experience. The study tries to analyze the impact of such menus in the culturally rich city of Jaipur an area of the Rajasthan state of India where history has its sway, tourism is a major feature and culinary activities have been a vibrant history. The study will explore the role of AI-based personalization in enhancing customer satisfaction, engagement, and loyalty, offering valuable insights into the influence of AI on the hospitality sector in Jaipur, India. The Pink City is also known for its pink colouring of forts and palaces and the pink colour of the city because of the colourful markets, particularly in Jaipur that attracts millions of tourists to India each year (Singh, 2019).

Other than this, it is a genuine hotspot for the culinary traditions of the Rajasthan, which are part of it and are revered for their taste and history, such as dal baati churma, laal maas and ghevar. (Sharma and Rao, 2020) It performs side by side with the present-day dining experience in the luxury hotel, the historic establishment and the trendy hotspot that caters to the different groups of its visitors: the local who hold onto their past, the local tourist who looks for something authentic, and the international tourist who's on a regular trip in the world of globally flavored foods. In this era customers are more than happy with one product; they want what they want should be linked to their personality, health consciousness, cultural taste etc. (Gretzel et al., 2015).

The AI handles these needs when dealing with large amounts of data like previous orders, provides information on dietary restrictions, gives live feedback and even offers highly accurate and personalized suggestions for menu items. In sum, the studies so far show that, as soon as customers are felt, appreciated, their satisfaction and retention of customers will be significantly improved (Neuhofer et al., 2015). For example, following a study by Huang and Rust (2021), we see that the personalization of restaurants by using AI, helped in increasing the customer retention rates by 20%, demonstrating practical benefits for it. But most studies were conducted in urban metropolises like Tokyo, London and New York where people's dieting habits are less prominent than in other

cities and where people use technological devices to an extreme degree. However, there are areas that are yet to be explored such as Jaipur with its mix of tradition and modernity where AI isn't necessarily emphasized and other areas that are still under-explored into which new local investigations are needed regarding the implications of AI. So far, the use of AI in restaurants in Jaipur is gaining traction but promises are getting bigger when it comes to transforming the customer experience. Tourism driven economy of the city depends on restaurant industry as such its restaurants make a huge contribution towards revenue and employment (Kumar & Singh, 2022). This classic is also in line with the rich heritage of Rajasthani but traditional menus do not provide the flexibility required by people for various preferences such as vegan, gluten free diet, low calorie diet etc. these are the choices people have in their favor these days due to their health concern (Joshi, 2021). AI created menus which can be dynamically changed on the go can provide a solution to this problem, such as suggesting a variant of laal maas to a patron who is on a calorie-controlled diet or a vegetarian option for a vegetarian patron to gatte ki sabzi. This flexibility will support the sustainability objective by making it easier to reduce food waste, as previously found in hospitality research on sustainability, where a match of the recommendations and the customers' preference to foods was seen to be beneficial to sustainability (Han et al., 2020). The globalized outlook and access to Jaipur's restaurants has led local restaurants to look into both selling to different sets of customers as well as keeping their local culture alive, whereas AI is turning to be the most crucial tool that can balance everything, hence it is essential to study it in detail.

Advantages of using AI in hospitality have been extensively published in Western contexts but has a different socio-cultural fabric in Jaipur that calls out the need for a unique case study. In the city, which has a strong tradition and a tourism tradition, people enjoy other things than in metropolitan cities. For instance, a local resident might take care of authenticity of a Rajasthani thali, whereas a tourist will look out for fusion dish with native spices with well-defined flavors (Sharma & Rao, 2020). AI menus can be an opportunity to take care of these various expectations, by understands these shades and improving satisfaction demographics. AI has tremendous potential for the growth of business, both good and bad; with the use of AI, food restaurants will be able to provide better customer services, they will attract more people to come and visit them, more revenue and better reputation making Jaipur as one of the best food cities in the world (Kumar & Singh, 2022).

Potential Hospitality Establishments in Jaipur for the Adoption of AI-Powered Personalized Menu Systems.

The identified hotels and restaurants included those with a good market reputation, technological focus, customer base, and the ability to adopt and install AI-driven personalized menu systems to improve the dining experience

S. No.	Restaurant Name	Location	Reason for Selection	Potential AI-Powered Menu Application
1	Suvarna Mahal	Rambagh Palace, Jaipur	Renowned for royal Rajasthani cuisine and luxury dining experiences.	Personalised royal thali recommendations based on guest preferences and dietary needs.
2	Peshawri	ITC Rajputana, Jaipur	Famous for authentic North-West Frontier cuisine and premium service standards.	AI-driven recommendations for spice levels, accompaniments, and meal combinations.
3	1135 AD	Amber Fort, Jaipur	Unique heritage dining destination attracting domestic and international tourists.	Customised menu suggestions based on customer tastes and dietary requirements.
4	Bar Palladio	Narain Singh Road, Jaipur	Popular among tourists and elite customers for its ambience and fusion cuisine.	Interactive digital menus offering personalised dish and beverage recommendations.
5	Mohan Mahal	The Leela Palace Jaipur	Known for authentic royal dining experiences and premium hospitality.	AI-powered recommendations based on dining history and guest preferences.
6	Surya Mahal	The Oberoi Rajvillas, Jaipur	Premium restaurant offering Indian and international cuisines.	AI-enabled menu personalization according to guest profiles and dietary patterns.
7	Spice Court	Civil Lines, Jaipur	Well-established restaurant famous for traditional Indian cuisine and ambience.	QR-based AI recommendations tailored to customer tastes and health preferences.

S. No.	Restaurant Name	Location	Reason for Selection	Potential AI-Powered Menu Application
8	Handi Restaurant	MI Road, Jaipur	Popular destination for authentic Rajasthani and North Indian cuisine.	Personalized menu suggestions and spice customisation based on order history.
9	The Forresta Kitchen & Bar	Khasa Kothi Circle, Jaipur	Trendy restaurant attracting young professionals and tourists.	AI-powered recommendations for food and beverages based on customer preferences.
10	Chokhi Dhani Restaurant	Tonk Road, Jaipur	Iconic Rajasthani dining destination offering traditional cuisine and cultural experiences.	AI-assisted personalized thali options and dietary-based menu customization.

Review of Literature

Currently, AI is making a difference in the food and beverage industry and has positive effects on the operational efficiency, the personalisation of the customer experience and sustainability. AI to create menus, AI to prepare food, AI to interact with customers are all examples of such AI powered technologies which are transforming in menu design, food preparation and customer interaction (M.K. Murugeah, 2024; Dr.T. Milton 2024). By these innovations' restaurants can provide more personalized offerings, improve inventory management and minimize the waste (Navleen Kaur et al., 2023). There are also AI systems like chatbots or virtual assistants that analyze the data of the guests and make recommendations to each guest, which are personalized and streamlines the ordering process (Dr.T. Milton & Tourism Hospitality Management Dean, 2024). Furthermore, it facilitates the creation of personalized meal recommender systems powered by decision tree machine learning to predict user preferences and improve food choices (Mohammed Al-Hubaishi et al., 2024). As AI technology continues to advance, the prospects for its application in the hospitality sector may prove even more compelling in the future, where it has the power to enhance industry efficiency, customer satisfaction, and sustainability (M.K. Murugeah, 2024; Dr.T. Milton & Dean Tourism Hospitality Management, 2024).

From various industry segments, AI is making a major contribution in optimizing the customer journey. Real time customer data analysis on AI systems offers numerous benefits, such as personalized marketing, customer recommendations, and customer service (Pendyala & Lakkamraju, 2024). In the restaurant sector, AI is employed to offer suggestions for customers with particular dietary requirements or a preference to guide their food selection (Hasan et al., 2022). AI powered chatbots and virtual assistants enhance the customer service in recommendations and also in retail and hospitality and finance sectors (Bhuiyan, 2024). When it comes to millennials, the way they dine out is an excellent place for AI to make a difference: the recommendation engine, the chatbot and the sentiment analysis have worked well in casual dining restaurants (Dabral et al., 2021). The application of AI across the various stages of the customer journey has transformed the customer journey into a more satisfying, loyal and efficient business by customising activities and anticipating customer needs and desires. (Pendyala & Lakkamraju, 2024; Bhuiyan, 2024).

A recent study has been undertaken into creating new technology to make the restaurant dining experience better. Argueta et al (2013) found that smart phones enabled with Near-Field Communication (NFC) technology can help to streamline the ordering process, offer a review of the food and inform the customer of the food being prepared. On a growing scale, consumers use social media sites to seek out credible restaurant data on social media that is integral to their restaurant selection process (Goyal, 2016). Content and knowledge-based recommendation systems can be used by customers to go through the complex menus and make an appropriate food selection (Gulati and Bhagat, 2021). There are a number of benefits to the mobile apps that are fitted with a clever menu card system such as how easy it is to order, change the menu, pay the bill, reserve a table and giving customer feedback (Fiorenza et al., 2018).

AI-powered services can enhance customer satisfaction by personalizing their experience, making it more convenient, or improving service quality. (Ameen et al., 2020). Based on Mohamed et al., (2022) study, the findings indicated that digital menu in restaurants positively influenced customer behavioral intentions through customer satisfaction. Similarly, the quality of restaurant services, and satisfaction of restaurants' customers, will be enhanced by the e menu recommendation systems as well (Pawar et al., 2018). However, businesses must invest in and reskill themselves to provide safe and tailored customer services. Ameen et al., (2020) argue that the factors that make these happen are trust, perceived sacrifice and relationship commitment. AI's potential in these discoveries is to improve customer experiences in different industries.

Recent research into the application of AI in the banking sector very much highlights the importance of AI in customer experience and satisfaction. The use of AI driven Electronic Customer Relationship Management (ECRM) systems to drive customer experience and satisfaction in private banking has been seen to affect the customers positively (Singh et al., 2023). AI's application in banking operations has played a crucial role in enhancing customer interactions and streamlining banking services, alongside its ability to enable personalized interactions through chatbots. (Bhattacharya & Sinha, 2022).

2.2 The study aims to achieve the following:

To evaluate the effect of AI-driven customised menus on customer satisfaction in restaurants of Jaipur.

To assess the effectiveness of the use of AI-based customized menus in improving customer engagement during eating moments in Jaipur.

To find the impact of personalized menus based on AI on the re-visits to restaurants in Jaipur area.

2.3 Hypotheses of the Study

H1o: AI-driven customised menus make little to no difference in the satisfaction of customers, In Jaipur restaurants

H2o: AI-powered personalised menus doesn't contribute to customer engagement in eating experiences in Jaipur.

H3o: There is no impact of AI-powered personalised menus on repeat dining experience in restaurants in Jaipur.

Methodology

This study employs quantitative research methodology to gauge the impact of AI-generated personalized menus on customer satisfaction in dining experiences in Jaipur. The descriptive and inferential research designs have been used to analyze the relationship between AI-driven personalization and customer satisfaction, engagement, and repeat visits. The study involved 200 respondents from different restaurants in Jaipur that have implemented or are planning to use AI for creating personalized menus. Convenience sampling was used to determine sample size to include a broad spectrum of customers by demographic. The respondents were chosen from non-probability sampling method called convenience sampling. Customers were approached for the survey during the restaurants visited with personalized menus using AI. Structured questionnaires were used to collect primary data, which were physically distributed and online through Google forms to restaurants. Data collected were analysed using the Statistical Package for Social Sciences (SPSS) and the Microsoft Excel for statistical interpretation. The following tests were used:

Descriptive statistics are mean, standard deviation and frequency analysis.

Chi-square test was used to test the relationship between categorical variables.

The t-test is used to compare means of two groups.

To assess the impact of AI-generated menus on customer engagement and customer return rates, regression analysis was conducted.

Data Analysis

4.1 Hypothesis for H1:

A detailed study of the dining experience of these customers shows that they prefer an AI driven personalized menu compared to a standard menu with a high degree of preference, statistically significantly. This is confirmed by good statistics, including a t test ($p=0.0002$) and regression model ($p=0.002$), both of which showed that the average satisfaction score of AI menus (3.86) was not random, but rather more likely a result of the product offered. AI recommendations, menu options, service time and usability are the top three reasons for higher satisfaction ratings, with accuracy of AI recommendations being 70% and more options on the menu being 66%. Additionally, the majority of customers (64%) said the AI menu provided a more engaging and personalized experience, supporting the second alternative hypothesis that AI-powered personalization definitely improves the customer experience while eating.

4.2 Hypothesis for H2:

Research examining customer dining experiences reveals that there is a clear and statistically significant preference for customised menus that are tailored to each customer using AI compared to the standard menu. The data is solid, with both a t-test ($p=0.0002$) and a regression model indicating that the greater satisfaction score (3.86) with AI menus was not due to chance compared with a traditional menu (3.35). The ones that helped with the most satisfaction include AI based recommendations (70% of users), more menu options (66%), quicker waiting time (60%) and overall ease-of-use (57%). Also, the majority of the participants (64%) said that they were more satisfied with the AI menus and more engaged in the dining experience, which is in support of the alternative hypothesis that AI-powered personalization has a significant effect on the customer's dining experience.

4.3 Hypothesis for H3:

AI-powered personalised menus have been proven to have a significant impact on fostering customer loyalty in restaurants across Jaipur, according to research. This is supported by statistical analysis that shows that the average

score for the AI menus (3.89) is significantly higher than the traditional menus (3.41), with respect to customers intention to revisit. This increased loyalty is mostly attributed to having a more customized dining experience (78%), more menu options presented (69%), faster and more accurate service (61%) and a loyalty rewards system that is offered (53%). Additionally, the benefits of AI menus in word-of-mouth marketing are significant: 82% of diners who experienced AI menus are more likely to recommend the restaurant compared to 63% of users of traditional menus. Overall, the statistics reveal that AI menus are a crucial element in fostering repeat sales.

Key Findings and Insights

The results of the study suggest that using personalised menu systems has an impact on the overall dining experience. The recommendations cater to the individual tastes, dietary requirements and past dining experiences of the customer, which simplifies and makes the task of menu selection easier. This personalization minimizes the amount of time needed to make decisions and improves the dining experience satisfaction. The research further shows how menus can be designed to engage customers by encouraging them to try new foods, personalize their menus, and provide them with more information on foods and nutrition. Personalized offers and promotions further reinforce the relationship of restaurant services with customers. Additionally, customised recommendations play a key role in retaining customers, as they are far more likely to revisit a restaurant that seems to care about their well-being. Repeat visits and long-term patronage is further encouraged by loyalty programs.

Challenges and Limitations

Custom menu systems have several benefits, but there are a few things that may influence the restaurant's success in implementing it. One such worry is the handling and securing of customer information, which is vital for delivering customized recommendations for food, travel, and other areas, considering factors like customer purchasing patterns, dietary choices, and food tastes. Personalised recommendations are based on eating habits, dietary needs, shopping habits, etc. and these aspects of data collection and security are a concern. An important obstacle is the implementation costs, such as digital infrastructure investments, software, equipment, maintenance and technical support. These expenses can be hard for restaurant businesses that are small and medium-sized. Furthermore, the implementation of personalized menu systems depends on a reliable technological infrastructure and preparation of the personnel. One of the things restaurants must invest in to keep things running smoothly and have a great customer experience is staff training and customer facing systems. Lastly, overuse of technology can also impact the connection that is the foundation of hospitality services. A lot of people still value the directness of the services provided by the restaurant and the attention that is given to them by the employees of the restaurant.

5.2. The Implications and Recommendations for The Future will be provided in

The result of the study guided following research and applications as follows:

Comparisons of different areas: A comparative study of the AI-optimized menu for both cities, including Jaipur, can be useful to understand the difference in the utilization of Artificial Intelligence in other cities of India. In various markets, the impact of AI-driven personalisation could vary due to cultural preferences, economic considerations, and technological adaptability.

AI and Sustainable Dining Practices: AI menus have the potential to encourage sustainable food production and can be used to minimize food waste by optimizing menu planning for available supplies and forecasting demand. Future studies could focus on the effect that AI menus have on sustainability and how AI menus can be used to reduce food waste.

Personalising with AI – Ethical implications: Ethics of AI personalisation. With the advancements in AI technology, there's an increasing need for studies on ethical AI development in the hospitality sector. AI's potential for ethical applications, for example, in the restaurant sector, where future investigations could range from what is considered transparency in the recommendations, fairness in pricing, and privacy protection of customer data.

AI-powered Customer Service for Enhanced Efficiency: When paired with augmented reality, Virtual Reality and voice-enabled AI assistants, the possibilities within a menu through the use of AI add another level of immersive dining experience. These technologies could be further explored in future research for its potential to enhance the personalisation and engagement part of the restaurant experience.

Conclusion

Defence Science Journal proves AI-based menu personalisation as an essential element which boosts guest satisfaction and cuts down food waste along with promoting health choices while enhancing hotel operational efficiency in star hotels. AI-based food suggestion systems could be a solution, but there are drawbacks, including cost, ethical issues, data security concerns and the fact that staff need to alter their workflow. To discuss long-term effects along with cultural concerns of AI ethics and new technology programs and sustainable measurement approaches is recommended. These studies pave the way for industry players and researchers to continue innovative and efficient advancements in AI's application to hospitality processes and systems.

AI technology will grow increasingly important in the hotel food and beverage industry due to its ongoing evolution. All the scenarios of AI are analysed from various angles to maximise the companies' gains and minimize its risks. Further studies should focus on the development of balanced technological systems based on ethical and sustainable work and improve guests' satisfaction and business efficiency in the long-term...

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