Home Cooked Delights

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Abstract— This study examines the profitability of running a cloud kitchen over a traditional restaurant when it is pursued with the same level of efforts from the entrepreneur. Cloud kitchen with its many advantages over the traditional setup of a restaurant has shown to be a more profitable option in most of the cases. Cloud kitchens are not here to replace restaurants, it is just an additional food serving avenue for consumers. Only people who want to spend quality time with friends, colleagues, and family members will visit restaurants. For consumers who wish to enjoy and celebrate at home, cloud kitchens are available. These are two different venues altogether and none of them are here to replace each other.

With direct competition with aggregators, new players are expanding the overall market. It fairly seems possible that in the future even lower-end traditional restaurants also will migrate to new norms and methods. Cloud kitchen hence seem a viable option for its enhanced efficiency in reach of customers, costs, time, ease, and regulated operations.

Keywords-Home Cooked Delights, Cloud Kitchen, Homely food.

I. INTRODUCTION

While number of new formats have emerged on the F&B scene in recent years, one format that has been making waves is Cloud Kitchen. With a model of minimum capital investment, low risk, high margins and endless opportunities, cloud kitchens are becoming one of the safest food business formats. Such has been the attraction of cloud kitchens, that many traditional kitchens have begun to shut their brick-and-mortar formats to make a move to the cloud kitchen format. Cloud Kitchens, also referred as Ghost Kitchens is an outlet that gives no dine in facility in its premises it solely focuses on take-away and delivery for their business. Most research and consulting reports on Indian cloud kitchens suggest that market size is expected to be about $1 billion by 2023 with a healthy double-digit growth rate every year, points out Narendra Singh Dahiya, Founder and Director, Homefoodi, a mobile application for home food made by home chefs.

According to Dahiya, earlier the contribution by cloud kitchens was estimated to be 20 percent of the food delivery market. However, this percentage is changing and will undergo drastic changes in the favour of cloud kitchens. The

Indian F&B industry is witnessing a major drift from dine in to delivery business and the pandemic of Covid-19 has worked as a "catalyst" in the growth story. The closure of restaurants due to the lockdown has pushed a majority of the population to opt for either home cooked meals or depend on food brought in through deliveries. (SOURCE: Gupta, P. (2020) “Growth of Cloud Kitchens in India” Retrieved from (https://ianslife.in/food-fitness/growth-cloud-kitchens-india)). According to RedSeer Management Consulting, the Cloud Kitchen industry in India is projected to become a $2 billion industry by 2024. It has been growing at 12% (2018-2023). The emergence of food aggregators and the changing food habits, especially in Metro cities, are critical in driving the industry’s growth.Convolutional Neural Networks as well as adaptive machine learning models capable of analysing large volumes of visual data accurately.[11] With all these advances, diversity in various environmental conditions can be identified in terms of animal species even when the visibility is low or the animals are partially obscured by foliage. The system can therefore be applied in continued operation and with adaption to diverse habitats, it comes out therefore as a versatile tool for both researchers and conservationists.

Cloud Kitchens accounted for 20% of the food delivery market, but that trend is about to change drastically in favour of Cloud Kitchens. Around 15 million people in India are freelancing as of 2020 majorly working in sectors of IT, Sales, Marketing.

This paper attempts to contribute toward the research base by introducing a holistic framework for cloud kitcehn through the integration of advanced tools such as flutter and firebase architectures. The system adopts real-time orderprocessing, adaptive preprocessing techniques and a cloud-based deployment model so as to make it scalable and accurate for order placement.A cloud kitchen is a restaurant that focuses exclusively on takeaways. These restaurants do not offer dine-in

facilities. In these outlets, only the production of food happens. The orders are only received online and the food is then sent to the customer in the form of a takeaway.

The key objectives of the research are as follows:

The concept of cloud kitchen in India have been instances when visiting a restaurant was the only option for enjoying a meal with your loved ones. But thanks to technological advancement, the globe is now at our doorstep. The food service and restaurant sectors have seen an increase in customers recently, particularly in the wake of the pandemic.Eating at home is safer, more pleasant, and more convenient than eating out. The idea of cloud kitchens has gained popularity across the globe and in India in large part due to this rise in demand for home dining. Having said that, setting up a cloud kitchen is not a simple operation; there are technical and legal considerations that must be made before proceeding.

This article explains what a cloud kitchen is, the fundamental legal requirements to meet before forming one in India, and the most recent issues that have emerged around them."cloud kitchens" are set up to provide food exclusively for delivery. Through a website or app, they accept food orders. Despite having no physical location, these kitchens have made significant inroads into the market due to food delivery services like Swiggy or Zomato. In the coming years, the value of cloud kitchens is expected to increase by USD 2 billion, according to a survey by Red Seer Management Consulting. They are also economical. Since a significant portion of hospitality profits are typically used to pay employees or rent, digitising the dining experience results in lower capital, infrastructure, personnel, overhead, and operational costs.By achieving these objectives, the research aims to significantly enhance automated detection, offering a practical and scalable solution for real-time order monitoring.

II. LITERATURE REVIEW

Through a medium it describes the initial days of cloud kitchen concept in the article published in Restaurant India. In published on July 27, 2021. Food trucks are a type of mobile canteen that have been around for a while, but the events that followed the 2008 financial crisis can be seen as the beginning of the concept's progression from food trucks to home delivery to cloud kitchens. The pricey and high-end restaurants did poorly in the years following the recession, and many of them had to shut their doors. Food trucks became a rival to these establishments, and the entrepreneurs of that time seized the chance to profit from it. Due to the trucks' low cost and mobility, they could serve a number of places, be close to clients, and have reasonable rent. Ondemand meal delivery was made popular by the mobile canteens as well. Orders placed over the phone or through SMS were filled utilizing contract labour that was affordable. Over the past ten years, this strategy has allowed a lot of chefs to test out their dishes and fine-tune a menu before looking for funding for a more formal restaurant. These mobile canteens were only available in large cities and business hubs, despite being quite popular. The response to the growing consumer demand for quick delivery and more variety is Cloud Kitchens. Although automation in the restaurant sector is still in its infancy, some prototypes are currently in use, thus the environment appears to be changing quickly. Industry perspectives on the potential for robotics and AI to bring down the price of prepared/delivered meals are generally positive. Robots on the ground and drones in the air may help the expanding gig economy by cutting the cost of delivery and offering theft protection. Robot chefs and automated, standardized processes using machine learning-based prediction tools will be used in the cloud kitchen of the future to quickly produce customized, high-quality meals and distribute them. IANS (July13. 2020) According to Narendra Singh Dahiya, founder and director of Homefoodi, a mobile application for food prepared at home-by-home chefs, the majority of research and consulting reports on Indian cloud kitchens indicate that the market size is anticipated to be about $1 billion by 2023 with a healthy double-digit growth rate every year .The pandemic has acted as a "catalyst" in the growth story for the Indian food and beverage industry, which is seeing a significant shift from dine-in to delivery business. Cloud kitchens have completely revolutionized the food services sector worldwide. Anyone who is still unaware of cloud kitchens should know that they are online-only, delivery-only restaurants with no physical location for dine-in customers. A statistic that continues to rise as the food services industry further embraces this trend, accentuated by the decline in retail business due to lockdown and the consumer's shifting preference towards convenience consumption over experiential consumption, gives an idea of how absurd this concept is: almost 600 outlets are delivery-only out of the total 3000 restaurants listed on Zomato, or approximately 20% of the listings in Chandigarh.

III. PROPOSED METHODOLOGY

A . IDEATION:

To develop an innovative platform that connects home chefs with customers who are seeking unique, homemade meals. The platform will facilitate the discovery of local home chefs, streamline the ordering process, and ensure quality and safety standards.The Home Cooked Delights platform envisions a seamless connection between home chefs and customers seeking unique, homemade meals. It will offer a user-friendly interface where chefs can create and manage profiles, menus, and orders, while customers can easily discover, order, and review dishes. Key features include secure payment processing, real-time order tracking, and a robust review system. The project leverages modern technology stacks for scalability and security, with an initial focus on providing a rich, engaging experience for both chefs and customers. The feasibility is supported by a clear market demand for personalized food experiences, a well-defined technical approach, and a scalable economic model.

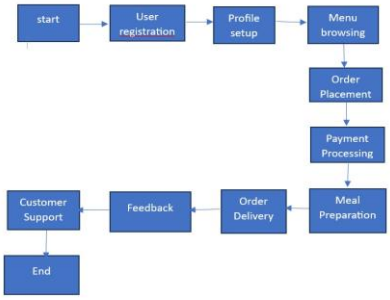


Fig. 2. Online Food Ordering Methodology

B. CONCEPT:

A cloud kitchen is a restaurant that focuses exclusively on takeaways. These restaurants do not offer dine-in facilities. In these outlets, only the production of food happens. The orders are only received online and the food is then sent to the customer in the form of a takeaway. Yumist, Spoonjoy, Box8, ITiffin, Biryani by Kilo, FreshMenu, Eatlo, Hello Curry, etc. are some of the popular examples of Cloud Kitchens. The concept of cloud kitchen as explained in terms of demand and supply is given below

A. Real-time processing and deployment:

Optimization techniques like model pruning and quantization are employed to reduce model size and computational cost. The system is deployed on edge devices to enable real-time processing and reduce latency.

IV. RESULTS

The successful implementation of a cloud kitchen project demonstrates the potential of leveraging technology and modern business models to address evolving customer needs in the food delivery industry. By adopting a cloud kitchen model, businesses can achieve operational efficiency, reduce costs, and maximize their market reach.

Cloud kitchens are reshaping the food service landscape by combining innovative operational models with advanced technologies. While challenges such as maintaining quality and managing competition persist, strategic planning and continuous improvement ensure long-term success in this rapidly growing sector.

Customer-Chef Messaging Interface
Real-time Chat: Enable customers to chat with chefs before placing an order. They can discuss ingredients, portion sizes, and preparation methods.
Voice and Video Option: Optional voice or video calls for more complex discussions (e.g., live cooking consultation).
Preset Templates: Allow customers to select preset health profiles (e.g., low-carb, gluten-free) and suggest meal customizations automatically to streamline communication.

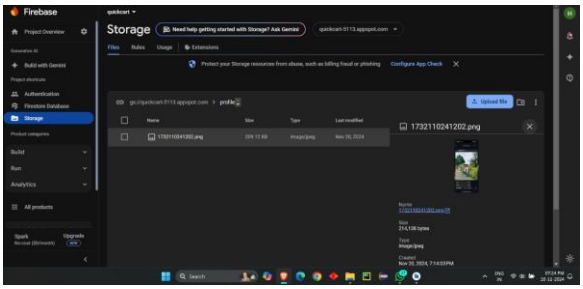
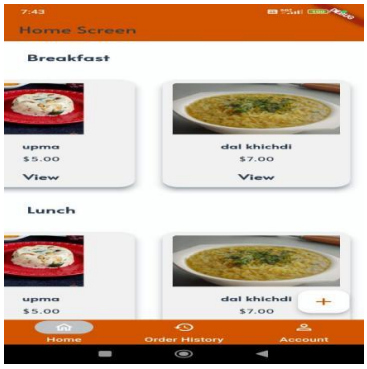


Fig. 3. Image showing real-time monitoring

The cloud kitchen can be set-up at high customer demand areas such as residential or Industrial vicinity, shopping areas back-lanes, unused parking lots, etc. where high demand can be expected. It does not require a location with high footfall and prime property. The monthly rental per sq.ft. in some of the top cities in India ranges between INR 60-80 per sq.ft. In Pune and Gurgaon the rentals are approximately INR 63-70 per sq.ft. and in Noida the rentals are even lesser for cloud kitchen spaces and is around INR 54-60 per sq.ft., while it goes slighly up to INR 72-80 per sq.ft. for Delhi market. The affordable rental options, industrial area and unused warehouses are the first preferences of cloud kitchen operators.

Although, cloud kitchen is a more lucrative business model for the Foodservice players in the pandemic times for most restaurants, switching to cloud kitchens isn't easy as they need to first understand the unit economics behind it clearly. Running a cloud kitchen will still need a different set of expertise. And for many, small establishments sustaining on a cloud kitchen model will also not be an easy task and only serious players with expertise and deep pockets or backed by investment will be able to operate and succeed in this model.

1.Sign In/sign up page



2.Menu page

A. Order Fulfillment Time:
The average time taken to prepare and deliver orders.
Result Example: Reduced from 30 minutes to 22 minutes due to optimized workflows.

B. Order Accuracy Rate:
Percentage of orders correctly fulfilled without errors.
Result Example: Achieved 98% order accuracy by implementing quality control steps.

C.Kitchen Utilization:
The percentage of kitchen capacity used effectively during peak and non-peak hours.
Result Example: Improved to 85% during peak hours with batch preparation strategies.

D.. Financial Metrics

Revenue Growth:
Increase in sales over the project period.
Result Example: Achieved 20% monthly growth with targeted online promotions.

Cost Reduction:
Savings from bulk ingredient procurement, reduced wastage, and optimized delivery routes.
Result Example: Reduced food waste costs by 18% using predictive demand analysis.

Profit Margins:
Improved margins from efficient operations and economies of scale.
Result Example: Increased margins by 12% by leveraging shared kitchen spaces.

V. CONCLUSION

The successful implementation of a cloud kitchen project demonstrates the potential of leveraging technology and modern business models to address evolving customer needs in the food delivery industry. By adopting a cloud kitchen model, businesses can achieve operational efficiency, reduce costs, and maximize their market reach.

Cloud kitchens are reshaping the food service landscape by combining innovative operational models with advanced technologies. While challenges such as maintaining quality and managing competition persist, strategic planning and continuous improvement ensure long-term success in this rapidly growing sector.

The cloud kitchen project aimed to establish a scalable, technology-driven food delivery business that minimizes overhead costs, optimizes operations, and leverages digital platforms to serve customers efficiently. This conclusion provides a detailed analysis of the project's outcomes, challenges, and future prospects.

Key Achievements:

echnology Integration:
Advanced technologies, including online ordering systems, real-time inventory management, and data analytics, were integrated. These tools improved order accuracy, reduced waste, and enhanced customer satisfaction.

Diverse Menu Options:
A data-driven approach was used to design a menu that

catered to customer preferences, ensuring high demand and repeat orders.

Cost Optimization:
Bulk purchasing, optimized ingredient utilization, and a multi-brand strategy within the kitchen led to better profitability.

VI. FUTURE WORK

- Customer-Chef Messaging Interface
- Real-time Chat: Enable customers to chat with chefs before placing an order. They can discuss ingredients, portion sizes, and preparation methods.
- Voice and Video Option: Optional voice or video callsfor more complex discussions (e.g., live cooking consultation).
- Preset Templates: Allow customers to select preset health profiles (e.g., low-carb, gluten-free) and suggest meal customizations automatically to streamline communication.
- AI-Driven Analytics: Implement predictive analytics to forecast demand trends, optimize ingredient procurement, and reduce wastage.
- IoT-Enabled Monitoring: Use IoT devices for real-time tracking of inventory, kitchen equipment health, and food preparation processes.
- Green Energy Adoption: Utilize solar panels or other renewable energy sources to power cloud kitchen operations.
- Waste Management Systems:
- Integrate waste segregation and recycling systems.
- Convert food waste into compost or bioenergy.
- Sustainable Packaging: Transition to biodegradable or reusable packaging to reduce environmental impact.

VII. REFERENCES

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