

A Study on the Prospect of the Cloud Kitchen Model in Dhaka

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Received: October 11, 2022

Accepted: November 16, 2022

Online Published: November 30, 2022

doi:10.5539/ijbm.v18n1p46

URL: <https://doi.org/10.5539/ijbm.v18n1p46>

Abstract

This study looks at the prospect of the Cloud Kitchen Model (CKM) in Dhaka, Bangladesh. Cloud kitchen is a centralized commercial food production facility with no dine-in facility. The study first identified the existing perceptions and expectations of the critical stakeholders for whom the CKM can potentially bring competitive advantages over traditional brick-and-mortar-based models. The target audiences for this study are consumers of online food delivery systems, traditional restaurant owners, potential CKM restaurant owners, and industry experts. To perform this mix-method based study, the researchers conducted surveys along with Focused Group Discussions and In-depth Interviews targeted to various stakeholders such as consumers, restaurant owners, and industry experts besides utilizing secondary data sources. Most respondents know about cloud kitchens, and primarily most of them heard from social media, but mere knowledge of the CKM does not influence their ordered food preference. The only time consumers showed a greater preference for CKM over traditional brick-and-mortar models is when the comparison comes mostly in terms of price, quality, and packaging. As per the results of this study, for the restaurant ecosystem of Dhaka, CKM offers a narrow sales prospect for the next three years even though it offers Value Added Tax (VAT) benefits in general. Existing restaurant owners perceived immediate additional capital requirements, other than their available capital in hand for running their existing restaurants at the moment, as a barrier towards entering the cloud kitchen business and thus stopping the adoption of CKM in the next three years even though they are interested to initiate CKM. It is recommended that those who want to start a CKM business should proceed with a robust business model and can look for angel investors or venture capitalists to secure funds and add experts to the business while prioritizing their marketing activities. CKM-based restaurants should utilize social media platforms to build a positive brand image. Finally, CKM-based restaurants should focus on consumer needs through customized platforms (e.g., their own delivery media and websites) and emphasize employee retention through proper employee training and benefits.

Keywords: cloud kitchen model, mixed method research, qualitative research, quantitative research, Dhaka, Bangladesh, prospect, sales, restaurant industry, competitive advantage, ghost kitchen, NVIVO, IBM SPSS

1. Introduction

1.1 Introduction to the Issue

The COVID-19 pandemic has created significant disruption across all industries (WHO, 2020). The pandemic has impacted the restaurant industry globally, affecting 144 million workers around the world (UN news, 2020), and has forced 95% of restaurants to close (Bhuiyan, 2020). This restaurant industry comprises approximately 1 million working people dealing with unprecedented problems (Haider et al., 2020). In this unprecedented crisis best way to adapt is to take elements of the creative economy. Cloud kitchens can be an innovative approach for the restaurant industry in this situation (Saxena, S. 2021). The change in consumer behaviour triggered by the pandemic is another catalyst that businesses keep in mind. As a result, the cloud kitchen concept became popular. A Cloud kitchen is defined as a commercial kitchen space with no dine-in facility. They operate through online ordering and delivery methods. There are home-based cloud kitchens available, and the trend is rising. However, even for home-based CKM, commercialization is needed (Dny Group (Ed.), 2022). Cloud kitchen is a relatively new but rapidly becoming popular business concept system that is more or less a novelty in the Bangladesh restaurant and food delivery system (Nath et al., 2020). Food delivery service is a major partner component of the business model (Kuddus et al., 2021). This business model has already garnered lucrative success in the western

markets and is now gaining more popularity day by day in Bangladesh, especially among the community of aspirant entrepreneurs. The Cloud Kitchen (CK) concept had its root implemented as early as 15 years back (Paul, 2020). In Indonesia, cloud kitchens were popular long before the Covid-19 pandemic hit (Moyeenudin et al., 2020). In India, cloud kitchens are at a stage where most online food ordering customers could differentiate cloud kitchens from other food delivery models (Bhat et al., 2020). As stated by Mehnaz et al. (2021), in India, the cloud kitchen business suffered due to disruption in the supply chain, lack of awareness, etc. Mehnaz S et al. (2021) have illustrated several cloud kitchen models. The hub and spoke model depends on two different centralized processes (Choudhary, 2019). The pod kitchen model discussed by Fridayani et al. (2021) has mobile characteristics. The study aims to provide more insights to the stakeholders of the Cloud Kitchen restaurants in Dhaka so that it helps in their strategic decision-making.

1.2 Justification of this Study

Amid the pandemic, various restaurants closed their business in Dhaka as they could not meet the expenses. To contain the pandemic, the government had to impose strict lockdowns, which reduced the serving capacity of the restaurants and hence, brought down their revenue (Haider et al., 2020). Simultaneously, various cloud kitchens (e.g., Kludio and Onnow - previously branded as The Ghost Kitchen Bangladesh) have started their operations in Dhaka (Maisha A., 2021). Kludio went out of business by the end of 2021, whereas 'The Ghost Kitchen Bangladesh' has been operational since 2019. Hence, success (Onnow.io) and failure (Kludio) case studies are present in Dhaka for CKM businesses which entail a more in-depth look at the CKM prospect in Dhaka. These newly launched cloud kitchen brands are still getting traction among consumers, and their case study calls for analysis to understand the nascent cloud kitchen business atmosphere in Bangladesh. The wide range of benefits (both financial and non-financial) of the cloud kitchen models have been identified along with their pitfalls in the context of different countries through the exploration of various studies. Using the findings from those studies as the basis, this model's benefits in Dhaka's context can be identified. Several studies (quantitative, qualitative, and mixed approaches) have been conducted on the markets of India, Indonesia, the USA, and the UK, regarding the prospects of cloud kitchens. However, no such in-depth study could be found in the case of the Bangladeshi market. Here comes the question of whether the cloud kitchen model will be appropriate (i.e., will it bring any competitive advantages) and what are the barriers to this restaurant model business in Bangladesh. This is why the project CKM is chosen to understand the prospect of this model for this country. To narrow down more and to access a viable population, the geography of scope for this study is limited to Dhaka city. This specific choice of Dhaka city is further inspired by the explored research of India and Indonesia, where the majority of the quantitative and qualitative research in those regions are based on metro city regions of those countries.

1.3 Scope of this Study

The purpose of the study is to investigate the strengths and challenges of the cloud kitchen model to identify its competitive advantage over the traditional models in the context of Dhaka city. The study aims to assess the customers' perspective of online restaurant and food delivery services, the view of the restaurant owners, and the industry experts about the cloud kitchen restaurant business model. The methodology follows a mixed-method approach, with a quantitative method being the predominant technique. Non-probability sampling techniques are used within the target samples of the population of Dhaka city in three different phases. The study followed a descriptive approach where quantitative methods drove the primary analyses. The findings of the specific objectives will primarily be helpful for those interested in the 'delivery-only' meals business model as well as the research consumers (e.g., entrepreneurs, marketing research teams, researchers of academia, etc.). They might be eager to learn more about cloud kitchen-modelled businesses.

1.4 Literature Review

The Cloud Kitchen (CK) concept had its root implemented as early as 15 years back, even though the term 'Cloud Kitchen' was not used (Paul, 2020). In Indonesia, cloud kitchens were popular long before the Covid-19 pandemic hit (Moyeenudin et al., 2020). In India, cloud kitchens are at a stage where most online food ordering customers could differentiate cloud kitchens from other food delivery models (Bhat et al., 2020).

Indian restaurant owners are contemplating setting up cloud kitchens instead of traditional restaurants due to increasing internet penetration, amelioration of logistics systems, and comparatively low set-up costs (Sarangdhar et al., 2021). Additionally, cloud kitchen models have the potential for faster delivery times (Setyowati, 2020). On the other hand, traditional restaurant models inherit several comparative disadvantages, such as a more significant initial capital requirement and physical storefront setup, which discourage low-capital investors (Lapegna et al., 2016).

Mehnaz S et al. (2021) have illustrated several CKM concepts. The hub and spoke model relies on a kitchen that

prepares the food and an outlet that delivers the food to the customers (Choudhary, 2019). The pod kitchen model can be set up and dismantled anywhere as needed. The commissary kitchen model includes giving access to the same kitchen and food elements to different independent brands, which opens up the possibilities for a variety of food menu items and unique cuisines (Fridayani et al., 2021). The independent kitchen model facilitates collaboration between a kitchen and a delivery partner or another aggregator to operate under one independent brand.

According to Beniwal T. et al. (2021) and Mehnaz S et al. (2021), a cloud kitchen's advantage over a traditional restaurant is that it has a lower cost of entry and operating costs, such as rental cost, licensing costs, and equipment costs, as there is no need to pay for prime locations or on-front employees. Also, it is flexible regarding changing locations and adopting new items to deliver. One can easily extract customer data from apps and websites, which helps determine competitive prices. Customer acquisition cost is lower than traditional ones. As there is no need for aesthetic decor and more extensive staff, cloud kitchens have lower management costs also. This results in a higher profit margin for cloud kitchens than traditional restaurants. Cloud kitchens benefit from a scalable architecture and lower labour expenses. According to market analyst Datalabs by Inc42, the cost of creating a cloud kitchen in India is around a third of the cost of a traditional restaurant (Cheema, 2019). Similarly, data shows that the average price of starting a restaurant business in the USA requires a capital investment of around \$275,000. In contrast, the capital investment needed for a cloud kitchen restaurant is \$40,000 (bdtask.com, 2022).

Despite all these bright prospects, the model has its pitfalls. Beniwal T. et al. (2021) and Choudhary (2019) have shown the challenges of a cloud kitchen. The major limitation is its only online presence and dependence on delivery apps for food delivery. Also, it is hard to maintain food quality once it is in the hands of delivery people. As it has a lower cost of entry, newer competition is always a threat. Unlike full-service providers, these segments lack visibility and brand recognition. These facts are similar to the Deloitte Indonesia Business and Industry Update (2020) findings. Barber et al. (2013) and Gu et al. (2002) conducted a market risk analysis of the restaurant business industry, which can be applicable in the case of CKM when the model has fully developed the distinct part of the industry itself.

Choudhary (2019) stated that cloud kitchens are the future as it is rapidly gaining relevance among the young generation. According to the author, the core reasons behind the rising popularity of cloud kitchen includes stiff competition, changing customer preferences, reduced operational cost, increased food quality, increased personal disposable income, and change in customer lifestyle. The advantages are further agreed upon by Juliana et al. (2020) and Sitorus et al. (2021).

SMEs are a major contributor to the GDP of Indonesia, as per Kolhekar (2020), Resti (2020), and Fridayani et al. (2021). SMEs can adopt more success by following innovative businesses like CKM. According to Realtor (2020) and Li et al. (2020), SMEs will need to make adjustments to their models in the post-pandemic environment of business to maximize profit. For Bangladeshi entrepreneurs, whether the CKM can bring similar adaptive advantages in their SME approaches is, therefore, to be studied. According to Chhabra et al. (2021), consumer behavior shifted towards home delivery food, allowing them to explore new food ventures during covid-19 times in India, and they would prefer cloud kitchens over traditional restaurants if they provide good quality food and fast delivery. According to Resti (2020), Juliana et al. (2020), and Sitorus et al. (2021), the cloud kitchen was introduced by community media to reduce the negative effect of covid-19, which was disrupting the economy of DKI Jakarta.

As stated by Mehnaz et al. (2021), in India, the cloud kitchen business suffered due to disruption in the supply chain, lack of awareness, etc. According to Neil (2020), Fajriana (2020), Upadhye et al. (2020), Wankhede et al. (2021), and Fridayani et al. (2021), some strategies and factors are needed to be considered for a successful cloud kitchen business. Notable strategies include high exposure in social media and e-commerce platforms, implementation of digital marketing tools, discounts, and other cost optimization methods, well advertisement, offering something unique without compromising on quality and integration with the online delivery platforms, reward mechanisms for reviewing, customer feedback mechanism, continuous improvement of the efficiency, the effectiveness of the utilized process and true collaboration with delivery chains. The factors are location, online food ordering system, license, marketing, staff, etc. Consumers rely on reviews and feedback provided by previous users while ordering through cloud kitchen platforms, Vaidya (2017). So, cloud kitchens should operate through online delivery apps that provide user feedback or through their own webs and apps, Moyeenudin et al. (2020).

As per Mehnaz S. et al. (2021), the Indian food delivery market, estimated at around \$15 billion, has grown 150% in 2018 and will be the second-largest market for cloud kitchens. A report from 'Euromonitor International' (2020) estimates 3,500 active cloud kitchens in India, outpacing the USA (1,500) and the UK (750) (Schaefer, 2020). An

expansion was anticipated following the outbreak, from \$400 million in 2019 to \$2 billion in 2024 (Biswas, 2020). However, revised expectations indicated cloud kitchens capturing 30% of the total market share in India by 2021 (Inresto, 2020), reaching \$365 billion in 2030. These potentials made reluctant venture capitalists interested.

A case study by Upadhye et al. (2020) states that Swiggy started as an online food delivery platform in 2014 and expanded into a cloud kitchen in 2019, adding 35 then and targeting 300 more restaurants as partners. Mehnaz S. et al. (2021) state that South Indian chefs adopted the cloud kitchen model from home after losing jobs during the pandemic. Though it does not show any unique model to be more successful, the perspectives of the study can be applied in Dhaka to reach and retain target customers and convert struggling local brands into cloud kitchens.

Using hypothesis analysis, Othman M. S. et al. (2021) found a strong relationship between perceived control, convenience, and service fulfilment of customers in using ghost kitchens during Malaysia's restrictions. The shift in Indian customer behaviorism found prioritizing safety and health issues more than offers or discounts. Maintaining hygiene and safety measures in a cloud kitchen is easier than in traditional models. Along with the existing benefits of the model, this consumer behavior is an added factor in ensuring the ease of entry into the cloud kitchen business.

In these literature reviews, notable studies are unavailable on cloud kitchens in the Bangladeshi Context. Most of the studies are qualitative and case study-based. Quantitative ones include analysis of market risks and customer retention-based models revealing a buildup of awareness among the customers in respective countries. A study would be appropriate to determine the proportion of consumers in Dhaka familiar with the cloud kitchen model, consequently finding the potential of ordering from cloud kitchens by prospective consumers.

2. Methodology

Some of the initial assumptions for the study include that Dhaka city has an increasing trend of smartphone users (Bhuiyan M., 2021), among whom the majority of the users (Statista (Ed.), 2022) are used to ordering foods from food-delivery apps. Therefore, it is assumed that the target population has enough literacy regarding operating delivery applications.

2.1 Sampling Technique

The study was divided into three specific audience groups. The first group is the customers of cloud kitchen and online food delivery restaurants, the second one is the owners of the restaurants (either the traditional modelled or the CKM modelled owners or owners of both types), and finally, the third group is the industry experts. All the samples were collected using the nonprobability sampling technique. A convenience sampling procedure was followed to collect the data for the customers. For the restaurant owners, the snowballing sampling method was followed for the survey to ensure their availability within a limited time. For the FGD and expert selection, the purposive sampling procedure was followed.

2.2 Sample Size

The sample size of the first group, i.e., the customers of the online delivery restaurants (including those of the cloud kitchen), was 168. The sample size achieved is greater than the intended 150. The rationale for choosing 150 as the sample size was that the questionnaire had 15 questions. Approximately ten respondents per question are considered to ensure a minimum standard sample size (Bullen, P. B., 2022). The general expected profile of the customers includes; being residents of Dhaka city, age range between 18 to 55 years irrespective of gender. For the survey on restaurant owners, the sample size is 33. This number is more than the minimum limit per Roscoe's (1975) rule. For this survey considering the limitations regarding connections with reliable restaurant owners, a minimum of 30 seems an attainable number. The restaurant owners' target population is those who use food delivery systems for their prepared meals in Dhaka city. In the case of FGD, we chose six restaurant owners for an FGD. The 6 -member FGD is appropriate as it ensures the participants' active participation in social research (Boateng, 2012). Three industry experts were interviewed to gain expert insights regarding cloud kitchen versus the overall industry.

2.3 Data Collection Method

To collect the primary data from the customers of the cloud kitchen and online delivery restaurants, as well as from the restaurant owners, two separate questionnaire-based surveys were used. Apart from this, to get a deeper insight into the customers' behavior, order preference, and perspective, a 6-member FGD was conducted with the restaurant owners who are either operating in CKM or are planning to adopt CKM. Thirty-three (33) in-person surveys were conducted with the traditional restaurant owners. In-depth interviews were conducted with three industry experts. The online survey was considered appropriate for the customers as these are the people with internet connectivity who could access the facilities required to place online orders. On the other hand, the offline

survey was conducted on the restaurant owners as the restaurant owners and managers could get clarification from the data collection team, which helped to minimize the communication error. Again, the FGD has been conducted online to ensure health safety and provide flexibility to the participants so they can participate from their comfort zone. Two of the three expert interviews were also conducted online for the same reason. The other expert interviewee allowed the research team to meet him in person and ask questions directly. Hence, it was conducted offline. The expert interview includes owners of successful cloud kitchen facilitator brands, successful traditional restaurant owner brands, and national Information and Communication Technology (ICT) experts.

Table 1. Summary of the overall data collection and tools

Target Audience	Sample Size, n	Tools of Data Collection
Customers	168	Survey (Online)
Restaurant Owners	33	Survey (Face-to-face)
Restaurant Owners	6	FGD (Online)
Industry Experts	3	In-depth Interview (Online and Face-to-face)

Considering all the factors of sample size, data collection method, and techniques, the study can be termed as a mixed method-based one.

For the secondary data collection process, the researchers used an array of publications on the cloud kitchen models, including both the qualitative and quantitative methods of studies. Furthermore, relevant news articles, statistics sites, and expert-oriented blogs are utilized in this regard. Since Bangladesh is an emerging economy (Samme S., 2021), the focus of the secondary research was mostly on developing and emerging economies like India, China, Malaysia, and Indonesia.

3. Analysis Tools Used

The data has been entered into a google sheet and then converted into Microsoft Excel workbook for cleaning and formatting purpose. Statistical analysis has been performed using IBM SPSS version 25.0. Furthermore, the NVIVO software package has been used to analyze the qualitative data. The following subsections describe various quantitative and qualitative mechanisms that are applied for analysis and generating results for the study.

3.1 Descriptive Statistics

Comparing distinct measurements across numerous variables is made possible by descriptive statistics. Included in them are the mean, mode, standard deviation, etc. Histograms and boxplots are only a few graphical summary techniques available. This study uses histograms, pie charts, and percentage distributions to describe various findings during the comprehensive presentation of the results as per the research method course requirement.

3.2 Binomial Tests

The binomial test is a precise statistical test that uses sample data to determine the statistical significance of departures from a theoretically anticipated distribution of occurrences into two categories. In this study, binomial testing is conducted on a 'yes/no' category basis while analyzing the data for generating and testing results.

3.3 Thematic Coding

To classify the material and create a "framework of thematic notions about it," thematic coding, a kind of qualitative analysis, entails noting or recognizing sections of text or pictures that are connected by a similar subject or concept. This study utilizes this thematic coding method using the NVIVO qualitative analysis software for in-depth interviews and focused group discussions. A hierarchy chart was established using the results of NVIVO analysis to aid the core findings and was demonstrated in the final presentation of the research.

4. Core Findings

4.1 Results

Most (72%) of the survey respondents heard about cloud kitchens based on the binomial test. Among those who have heard, the majority learned about the concept from social media. More than half of the respondents (60.1%) are 25 to 31 years old. As per the survey, among the respondents who know about CKM, for the larger share of respondents (34.5%), their food preference is not influenced by the knowledge of CKM as per the Likert scale-based question's output. Most respondents are indecisive regarding whether they will consider ordering from CKM-based restaurants as per their 'neutral' outputs in a Likert scale-based question that asked, "How Likely are you to consider CKM restaurants to order takeaway or food delivery for your next online order?".

Based on the binomial test, in terms of perceived ranking of consumer-centric factors (e.g., Price, taste, etc.), CKM-modeled restaurants are preferred over traditional ones. Based on Price, Packaging, and Quick delivery, CKM is preferred. CKM offers a lower initial investment with a narrow sales prospect for the next three years as per the binomial test of the response from the restaurant owner's side. As per the qualitative findings, low operational costs, and VAT bracket benefits are experienced in CKM restaurants in Dhaka. It is inconclusive whether consumers are willing to pay more for better quality foods offered by CKM than traditional modelled restaurants. Binomial tests on the survey from restaurant owner respondents further show that CKM might offer lesser flexibility regarding workforce payroll management and Supply Chain Integration. Using the same test, it is found that the availability of a large delivery workforce and growing online purchase trends add to the prospect of CKM as per the thinking of the current restaurant owners. In-depth interviews with the experts have revealed that higher customer churn rates, fake reviews, and lack of technology literacy are challenges for CKM in Dhaka. The majority of the restaurant owners (55.4%) are interested in opening a CKM business in the next three years based on the 'yes/no' optioned question when asked whether they are looking forward to opening a CKM business front within the next three years. The majority of restaurant owners think right at the moment going for additional capital is one of the significant impediments to not adopting CKM-based restaurants anytime soon. Thus, a perceived barrier towards entry prevails. As per the survey results on restaurant owners, most new restaurant owners have shown interest in operating under a one-brand umbrella, whereas already established restaurant owners showed reluctance to go under one umbrella brand. Evidence from in-depth interviews indicates that new restaurants can benefit by operating together under an umbrella brand or in an aggregation format (For example, Friggy's, Party Pizza, and Wrappo operate under the collaborative facilitator brand *onnow.io*). Further analysis reveals that new traditional restaurant owners have shown comparative reluctance to adopt the CKM business model in the next few years than the traditional restaurant owners who are already established in the industry for several years. Furthermore, qualitative findings and binomial tests on the quantitative data indicate that several financial disadvantages for the CKM adoption include discount-seeking consumers, low order generation of SME-based cloud kitchen models, and price fluctuations from the raw material sides. These findings also corroborate with quality challenges of CKM stated by Beniwal T. et al. (2021), Choudhary (2019), and the report of Deloitte Indonesia Business and Industry Update (2020).

4.2 Comparison of the Results with the Previous Studies

Table 2. Detail Comparison of the findings between this project and the literature findings

<i>Findings of this Study</i>	<i>Findings from Previous Studies and Comparison</i>	<i>Remark</i>
Those who know about cloud kitchens know them through social media mainly.	Fridayani et al. (2021) have found social media exposure as a critical strategy for cloud kitchens to succeed. Therefore, cloud kitchens can capitalize on the build on the existing social media exposure to widen their reach.	Supported by Previous Studies
Customers can differentiate between cloud kitchens and traditional models.	Bhat et al. (2020) have found that customers could differentiate between the two models in India. We have similar findings.	Supported by Previous Studies
In terms of food prices, customers prefer cloud kitchens over traditional models.	Beniwal T. et al. (2021) have found that a cloud kitchen's advantage over the traditional restaurant is that it has a lower cost of entry and operating costs. Therefore, they can charge lower prices.	Supported by Previous Studies
In terms of food quality, customers prefer traditional restaurants.	Choudhary (2019) has supported this view as the food can deteriorate after leaving the kitchen and while in the hands of the delivery persons.	Supported by Previous Studies
In terms of a quick delivery, customers prefer cloud kitchens.	Setyowati (2020); Fridayani et al. (2021) have found that cloud kitchens can deliver food faster since they are entirely focused on handling online orders, so there is no crowding of orders from the offline counterpart. Our finding supports this view.	Supported by Previous Studies
Cloud kitchens have lower initial investment requirements.	Mehnaz et al. (2021) have stated several benefits of cloud kitchens, one of which is the lower initial investment requirement.	Supported by Previous Studies
Cloud kitchens offer less flexibility in terms of workforce payroll management.	Beniwal, T. et al. (2021) and Mehnaz, S. et al. (2021) contradict this view by saying cloud kitchens have better workforce management potential since front-end employee management is not required. Further research can be done to find out the reason behind this contradiction.	New findings are contradictory to the previous studies.
Restaurant owners are indecisive regarding adopting the CKM business in the next three years.	Choudhary (2019) has found that the popularity of cloud kitchens is growing in India. The same cannot be said for Bangladesh from our findings.	New findings are contradictory to the previous studies.
Restaurant owners are still deciding on the collaborative business model for CKM.	Fridayani et al. (2021) have mentioned a cloud kitchen model that requires collaboration with several other cloud kitchens to work under one independent brand. From our findings, such a model may not be appropriate in Bangladesh.	New findings are contradictory to the previous studies.

5. Discussion and Recommendations

The significant barriers to new cloud kitchens-based entrepreneurs are the perceived immediate additional capital requirement for opening up a new cloud kitchen, the challenge of ensuring consistency of the food quality, consumers' confusion about the brand, and the lack of opportunity to differentiate as a cloud kitchen respectively. Hence, any business planning to start a cloud kitchen restaurant should carefully mitigate these challenges. The restaurants can look for angel investors or venture capitalists to secure funds in the early stage. But for that, they will need a robust business plan. They should hire experienced professionals to ensure consistent quality of food and service. Again, the scope for creating a unique position in the industry is a daunting task. Hence, the business must be vigilant and brave enough to try new things.

It is established from the study that consumers are indecisive in ordering from cloud kitchen restaurants. They do not have any specific preference merely based on the potentially elevated quality of foods by CKM. However, the qualitative analysis shows that existing local cloud kitchen restaurants successfully influence the purchasing decision of the users through their marketing activities and building strong brands. Hence, cloud kitchen restaurants should prioritize their marketing activities. They can take inspiration from the continuously growing online food delivery market globally (Mehnaz S. et al. (2021), Schaefer (2020), Biswas (2020), Inresto (2020), Upadhye et al. (2020)).

As per the findings, most consumers consider social media the first point of knowing about the cloud kitchen. Hence, cloud kitchen restaurants need to be proactive on social media platforms and carefully communicate their messages through these platforms. Consumers rely on reviews and feedback provided by previous users while ordering through cloud kitchen platforms, Vaidya (2017). So, cloud kitchens should operate through online delivery apps that are owned by themselves (instead of merely relying on the delivery partner apps) and analyze user feedback or through their websites and apps (Moyeenudin et al., 2020). From a qualitative study, we found that own delivery platforms can provide more accurate feedback for cloud kitchen owners.

Another important finding is that the retention rate of customers is meagre, as mentioned by several experts during the in-depth interviews. It can be attributed to the absence of switching costs. Hence, restaurants need to be focused on the customers' needs and try to adapt. On the other hand, the employee turnover rate is also very high. Even though this is true for the entire restaurant industry, the CKM businesses should try to focus on their process more and outline the standard practices. According to Realtor (2020) and Li et al. (2020), SMEs need to adjust their models in the post-pandemic business environment to maximize profit. This will help the business be more resilient. Cloud kitchen owners can create strong investment networks through collaboration. The founder of *onnow.io* has claimed to build a sustainable business model by bringing various cloud kitchens under one umbrella.

6. Conclusion

Every new idea or business model takes time to adapt and thrive in. Cloud Kitchen Modeled restaurants are globally competing head-to-head with brick-and-mortar-based traditional modelled restaurants (Saxena, S., 2021). In Bangladesh, even though the concept of the Cloud Kitchen Model is relatively new, there is potential for the model in the long run. The study came up with a gloomy prospect of the cloud kitchen model in Dhaka for the near term, more specifically within the next three years, based on the existing trends, preferences, and knowledge among consumers and restaurant owners alongside the technology infrastructure. Several pieces of evidence presented and analyzed in this study suggest that the cloud kitchen model can be sustainable through commercialization and adoption of the aggregation of brand strategies for long-term prospects. The industry players need to learn to forecast the trends and understand the existing solvable gaps such as lack of superior quality food, the rarity of offering unique items, lack of aggressive targeted marketing, insufficient incorporating of consumer feedback dynamically, absence of own delivery systems, lack of long-term partnering with more extensive delivery associates with clear mitigations policies, reluctance in collaborating with other cloud kitchen aspirants through a facilitator umbrella brand and most importantly inability to create a robust financial model to ensure a successful venture based on the cloud kitchen model. Furthermore, entrepreneurs and policymakers can use examples from countries like India, Malaysia, Indonesia, and China to help build policies in favor of Cloud Kitchen-based restaurants considering the benefits of the model over traditional ones, especially in the context of saving extra space in an overpopulated city like Dhaka.

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Appendix A

List of Abbreviations

Abbreviations/Acronym	Full Meaning
CK	Cloud Kitchen
CKM	Cloud Kitchen Model
COVID-19	Coronavirus Disease 2019
FGD	Focused Group Discussion
IBM	International Business Machines
SME	Small and Mid-size Enterprise
SPSS	Statistical Package for Social Sciences
VAT	Value Added Tax
WHO	World Health Organization

Appendix B

List of Definitions

Aggregation: This refers to building a strong relationship with online food delivery partners, food brands and supply chains to bring them under one umbrella of cloud kitchen for better collaboration.

Angel Investor: This refers to a high-net-worth individual who provides capital for small business start-ups and entrepreneurs in exchange for ownership equity in the company.

Availability of delivery people: This refers to the availability of people in the delivery business.

Collaboration: This refers to the integration opportunities of various independent cloud kitchen modeled businesses to go under one famous established facilitator brand which can have the possibility to decrease supply chain-related costs in selected situations.

Commercialization: This refers to the difference between home kitchens and commercial restaurants. Commercial restaurants have business license and their business model is scalable whereas home kitchens do not have license and their business model is not scalable.

Competitive Advantage: Better opportunities for the cloud kitchen-based restaurant owners as compared to the general or traditional model-based ones.

Competitive Pricing: This refers to setting the price at a point which will give advantage over competitions.

Complaint Mitigation: This refers to the steps and initiatives taken by the restaurant owners as well as the delivery partners of the online food delivery ecosystem in order to ensure that there are enough measures available to address customer complaints and concerns along with providing satisfactory remedies to their reported problems.

Current Internet Facilities: This describes the currently available infrastructure as well as technologies that are available near the customers in order to make the order of their desired meals.

Customers/Consumers: Users of online food delivery platforms, who are willing to try foods not cooked in their homes. They are also one of the target audiences to be surveyed on. Even if the terms customer and consumer are different in terms of end-user. We are using them synonymously in our project and survey.

Customer Comfort: This refers to the level of convenience that customers may perceive from their side in terms of ordering food using online platforms as compared to their ordering from the storefronts with dining facilities.

Customer Priorities: This refers to the general priorities of the customers while ordering food online that may include: taste, price, packaging, etc. Furthermore, this also encompasses the comparative priority between CKM and traditional restaurant models in terms of the various choice factors from the side of customers.

Customer Willingness: This refers to the intentional decision of the customers to make increased payments knowing that there will be a positive relationship between the increased cost of the food and the perceived quality of the food (in terms of taste, presentation, packaging, delivery timing, after-service, etc.).

Different Packages: This refers to different item offers such as subscription package, lunch package, combo pack etc.

Delivery-only meals business: The businesses of cooked meals that do not provide any dining spaces like traditional restaurants but are available through delivery apps or mediums. These are also termed under the CKM modeled businesses both for home-cooked and commercially prepared meals.

Discount Seeking Consumers: This refers to the consumers who seek discounts in every aspect of food ordering online. Consumers of Bangladesh are price sensitive, as a result they will mostly prefer to food items having discounts, less willing to pay for premium foods and will choose pick up option over being delivered if possible.

Ease of entry: This refers to the level of difficulty a traditional restaurant owner or anyone interested in doing CKM modeled business has to face to join a cloud kitchen network. These encompass various financial as well as non-financial barriers. Factors that can be helpful to measure the ease of entry (or barrier to their entry in the case when they are not being able to enter into the CKM based businesses) may include the initial capital requirement for the restaurant owners, increased market capturing opportunity, better networking with more delivery partners, possible competitive pricing opportunities, confusing the brand message, etc.

Ease of Online Interaction: This refers to the ability of the customers to clearly and understandably communicate or interact with the restaurants as well as the delivery partners in the online food delivery ecosystem using the existing online platforms.

Ease of Ordering: This refers to the perceived convenience from the side of the customers in terms of using the mobile applications, the convenience of available internet connection and packages, and other relevant technologies that will facilitate the online food delivery ecosystem.

Fake Reviews: This refers to the reviews which posted by people without having the experience of the service and product.

Familiarity: This refers to the fact that customers are aware of what a cloud kitchen is and how it is different from conventional restaurants. This can be measured through the first phase of the survey that will include queries such as whether they have heard about cloud kitchen, their understanding of the few or more common characteristics of cloud kitchens, and their source of knowledge regarding the CKM modeled restaurant businesses, etc.

Favorable: The events that will lead to a desirable outcome for the business. It can be in the form of an increase in revenue and/or profit, an increase in expenses.

Financial Benefits: Identifying the cost advantages of the cloud kitchen model, reduction of the investment requirement, and opportunity to increase the addressable market size for a particular restaurant.

Financial Advantage: Same as “Financial Benefits”.

Financial Disadvantage: Identifying the cost disadvantages of the cloud kitchen model, handling price fluctuation of supply and difficulties to attract discount seeking consumers and tackling low order generation.

Growing Trend of Online Purchase: This refers to the bloom of online purchasing during the pandemic lockdown.

High Churn Rate: This refers to the high rate of exiting the cloud kitchen model just after entering in one after they could not generate enough orders to sustain.

Higher Return: This refers to cloud kitchens having a high return rate than the traditional restaurants.

Indifference Between CKM and Traditional Model: This is the scenario where the customers do not show any preference while ordering and receiving their meals in terms of CKM and traditional modeled restaurants. Customers simply don't care from which type of restaurant their foods are delivered, rather they focus more on their own priorities of the food qualities.

Key Stakeholders: The target customers of CKM, and the restaurant business owners in Dhaka. The restaurant owners can be owners of the traditional model restaurants and/or the owner of cloud kitchen model restaurants.

Knowledge of CKM: The customers have basic knowledge about the cloud kitchen that the cloud kitchen restaurants do not have any dine-in facility and offer only takeaway and delivery services.

Lack of Digital Literacy: This refers to people's lack of knowledge in surfing the internet.

Learned About CKM: The customers got to know about the cloud kitchen model restaurants and heard about one/two specific brands or restaurants that are currently operating as cloud kitchens and have adequate knowledge to differentiate a cloud kitchen from the traditional model.

Likelihood of Ordering from Cloud Kitchen: For the existing customers, the likelihood of the customers being repeating customers of the cloud kitchen and for new customers their likelihood to consider ordering from a cloud kitchen.

Low Operational Cost: This refers to cloud kitchens having a smaller initial investment requirement and less overhead management expenses than traditional restaurants.

Low Order Generation: This refers to SME restaurants receiving orders at a low rate than big restaurants for their small capital to support big operations.

Multiple Brands: This refers to the SME restaurants and franchise food brands who will be interested in opening a cloud kitchen or being in one.

Negative Reviews: The user will share negative words about the restaurant or the brand that might discourage other users to order from the restaurant.

New Restaurant Owners: The entrepreneurs who have decided to start the restaurant business for less than three years.

Non-financial benefits and disadvantages: Idea generation, savings through no dining space and smaller space utilization, shared experience as multiple restaurants are sharing their infrastructure, whether there can be any breach of confidentiality or not, etc.

Online Penetration: Refers to the facts that what portion of the customers are placing their food orders online. In association with this, the customers' basket size in the online mediums will be compared with the offline to understand the difference in their purchasing behavior.

Opportunity: A set of circumstances that makes it possible to do something that will lead to the desired outcome in terms of additional profit and/or revenue, gain a sustainable advantage over the competitors.

Positive Reviews: The user will share positive words about the restaurant or the brand, showing their support towards them that will encourage other users to order from the restaurant.

Population: The target population is different for four data collection parts. The first group is the consumers. In the second part and third parts, the target population is the restaurant business owners and finally, for the expert sampling, there is a target population of industry experts (in terms of the restaurant business and legislative procedures).

Price Fluctuation of Supply: This refers to the volatile pricing system of raw materials in Bangladesh.

Prospect: This includes all the facts that will make the cloud kitchen model a success through competitive advantage/advantages. These factors can be familiarity and popularity, ease of access for the entrepreneurs in adopting cloud kitchen modeled business, etc.

Quality Control: This refers to maintaining the quality of the food and hygiene of the kitchen.

Quality Perception: The quality perception refers to the facts which the customers feel right about the restaurant including the ingredients used in preparing the food, consistency of taste, visual appeal of the food, and right flavor of the food.

Recommendation: The satisfied customers will suggest the brand to their friends and family members so that they also order from the same restaurant/brand.

Spontaneous Bad Review: This refers to the customers' behavioral tendency to provide lowest points easily for a bad service but not putting highest remarks that easily for the good ones.

Strong Networking: This refers to building a strong connection with investors and investing firms which will help to find investments.

Taste: This refers to what people think of the food after they ate it and how it felt in the mouth.

Unfavorable: The events that will lead to a hostile or undesirable outcome for the business. It can be in form of a decrease in revenue and/or profit or an increase in expenses.

Uniqueness: This refers to the points which differentiate one brand from their competitors.

VAT Bracket Benefit: In Bangladesh AC restaurants pay 10% VAT and Non-AC restaurants pay 5% VAT. As cloud kitchens do not have any dine-ins, they take this opportunity and pay at a lower VAT rate of 5% and takes the benefit of the VAT bracket.

Venture Capital: This refers to a form of private equity financing by investors or venture capital firms to small startups which have potential for high growth.

Workforce Challenge: This refers to the risk of a trained worker leaving the job.

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