Original Research Article

A study on financial feasibility of cloud kitchen firms in Hyderabad region in Telangana.

ABSTRACT

Cloud kitchens are commercial kitchens that prepare food only for delivery purpose and do not provide dine-in facility for customers. In the cloud kitchen model, a brand owns or rents a space where its chefs work and uses its own or third-party order and delivery systems. It may also provide a takeaway service where customers can wait to collect their food. The cost incurred to establish a cloud kitchen is much lesser than conventional restaurant and can be situated within a small area and it has less operational costs due to which cloud kitchens are more profitable than normal restaurants. In this perspective, the study is conducted to analyze the financial viability of cloud kitchen firms. Hyderabad city was preferred as the study area. For the analysis, data was collected through personal interviews from the selected cloud kitchen firms with the help of structured questionnaire. Data regarding the establishment and operational costs of cloud kitchen firms are taken from cloud kitchen. The analytical tools NPV and B: C ratios are used to know the financial feasibility of the cloud kitchen firms.

Keywords: [Cloud kitchen, Financial feasibility, Restaurants, food aggregators.]

1. INTRODUCTION

Cloud kitchen is considered as a highly profitable model as it requires low investment and has less risk involved, as the cost of setting up a cloud kitchen is much less than setting up a traditional restaurant with dine-in facilities. Spoonjoy, Yummist, Box 8, Freshmenu, Biryani By Kilo, are popular examples of cloud kitchens in Hyderabad. As the fixed costs and operational costs are low, the cloud kitchen provides restaurants an opportunity to experiment with different formats, cuisines and concepts, which in turn, lead to varied food delivery business models.

The COVID-19 pandemic has the negative impact on the hospitality sector. It lead to the shut down of many hotels and restaurants. Even though lockdown is lifted, people are reluctant to go to restaurant and willing to order the food online. Due to high maintenance cost of the restaurant and low income many restaurants are likely to switch to cloud kitchen model.

Cloud kitchens can be operated under a single brand or multi-brand with various franchises. Based on the way of operating the cloud kitchens are differentiated into various models.

1. **Single brand cloud kitchens:** A single brand cloud kitchen operates under a single theme and concept. It only offers 1-2 cuisines. An average stand alone cloud kitchen is around 300 Sq ft in size. These type of cloud kitchens mostly rely on different food aggregators or delivery channels.
2. **Multi-brand cloud kitchen:** A multi-brand cloud kitchen is a large kitchen infrastructure where multiple brands operate from a same cloud kitchen, they use same equipment and

resources. Example of this type of cloud kitchen is Rebel Foods company which operates multiple brands i.e, Fasoos, Mandarian Oak, Wendy's and Sweet Truth.

3. **Aggregator managed cloud kitchen:** This type of cloud kitchen is a large co-working kitchen space managed by online food aggregators. Swiggy and Zomato who are the major players in online food delivery space have started their cloud kitchens in recent years in metro cities.
4. **Operator managed cloud kitchen:** In an operator managed cloud kitchen, the kitchen operator runs the operations of existing or upcoming restaurant brands on their behalf. The brands are listed separately on online food aggregator sites and orders are also received from the cloud kitchen operator's central food ordering website mobile app or call centre. For example popular biryani chain Biryani Blues has started it's operations by partnering with the cloud kitchen operator Kitopi. Biryani Blues has currently three outlets with Kitopi and works on a revenue sharing model.
5. **Hub and spoke model:** In the hub and spoke model, a central kitchen prepares the food, and then semi-cooked dishes are shipped to final smaller outlets where they need to be cooked before shipping. It reduces the cost due to scale and standardization.
6. **Virtual restaurant:** A virtual restaurant is a brand that operates from inside an existing restaurant. These brands are only listed on the online food aggregator sites and utilize the kitchen infrastructure and resources of the existing restaurant just under a different brand name.

In Hyderabad there is a substantial growth in the number of cloud kitchens in past decade. As the setting up costs and operational costs are much low compared to traditional restaurant and as there is availability of online delivery apps and due to the customer preferences towards outside food, the number of cloud kitchen businesses in Hyderabad is showing a positive trend. In Hyderabad, virtual kitchens, single brand and multi-brand cloud kitchens are prevalent. Looking at the growing prominence of cloud kitchen business in Hyderabad, this study on cloud kitchen business in Hyderabad has been taken up. The following research is done to analyze financial feasibility of single branded cloud kitchens in Hyderabad area.

2. MATERIAL AND METHODS

The following 12 cloud kitchens were taken as sample for conducting the research study.

Table.1 Cloud kitchens taken as sample for the research study.

S.no	Cloud kitchen firm	
1)	URS cloud kitchen	produces multi-cuisine dishes
2)	Meghduth	produces only biryani
3)	Leo's cloud kitchen	produces multi-cuisine dishes
4)	Pappannam	produces only south Indian cuisine
5)	Bong foodies	produces multi-cuisine dishes
6)	Reddy gari kitchen	produces multi-cuisine dishes
7)	Ladddubox	produces only sweets (laddus)
8)	Roches cloud kitchen	produces multi-cuisine dishes
9)	Sahadeva reddy cloud kitchen	produces multi-cuisine dishes
10)	Chi chan Cloud kitchen	produces Chinese cuisine
11)	Momo's corner	produces only momos

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12)	Bowl's kitchen	produces multi-cuisine dishes

Method of Data Collection: Data was collected through survey method from the cloud kitchen firms. The data regarding the costs and returns of cloud kitchen was collected from the cloud kitchen firms through the interview.

Method of Sampling: For selecting the cloud kitchen firms, convenience sampling method was employed.

2.1 Business Viability Analysis

A business viability study projects how much start-up capital is needed, sources of capital, returns on investment and other financial considerations. The measures that would be used to assess business viability are NPV, IRR and B:C Ratio.

2.1.1 Net present value (NPV):

Net present value is the present worth of the net benefits or cash flow stream. Mathematically, the net present value is estimated as follows:

$$\text{NPV (Net present value)} = \sum_{t=1}^{n} \frac{Bt - Ct}{(1+i)^t}$$

Where,

Bt =benefit (Cash inflow) in year t,

Ct = cost (Cash outflow) in year t,

n = investment lifespan,

i = interest rate

t = time measured in years.

If the calculated NPV is positive it implies the investment is viable and where the NPV is equal to zero implies that the investment breaks even.

2.1.2 IRR (Internal rate of return)

Internal rate of return = LDR + $\frac{\text{NPV at LDR}}{\text{(NPV at HDR – NPV at LDR)}}$ * (HDR –LDR)

Where,

LDR = Lower discount rate.

HDR = Higher discount rate.

2.1.3 Benefit-Cost Ratio:

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The BCR is used for analyzing the overall value for money of a project.

$$\textbf{B:C Ratio} = \frac{\sum_{t=1}^{n} \mathrm{Bt}/(1+r)^n}{\sum_{t=1}^{n} \mathrm{Ct}/(1+r)^n}$$

Where,

Bt = denotes benefit (Cash inflow) in year t.

Ct = denotes cost (Cash outflow) in year t.

n = Economic life of the project.

t = Number of years.

r = Discount rate.

2.2 Total costs associated with the production

Variable cost

Variable cost constituted the cost of human labor, operational maintenance cost, raw material, marketing cost, rent paid and interest on working capital.

Fixed cost

The fixed cost included depreciation of the cutlery, equipments used in food production.

3. RESULTS AND DISCUSSION

The results regarding costs and returns in cloud kitchen business in the study area have been depicted in this section. This information helps to know about the viability of cloud kitchen business.

3.1 Cost of establishment of cloud kitchen business

The cost of establishment includes the cost of building a kitchen, buying franchise, cost of inventory and cost incurred for acquiring licenses for business, the information regarding the cost of establishment of cloud kitchen firm in the study area has been calculated and presented in the table 2.

The total cost incurred for establishment of cloud kitchen firm varies from Rs.3.9 lakhs to Rs.9.6 lakhs. Cost incurred for acquiring licenses for business ranges from Rs.10,000 to Rs. 25,000. The cost of machinery varies from Rs.1.7 lakhs to Rs. 6 lakhs and the cost incurred to build a kitchen ranges from Rs. 1 lakh to Rs.4 lakhs.

The fixed cost varies from Rs.7.2 lakhs to Rs.14.5 lakhs. land rent varies from Rs.96000 to Rs.7,20,000, interest on fixed capital varies from Rs.17,425 to Rs.61,500, salaries were varied from Rs. 4,00,000 to Rs.9,00,000 and depreciation of inventoryvaried from Rs.8,750 to Rs.35,000.

3.2 Total costs incurred during a period of one year

The variable cost includes maintenance cost, raw material cost, labor cost, marketing cost and interest on working capital. The total variable cost varies from Rs.3.5 lakhs to Rs 9 lakhs. in which maintenance cost varies from Rs.1,08,000 to Rs.1,92,000, raw material costs varies from Rs. 1,80,000 to Rs 7,20,000, marketing costs varies from Rs. 12,000 to Rs 50,000 and interest on working capital varies from Rs. 25112 to Rs 50,430. The total cost incurred for establishment and running of a cloud kitchen varies from Rs. 11 lakhs per annum to Rs. 20 lakhs per annum. The total running cost for running a cloud kitchen per annum varies from Rs.9

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lakhs to Rs.19 lakhs. Cloud kitchens firms has very low wastage costs as the food is prepared based on the orders received.

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Table no.2 Establishment cost of cloud kitchen firms in study area

s.no		URS cloud kitchen	Meghduth	Leo's cloud kitchen	Pappannam	Bong foodies	Reddy gari kitchen	Ladddubox	Roches cloud kitchen	Sahadeva reddy cloud kitchen	Chi chan Cloud kitchen	Momo's corner	Bowl's kitchen
1)	Machinery (Rs.)	200000	600000	350000	500000	700000	300000	350000	250000	170000	175000	200000	250000
2)	Cost incurred for license and permissions (Rs.)	20000	15000	25000	15000	10000	10000	25000	12000	10000	15000	10000	20000
3)	Cost incurred to build kitchen (Rs.)	300000	350000	200000	250000	150000	100000	400000	250000	300000	200000	250000	300000
4)	Total	520000	965000	575000	765000	860000	410000	775000	620000	480000	390000	460000	570000

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Table. 3 Total annual cost incurred for running a cloud kitchen firm

	URS cloud kitchen	Meghduth	Leo's cloud kitchen	Pappanna m	Bong foodies	Reddy gari kitchen	Laddu box	Roche scloud kitchen	Sahadev a reddy cloud kitchen	Chi chan Cloud kitchen	Momo's corner	Bowl's kitchen
Fixed costs(Rs.)												
Land rent	96000 (8.31)	720000 (38.8)	360000 (17.1)	600000 (30.30)	480000 (26.9)	360000 (21.32)	540000 (30.3)	120000 (12.4)	96000 (8.83)	132000 (12.06)	132000 (12.06)	144000 (10.99)
Depreciation of Machinery	10000 (0.86)	30000 (1.61)	17500 (0.83)	25000 (1.26)	35000 (1.96)	15000 (0.88)	17500 (0.99)	12500 (1.29)	8500 (0.75)	8750 (0.79)	10000 (0.91)	12500 (0.95)
Interest on fixed capital @ 10.25 per cent/ annum	20500 (1.77)	61500 (3.32)	35875 (1.70)	51250 (2.58)	71750 (4.03)	30750 (1.82)	35875 (2.03)	25625 (2.66)	17425 (1.60)	17937.5(1.6)	20500 (1.87)	25625 (1.9)
d) salaries	600000 (51.9)	480000 (25.9)	720000 (34.2)	780000 (39.3)	840000 (47.2)	900000 (53.3)	700000 (39.6)	360000 (37.4)	600000 (55.2)	600000 (54.8)	576000 (52.6)	780000 (59.5)
Total fixed cost (A)	726500 (62.9)	1291500 (69.7)	1133375 (53.9)	1456250 (73.55)	1426750 (80.22)	1305750 (77.3)	1293375 (73.24)	518125 (53.8)	721925 (66.4)	758687.5 (69)	738500 (67.4)	962125 (73)
Variable cost (Rs.)												
Maintenance costs	180000 (15.5)	120000 (6.47)	120000 (5.71)	180000 (9.09)	120000 (6.7)	192000 (11.3)	180000 (10.1)	144000 (14.96)	180000 (16.5)	168000 (14.5)	168000 (15.3)	108000 (8.2)
Raw material	180000 (15.5)	360000 (19.4)	720000 (34.2)	240000 (12.21)	180000 (10.12)	120000 (7.1)	192000 (10.8)	240000 (24.9)	144000 (13.2)	180000 (15.5)	132000 (12.0)	180000 (13.7)
Marketing cost	30000 (2.59)	30000 (1.61)	40000 (1.9)	60000 (3.03)	20000 (1.1)	30000 (1.77)	50000 (2.83)	20000 (2.07)	15000 (1.38)	12000 (1.0)	25000 (2.2)	30000 (2.29)
a) Interest on working capital @ 10.25	37925 (3.2)	50737.5 (2.7)	86150 (4.1)	43665 (2.2)	31775 (1.78)	40180 (2.38)	50430 (2.85)	39975 (4.15)	25112.5 (2.31)	35772.5(3.0)	31006.3 (2.83)	29827.5 (2.27)
b) Total (B) variable costs	427925 (37.06)	560737.5 (30.2)	966150 (46.1)	523665 (26.44)	351775 (19.77)	382180 (22.6)	472430 (26.7)	443975 (46.11)	364112. 5 (33.5)	395772.5 (34)	356006 (32.5)	347827.5 (26.5)
c) Total annual costs (A+B)	1154425	1852238	2099525	1979915	1778525	1687930	1765805	962100	1086037	1154460	1094506	1309952

Note: Values in parentheses indicate percentages of fixed cost and variable cost to the total

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Table .4 Sales and returns in cloud kitchen business

	URS cloud kitchen	Meghduth	Leo's cloud kitchen	Pappannam	Bong foodies	Reddy gari kitchen	Laddu box	Roches cloud kitchen	Sahadeva reddy cloud kitchen	Chi chan Cloud kitchen	Momo's corner	Bowl's kitchen
Avg. sales per annum (Rs.)	18250	18250	18250	14600	18250	21900	18250	10950	14600	14600	18250	10950
Avg. value of an order (Rs.)	150	250	250	300	250	200	250	250	200	150	150	300
Avg. value of an order (after 25% commission to food aggregators.) (Rs.)	115	185	185	225	185	150	185	225	150	150	115	225
Gross returns (Rs.)	2098750	3376250	3376250	3285000	3376250	3288500	3376250	2463750	2190000	2190000	2098750	2463750
Total annual costs (Rs.)	1154425	1852238	2099525	1979915	1778525	1687930	1765805	962100	1086037	1154459	1094506	1309952
Net returns (Rs.)	944325	1524012	1276725	1305085	1597725	1597070	1610445	1501650	1103963	1035541	1004244	1153798

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Table.5 Estimates of investment analysis parameter in cloud kitchen business.

	URS cloud kitchen	Meghduth	Leo's cloud kitchen	Pappanna m	Bong foodies	Reddy gari kitchen	Laddu box	Roches cloud kitchen	Sahadeva reddy cloud kitchen	Chi chan Cloud kitchen	Momo's corner	Bowl's kitchen
Net present value	5740671	8778034	7761373	7933777	5829730	7346916	5907057	5501301	6711131	6295185	6104926	7014084
Cost benefit ratio	1.81	1.77	1.60	1.65	1.53	1.92	1.55	1.94	2.01	1.89	1.91	1.88

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3.3 Sales and returns

Total sales and returns of cloud kitchen business in study area is shown in the table 4. Cloud kitchens in the study area cater from 10950 to 21900 orders per year. The value of orders range from Rs.150 to Rs. 300 on an average and after the 25% commission which is given to the food aggregators is deducted, the value of an order works from Rs.115 to Rs. 225. The gross returns for a cloud kitchen in study area varies from Rs. 20 lakhs to Rs. 33 lakhs and net returns vary from Rs. 9 lakhs to Rs. 16 lakhs.

3.4 Financial feasibility of cloud kitchen business in study area

The techniques of project evaluation such as Benefit-Cost ratio, Internal Rate of Return(IRR) and Net Present Value(NPV) were used to assess the financial feasibility of cloud kitchen business. For the analysis, working costs, establishment cost and gross returns of the cloud kitchen were discounted at 10.25 per cent discount rate and this shows the opportunity cost of capital.

The Net Present Value of cloud kitchen business in study area at 10.25 per cent discount rate is varies from Rs. 55 Lakhs to Rs. 87 lakhs. The selection criterion of Net Present Value is to know about the feasibility of the projects. The projects with positive Net Present value are accepted. As the cloud kitchen projects have the positive Net Present value, it is accepted (Table. 5). It can be interpreted that cloud kitchen business is viable in study area.

Benefit- cost ratio is used to know the returns we get on one rupee spent by using total cash outflows and total cash inflows. The projects which have B:C ratiomore than one are selected. The B:C ratio of cloud kitchen business firms at discount rate of 10.25 per cent varies from 1.53 to 2.01 , the B:C ratio is greater than one hence, the cloud kitchen business in the study area is financially feasible. (Table.5).

Internal Rate of Return (IRR) is used to know project feasibility. The IRR is the rate at which the Net Present Value is zero or the discounted outflows and inflows are equal. The projects which have IRR greater than the opportunity cost of capital are accepted. IRR represents an interest rate where NPV of a specific project equals zero. Which concludes IRR represents the highest return a project can generate. Cost of capital which is greater than IRR will give us negative NPV. Hence only those projects should be considered which have IRR> cost of capital. IRR was not obtained for cloud kitchens as all cash inflows were found to be positive and to calculate IRR, at least one year cash inflow should be negative.

4. CONCLUSION

The total cost incurred for establishment of cloud kitchen firm varies from Rs.3.9 lakhs to Rs.9.6 lakhs. The total fixed costs varies from Rs.7.2 lakhs to Rs.14.5 lakhs. The total variable cost varies from Rs.2.7 lakhs to Rs 9.3 lakhs . The total running cost for running a cloud kitchen per annum varies from Rs.9 lakhs to Rs19 lakhs. Cloud kitchens in the study area cater from 10950 to 21900 orders per year. The value of orders range from Rs.150 to Rs. 300 on an average and after the 25% commission which is given to the food aggregators is deducted, the value of an order works from Rs.115 to Rs. 225. The gross returns for a cloud kitchen in study area varies from Rs.20 lakhs to Rs. 33 lakhs and net returns varies from Rs.9 lakhs to Rs.16 lakhs. The Net Present Value of cloud kitchen business firms in study area at 10.25 percent discount rate is varies from Rs. 57 Lakhs to Rs. 87 lakhs.

The B:C ratio of cloud kitchen business firms at discount rate of 10.25 per cent varies from 1.53 to 2.01, the B:C ratio is greater than one hence, the cloud kitchen business in the study area is financially feasible.

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COMPETING INTERESTS DISCLAIMER:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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REFERENCES

1. Bhotvawala, M.A., Balihallimath, H., Bidichandani, N. and Khond, M.P., (2016). Growth of food tech: a comparative study of aggregator food delivery services in India. In *Proceedings of the 2016 International Conference on Industrial Engineering and Operations Management, Detroit, Michigan, USA* (pp. 140- 149).

2. Eunju, Y. & Jang, S. C. (2005). The effect of financial leverage on profitability and risk of restaurant firms. *The Journal of Hospitality Financial Managements*, 13, 200-210.

3. Hung, H. C. & Chad. D. M. (2020). COVID-19 and the Demand for Online Food Shopping Services: Empirical Evidence from Taiwan. *American journal for Agricultural Economics.*

4. Lee, J. and Blevins, D.E. (1990). "Profitability and sales growth in industrialized versus newly industrializing countries.". *Management International Review*. 30(1). 87- 100.

5. Leong Wan Hong. (2016). "*Food ordering system using mobile phone*". A report submitted to BIS (Hons) Information Systems Engineering. Faculty of Information and Communication Technology (Perak campus). 82.

6. Maurya, A., Geeta, S. and Swtha, D. (2021). Laying the table from the cloud during Lockdown: Impact of Covid crisis on Cloud Kitchens in India.*International Conference on Computation, Automation and Knowledge Management (ICCAKM).*

7. Mun, S.G. and Jang, S.(S). (2019), "Restaurant firms' IPO motivations and post-IPO performances: Staying public, being delisted or merged?", *International Journal of Contemporary Hospitality Management*. 31 (9), pp. 3484-3502.

8. Vijaya, L. K. (2018). A study on online food delivery companies in India. *International Research journal of Management Science and Technology.* 9(3). 2018.

9. Xiaofan, W. (2012). How different types of restaurants behaved differently through the recent recession an analysis of stock market and financial ratios. *Iowa State University, ProQuest, UMI Dissertations Publishing.* 72-76.

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