Portland State University

FINAL PROJECT:

A MULTI-BRAND GHOST KITCHEN FACILITY

TEAM #2

Duane Murray
Yaya Sirimongkarakorn
Colleen Nhim
Sara Ferdousi
Marwah AlZabidi

ETM545
PROJECT MANAGEMENT

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TABLE OF CONTENTS:

Abstract

Ghost kitchens, cloud kitchens, or virtual kitchens or any type of food establishment that primarily exist for delivery have gained a great amount of traction and national prominence both before and especially during the COVID-19 pandemic. It is expected that this will continue even after the global health pandemic, with additional capabilities and technologies becoming available to assist such operations. During the COVID-19 pandemic, the restaurant industry struggled to stay afloat as dining inside was restricted. With these ghost kitchens becoming a disruptor in the restaurant and food service industry, this project aims to assess the various processes and/or steps required that are associated with implementing a ghost kitchen facility to house these various restaurant brands.

Purpose

The restaurant business can be considered as one of the toughest industries to compete in, mostly due to high operating expenses and slim margins. Nonetheless, the emergence of ghost kitchens (aka. cloud kitchens) brings a unique value proposition to the industry by providing greater flexibility and scalability during the COVID-19 pandemic; where online food ordering and delivery have surged. The ghost kitchen model has reshaped the equation for many investors, restaurateurs, entrepreneurs and stakeholders in the restaurant industry through decreasing upfront costs and operating expenses.

The purpose of this project aims to evaluate the process and implementation of a dedicated ghost kitchen facility and business model. Undertaking such a project will require an in-depth assessment of ghost kitchens and project risks [1] which will be conducted by our project team of 5 individuals. Given the amount of knowledge on project management that each team member has gained throughout this course, we feel positive that we are adept to undertake this project and effectively complete project objectives.

Objectives

The primary objective for this project is to open a multiple brand ghost kitchen facility that prepares and produces food products for delivery to consumers. The plan is to initially find a

kitchen location that provides the highest population density that best matches the demographics ideal for food delivery services. This location planning and selection process will provide the highest probability of potential profitability for the business [2].

Next, taking into consideration that this project is for a “multiple brand” food product facility that provides inventory management, preparation, packaging, and delivery service for different menus that are owned by the clients of the business, the project scope includes sourcing and installing specific kitchen equipment to provide these services [3]. In addition, specialized third-party enterprise resource planning software that integrates delivery services using multiple menus, order processing, and inventory management is a required element for the smooth operations of the facility [4].

Additional critical path milestone objectives that fall within this project's scope include government mandated legal and safety requirements for the operation of a restaurant. These are permits for all facility floor plan construction activities, health department inspections, food handling permits for staff, and protective insurance policies [5].

Success for this project will be determined through meeting the project budget and schedule, having the ghost kitchen open and operational, all stakeholders are pleased, and the resulting business being profitable.

Overview

Ghost kitchens (aka. cloud kitchens, virtual kitchens, dark kitchens) can essentially be described as professional kitchen prep and cooking facilities that do not have a designated dining area for consumers to dine-in on premise. Ghost kitchen facilities rent out their space, often hosting multiple tenants and different restaurant brands. Orders for these kitchens are meant to be made remotely, with consumers either placing them online or via phone, and providing the option of either being picked up or delivered.

The COVID-19 pandemic has played a major role towards the growing disruption of ghost kitchens, as it has had a large effect on the traditional restaurant industry and business models.

These effects have been expected to be long-term, and are predicted to still be relevant even after the pandemic [6]. Nonetheless, the short term effects of ghost kitchens have shown shifts in consumer dining habits/patterns, commuting, as well as other daily routines that can be juxtaposed with pre-pandemic conditions. We can ultimately anticipate that these short-term changes will influence longer term patterns that will likely reshape the restaurant/food industry and environment.

The main reason that these ghost kitchens have become so sought out during this time has to do with the newfound constraints and limitations that have been brought upon us by the disruption of the COVID-19 pandemic. This has created additional safety measures that now need to be considered by consumers, staff, and business owners with a great deal of caution. Many consumers are sensitive to such operations, with the increased concern for food safety and sanitation. On top of consumers and their hesitancy to dine out, government mandates have imposed strict enforcements for restaurants to temporarily seize dine-in operations or shut down entirely.

Ghost kitchens have become an attractive value proposition for those in the restaurant industry, as it allows businesses to tap into larger market opportunities, as well as spend/invest less in square footage, labor, amenities, and other overhead expenses. Nonetheless, these types of kitchens often require a commission to be paid to third party delivery companies in exchange for their services. These delivery and pick-up only concepts are enabling access to entrepreneurs that are seeking to test markets without the need of an existing customer base or without the need to be based in metropolitan locations and/or areas with high foot traffic. With these ghost kitchens emphasizing the delivery aspect of a restaurant, this allows them to spend more time and resources into optimizing other aspects such as streamlining the kitchen, creating workflows that support digital ordering, investing more into packaging to reduce delivery frictions, and customization of menu items.

These commercial kitchens and facilities require proper permits, certification, licensing, and inspection to legally function [7]. The landlord that provides the shared kitchen space is responsible (as well as liable) for ensuring that all health, safety, and quality standards are met

and/or up to code. In Oregon, the state has a department of agriculture (ODA) which oversees the licensing of various residential and commercial kitchens. On the other hand, licenses for restaurant and catering kitchens are done through the county health departments. The ODA regulates general standards of food establishments construction and maintenance, such as employee cleanliness, food transportation, food labeling, and protocols for kitchen floors and/or walls. Property drainage and ventilation need to comply with various state fire marshal regulations or codes. It's also important to ensure that there is waste disposal, surfaces are easy to clean, that there is an adequate water system, toilet and handwashing facilities for tenants to efficiently operate. In addition to all of this, the ODA states information regarding licenses for buying an existing food business, starting a new food business, and protocols for those commercial kitchens that are shared by more than one person and/or restaurant brand. Average commercial kitchen sizes range from 500 to 10 square feet, averaging around 800 square feet (or ⅓ of the size of typical restaurants) [8]. The rates that are charged to rent these commissary or commercial kitchens typically go by the hour or month and include use of equipment, appliances as well as cost of utilities. This allows ghost kitchens greater flexibility in controlling their operating hours and enables them to spend less on overhead costs - especially labor. Nonetheless, some ghost kitchen facilities offer discounts for those who are able to provide longer-term dedications, such as signing a 6-month lease. This provides landlords of such ghost kitchen facilities with a degree of confidence in regards to renting out their spaces and securing optimum levels of rentals. The prices for renting such spaces (per square foot) will vary depending on the geographical area of each facility and where they are located. Rent for locations that are located in highly populated or metropolitan areas will oftentimes be higher than locations or facilities situated in rural or suburban areas.

To kick off the project we created a Project Charter (Appendix F) where we defined the project and identified stakeholders, project team and project scope. It includes project communication methods to ensure the team members commit to the hours needed to accomplish the project activities and provide regular updates. We created a RACI Chart (Appendix K, Fig. 1) indicating key roles and responsibilities of the team members against project activities.

Schedule

For planning purposes, milestone dates were created to capture the main goals for this project [3]. The milestones determined are:

Milestone 1: Secured location for kitchen on January 15, 2022.

Milestone 2: Finalized floor plan on January 22, 2022.

Milestone 3: Secured appropriate permits through the city and insurance on February 6, 2022.

Milestone 4: Ordered kitchen equipment and appliances on February 15, 2022.

Milestone 5: Appliances installed in the kitchen on March 20, 2022.

Milestone 6: All help hired on April 1, 2022.

Milestone 7: Passing inspection from local health department on April 15, 2022.

Milestone 8: Test with a soft opening on April 20, 2022.

Milestone 9: Make any final adjustments to improve (learnings from soft opening) on May 7, 2022.

Milestone 10: Grand opening on May 7, 2022.

The project will start January 1st and end May 7th of 2022 , lasting approximately 18 weeks. To break the large amount of work into smaller, more manageable tasks, we have created a Work Breakdown Structure (WBS) as seen in Appendix A. The WBS has all the tasks that need to be accomplished during the duration of the project. We have identified seven main categories:

1. **Location**: covers the tasks needed to get the physical location rented in the Portland area.
2. **Tools & Equipment**: covers the purchase and installation of the appliances, security systems, technologies, and kitchen tools needed.
3. **Permits and Documentation**: covers all the permits needed by the city, inspections, contracts, and setting up the utilities.
4. **Food**: includes the tasks to determine the food, food suppliers, and getting registered with the delivery services.
5. **Resources**: captures the work needed to hire all the kitchen staff and the training.
6. **Marketing**: covers the marketing strategy, plan and execution.
7. **Opening**: covers the soft opening, the final adjustments, and the grand opening.

From these tasks and categories in the WBS and based on the project milestones, we created a Gantt Chart as seen in Appendix B. The Gantt Chart shows where each task takes place within the 18 weeks and all the dependencies for each of the tasks. In the Gantt Chart, each of the seven categories can be seen on the left in grey. Then we see visually by color each of the tasks and where they take place. Starting with January in blue, February in green, March in red, April in yellow, and May in green.

As a brief overview of the Gantt chart, January mostly consists of tasks regarding the location of the space, the equipment and the utilities. February mostly consists of permits, inspections and documentation tasks. March has a bit of everything. This is essentially the halfway point in the project. Appliances are being installed, contracts are being formed, the beginning of the hiring process and the marketing strategy is being determined. April mostly has tasks for hiring all the resources and the marketing starts to ramp up before the grand opening. May focuses on the soft opening, any final adjustments, some marketing, and the grand opening.

The WBS and the Gantt Chart assists with the planning and the scheduling of the project. The Gantt Chart will visually show the key dates for each of the tasks and the important project milestones. These charts will help keep the project on track and will help deliver the kitchen's Grand Opening on time.

Resources

The equipment needs for restaurant brands can vary depending on menu, concept, and growth. Nonetheless, there are essential tools that are staple to any commercial kitchen [8]:

- Commercial (convection) oven
    - Typically cost a few thousand dollars per unit (depending on size and functionality)
- Ranges (stovetops) and ventilation
    - This is one of the most vital pieces of equipment that is needed in almost any kitchen, and serves as a stovetop. They require a ventilation system that works to remove grease, smoke, fumes, steam, and/or heat from the kitchen, allowing them to also serve as a safety factor.

    - Can be used for boiling/simmering, sauteing, pan frying, steaming, etc.
    - Typically cost thousands or tens of thousands of dollars and require professional installation
- Grills
    - One of the most vital pieces of equipment for a kitchen
    - Size, fuel source, accuracy in temperature, and plate quality are main components to consider
- Food processors
    - While not all cooks or kitchens rely heavily on food processors, they provide an easy way for kitchens to quickly and efficiently do their prep work
    - Can be used for cutting, dicing, grating, pureeing, blending, chopping, and slicing.
    - Typically cost a few hundred dollars to over a thousand dollars
- Mixers
    - Great tools that are mainly only needed for those who bake, and/or mix batter and dough
    - Typically cost a few hundred dollars to over a thousand dollars
- Slicers
    - These can come in two forms: either a deli/meat slicer (essential to any deli or sandwich shop), or a produce slicer (must-have to almost all kitchens).
    - Typical cost for these can vary, since they can come in many forms: handheld, tabletop, or even electric
- Cutting boards
    - Necessary to all kitchens, can last for years
    - Need to follow FSA and HACCP color-codes to reduce risks associated with cross contamination
- Food preparation counter
    - Providing working space, and counter space for equipment/tools
    - It's better to invest in counters that are versatile or modular for commercial kitchens
- Refrigerators and Freezers
    - Refrigerators are generally essential, however freezers may be optional.

    - Can come in many sizes and degrees of power
    - Typically, walk-in units are not significantly more expensive than most standing units and oftentimes perform better.
- Other specialty cooking equipment
    - Espresso/coffee machines, Meat slicer, Panini grills, Sous vide immersion circulators, Crepe makers, Steamers, Vertical broilers, Smokers, Flash freezer, Rethermalizers, Woks, etc.
- Serving ware/To-go packaging
    - Ghost kitchens would not require the serving ware that typical restaurants or kitchens do, since their outputs are packaged for pickup/delivery.
- Food storage containers
    - Alongside of this, proper food storage labels and dates are necessary. The type may vary depending on local food safety requirements and expectations.
- Sinks
    - Critical to any industrial kitchen and needed to meet local food safety standards.
    - Most require at least a two compartment sink or two sinks (one designated for washing, another for rinsing).
    - For larger commercial kitchens, at least one three compartment sink is optimal. Some may even consider commercial dishwashers.
- Microwave ovens
    - Many industrial microwave ovens dual as small convection ovens
- Ice maker
    - These machines require appropriate plumbing and electrical setup
- Point of Sale (POS)
    - A point of sale system enables the kitchen to take orders, process payments, track customer data, better manage inventory, and pull productivity reports that can be utilized to generate more sales.
    - With ghost kitchens, these POS systems will need to be integrated with third party delivery systems and platforms.
    - System Selected: OrderB4 (https://orderb4.com) [4]
        - Software as a Service

- $100 / Mo. per Restaurant (menu)

Cost analysis to open a Ghost Kitchen facility (See Appendix J):

Annual rent (cost to lease) @3,500 square feet	$87,500
Refurbishing costs	$350,000
Kitchen construction, build out (4 kitchens)	$800,000
Kitchen equipment costs	$320,000
Licenses, permits, insurance	$12,000
Administrative charges	$5,000
Technology (hardware & software)	$9,000
Utilities	$8,000
Labor	$26,564 & $36,564
Total projected annual expenses:	$1,654,628

We assume that rent would cost $25 dollars per square foot annually, based on average commercial real estate rates in Oregon [Appendix I]. We intend to house 4 commercial kitchens within the facility, each sized at 800 square feet (800x4 = 3,200 square feet). Assuming that the leased space is completely empty and that we are working with a blank canvas that is not move-in ready, it is estimated that it would cost roughly $50-$100 per square foot to refurbish the space and get things up to code [9]. Factoring in room for walkways/hallways at around 300 square feet, the entire space is estimated to be a total of 3,500 square feet. Having a 3,500 square foot space, this totals out to $350,000. This would include the installation of walls, flooring, painting, and window treatments. Kitchen construction costs are considered to be $250 per square foot [13]. For 4 kitchens, or 3,200 square feet, this comes out to $800,000. The cost of kitchen appliances and equipment are assumed to be up to $80,000 per kitchen for smaller commercial kitchens depending on type and quality of the equipment [9]. For this project, we do

not plan to provide every single piece of specialized equipment that is available, and plan to purchase new equipment rather than purchasing used equipment. In addition, fees associated with attaining food licenses, permits, and insurance are estimated to be approximately $12,000 [11].

To begin any commercial operations, a business entity would need to be formed, fees would be incurred to the state of residence (such as taxes). Working with an attorney ensures that all legal needs would be met, but also requires legal fees. This can range anywhere from $1000 to $5000, depending on the work that is required. Government filing fees add an additional $50 to $100 to these expenses. The process of choosing to incorporate or become a corporation allows for a legal structure that offers great protection, and the process can cost anywhere from $100 to $250 in filing fees, depending on the local government or state [10]. These administrative charges are estimated to be around $5,000 for the ghost kitchen facility.

POS systems are estimated to cost roughly $1250 as an initial investment (this would be per kitchen), and then $1000 per year to use the POS - this is usually broken down into monthly charges [12]. We can use this information to determine the annual expense for this technology, which totals to approximately $9,000 for all 4 kitchens. The average cost of utilities for commercial buildings are averaged at $2.10 per square foot annually [13]. For commercial kitchens that typically use more water, gas, and electricity; we can estimate that utility costs will be roughly $8,000. Moreover, these costs can be variable based upon the amount of resources used up by tenants or levels of vacancy. Costs of kitchen support or labor were derived using average annual salaries for both cooks and line cooks. This allows us to determine the total annual expense for the first year to get this project up and running which is expected to be $1,654,628. After the first year, expenses are estimated to be $167,628 when we factor out initial investment costs.

If we assume that these kitchens will be rented out for $35 an hour, and that all 4 kitchens will be rented out for at least 12 hours a day, we can expect our payback period to be roughly 4 years when rounded to the nearest year [Appendix J]. While the rate is higher than typical commercial or commissary kitchens that are up for lease, the included labor that our facility would provide

justifies the price increase. Nonetheless, depending on scheduling, the amount of hours we anticipate to make this facility available or accessible throughout the day; this can vary depending on the amount of rentals attained.

Personnel

Appendix L shows the project organizational structure that were involved in the project and their role. The project manager Gordon Ramsey takes a role in overseeing the schedule creation, planning and execution. He ensures that the overarching goals and vision of the kitchen meet the set schedule, budget, and resources. The team lead and project planner role focuses on assisting the project manager with coordination and planning, communicating to the kitchen owner information about the ghost kitchen work. In addition to that, making sure the project is carried through to fruition by engaging with necessary stakeholders, while the owner Wolfgang Puck ensures all is going as planned and as expected by creating a positive environment that leads to a successful ghost kitchen project. The other team members play great roles in managing the project budget, setting up the kitchen and any necessary equipment, and ensuring all food options and preferences are met and delivered on time and with the highest quality to the customers.

Risk Management

The top 10 business risks that typical bars and restaurants face that were found through our literature [1] were insufficient cash flows, inadequate marketing, poor brand or reputation management, certifications and licensing, food storage, foodborne illness, fire safety, workplace injuries/insurance, burglaries/vandalism, and cyber security. These were all critical risks that we considered for our project and from that, we derived our own risk register catered to ghost kitchen facilities.

There were a variety of different risks that were determined relevant to this project. These are listed in our risk register [Appendix C], which includes a description of the risk, description of the impact, impact levels, probability levels, priority levels, risk owner, and mitigation strategies. The COVID-19 virus was a risk that scored high across all 3 levels, stressing the importance of health and food safety. Many of the other risks that were high priority had to do with meeting

sufficient standards, whether it be through cash flows, permits/insurance, safety or proper food handling. Attainment of permits and proper licenses posed as a high priority task, since it had the greatest potential to impact project schedule and ultimately, project success.

Project Evaluation

We used project management tools to analyze the project and will measure the project activities against milestones to evaluate success. At the end of the project we will conduct lessons-learned to evaluate areas of success and areas for improvement and project outcomes, as well as explore whether our project was undertaken in a manner consistent with the original plan. To confirm goals and objectives are fully achieved during the course of the project and whether desired outcomes and impacts have been reached, we will use the evaluation methods described below.

Evaluation Methods:

Iron Triangle: In the Classic Iron Triangle, a project is controlled against time, cost and scope. This approach provides easy-to-understand measures that are operational or they may be proxies for specific success criteria [14]. To monitor the progress of the project, the team will meet weekly and will record the expenditure, activities performed, milestones achieved and produce budget projections. Using the triangle, we will balance the progress by adjusting scope to be on track of the schedule and within budget. However, it may not be possible to scale down scope in critical activities such as appliances and resources. This could be due to unforeseen events such as higher price of tools and appliances, malfunctioning appliances may need to be returned and such events can increase the timeline of our project. Another risk could be that a hired staff member leaves for other opportunities even before the launch and this will set back the project schedule.

PERT Analysis: We conducted PERT Analysis to identify critical activities, determine the critical path and standard deviation of the estimated duration of project activities. In Appendix G: Figure 1, the PERT estimate table shows the optimistic, most likely and pessimistic duration in days for all critical activities of the project. To determine the pessimistic estimation we considered potential risks in achieving each milestone. For optimistic estimation we factored in

the known issues for project tasks. We used the formula (Optimistic + (Most Likely * 4) + Pessimistic)/6 [15] to determine the PERT estimate and calculate the standard deviation using this formula (Pessimistic - Optimistic)/6 [15]. The standard deviation is less than 2 for most of the project activities which reassures confidence in our schedule. In Appendix G: Figure 2, the PERT chart shows the project milestones, activities, critical activities and critical path. In the figure, each node represents a project milestone and is assigned a number. The arrows indicate project activities and include PERT estimated duration in days. The critical path identified for the project is 0,1,2,3,4,5,13 and the critical tasks along the path are serving and securing location, getting permit, passing health inspection, marketing and test launch.

Project Closure and Lessons Learned: After the successful grand launch of the ghost kitchen we will conduct our lessons learned meeting using the template presented in Appendix M, and officially close the project. In the lessons learned meeting we will invite the project team, the kitchen personnel and a neutral project manager to facilitate and assess the overall project. In this meeting, participants will discuss: what went well in the project, areas of improvements and overall outcomes of the project. The key contributors will be recognized and the project report will be handed over to the project team.

Conclusion

The global pandemic in 2020 has introduced many virtual business ideas. When dining-in was not an option, the restaurant industry needed to venture out and look for innovative ways to provide service to their customers and the ghost kitchen business started to gain popularity. In this project we managed all aspects of implementing a ghost kitchen. We adopted the waterfall method for the project and utilized project management tools including Project Charter, RACI Chart, Work Breakdown Structure, Gantt Chart and Risk Register to identify and implement all activities of the project successfully. The PERT analysis increased our confidence in the project schedule. Due to the lack of any historical data, we do not have project metrics' set to measure it against. Our thorough analysis and expert use of project management knowledge and tools will ensure the successful implementation of the project.

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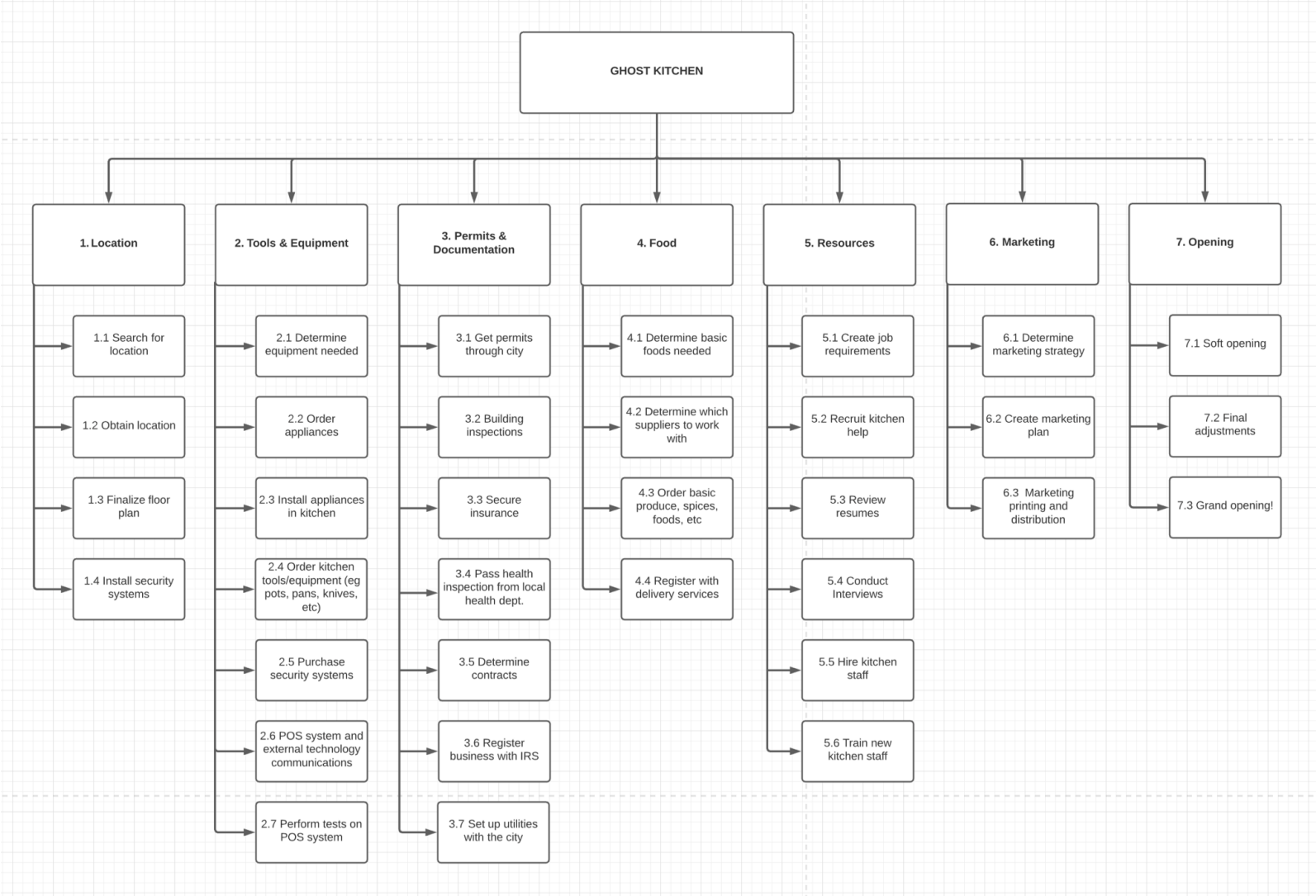
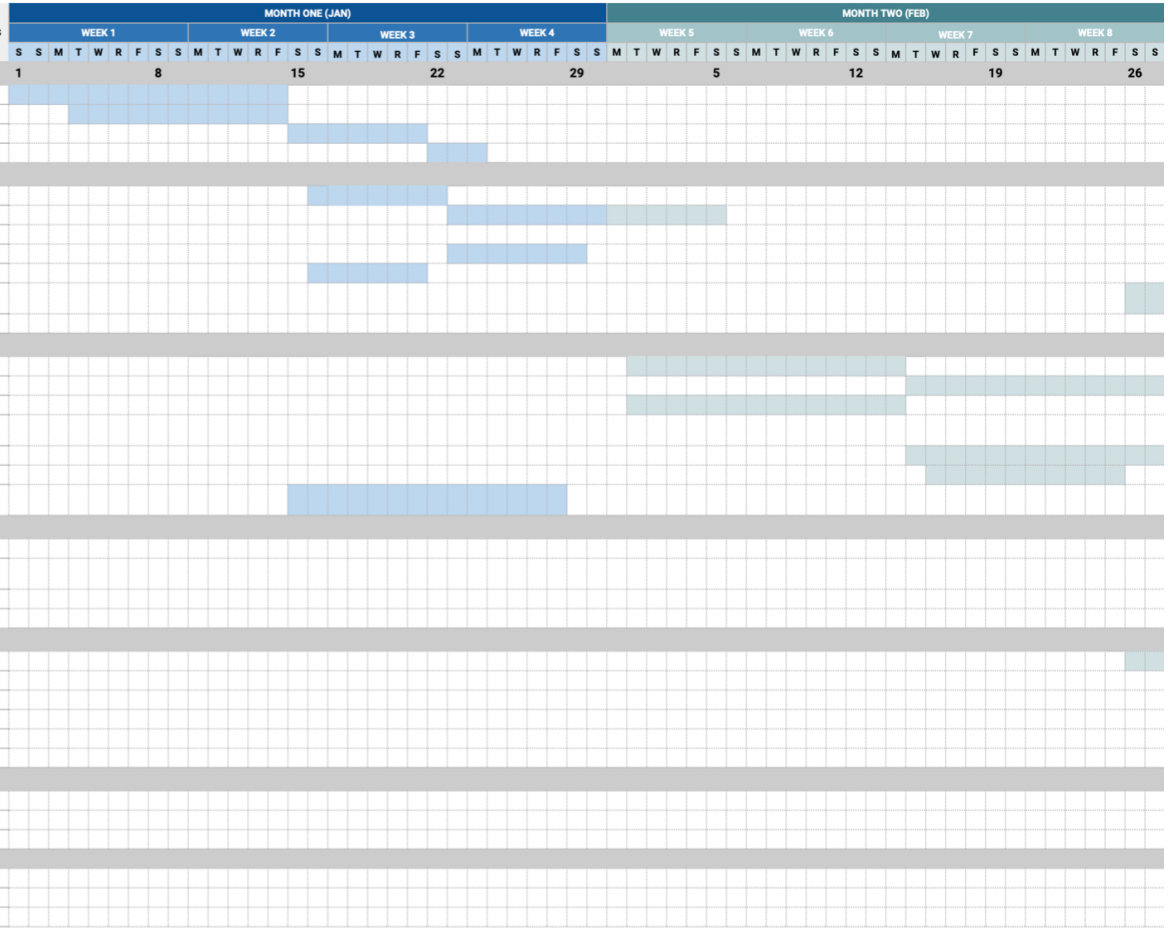
Appendix A: Work Breakdown Structure (WBS)



Appendix B: Gantt Chart

PROJECT TITLE	A Multi-Branded Ghost Kitchen
PROJECT MANAGER	Gordon Ramsey

WBS NUMBER	TASK NAME	START DATE	DUE DATE	DURATION (DAYS)	PREDECESSORS
1	**Location**				
1.1	Search for location	1/1/22	1/15/22	14	-
1.2	Obtain location	1/4/22	1/15/22	14	1.1
1.3	Finalize floorplan	1/15/22	1/22/22	7	1.2
1.4	Install security systems	1/22/22	1/25/22	3	1.2, 2.5
2	**Tools & Equipment**				
2.1	Determine equipment needed	1/16/22	1/23/22	7	1.2, 1.2
2.2	Order appliances	1/23/22	2/6/22	14	2.1
2.3	Install appliances in kitchen	3/6/22	3/20/22	14	1.2, 1.2, 2.2
2.4	Order kitchen tools/equipment	1/23/22	1/30/22	7	-
2.5	Purchase security systems	1/16/22	1/22/22	6	-
2.6	POS system and external technology communications	2/26/22	3/15/22	21	1.2
2.7	Perform tests on POS system	3/15/22	3/29/22	14	2.6
3	**Permits and Documentation**				
3.1	Get permits through city	2/1/22	2/15/22	14	1.2
3.2	Inspections	2/15/22	3/20/22	35	1.2
3.3	Secure insurance	2/1/22	2/15/22	14	1.2
3.4	Pass health inspection from local health dept.	4/8/22	4/15/22	7	1.2, 2.3
3.5	Determine contracts	2/15/22	3/15/22	30	-
3.6	Register business with IRS	2/16/22	2/26/22	10	3.1
3.7	Set up utilities with city (eg: water, waste, electricity)	1/15/22	1/29/21	14	1.2
4	**Food**				
4.1	Determine basic foods needed	3/1/21	3/5/22	4	-
4.2	Determine which suppliers to work with	3/5/21	3/19/22	7	4.1
4.3	Order basic produce, spices, foods	4/10/21	4/12/21	2	4.1, 4.2
4.4	Sign up with delivery services	3/15/22	3/29/22	14	3.5
5	**Resources**				
5.1	Create job requirements	2/26/22	2/28/22	2	-
5.2	Recruit for kitchen help	3/1/22	3/11/22	10	5.1
5.3	Review resumes	3/11/22	3/15/22	4	5.2
5.4	Conduct interviews	3/15/22	3/30/22	15	5.1, 5.2, 5.3
5.5	Hire kitchen staff	3/30/22	4/1/22	2	5.3, 5.4
5.6	Train new staff	4/5/22	4/20/22	15	5.5
6	**Marketing**				
6.1	Determine marketing strategy	3/12/22	3/23/22	11	-
6.2	Create marketing plan	3/23/22	3/30/22	7	6.2
6.3	Marketing printing and distribution	4/6/21	5/7/21	31	6.1, 6.2
7	**Opening**				
7.1	Soft opening (test)	4/20/22	4/23/21	3	1, 2, 3, 4, 5, 6
7.2	Final adjustments	4/20/22	5/7/22	17	7.1
7.3	Grand opening	5/7/22	5/7/22	1	7.2



Appendix C: Risk Register

(Low, Medium, High)

Risk description	Impact description	Impact level	Probability level	Priority level	Risk owner	Mitigation
Insufficient cash flow	Deficit in funding to operate	High	Medium	High	Budget manager	Increased marketing, outreach, involvement in industry
Inadequate marketing	Lack of awareness, reach, new customers	Medium	Low	Medium	Owners	Exploiting marketing from 3P platforms, use of social media
Poor brand/reputation management	Influence of negative reviews and feedback	Medium	Low	Low	Owners	Encourage content marketing and values
Certification and Licensing	Lack of proper documents to operate	High	Low	High	Project Manager	Hiring legal help of an attorney, ensuring standards are met
Permits and Insurance	Delays in schedule, Liability	High	Low	High	Project Manager	Ensuring inspections are passed, things are updated and up to code
Food handling	Spread of	High	Medium	High	Project	Increased quality

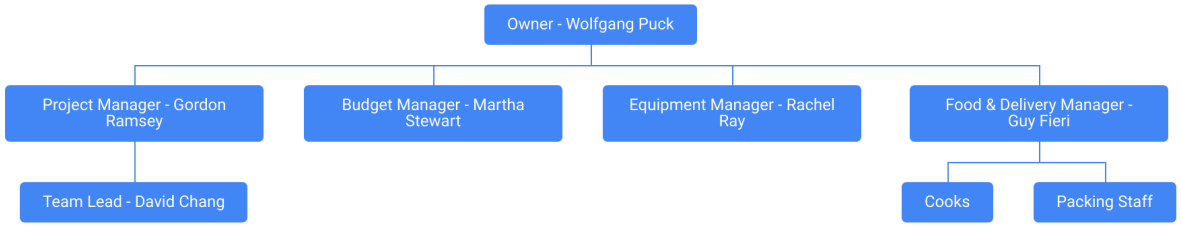
and safety	diseases, bacteria, food poisoning, Liability				Manager	control and training
COVID-19 virus	Health & safety of employees and customers, unemploym ent	High	High	High	Owners	Increased levels of sanitation and preventive measures (masks, social distancing, tamper proof seals, etc.)
Technical software integration/host failures	Disruption to ordering process (both ends)	Medium	Low	Low	Food / Delivery manager	Having designated methods and services that provide troubleshooting
Fire safety	Fire hazards and damage	High	Low	High	Owners	Ensuring the proper maintenance of fire alarms, systems and enforcing prevention
Burglaries, vandalism, security	Potential trespassing, damage to property	High	Medium	High	Owers	Installing a security system that provides 24/7 surveillance

Appendix D: Stakeholder Analysis

Stakeholders	Expectations	Name	Communication
Owners	Creating a positive environment leading to a successful project, final budget and completion time	Wolfgang Puck	Meeting in person/phone every month to check project status
Managers	Allocate resources, making sure that everyone is on the right track, and work is done as planned by managers and on time	Project managers/ team members	Meeting everyday to review details and tasks
Employees	Cooking and preparation staff	Staff, Chefs	
Creditors	Ensure the stability of the kitchen, stability of the money collection	Banks	Meeting monthly as needed to assure ongoing funding
Supplier	Provides goods and services to the ghost kitchen	Food suppliers	As needed via email/phone to provide the quantity of food needed
3PL / Couriers	Deliver and handle supplies/equipments safely and on time	Third party delivery companies (Doordash, Ubereats, Postmates, Grubhub)	As needed online/in person to ensure completed delivery
Customers	Ensure the food and service meet	Local	Every couple of

	their expectations (quality, price, satisfy their needs)	residents	days, in person or via website to check food type, price and services
Competitors	Compares the quality of the food, service and price	Other kitchens/ restaurants	Visit as customer before and after the project
Local government	Decide the amount of taxes, planning permission (budget laber, healthy environment)	Inspectors	Formal proposal before starting the project

Appendix E: Organization Chart



Appendix F: Project Charter

Project Definition	Implement a dedicated Ghost kitchen facility and business model.	
Project Scopes	Provide kitchen space and appliances Provide Cooks/chefs Delivery Services PoS Ordering Software Marketing	

Out of Scope	Long term support Menus Dine-in Facilities	
Project Stakeholders	Suppliers Delivery Organizations Local Government Owners Employees Managers Competitors	
Project Team:	**Function**	**Name**
	Owners	Wolfgang Puck
	Project manager	Gordon Ramsey
	Team lead/planner	David Chang
	Budget manager	Martha Stewart
	Equipment manager	Rachel Ray
	Food/delivery manager	Guy Fieri
Project Communication	Team will meet every week and provide monthly updates	

Appendix G: PERT Analysis

WBS NUMBER	TASK NAME	Optimistic	Most Likely	Pessimistic	PERT Estimate	Standard Deviation
1	**Location**					
1.1	Search for location	14	14	21	15	1.166666667
1.2	Obtain location	14	14	21	15	1.166666667
1.3	Finalize floorplan	7	7	14	8	1.166666667
1.4	Install security systems	3	3	7	4	0.6666666667
2	**Tools & Equipment**					
2.1	Determine equipment needed	7	7	7	7	0
2.2	Order appliances	10	14	20	14	1.666666667
2.3	Install appliances in kitchen	14	14	21	15	1.166666667
2.4	Order kitchen tools/equipment	7	7	14	8	1.166666667
2.5	Purchase security systems	4	6	10	6	1
2.6	POS system and external technology communications	21	21	30	23	1.5
2.7	Perform tests on POS system	14	14	21	15	1.166666667
3	**Permits and Documentation**					
3.1	Get permits through city	10	14	21	15	1.833333333
3.2	Inspections	28	35	40	35	2
3.3	Secure insurance	14	14	21	15	1.166666667
3.4	Pass health inspection from local health dept.	7	7	14	8	1.166666667
3.5	Determine contracts	21	30	30	29	1.5
3.6	Register business with IRS	7	10	14	10	1.166666667
3.7	Set up utilities with city (eg: water, waste, electricity)	7	14	14	13	1.166666667
4	**Food**					
4.1	Determine basic foods needed	4	4	14	6	1.666666667
4.2	Determine which suppliers to work with	7	7	14	8	1.166666667
4.3	Order basic produce, spices, foods	2	2	5	3	0.5
4.4	Sign up with delivery services	7	14	14	13	1.166666667
5	**Resources**					
5.1	Create job requirements	2	2	5	3	0.5
5.2	Recruit for kitchen help	10	10	14	11	0.6666666667
5.3	Review resumes	4	4	7	5	0.5
5.4	Conduct interviews	14	15	21	16	1.166666667
5.5	Hire kitchen staff	2	2	7	3	0.8333333333
5.6	Train new staff	15	15	15	15	0
6	**Marketing**					
6.1	Determine marketing strategy	11	11	14	12	0.5
6.2	Create marketing plan	7	7	7	7	0
6.3	Marketing printing and distribution	21	31	31	29	1.666666667
7	**Opening**					
7.1	Soft opening (test)	3	3	7	4	0.6666666667
7.2	Final adjustments	17	17	25	18	1.333333333
7.3	Grand opening	1	1	7	2	1

Fig 1: PERT Estimates

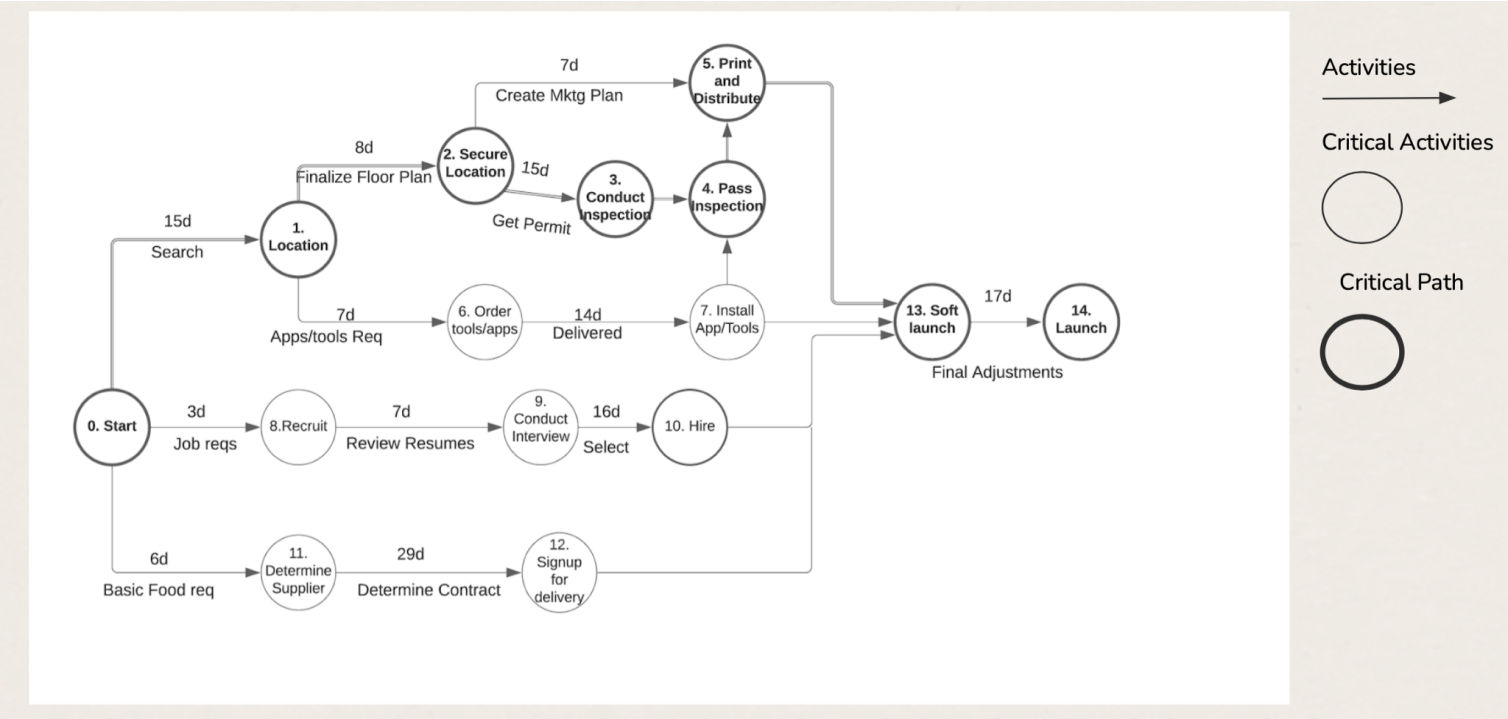


Fig 2: PERT Chart

Appendix H: SWOT Analysis

Ghost kitchen facility:

Strengths ● Ability to house multiple tenants ● Provides greater flexibility to clients ● Increased collaboration ● Established rental agreements and contracts ●	**Weaknesses** ● Lack of dine-in services ● Lack of privacy, security ● Limited access ● Quality control and oversight ● Ambiguous cost for utilities (based on tenants and their levels of usage) ● Scalability
Opportunities ● Maximizing time, space and capacity to cater to more clients ● Establishing connections and relationships with restaurant brands	**Threats** ● Lack of awareness, attracting renters ● Location and area ● Shared reputations with restaurant brands ● Health and safety concerns/risks

Ghost kitchen restaurant brands:

Strengths ● Decreased costs up front (rent) ● Decreased operating expenses throughout lifetime ● Increased profits in the long run ● Decreased costs in the event of mergers and acquisitions ● Maximized work flows ● Maintaining the same food quality ● Adjustable menu ● Lower risk	**Weaknesses** ● No physical locations for branding ● Commission and Fees ● Consistent food quality ● Increased packaging costs ● Minimal customer interaction ● No dine-in services/alcohol sales ● Masked customer information ● Customer retention

Opportunities	Threats
● Lower overhead costs ● Rent Savings & Fewer Employees ● Ability to expand quickly, Scalability ● Advertisement and partnerships on 3rd party platforms ● Increased speed to market ● Capturing a wider market	● Variable demand/supply ● Human factors (couriers), Delivery errors ● Brand image ● Competition with brick and mortar restaurants ● Dependence on food aggregators: Online reviews and ratings ● Food and plastic waste

Appendix I: Commercial Real estate in Portland OR (per square feet)

Market	Class A	Vacancy	Class B	Vacancy
Austin	$33.40	10.50%	$25.75	8.50%
Denver	$29.06	11.20%	$20.48	10.80%
Phoenix	$25.36	16.40%	$20.30	18.40%
Greater Portland	**$25.46**	**9.90%**	**$20.36**	**8.70%**
San Francisco	$49.64	7.70%	$45.35	6.80%
San Jose (South Bay)	$37.72	9.20%	$33.10	10.50%
Seattle	$37.81	11.00%	$25.18	9.40%

Appendix J: Cost Analysis

# of kitchens	4		initial investment	$1,487,000.00			
hourly rate	35		annual expenses	$167,628.00			
hours rented per day	12						
$$ for 1 kitchen per day	$420.00						
$$ for 1 kitchen per year	$153,300.00						
$$ for 2 kitchens per day	$840.00						
$$ for 2 kitchens per year	$306,600.00						
$$ for 3 kitchens per day	$1,260.00						
$$ for 3 kitchens per year	$459,900.00						
$$ for 4 kitchens per day	$1,680.00						
$$ for 4 kitchens per year	$613,200.00						
		Expense		Revenue	Net Cashflow		
		Year 1	Year 2		Year 1	Year 2	Pay back Period
	4 kitchens	$1,654,628.00	$167,628.00	$613,200.00	-$1,041,428.00	$445,572.00	3.713491871

Appendix K: RACI Chart

WBS NUMBER	TASK NAME	Owner Wolfgang Puck	Project Manager Gordon Ramsey	Team Lead David Chang	Budget Manager Martha Stewart	Equipment Manager Rachel Ray	Food Delivery Manager Guy Fieri	Third Party
1	**Location**							
1.1	Search for location	A	C	R	C	I	I	
1.2	Obtain location	C	C	R/A	I	C	I	
1.3	Finalize floorplan	R	C	R/A	I	C	C	
1.4	Install security systems	I	I	C	C	A	C	R (ADT)
2	**Tools & Equipment**							
2.1	Determine equipment needed	R/A	I	C	C	C	C	
2.2	Order appliances	I	C	A	C	R	C	
2.3	Install appliances in kitchen	I	I	C	I	R/A	I	
2.4	Order kitchen tools/equipment	I	I	C	C	R/A	C	
2.5	Purchase security systems	I	C	C	C	R/A	I	
2.6	POS system and external technology communications	A	I	R	C	C	I	
2.7	Perform tests on POS system	I	C	A	I	R	I	
3	**Permits and Documentation**							
3.1	Get permits through city	R/A	C	C	C	I	I	
3.2	Inspections	C	I	A	I	I	I	R (City of Portland)
3.3	Secure insurance	R/A	C	C	I	I	I	
3.4	Pass health inspection from local health dept.	A	C	C	I	I	I	R (OHA & ODA)
3.5	Determine contracts	A	C	R	C	I	C	
3.6	Register business with IRS	R/A	C	C	I	I	I	
3.7	Set up utilities with city (eg: water, waste, electricity)	C	C	R/A	I	I	I	
4	**Food**							
4.1	Determine basic foods needed	I	I	C	C	I	R/A	
4.2	Determine which suppliers to work with	C	C	R	C	I	R/A	
4.3	Order basic produce, spices, foods	I	R	C	C	I	A	
4.4	Sign up with delivery services	I	C	R	C	I	R/A	
5	**Resources**							
5.1	Create job requirements	R	C	R/A	I	I	C	
5.2	Recruit for kitchen help	C	C	R/A	I	I	C	
5.3	Review resumes	A	R	R	C	I	I	
5.4	Conduct interviews	A	R	R	C	I	C	
5.5	Hire kitchen staff	C	C	R/A	C	I	I	
5.6	Train new staff	I	R	A	I	C	C	
6	**Marketing**							
6.1	Determine marketing strategy	C	R	A	C	I	I	
6.2	Create marketing plan	I	R	R/A	I	I	I	
6.3	Marketing printing and distribution	I	R/A	C	C	I	I	
7	**Opening**							
7.1	Soft opening (test)	C	A	R	C	I	I	
7.2	Final adjustments	I	C	R/A		R	R	

Fig 1: RACI Chart

Appendix L: Organizational Structure

Function	Name	Role
Owners	Wolfgang Puck	Ensure all is going as planned, stakeholders are satisfied
Project manager	Gordon Ramsey	Oversees the schedule creation, planning, execution, ensure the overarching goals and vision of the ghost kitchen meets the set schedule, budget, and resources.
Team lead/planner	David Chang	Leads handling the team, communication to the owners, assists the project manager with coordination and planning. Make sure the project is carried through to fruition, engaging with necessary stakeholders.
Budget Manager	Martha Stewart	Coordinates budget and payments.
Equipment manager	Rachel Ray	Leads setting up the kitchen, decorations, setting up any other necessary equipment. Cleaning up the venue.
Food/delivery manager	Guy Fieri	Ensures all food options and preferences are met and delivered to customers.

Appendix M: Lessons Learned Template

Meeting Name: Lessons Learned	**Date:**

Attendees:

Project Activity	**Areas of Success:**	**Areas of Improvement:**
Initiation		
Planning		
Execution		
Closing		
Timeline		
Scope		
Cost		
Communication		
Risk Management		
Other Activity		