LUND UNIVERSITY
School of Economics and Management

Department of Business administration

FEKH99

Bachelor Degree Project in Entrepreneurship and Innovation Management

Spring 2023

Mechanisms to enable operational efficiencies in a virtual context

A case study into virtual kitchens

Authors: Morgan Bryer, Anton Palmén, Nathan Nilsson

Supervisor: Ziad El Awad

May 29

Acknowledgments

This thesis marks the end of a three-year education in business and economics and Lund University. It also marks the end of a chapter in our lives as it is finally time for us to show the world the quality of education this university can offer. Regardless of where we end up in the future, we would like to thank everyone at Lund University who has made this journey possible. From students to teachers, this education has been filled with benevolent people who, not only made the journey educational, but also joyfull. We would also like to especially thank our supervisor during this thesis, Ziad El Awad. While at times frustrating, the constructive critisism given during supervisions and seminars has been invaluable and the quality of this thesis has improved tremendously with your guidance. We wish you all the best in your future ventures and hope our paths cross again. Finally, we owe immeasurable gratitude to our families for their constant encouragement and belief in our abilities. Their sacrifices, late nights, and heartfelt pep talks have been the driving force behind our perseverance and success in completing, not only this thesis, but education.

Sammanfattning

Examensarbetets titel: Mechanisms to enable operational efficiencies in a virtual context

Seminariedatum:1 Juni 2023

Ämne/kurs: FEKH99, Examensarbete i Entreprenörskap och Innovation, 15 högskolepoäng

Författare: Morgan Bryer, Morgan.bryer@gmail.com Nathan Nilsson, Natherionilson@gmail.com Anton Palmén, Palmenanton@gmail.com

Handledare: Ziad El-Awad, Lunds universitet

Nyckelord: Virtuella kök, Operationella mekanismer, Operationell effektivitet, Business Model Canvas, Virtualitet

Forskningsfråga: Att undersöka hur de interna mekanismerna i virtuella kök möjliggör operationell effektivitet

Bakgrund: Sedan Corona-pandemin tog ett grepp på vår värld har restaurangindustrin behövt anpassa sig efter detta skifte mot beställningmat. Restauranger har därför behövt anpassa sig till det digitaliserade samhälle vi rör oss mot. Detta inkluderar ett skifte i fokus mot beställningsmat istället för att äta på plats. Detta har skapat ett ny möjlighet för denna industri

Syfte: På pappret är virtuella kök mer effektiva och lönsamma affärsverksamheter än traditionella restauranger. Syftet med denna avhandling är att utvärdera de interna mekanismer som möjliggör operativ effektivitet i virtuella restauranger

Metod: För att kunna uppnå syftet med denna studie utförs en kvalitativ, abduktiv studie. Processen inkluderar att utföra en fallstudie på Bite Kitchens, för att kunna samla in empiri. Insamlad data kommer att analyseras med det teoretiska ramverket Business Model Canvas, som vidare kommer att ändras för att specialiseras och passa bättre för Bite Kitchens, liksom för andra virtuella företag.

Teoretiskt perspektiv: Arbetet grundar sig i tidigare forskning kring virtuella kök och använder ramverket "The business model canvas" för att analysera de resultat som fås fram från empirin.

Resultat och Slutsatser: I avhandlingen identifieras tre mekanismer som möjliggör operativ effektivitet för virtuella kök, dessa är: "Minska beroenden", "Utnyttja synergier" och "Rekonstruera arbetsprocesser" som i sin tur är beroende av flera metoder som företaget tillämpar. Slutsatsen är att användningen av dessa

mekanismer möjliggör en högre produktion av producerade och levererade måltider per kvadratmeter restaurang och per totalt investerad monetär enhet. Dessutom skapas en ny modell med namnet “The Virtual Model Canvas” som bättre förklarar mekanismerna för virtuella företag.

Abstract

Title:
Mechanisms to enable operational efficiencies in a virtual context

Seminar date: 1st of June 2023

Course: FEKH99, Examensarbete i Entreprenörskap och Innovation, 15 University Credit Points

Authors:
Morgan Bryer, Morgan.bryer@gmail.com Nathan Nilsson, Natherionilson@gmail.com
Anton Palmén, Palmenanton@gmail.com

Supervisor:
Ziad El-Awad, Lund University

Keywords:
Virtual kitchens, Operational Mechanisms, Operational Efficiency, Business Model Canvas, Virtuality

Research question:
Research how the internal mechanisms of virtual restaurants enable high operational efficiency

Purpose
On paper, virtual kitchens are more effective and profitable business ventures than traditional restaurants. The purpose of this thesis is to evaluate the internal mechanisms that enable operational efficiencies in virtual restaurants.

Background Since the corona pandemic hit our world, the restaurant industry has had a paradigm shift towards off-premises eating. Restaurants have had to adapt to the digitalized behavior of today's society. This includes shifting focus towards delivery and pick-up of food. This shift in the industry created a new opportunity for so-called virtual kitchens. Virtual restaurants are, contrary to traditional restaurants, only focused on off-premises services. They thus have no storefront and can focus their efforts in the kitchen elsewhere.

Methodology:
To be able to reach the purpose of this study, a qualitative, abductive study is performed. The process includes performing a single case study on Bite Kitchens, to be able to gather empirics. Collected data will be analyzed with the theoretical framework business model canvas, which further will be altered to be specialized and a better fit for Bite Kitchens, as well as other virtual businesses.

Theoretical Perspective:
The work is based on previous research on virtual kitchens and uses the business model canvas framework to analyze the results obtained from the empirical data.

Results and Conclusion:
The thesis identifies three mechanisms that enable operational efficiencies for virtual kitchens, these being: “Reduce dependencies”, “Exploit synergies”, and “Reconstructing work processes” which in turn are dependant on multiple methods that the business applies. It is concluded that the use of these mechanisms allows for a higher output of meals produced and delivered per square meter of restaurant and per total invested monetary unit. Furthermore, a new model named “The Virtual Model Canvas” which better explains the mechanisms for virtual businesses is created.

Vocabulary

Operational efficiency: Refers to reducing waste in time, effort, and materials within an organization while still producing high-quality output.
Virtual kitchen: Often confused with ghost kitchens, however, there is a distinction between the terms. A virtual kitchen is one where customers only can order food online or through some type of device and not from waiters.
Virtual food court: A virtual kitchen with multiple different restaurants with different menus where orders can be comprised of a combination of these restaurants.
Ghost kitchen: A restaurant that only delivers food. Often located on the outskirts of cities since guests do not have to physically visit to receive their food.
Mechanism: a process by which something takes place or is brought about with the aim of reaching goals for a business.

Contents

1 Introduction

The introduction consists of a brief background regarding the changing restaurant industry and one adaptation to this change; called virtual kitchens. Problem formulation, objectives, and research questions will also be presented. Lastly, a list will introduce definitions relevant to this thesis.

1.1 Background

Ever since the corona pandemic hit our world, the restaurant industry has had to change and adapt. Even though the pandemic is in the past and there are barely any restrictions left, COVID-19 has left its footprint on this industry and the future of restaurants is as of now changing. Restaurants have to adapt to the digitalized behavior of today's society and meet the demand of consumers. Consumer behavior has shifted towards online food delivery and thus the focus of many restaurants has shifted towards delivery and pick-up services (Cai et al. 2022).

The market for online food delivery worldwide has had a rapid growth rate in the last few years and is expected to grow further. According to Statista the market will, from 2017 to 2027, grow more than four times its current size. The approximate value of the online delivery market in 2027 is 450 billion U.S. dollars (Coppola 2023). This is something that implies that the industry would have to change, the question is a matter of how to adapt to this and what the best solution is. The national restaurant association underscores that the market has shifted more towards takeout and delivery. In a survey that was done in December 2020, they found that 53% of the respondents experience that takeout and delivery are essential to how they live. Furthermore, 28% also said that they do not order as much takeout and delivery as they would like, which proves the industry is not a saturated market Grindy (2021).

Existing restaurants and newly opened restaurants have to take this into account when looking toward the future. To survive in the industry and keep growing in the digital era the restaurants searched for solutions to give response to the skyrocketing demand for off-premises orders. This demand shift and new post-pandemic conditions have created an opportunity for so-called *virtual kitchens*.

1.1.1 Virtual kitchens

Virtual kitchens are restaurants that, contrary to traditional restaurants; do not have a storefront, meaning that there is no direct interaction with customers and that the restaurants only offer pick-up or delivery services. These establishments therefore only focus on ready-to-eat meals with off-premises orders. The model for virtual kitchens is that of a back-of-house-only kitchen. Back-of-house includes the area where the food is produced and an office (Backofhouse 2020). In these virtual restaurants, one owner can start several virtual brands under the same roof that each specifies specific cuisines or just a single dish. This creates a virtual food court where consumers can order. Visually it is different brands with different names but served from the same kitchen. An example of this is if a food truck opens a virtual restaurant with a different name that solely sells online via food apps whilst using its own equipment in the already existing kitchen. Roaming Hunger says that, on paper, a virtual kitchen is a quicker and cheaper way to launch a restaurant. It is also decreasing the cost of equipment in the front-of-house in the restaurant (Roaminghunger 2020).

1.2 Problem formulation

As stated, there are different ways of pursuing a restaurant business and we are currently seeing a market shift towards fewer dine-in restaurants, and more delivery-only (de Albuquerque Gouveia 2021). The traditional way of operating a restaurant is with a storefront where consumers can be served food, sit down and eat, and drink beverages. In the digitized era, the demand for off-premises orders is increasing and restaurants have had to adapt to this paradigm shift in the industry (de Albuquerque Gouveia 2021). Delivery and pick-up have thus had

an increased focus in multiple countries (Hakim et al. 2022, John 2020, de Albuquerque Gouveia 2021), which introduced concepts of virtual restaurants consisting of only a kitchen, and thus not being able to serve customers in the storefront. Two studies from India that address market growth find that customer demand is expected to further grow (Chhabra & Rana 2021), the reason for this is explained as restaurants following the trend in the digitalized era but do not address the business itself (John 2020).

Much has been said about how this new business model is growing in popularity, and how the market has to adapt to be able to stay relevant in this shift (de Albuquerque Gouveia 2021). On paper, virtual kitchens should be a more effective and profitable business venture, which can be seen from empirical evidence since more of these restaurants are opening up worldwide indicating a successful business concept. It has previously been discussed how, so-called, cyber-entrepreneurs take advantage of the low operating costs that come with this type of entrepreneurship (Tajvidi & Tajvidi 2021). What is still unclear is what mechanisms, correlated to operational optimization, can be used to utilize these lower costs in one's favor, and thus achieve higher operational efficiency. Operational efficiency is defined as reducing waste in time, effort, and materials within an organization while still producing high-quality output, where the end goal is greater profits (Barlan-Espino 2017). Specifically for this thesis, operational efficiencies are defined as produced and delivered food per square meter as well as per total invested monetary unit. Many current studies agree that a business model has two primary functions, these being value creation for the stakeholders and value capture for the owners. The value created can in turn be reflected in multiple different factors for example satisfaction from customers or profit and growth (Biloshapka & Osiyevskyy 2018). The operational efficiencies of virtual kitchens should be high, as a virtual restaurant does not have to allocate resources towards for example a storefront or towards waiter-staff like a traditional restaurant does therefore profits should prove to be high in relation to other business models. Moreover, operational efficiencies encompass the ability to deliver products and services with cost-effectiveness and uphold a high level of quality. This capacity encompasses efficient time management and minimizing resource usage to generate superior outputs for customers (Johnson & Lee 2012). Once again,

the lack of understanding regarding what mechanisms contribute to these operational efficiencies is still unclear in the context of virtual kitchens.

It was previously been written about the effects on food supply chains in regards to virtual kitchens and how these change and adapt due to multiple factors for example consumer preferences and advances in technological advancements (de Albuquerque Gouveia 2021). Virtual kitchens with their external factors, such as the technological advancements in the supply chain, evolve together. This also has an effect on the shared economy in the market of restaurants (Chern & Ahmad 2020).

The ambiguity in internal processes and mechanisms that make these restaurants more efficient allowing for high operational efficiencies and enabling more to open up shop, is something that needs further research. The aim of this thesis is therefore to: *research how the internal mechanisms of virtual restaurants enable high operational efficiency*.

The goal is to create enlightenment around why entrepreneurs are starting more virtual restaurants by highlighting the internal mechanisms that allow higher operational efficiencies. We conduct a single case study into a virtual restaurant and look at the processes and mechanisms of this virtual kitchen through the business model canvas framework (Osterwalder & Pigneur 2010) as a deductive approach. Based on our empiric data we inductively draw conclusions and spot the mechanisms that create efficiency in these restaurants, hence this thesis follows an abductive approach.

In this thesis, we reveal the operational optimization mechanisms through which virtual kitchens realize operational efficiencies. We contribute to entrepreneurial learning in this field by highlighting building blocks within internal efficiency. This will in turn lead to the creation of a new framework that can be used by future entrepreneurs.

2 Theory

This chapter will present the theoretical framework of the study by indexing the literature used to develop it. Initially, the context and prior research are addressed and then discussed. The use of these theories is instrumental in understanding the operations of virtual kitchens. The purpose here is also to clarify how theory influenced the following case study.

2.1 Literature review

Virtual kitchen is a relatively new concept and therefore little prior research has been done on the phenomenon. Operationally, virtual kitchens differ due to the fact that the initial investment of creating the kitchen can be minimized by leveraging equipment, personnel, and ingredients in the restaurant (Hamstra 2021). Prior studies on virtual kitchens have focused on customer perception often utilizing different theoretical frameworks related to Prospect theory. These studies have tried to answer questions regarding potential growth based on customer demand and they have focused on specific markets, e.g. Brazil, Italy, India, and Portugal. The study on Italian consumers found that convenience and variety attracted customers and that social networks have an impact on customers' knowledge and subsequent purchase intentions (Nigro et al. 2022). A Dutch study found that perceived personal benefits of these types of kitchens positively affect trust in them. A study from Brazil finds that most customers can not describe what a virtual kitchen is but that there is non the less an intention to use the service in the future (Hakim et al. 2022). There are two studies from India that address customer perception and market growth finding that customer demand is expected to further grow. One of these assesses how hygiene, good food quality, and fast delivery affects consumer behavior and needs (Chhabra & Rana 2021). The second one seeks to understand the changes in the market in India post-

covid-19. The study found that platforms that have pivoted towards the digital era, for example cloud kitchens, will rise to a leading position in the food services sector (John 2020). The Portuguese study tends to explain the business model of virtual kitchens, and not so much about mechanisms in the kitchen itself. It means to verify how novel and innovative business models can thrive among old and well-established industries for example the foods and beverage one. (de Albuquerque Gouveia 2021). Another study, researching the opportunities and challenges of virtual restaurants in Malaysia, also speaks to the market effects of these virtual kitchens, but at the same time touches on the effects this will have on supply chains. The main aim of the paper is to research the feasibility of virtual kitchens and does not really touch upon the internal mechanisms of the kitchens themselves (Chern & Ahmad 2020). In general, these studies seem to paint a picture in which virtual kitchens offer a successful value proposition to customers, but less about how these virtual kitchens operate and how they create this value which in turn can be offered.

There is also a study from Hong Kong researching ”platform-based restaurants” which is a term that includes virtual kitchens. The study finds that these types of restaurants have reduced dependence on location and transportation options, while not going further on how this affects internal resource allocation it does illustrate one of the fundamental advantages of virtual kitchens, the flexibility in choosing a physical location for the kitchen and the resources spent on it (Talamani et al. 2022). There is also a short unscientific article in a magazine called ”Restaurant Business” by professor of culinary arts Jonathan Deutsch listing some advantages of opening a ”delivery-only restaurant”. He lists, lower rent, as the space can be smaller and located in cheaper areas and more flexibility in scaling as one can ”start smaller” with less need for staff and scale easier as numbers of seats, not an obstacle (Deutsch 2017). He does not go into depth or provide empirical proof for these statements however they do represent quite obvious common sense advantages of these types of operation. The analysis lacks details on how these advantages interact with each other if there could be synergies and how the disadvantages influence things. There is also more than just these two listed aspects. That this unscientific article is the only one that even comes close to discussing the advantageous internal process of virtual kitchens

illustrates how little research there is out there. Therefore there is a need for scientific research to really figure out the balance between advantages and disadvantages. Especially when it comes to resourcefulness and internal operations in general.

To summarize, while there is some, but little, research about virtual kitchens, there have not been studies about the internal operations of virtual kitchens and how they can relate to the Business model canvas, specifically the internally focused left side of the canvas. Instead, research has focused on a consumer perspective, something that aligns more with the right side of the Business Model Canvas. There is therefore a knowledge gap that should be filled with new research. This lacks of theoretical knowledge makes inductive reasoning hard, its therefore important to gather data about virtual kitchens if the aim is to reach inductive conclusions. Utilizing abductive methods would also be positive for the theoretical discussion about virtual kitchens, as observations are expected to remain incomplete and the business model canvas could need further theoretical improvements. To understand how virtual kitchens are more effective with the mechanisms they use one needs to gather empirical data on the internal processes, as there is no such publicly available data today, a case study could help fill the gap.

2.2 The Business Model Canvas

The *Business Model Canvas* is a framework intended for businesses that enables them to map what elements they use to create, deliver and capture value. The canvas is divided into nine building blocks, all corresponding to a specific part of the business. These nine building blocks are: **Customers segments**, **Value Proposition**, **Channels**, **Customer Relationships**, **Revenue Streams**, **Key Resources**, **Key Activities**, **Key Partnerships** and, **Cost Structure** (Osterwalder & Pigneur 2010).

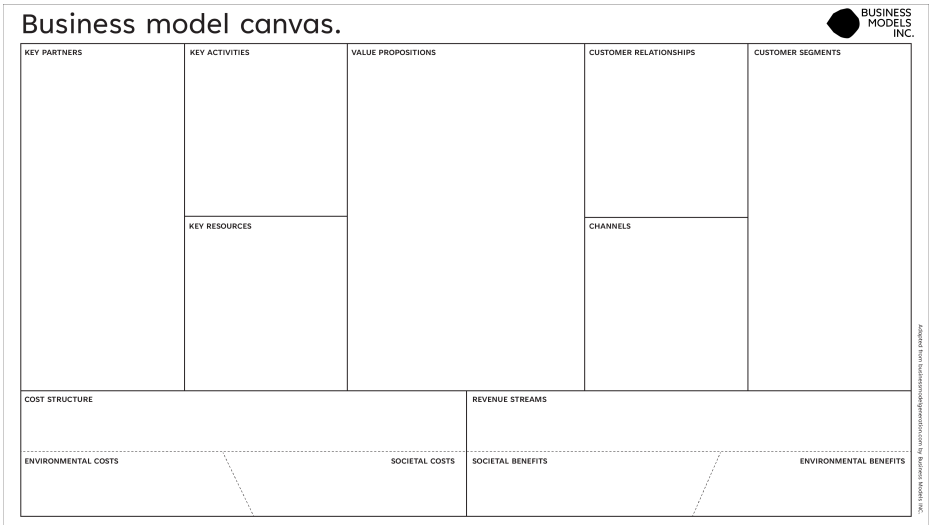

Figure 1: The business model canvas(Businessmodelsinc 2022)

Since this thesis has the goal of researching internal factors that come into play when operating a virtual restaurant, some of the building blocks of the canvas are not relevant. More specifically, the right side of the canvas, also known as the value-based side will not be used as a basis for analysis and will therefore not be discussed in the coming theoretical section. The right side, in this case, includes the building blocks "Value proposition", "Customer relationships", "Channels", "Customer segments", and "Revenue streams". The model is relevant for this thesis due to the fact that it clearly states how organizations operate their businesses and furthermore, separates the organizational aspects into clear and defined blocks making it easier to analyze the individual components by themselves. By using the left side of the canvas in this thesis, a more clear analysis can be made of the mechanisms affecting the internal operations in a virtual restaurant. The business model canvas in itself is a general model intended to be used in any type of business model. It covers a holistic perspective of every type of business. To use the model in this thesis practically, the canvas will be altered to fit into this context of virtuality. The building blocks that are relevant will be described further below.

2.2.1 Value Proposition

The Value proposition block describes the collection of products and services that the business produces to create value for the customer segments. The business's value proposition is what drives customers to choose one business over another. Furthermore, the delivered value is what satisfies a need from a customer and solves a problem that the customer might have. A business may have multiple value propositions consisting of a group of products and/or services providing value to the demands and requirements of one specific customer segment (Osterwalder & Pigneur 2010).

2.2.2 Key Resources

The Key resources building block means to explain what assets are of most importance and required in order to make the business model work. Key resources are a must for every business model since they enable a business to create and offer its value proposition thereby generating revenue, maintaining relationships with the customer segments, and also reaching new markets. Key resources may differ and are dependent on the nature of the enterprise's business model. They may take different shapes and can be categorized into four separate categories, these being **financial**, **physical**, **intellectual**, but also **human**. Furthermore, these key resources do not have to be owned by the business as they also can be gained through partners or leased. Physical resources are defined as physical assets including facilities, buildings, machines, systems, vehicles, etc. where all of these often are heavily capital-intensive. Intellectual resources are for example brands, patents, copyrights, and proprietary knowledge. These are often hard for businesses to develop but once having been developed enable the possibility to offer substantial value for any business. Human resources are the people working at businesses. These are very important in industries where intense knowledge is needed. The financial resources are those such as cash, lines of credit, stocks, and stock options (Osterwalder & Pigneur 2010).

2.2.3 Key Activities

The key activities block explains what the most important activities are for a company to enable its business model to work. These key activities vary depending on the business's chosen business model. These are, much like the key resources, a must to be able to create and offer their value proposition thereby generating revenue, maintaining relationships with the customer segments, and also reaching new markets. Key activities can be divided into four categories, these being **Production activities**, **Problem-solving activities**, and **Platform/network activities**. The production activities are those related to designing, creating, and delivering a product in high quantities and/or of better quality. The problem-solving activities are those related to coming up with novel solutions given a certain customer problem. The key activities of this type are commonly prevalent in service-based organizations. The platform/network activities are relevant for businesses with business models built around platforms as their key resource. These include networks, software, and matchmaking platforms (Osterwalder & Pigneur 2010).

2.2.4 Key Partnerships

The Key Partnership block explains the network of partners and suppliers which make a certain business model work. There are many reasons for businesses to create partnerships and partnerships are an important building block of many business models. Four types of partnerships can be distinguished, these being, **Strategic alliances between non-competitors**, **Coopetition: Strategic partnerships between competitors**, **Joint ventures to develop new businesses** and, **Buyer-supplier relationships to assure reliable supplies**. Furthermore, a distinction can be made between three underlying motivations for creating partnerships, these three being: **Optimization and economies of scale**, **Reduction of risk and uncertainty** and, **Acquisition of particular resources and activities**. Optimization and economies of scale are the most common and fundamental partnership due to the fact that it is unjustifiable for one business to singularly own and performs all resources and activities by itself. By partnering with other businesses, for example, outsourcing or sharing infrastructure costs can be min-

imized. Partnerships can also lead to reduced risk, especially in markets and environments prevalent with competition and uncertainty as multiple businesses working together are stronger than individual ones. Lastly, partnerships can extend the availability of resources and activities for businesses. This is due to the fact that it is difficult for one business to develop and own all of its key activities and resources. Partnerships can for example be formed to acquire licenses or knowledge (Osterwalder & Pigneur 2010).

2.2.5 Cost Structure

The Cost structure block of the business model canvas describes all of the most important incurred costs generated when operating a certain business model. When businesses create value, deliver said value, maintain their customer relationships, and generate revenue they also incur costs. These costs can be calculated after the above-mentioned blocks are defined. Cost structures can vary a lot between business models and can be divided into two broader classes, these being **cost driven** and **value driven**. Cost-driven business models are built around the process of keeping costs to a minimum by using as lean structures as possible. Lean processes include for example automation and outsourcing. Value-driven business models instead choose to focus on their value proposition and the value that can be created. These business models often include high levels of personalized services.

3 Method

This section describes the methodology used to reach the answer to the research questions. The section describes each step taken in the thesis as well as how to achieve validity and reliability in the thesis.

3.1 Research Strategy

Based on the research question and the theoretical framework this thesis used a qualitative research strategy. A qualitative study means that the researcher strives to collect data in naturally occurring situations and environments (Bryman & Bell 2019). Another reason to take a qualitative research approach is that the connection between theory and practice is more distinct than within quantitative research. In qualitative research, the research questions should be guided by considerations of theory, which then decides the method of collecting and analyzing data (Bryman & Bell 2019). When conducting qualitative research the research can be inductive, deductive, or abductive. An inductive approach means using empirical data to build theory but there has risen criticism about this method due to the statement that no amount of empirical data can enable the theory-building. An essence of an inductive process is to be able to draw generalizable conclusions based on observations (Bryman & Bell 2019). A deductive approach is based on theory-testing where the hypothesis is being tested. The weakness of this method is the lack of reliance when strictly using the logic of theory-testing and the ambiguity of how to test the theories chosen. The third reasoning is an abductive approach and is a research reasoning to overcome the weaknesses of inductive- and deductive reasoning. It is based on finding and solving a question with the help of theory and explaining the findings that the theory does not cover. The researchers find the 'best' explanation with the help of both explorations and interpretations (Bryman & Bell 2019). Since this thesis finds a gap in the theory

and literature, thereby following an inductive approach, while at the same time using existing theories as guidance, a deductive approach, the thesis can be seen as following an abductive approach. This is strengthened by the fact that a novel framework will be the outcome of this thesis. Therefore an abductive approach is followed, making use of theory while at the same time explaining unseen phenomena with the help of collected empirics.

3.2 Research Design

To gather relevant data for this thesis, a *single case study* was conducted by performing an interview with a company that is relevant to the topic that is being researched. A case study, also known as "Case research", is a research method involving a deep and thorough examination of a phenomenon within its natural setting over an extended period of time. The data collected in this single case study will be collected through interviews with the case company. Case research can be employed in two ways: as a positivist approach for theory testing or as an interpretive approach for theory building. While this method is widely used in business research, it is less prevalent in other social science disciplines. There are several strengths that the single case study has over other research methods for example experiments and survey research. Firstly, case research can serve two purposes, theory building or theory testing whereas positivist methods are limited to theory testing only. This thesis will take its basis in interpretive case research. This means that the thesis does not need to determine the constructs of interest in advance as they may arise during the research process. Additionally, the research questions can be revised during the investigation if the original questions are deemed less relevant. This flexibility is not feasible in any positivist method once the data has been gathered. Compared to other research approaches, case research provides a more comprehensive and contextualized interpretation of the phenomenon of interest due to its ability to gather a diverse range of contextual data. Finally, case research enables researchers to explore the phenomenon of interest from the point of multiple participants and through multiple levels of analyzis, such as individual and organizational perspectives. This does not mean that there aren't drawbacks to this method. Since the method does not contain experimental control, the internal validity of inferences remains weak. Furthermore,

the quality of the derived inferences from the single case study, is heavily dependent on the integrative powers of the researcher where inexperienced researchers may miss concepts and patterns which could make the findings subjective (Bhattacherjee 2012). This thesis used a single case study with the goal of conducting a profound study of the internal processes within the company.

3.2.1 Case company

The researched case company was Bite Kitchens. Bite Kitchens is a virtual restaurant located in Lund, Sweden that started during the pandemic. They saw a gap in the market that Sweden had not addressed yet, which was focusing on the pick-up and delivery of food. They then started a ghost kitchen and has since the start grown to seven brands and themes in their menu. Since then they have become more of a virtual restaurant that combines these brands under the same roof to create a 'virtual food court'. The two founders have previously studied economics and engineering but initiated the restaurant in their spare time. One of the founders has previous experience in the restaurant business as he has worked in kitchens for the last ten years in several roles. Thus he brings knowledge to the company within both these kinds of restaurants and can see how the internal operations differ in the restaurants (Strand 2021).

3.2.1.1 Selection criteria

The criteria for the case company was a virtual kitchen in Sweden where multiple stakeholders could be interviewed. The case company was chosen with a selective sampling due to the lack of virtual restaurants in the researched market. Furthermore, the chosen case was of special interest due to their unique, in-house logistical end-to-end solution.

3.3 Data collection

In this thesis, qualitative, semi-structured interviews were used. A semi-structured interview uses standardized questions but the following questions might alter depending on the answers that are given by the interviewee. Bryman & Bell rec-

ommend creating an interview guide in forehand of the interview to conduct the interview effectively and also to ensure that the relatively specific subjects in the interview were touched upon (Bryman & Bell 2019). The interviews were recorded in order to be able to transcribe them later to assist in the fluency of the interview whilst also being certain that the subjects were covered. Important to note is that the interviewees were asked for consent to recording the interview and the interviewee consented to be recorded. When interviewing it is also important to structure the interview in such a way as to maximize both the validity and reliability of the exploration of key concepts. Important to note however is that qualitative interviews place emphasis on generality, meaning that specific answers to specific questions are not sought after as much as in quantitative research (Bryman & Bell 2019).

3.3.1 Interview guide

For the interview to be general, reliable, and valid an interview guide was created. This provided the researchers with an overall understanding of the structure, discussion points, and goals of the interviews while at the same time leaving the interviewees open to discuss freely, which goes in line with the use of semi-structured interviews. The use of the guide did therefore not limit the answers of the interviewee, on the contrary tangents were encouraged as more information and concepts from the interviewee's point of view are of interest in qualitative research (Bryman & Bell 2019). The interview guide for the semi-structured interview contained a list of relevant subject topics and questions while at the same time giving the interviewee freedom in how to answer, meaning that the topics were used to lead the interview in the right direction, but still provided wiggle room in the answers. Questions that were not included in the guide but that interviewers found interesting during the course of the interview were also asked to receive a deeper knowledge of the area, something that Bryman & Bell (2019) means is a good practice during qualitative interviews. During qualitative interviews, it is also important to limit the amount of influence from the interviewer's views and opinions thereby trying to gain a true-to-life and genuine understanding from the interviewee's point of view. This can be done by applying the grounded theory approach emphasizing the importance of not going into the interview with

preconceptions (Bryman & Bell 2019).

The interview guide contained questions that would give answers enabling the answering of the research questions. The questions in the guide, therefore, were related to virtual kitchens and the virtual processes that are used in these environments. These questions were connected to the building blocks of the business model canvas. Furthermore, questions, where the interviewee is meant to compare their experience in virtual restaurants compared to traditional ones, were asked. Furthermore, the start of the guide contained questions regarding general information about the interviewee as age, name, position, etc. as this information could later on be used to create a context in regard to the given answers. The interview guide can be seen in Appendix A.

3.4 Data analyzis

Since data collected in qualitative research usually is derived from interviews they are not always as straightforward to analyze as for example quantitative data. Furthermore, there are no set rules on how this data should be analyzed. Something that most qualitative analyzis tools have in common is the iterative context they should be used in. This means that analyzis of the data starts when some of it has been collected and the insights that come from the analyzis are then used to shape future data collection. The main challenge when collecting qualitative data through qualitative research is that the data sets often are very large, complex, and unstructured due to the nature of interviews. There are mainly two approaches that can be followed when analyzing qualitative data, these being *thematic analyzis* and *grounded theory*. The thematic analyzis approach is based on the idea of finding themes in the qualitative data that has been collected. These could be topics that are frequently recurring, metaphors and analogies used by interviewees, and similarities and differences found between the answers from interviewees. The grounded theory is one where the components of data collection, analyzis, and theory (if existing) are closely connected. Therefore two central features of this approach are the development of theories out of the collected data and the approach being iterative in nature (Bryman & Bell 2019). As this thesis is abductive in nature, the following method for data analyzis will be the grounded

theory approach. The analyzis will therefore consist of coding where the data is separated into components. The results of the data analyzis will also lead to concepts and theories. Furthermore, the data structure and coding presented by Gioia et al. (2012) will be used where the data starts as a first order category, moving towards abstraction where the end goal is to reach a theroetical understanding of the studied phenomena.

3.5 Reliability, Validity

In qualitative research reliability and validity are different kinds of measurements of the rigor and quality of the research. These will be further explained in the following sections.

3.5.1 Reliability

Reliability is closely connected to the replicability of the research. This means that if the research is repeatable for other researchers it enhances the reliability aspect of the work. The reliability can in turn be split into *external reliability* and *internal reliability* (Bryman & Bell 2019). External reliability explains replicability, which can be considered hard in qualitative research. One tool to improve external reliability is to adapt to the social role of the original researcher. Otherwise, the researcher can be affected differently by what is heard and seen throughout the research. Internal reliability refers to the objectivity of the researchers. If there is more than one researcher the interpretation of the data collection has to reach the same understanding (Bryman & Bell 2019). This thesis will strive for high reliability using multiple methods. Firstly the interviews will be recorded, and in turn, transcribed so as not to base the analyzis on the researcher's recollection of the interviews. Secondly, questions stated to interviewees will be done in an objective way so as to not affect the interviewees and thereby their answers. Lastly, the same interview guide will be used for all interviewees where only follow-up questions might vary depending on the answers given from interviewees.

3.5.2 Validity

Another crucial factor in research often considered the most significant, is validity. Validity revolves around the credibility of the conclusions derived from a research study. There are different types of validity and the main ones are *Measurement validity*, *Internal validity*, *External validity* and, *Ecological validity* (Bryman & Bell 2019). Measurement validity mainly relates to quantitative research and is concerned with if the measurements were done actually capturing what it is intended to. Internal validity also mainly refers to quantitative research. This type of validity mainly concerns the understanding of if conclusions that contain causal relationships hold, i.e., does x cause y and can we be sure that x is the responsible variable. Ecological validity refers to the extent to which social scientific findings can be applied to everyday situations and naturally occurring social settings. It addresses whether the research instruments capture the authentic conditions, opinions, values, attitudes, and knowledge of the individuals that are studied within their natural environment. When it comes to business research, there is a concern that the findings generated, while technically valid, may only partially correspond to people's actual daily lives. When research lacks ecological validity, its usefulness in understanding real-world dynamics becomes limited. The level of ecological validity can be compromised when social scientists excessively intervene in natural settings or create artificial ones, such as laboratories or controlled interview rooms. Ecological validity is crucial in determining the applicability of social scientific findings to everyday life. The more closely research reflects natural settings and minimizes artificial interventions, the greater its ecological validity, and consequently, its relevance in understanding the real world. The validity of this thesis will be strengthened using multiple methods. Firstly, multiple interviews will be conducted to not get biased results from any single individual. Furthermore, when creating the interview guide, the entire research team will be involved so as to take multiple perspectives into consideration, limiting any personal biases from researchers. All interviewees will also be present at interviews to limit any human error during interviews (Bryman & Bell 2019).

4 Empirics

The empirics chapter presents the collected data from the interviews with the founders of Bite Kitchens. The data from the interviews are structured according to which mechanism most applies to what was being said. Inside each section, the structure is based on the chronological order of the questions that were asked to preserve a sense that the data wasn't manipulated.

Bite Kitchen was founded in August 2021 by two founders and childhood friends. They define themselves as a "virtual kitchen but also as a virtual food court". They offer multiple brands and restaurants all under the name 'Bite'. They have been operating the company together since launch, and an "angel investor" has also been involved. Founder 1 has a background working in the restaurant industry and currently operates the kitchen itself, and the other one has experience with software development and economics.

4.1 Reduce dependencies

The launch was "very easy" according to the founder, the restaurant instantly appeared on other food delivery apps and since most people have these apps they made new customers fast. He goes on to explain that "we don't make any money from other food delivery apps" and therefore the plan was to launch an app of their own. "The other apps take 30% and with our own app the costs are 15%." With their app they have been focusing on customer service, creating a tracking system for the customer and calling customers directly when orders might be late. An effective delivery system through the app has been helpful. The "biggest challenge" is characterized as getting customers to actually use their app. Furthermore "building up a loyal base of customers" is another challenge the founders have noticed.

Renovating the space and purchasing equipment was funded by an angel investor

with a runway of 250.000 Swedish crowns. When asked about investments into this market in general he answers ”there were a lot of similar companies 2 years ago but most didn't make it” this he attributes to their inability to get a ”entirety” in their company, which he explains as the combination of ”good food, technology and customer service”. He also said many expanded too ”fast”. There is still an interest in the market but Bite has been unsuccessful in trying to recruit more funding. Funding of 5 million to a new startup is not something VC banks are interested in, ”they want to invest 30-40 million”. ”There is a risk in being such a new company, and we have proven proof of concept, but we still haven't found any new funding, we will continue to look”. He describes the investor market as ”tough” saying ”investments into new companies is down 40% since the start of the year”. When asked about their current financial situation he answered that they still aren't at ”break even” but that it's not that far away. ”We had a loss the first year, and in 2022 we made a small profit, and the same this year”. The biggest investment was renovating the premises, the mopeds used for delivery were costly too. ”In comparison to traditional restaurants the costs are low”. ”60% of the cost is furniture and cutlery in many traditional restaurants”.

Founder 2 says: When asked about the biggest obstacle faced when initiating the business, it was stated that finding the so-called “product-market-fit” was very difficult and took a long time. Founder 2 stated that very few had tried this type of business model before and that none had been able to make it profitable. The interviewee went on to explain owning a physical location with rent and employees make it challenging to keep costs down while trying to find the product market fit and therefore means that the biggest obstacles were patience and capital.

In regards to funding the interviewee explained that a local real estate company found a lot of interest in their vision of doing something different in an industry that has stayed the same and has not changed in a very long time. Furthermore, the investors were impressed by the team leading to them being the final investors in the virtual kitchen. As of now, these investors are the only external investors of capital. Founder 2 went on to state that the largest investment when initiating the business, time-wise, was the development of the tech-stack. This included the

app for customers to order food, the kitchen system, the ordering kiosks, and the logistics system for which riders to pick up which order and the routing of the riders, all having to work from the beginning. The largest capital investment, in the beginning, was the cost of the actual kitchen, i.e., building it. Founder 2 went on to explain that they have learned a lot from building their first kitchen, stating that the next kitchen will be able to be more capital-efficient.

In regards to the development of the application, it was all done in-house, meaning that Founder 2 developed it internally for the company. The founder went on to explain that since the application is developed by themselves, themselves, they have full control of the data in every step and can use it however they want. They have built some tailor-made analytical tools for themselves which they then connect some of the data to. These tools are also connected to their marketing tools.

4.2 Exploit synergies

Founder 1 explains that they knew from the beginning what path they wanted to take. Employing a strategy where they first established brand recognition and a loyal customer base, and then launching their own app. The menu was chosen carefully to be as resourceful as possible, the founder states ”effectiveness in ordering was of the highest importance to me”. And he goes on to explain how the menu has been expanded significantly since launch without increasing the number of different items ordered. ”The chicken used in the salad is the same as in the chicken dishes” and ”We added bulgur to the orders and could then add 4 more dishes”. What’s hampering the further expansion of the menus is time and space constraints.

Finding a physical space for the business is described as relatively easy, the timing; towards the end of the corona pandemic when many restaurants became insolvent, made it even easier. They did need to renovate the premises however and it took around 2 months to secure the space. When asked about internal dif-

ficulties he replies ”internally it’s been quite calm, there are always issues with employees but no, the main challenge has been finding loyal customers”. He further states that having customers use their app is the core of their business idea”. If that didn’t work then the business would not.

When it comes to partnerships they still work with other delivery apps as they can be found on their platform, however, actual interaction is close to 0, with the other apps sometimes reaching out with deals. Instead, they focus on working with different Student organizations, ”It’s easier to get a student to download the app than an old man” and they want to be seen as an integral part of the lives of students in the city. When it comes to further expansion they want to target families with children, as the student market is considered mature. They plan on launching kids’ menus and other solutions more attractive to families. ”There just aren’t enough students and they always come and go. It’s better to make loyal customers from people who live in Lund on a long-term basis”.

When asked about key resources. The founder highlights the food, ”if it doesn’t taste good then we don’t have any customers, it’s as simple as that”: However ”everything comes together because of technology” they have timers and systems in the kitchen to know when to start cooking certain dishes and that guarantees high quality. ”Good customer service through the app and good technology we have are our main strengths, and no one else can offer that”. He goes on to list competitors that have failed, something he attributes to them not having the right technology when it comes to an app, delivery, timing the cooking, etc. He characterizes the food and technology coming together as the main strength, a synergy of sorts. ”We can also control everything, we don’t need developers, we do everything in-house”.

When asked about differences to regular restaurants, he explains how deliveries mean a need to take into account different things, for example, the food not being too hot as that could lead to excess fog inside the delivery box, making the food soggy. They need to work more preventive and make sure the food is done fast to fit with deliveries and the time schedule. They also need less space than regular restaurants. ”Plates and cutlery take a lot of places, so we need less space

for dishes" further stating "in regular restaurants 70% of space is seating, we can produce more food by square meter, and that was the whole idea behind starting the business".

Regarding future plans, they have plans to further develop the app. "We want to create a sort of community on the app, if you order a lot you get points and you can use these to buy things and if you invite friends you get points". The reason it hasn't happened yet is lack of time. The founder also hopes to further develop the business financially and to invest some in the kitchen. When asked about their main competitive advantages he points to the accessibility of their food, "wherever you are, if in a park, alone at home, or with your friends, you can always grab your phone and find any type of food you want, it is a virtual food court, there is everything" He also lists the high-quality food, the customer service, and their youthful brand. "It's almost overpowered, We can deliver every type of food in one delivery, that's not something other delivery service apps can do". "We also have a better reputation than the other apps, regarding staff treatment and quality".

Founder 2 says: When asked what the vision for the company was at the initial start and what path the founders wanted to take, Founder 2 means that the path was not completely clear. Founder 2 states that the founders knew they wanted to create a "tech-heavy" virtual kitchen, but to get there multiple iterations of ideas were passed to be able to get where they are today. To be able to create the menus, the founder first started off by doing some market research with the goal of finding possible brands that would have a big enough demand. Once having done that, they looked for potential synergies between the menus and brands, i.e., using the same chicken in the salads, strips, burgers, and tacos. This would enable the purchase of higher quantities, making the preparation in the kitchen more efficient. Founder 2 also stated that due to the limited space in the kitchen for both storage, preparation, and cooking the efficiency of the menus was highly prioritized when forming them.

In regards to partnerships Founder 2 means that they have a few different types of strategic partnerships. Firstly, they are financed by external capital which re-

quires regular reporting. In the beginning, they also worked with marketing agencies that primarily helped them with their branding and public presence. Since all of their tech is developed in-house, they do not have any need for partnerships or contracts in regard to IT. What they have done, although, is integrate their brand with 3rd party delivery platforms, but even in these orders they are responsible for the delivery of the food. The integration into these platforms has allowed the brand to reach new customers in already well-established marketplaces. Furthermore, Founder 2 states that the company works closely with their suppliers, talking to them every day to be able to create a more efficient supply chain. As the location of the restaurant is a "student-city" the company has also chosen to partner with student organizations by providing food at lectures, events, and parties to be able to reach new and as many customers as possible.

According to Founder 2, the next step for growing the business is to focus on reaching higher base-level sales by getting better at leveraging personalized marketing automation. Furthermore, the founder stated that they have been very successful at finding a great product-market fit in a profitable way, so expansion to more cities is also a highly prioritized task.

When asked what Founder 2 saw as their biggest unique selling point as a virtual kitchen compared to a traditional one it was stated that it is connected to the food for the customer. Customers can order very different types of foods from the same place and still expect great quality as well as doing so in the same order, meaning that groups of people don't have to decide on a single type of food. Furthermore, the delivery process is also more consistent than other platforms leading to less cold food and more reliable delivery times. The internal unique selling points for the business are all the synergies and efficiencies they have compared to other restaurants or delivery solutions. The interviewee stated that the average restaurant in Sweden has a profit margin of 3%. They have proven to be able to reach 25% and at scale and they expect to be able to bring that up to 30%.

4.3 Reconstructing work processes

The app was developed by the other founder in around 2-3 months, this was not characterized as a big issue and the founders already had the skills necessary for that. There were however questions about which features to prioritize and developing the live tracking system did provide some challenges. The app was further tweaked by listening to their delivery drivers and their wishes. The app is continually being developed in this way ”it’s becoming better and better”.

When asked about things that could have been done differently he lists general overspending on small things. ”We could have been more effective in spending money on advertisement, now we know what works, the same with workers”. When it comes to developing the app they took inspiration for the layout from online supermarket/food delivery apps, and they have also listened to feedback from customers, staff have also requested things. ” I really like to talk to employers and customers and get ideas from them on how to further develop things”.

Asked about how technology more specifically plays a part in their internal processes he explains how being a delivery only, and not having wait staff, let technology play a big role. ”The customer puts in their order in the app, this in contrast to a waiter having to get it right and then telling the kitchen who also has to get it right, the directness from the customer eliminates a common source of mistakes”. They also have a ”packing station” where they can control all orders. The kitchen is divided into several stations, for example, one for salads, one for fried goods, one for burgers, etc and they are each equipped with a touchscreen that displays the order and when it has to be ready. Everything is then collected and packaged at another station. This is the same type of process that large fast food chains like Mcdonald’s and Dominos use. Sometimes only one kitchen staff is needed, but 2 or 3 work better, depending on demand. ”The effectiveness is higher in these types of restaurants. You need fewer people to operate the kitchen, you only need to cook and put it in a box and that’s it”. ”We have a system for how many orders to expect based on time of day, and we know how much we sold last week and that way we can construct a schedule 2 weeks in advance”, all their employees work by the hour and do not have permanent positions.

Another aspect where the founder highlights their internal processes is related to their data on customer eating habits. ”When people should eat is the billion dollar question in the restaurant business, and thanks to the technology we can actually control this somewhat, by sending out push notifications and special offers for example”. ”You don’t send these to everyone, let’s say to 10% of our user base, and only 10% of them go for it, you get 10 customers and then you make an extra 2500 SEK”. He goes on to further stress how scalable their business is, ”there isn’t the amount of seating or anything like that, that restricts us expanding, we just buy a new moped and hire a new rider and that’s it, the kitchen becomes more effective the more people order”.

Founder 2 says: When asked about the key resources Founder 2 stated that the talent of the team and the urge to try new things within the team were some of the most important resources they have. “Food deliveries have never been profitable” Founder 2 stated and went on to explain that it takes a lot of trial and error from a top team to be able to solve such a big gap in the market. Founder 2 went on to explain that activities that are different from their restaurant compared to a traditional one were almost all of them, stating:“The day-to-day work in the kitchen is very different when you have to prepare for 8 different restaurants in the same kitchen.”

When asked about the efficiencies of the internal processes and if the interviewee considered virtual restaurants to be more efficient than traditional ones it was stated that it completely depends on the virtual restaurant. Since they are very data-driven and they are digital in nature they have access to way more data than a traditional restaurant. Most of the big efficiencies for them are connected to the fact of how horizontally they have managed to scale their internal processes. They are a virtual restaurant but also do their own deliveries, where a lot of the efficiency occurs. The founder went on to explain that a virtual restaurant can be very inefficient but it opens a lot of opportunities to be efficient that do not exist for traditional restaurants. Due to their own specific ways of working they have been able to reach high efficiencies.

5 Analysis

In the Analysis the internal processes identified in the empirics are presented, analyzed, and discussed. Firstly by categorizing a framework of operational optimization and the mechanism employed. Further on the Bussines Model Canvas is utilized in the analysis and the canvas is then expanded upon according to virtual business operations.

5.1 Operational optimization

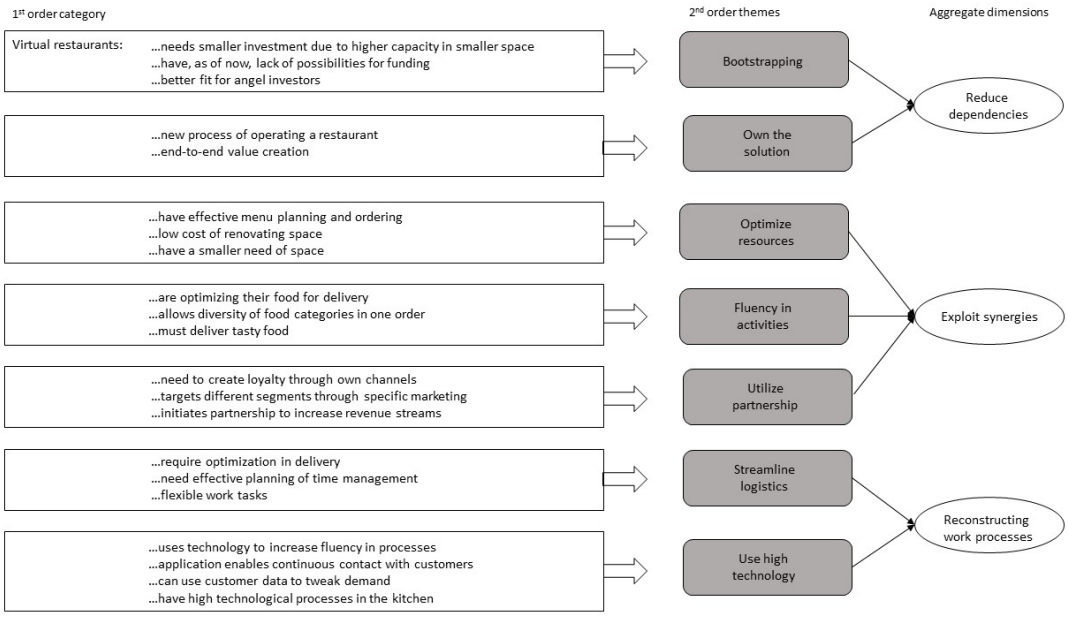

Figure 2: Mechanisms in virtual kitchens

5.1.1 Aggregate 1: Reduce Dependencies

One of the mechanisms of operational optimization utilized by virtual kitchens has been classified by the authors as ”Reduce Dependencies”. This is an aggregate dimension, constructed by second-order themes which were constructed by 1st order categories. These categories represent different elements taking place within the operations. The first element, sourced from the empirical data, is the lack of need for a large investment as the operations use less space and objects than a regular restaurant. The second element concerns the company's ability, or rather in this case; inability to raise money. This is an element that often has negative effects as these types of companies are of little interest to venture capital as the initial scale (and demand for money) is too small to show up on Venture Capital Funds radars. This often means (as in the case of Bite Kitchens) that an angel investor is more fitting, or in other cases, self-financing, the use of angel investors constitutes a third element in the category. These elements signify that bootstrapping methods are highly effective and rewarding as the financial sums needed are relatively small. Bootstrapping constitutes the 2 order theme here and reflects the lean use of financial resources that still results in large gains.

The new process of operating a restaurant and end-to-end value creation is part of the last category which constitutes the theme of ”own the solution”. This theme represents Bite's control of all value creation processes by doing as much as possible in-house, which means less profit sharing and more power to shape the operations. This is not something all virtual restaurants or regular restaurants can do, as things like developing an app or hiring delivery personnel often are outsourced. The endpoint of this process is the aggregate dimension, which is to Reduce Dependencies. As virtual kitchens (like Bite) launch without the need for large outside investments, owning their own solution, and utilizing bootstrapping, they end up with small dependencies, instead being largely independent in operational and financial decision-making. This is beneficial for founders who could retain more ownership, and beneficial for the company that enjoys greater flexibility. The reduction of dependencies leads to operational optimization.

5.1.2 Aggregate 2: Exploit Synergies

A second mechanism of operational optimization has been classified as Exploit Synergies. This is also an aggregate dimension constructed by second-order themes that in turn were constructed by 1st order categories. For this aggregate, there are 3 categories with themes, consisting of 9 elements. Effective menu and order planning, cost-efficient renovation, and lower cost of space combine to become the theme of ”optimize resources”. As the founders mentioned in the interview, by ordering relatively few items they can create several different menus under several brands. The optimization of resources synergies with the other themes to become the aggregate dimension ”Exploit Synergies”. These aggregate dimensions are also referred to as mechanisms.

The first element combined into the theme ”Fluency in activities” are optimizing their food for delivery, which refers to things like temperature and avoiding sogginess. There is also the fact that they allow for a diversity of food categories in one order as well as their prioritization of delivering tasty food. Fluency in activities is best understood as the high-quality activities related to their central product; their food. The next category consists of their need to create loyalty through their own channels, targeting different segments through specific marketing, and initiating partnerships to increase revenue streams. The second-order theme becomes ”utilize partnerships”. This highlights how Bite combines the internal with the external, they have tailored their practices to build partnerships with customer groups and social groups (i.e student organizations), with the aim of fostering loyalty, something they uniquely profit from as they have their own application, or ”channel”, which brings in a profit margin of 30% compared to 15% from Foodora. All of these themes are synergies that improve Bites operations, i.e. high-quality food is even more helpful when you don’t need to share the profit with another company. The mechanism (or aggregate dimension) is therefore referred to as ”Exploit Synergies.

5.1.3 Aggregate 3 Reconstructing Work Processes

The theme of ”streamline logistics” consist of a category containing elements such as flexible work tasks, optimization of delivery, and effective planning of time management. Here one can see that smart decision-making in the logistical sphere combines to streamline the processes. There is also the theme of ”use high technology” which refers to the category containing elements like using technology to increase fluency in processes, applications enabling continuous contact with customers, can use of customer data to tweak demand, and having high technological processes in the kitchen. The ability to send out deals to app users to induce demand is a great way to maximize revenues and manage workloads. Bite has consistently used technology to make their operations more efficient, and the virtual aspect of their business has made that absolutely necessary for their success. A good example here is how the logistics of the kitchen are increasing efficiency by screens displaying work tasks. Another one is the way technology helps in grouping deliveries by geographical region in the city, resulting in the ability to deliver to different customers in one trip; saving time and resources. These themes are the parts of what becomes the last mechanism; ”Reconstructing work processes”. This mechanism highlights the synergy Bite enjoys as a result of technology and innovative use of mentioned work methods that improve their internal operation.

5.2 Through the eyes of the canvas

As this paper focuses on the internal operational efficiencies of virtual kitchens, the left side of the Business model canvas will be analyzed in regard to the empiric. The left side of the canvas focuses on key internal building blocks that allow businesses to work efficiently, which goes in line with the objective of the paper.

5.2.1 Key partners

The key partners block in the canvas is meant to explain the network of partners and suppliers enabling certain business models to work. For Bite kitchens, these

are as of now limited. Their current partnerships are with the investors which require regular reporting and also the third-party delivery platforms but are only present to be shown on an already established marketplace. Virtual restaurants are not dependent on partnerships as established in the interviews. Instead, they want to become self-dependent and decrease the loss of margin to other parties.

Given the responses from the interviewees and the aggregate dimensions of reducing dependencies, the business model canvas does not accurately depict the concept of virtual kitchens. To optimize the efficiency and own the solution, the reliance on partners must be minimized as much as possible. The partners currently pursue partnerships in the output part of the business i.e. student association to sell catering food etc. but are not focused on partnership in the internal operations. There is therefore a need for a change in the canvas to be able to capture in what ways partnerships can be minimized.

5.2.2 Key activities

This building block can, as mentioned in section 2.2.3 Key Activities, be divided into four categories production activities, problem-solving activities, and platform/network activities. This building block is usually prevalent in service-based organizations, such as Bite Kitchens. This can be seen from the empiric that these categories are addressed to some extent. Bite is trying to decrease effort in production by using several different stations for each individual cuisine, but at the same time optimizing efficiencies by allowing one station to function for multiple menu items if allowed. This is to decrease the time it takes to deliver the output of the production. The work and delivery are also optimized which decreases costs in the activities around the production.

Another central key activity is the use of technology in internal processes. This enables fluency in the kitchen and can also use the application for continuous contact with customers for feedback but also to influence the demand to some extent.

What can be seen in the empiric is that the production activities can be covered in

the context of the building block 'Key activities'. What is lacking is the fact that Bite and virtual restaurants in general are service-oriented businesses. In comparison to a regular restaurant with a storefront and waiters, a virtual restaurant does not have the same ability to give a perception to the customers like a face outwards in to form of a waiter. The block 'Key activities' does therefore not depict the entire functioning of virtual restaurants that can be seen in the empiric and the aggregate dimension 'Reconstructing work processes'.

5.2.3 Key resources

The building block Key resources explains, as described in 2.2.2, what assets are of most importance in making a business and business model work. Key resources can be separated into the categories of financial, physical, intellectual, and human. In Bite's case, this can be used to describe the key resources in their business model but would be done in general terms. This means that a lot of businesses have key resources in the form of these four categories as this model and this block is generalized to fit into several different businesses.

To make this more specific to the virtuality of the business model and in the context of virtual kitchens, this building block will be altered. To depict the block key resources in a less generalizable fashion in the business model canvas, the block is connected to the aggregate dimension "Exploited synergies".

5.3 The Virtual Model Canvas

Due to the fact that the found mechanisms cannot accurately be placed in the canvas, there is a need for a alteration of the canvas in the context of virtual kitchens and virtual business models in general. This new model, named the "Virtual Model Canvas" can be seen in figure 3. This new canvas describes the building block of the business model canvas in a more specific way in the context of virtuality. When customizing the canvas into a specific context it allows the business to achieve more focus and a more targeted approach in their business model. These blocks create this more specific framework to provide a comprehensive understanding of the context. The model is comprised of three building blocks

meant to explain mechanisms that virtual businesses can make use of to maximize operational efficiencies. The mechanisms are in turn comprised of methods that can be used to in turn reach operational efficiencies which can be mapped out at the bottom of the canvas.

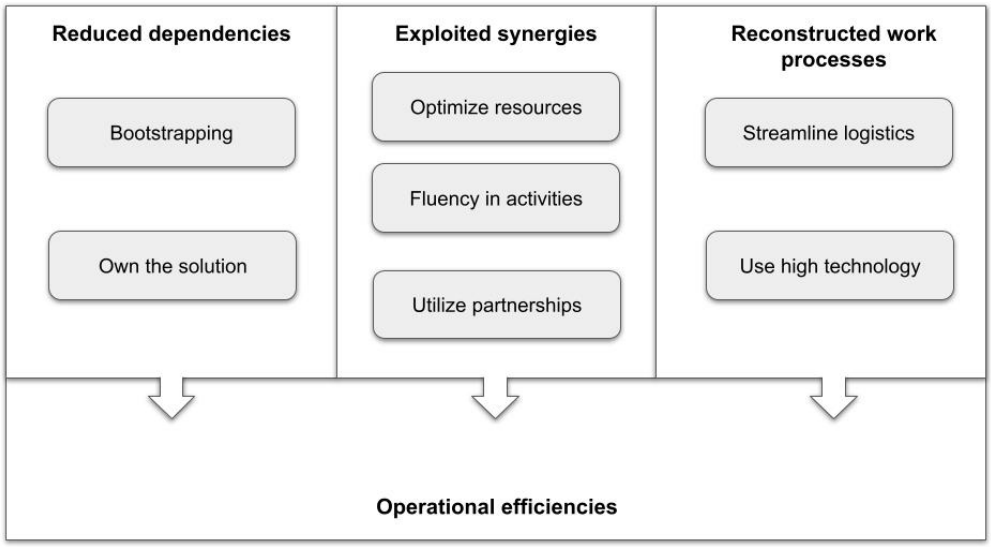

Figure 3: The Virtual Model Canvas, own work

5.3.1 Reduced dependencies

Firstly, the block "reduced dependencies" is meant to highlight in what ways and what measures the business in question is minimizing its partnerships and dependencies on other organizations. This is in turn done with two methods: Bootstrapping and owning the solution. Taking these measures and applying them to any business dependencies can be reduced and in turn, this will have effects on the operational efficiencies of the business in a beneficial way.

5.3.2 Exploited synergies

The second block "Exploited synergies" explains in what ways businesses can make the best use of and capture possible synergies in the business. This is done

with three methods: Optimizing resources, Having fluency in activities, and utilizing partnerships. By making use of these three methods virtual businesses can make sure synergies are exploited as much as possible, thereby maximizing operational efficiencies.

5.3.3 Reconstructed work processes

The third block "Reconstructed work processes" explains in what ways virtual businesses should reconstruct their work processes. This is achieved with two methods: Streamlining logistics and using high technology. The streamlining of logistics makes sure the logistics of the businesses are not wasteful and create any excessive costs while the use of high technology allows for the highest possible efficiency in regards to technology. This in turn leads to higher operational efficiencies.

5.3.4 Operational efficiencies

The final building block "Operational efficiencies" is meant to summarize the output of the above-mentioned mechanisms. By applying the mechanisms and in turn methods to a virtual business the end goal is to enable higher operational efficiencies.

6 Conclusion

The conclusions section of this thesis will summarize and present the answers to the research question as well as the goal of the thesis in its entirety. Furthermore a discussion about the thesis and the work done will be presented with contributions towards entrepreneurial learnings. Possible future research will also be discussed as well as the overall rigor of the work.

6.1 Answers to research questions

The goal of this thesis was to create enlightenment about why entrepreneurs are starting more virtual kitchens. This goal was intended to be reached by highlighting the internal mechanisms that allow them to reach higher operational efficiencies, which went in line with the aim of "research how the internal mechanisms of virtual restaurants enable high operational efficiency". Once the analyzis had been done, these mechanisms were found to be three: Reduce dependencies, Exploit synergies, and Reconstructing work processes. Operational efficiencies were in this thesis defined as produced and delivered food per square meter and per total invested monetary unit. What can be concluded is that the virtual kitchen from the single case study applies these mechanisms in multiple ways to reach higher operational efficiencies. Firstly, the amount of delivered food per square meter is kept high due to the fact that the restaurant can keep the kitchen as small as possible due to the exploited synergies and the reconstructed work processes. The exploited synergies stem from the fact that resource optimization is something that is well done and has always been a part of the mindset of the founders. Furthermore, the small kitchen, utilization of the same resources in multiple products, and product tailor-made for its way of reaching the customer allows for high fluency in activities. Summarized these mechanisms have allowed the restaurant to reach high outputs in produced and delivered foods per square meter. In re-

gards to the output per investor monetary unit, one can here as well, conclude that the restaurant makes use of these mechanisms to keep the efficiency high. Firstly, the reduction of dependencies on other parties allows the business to keep a larger share of total profits due to less being shared with investors or others dependent on businesses. Secondly, the fact that most of the technology and their solution is developed in-house allows for higher margins for the same reasons. All of these factors allow the restaurant to have a higher efficiency since less has been invested with the same amount, or more, of output.

The created Virtual Model Canvas is specified and a perfect fit for the case company in this thesis. Although the canvas was conducted with the aim that it can be used on a wide spread of businesses using or shifting to a virtual business model. The aggregate dimensions, which form the mechanisms, are spoken in general terms to try to include as many first-order themes as possible. Operational efficiencies do not have to be defined as in this thesis and the canvas could still be of assistance in a start-up and a virtual shift. Thus, this Virtual Model Canvas can be interpreted in different fashions by different businesses and still, be useful.

In conclusion, to use this Virtual Model Canvas, a business assesses the mechanisms that are being presented in this thesis. The model is then put into their context and business which will form an increase in operational efficiencies. The canvas could be slightly altered to the context it is put into, which will maximize the results. This can enable alignment in the businesses when working with virtuality and create a deeper dimension. Osterwalder's business model canvas is presented in a general way which could make it harder to actually form the business in a specific way since the model also could be interpreted in several different ways. The Virtual Model Canvas aims to specify which mechanisms to focus on in the virtual context. Using this model increases operational optimization and thus increases output per square meter as well as the monetary investment of the business. For future entrepreneurs to be able to adapt to the paradigm shift of the restaurant industry and grab a market share of the 450 billion dollar market, or the shift towards virtuality in many other industries, the work in this thesis will undoubtedly be of assistance.

6.2 Discussions

This thesis investigated the internal operations of virtual kitchens by doing a qualitative study of Bite Kitchens. We initially discussed if only focusing on one company is enough, but as these companies are still quite rare, and the scope did in our opinion not allow for more than one; we decided on studying Bite. While studying another virtual kitchen, or a regular restaurant and then comparing, would be of great interest, we felt that it would hinder and distract our ability to understand more deeply how Bite operates. The use of only one company however makes generalisation of the findings quite difficult. The big question here lies in how different the internal operations are when comparing two randomly selected virtual kitchens. As the business model needed to sustain this type of company means that operations are expected to be quite uniform, we do not think this end up damaging the relevance of our findings.

Both founders were interviewed once, and there were some difficulties in scheduling. This made the option of follow-up interviews unrealistic in practice. While more interviews could be constructive to the thesis, both were relatively long and we managed to get a good picture of the company's operations. Using an abductive method we could not be sure of the outcome of the interviews, so naturally some questions ended up being more relevant to the theoretical conclusions than others. Nonetheless, intervening delivery personnel at the company or other part-time workers could have been of interest as well. In general, we felt that the qualitative method used was successful in answering the thesis question and our end results reflect the aim of the thesis quite well.

As only one company was studied, operating in only one market, the universal reliability of this study is limited. At the same time, a lot of the operational challenges that Bite has dealt with are expected to be recurring in other similar businesses. The mechanism Bite employs therefore still possesses applicability when contextually applied. There could however be a need to further study and define all the synergies at play in virtual kitchens. As synergies arise as a result of the combination of different elements there can be a large number of possible combinations in most businesses, with different markets and actions producing

different synergies. While we feel that this study accurately captured the important synergies at Bite, there is still an opportunity for future research.

While embarking on this journey we hoped to really understand these types of businesses and also that our findings could be relevant to aspiring entrepreneurs thinking of opening a similar business. With that in mind, we are satisfied with the results, as it can be used as a guide and reference point when planning the internal operations of a virtual kitchen.

6.3 Contributions

This thesis contributes to research and entrepreneurial learnings in, not only the field of virtual kitchens but also of virtual businesses in general. This is done by creating clarity and enlightenment into what mechanisms enable these types of businesses to create organizational efficiencies. Firstly, this thesis highlights what gaps exist in the current theory about virtual kitchens, thereby creating clarity in where future research is needed. The contribution to the field of virtual kitchens is clear due to the fact that the case study and in turn empirics arrive from interviews with stakeholders in this industry. This however does not limit the learning to this very niche field of business, but on the contrary, provides learning to the field of virtual businesses in general. The concept of virtual businesses is built around, as the name implies, virtuality meaning less presence in the physical world and more presence in the virtual one. This applies to all virtual businesses. While the first-order themes relate to the work done in virtual kitchens, the mechanisms and second-order themes relate to virtuality in itself more than virtuality in virtual kitchens specifically. The results from this work are therefore generalizable and useful for ventures outside of the scope of this thesis.

6.4 Future research

Further research in this field could be applying the new Virtual Model Canvas to other virtual businesses to validate the generalizability. This could be on virtual restaurants as well as other types of businesses that are being influenced by a paradigm shift towards virtuality. Furthermore, it would be of interest to create

the right side of this Virtual Model Canvas, i.e. the value-based side. This would then form a holistic model that is specific to virtuality that could be used in a lot of businesses.

To increase the rigor of the created model a more comprehensive study could take place where a multi-case study is being conducted. This study could include a variety of virtual businesses.

Future research questions could be:

- How does the value-based side differ in a virtual business compared to a traditional business?
- Can the Virtual Model Canvas be used in every virtual context of businesses?

6.4.1 Rigor, reliability, and validity

While the authors of this thesis have tried to keep the validity and reliability of the paper high, more can always be done. For this paper to have a higher overall rigor, a multiple case study could have been done, with multiple virtual restaurants, as to be able to compare and see if the found mechanisms are the same for all of them. This however should not change the mechanisms too much as they were kept quite abstract, leaving the specifics to the 2nd order 1st order themes which might differ between restaurants. As stated previously though, this is a new business model with few actors existing, making it difficult to find other relevant case companies. Furthermore, more stakeholders could have been interviewed from the relevant case company, for example delivery drivers and kitchen workers to either strengthen the arguments of the founders or to find contrary opinions. What would have to be discussed in this case however is if these blue-collar workers know the inner workings of the processes and mechanisms researched in this thesis.

References

Backofhouse (2020), 'Back of house vs. front of house in a restaurant: understand the difference'.

Barlan-Espino, A. G. (2017), 'Operational efficiency and customer satisfaction of restaurants: Basis for business operation enhancement', *Asia Pacific Journal of Multidisciplinary Research* **5**(1), 122–132.

Bhattacherjee, A. (2012), 'Social science research: Principles, methods, and practices', *Textbooks Collection. 3* .

Biloshapka, V. & Osiyevskyy, O. (2018), 'Value creation mechanisms of business models: Proposition, targeting, appropriation, and delivery'.

Bryman, A. & Bell, E. (2019), *Business research methods*, Oxford University Press.

Businessmodelsinc (2022), 'Business model canvas.the holy grail of design thinking tools.'.
URL: *https://www.businessmodelsinc.com/en/inspiration/tools/business-model-canvas*

Cai, R., Leung, X. Y. & Chi, C. G.-Q. (2022), 'Ghost kitchens on the rise: Effects of knowledge and perceived benefit-risk on customers' behavioral intentions', *Elsevier ltd* .

Chern, B. T. P. & Ahmad, F. B. S. (2020), 'Supply chain evolution. a study of opportunities and challenges of virtual kitchens in malaysia', *International Journal of Research in Engineering, Science and Management* **7**(16), 361–368.

Chhabra, N. & Rana, A. (2021), 'Rise and the future of cloud kitchens in india: A consumer study', *International Journal of Research in Engineering, Science and Management* **4**(7), 158–165.

Coppola, D. (2023), 'Market size of the global online food delivery sector 2017-2027, by segment'. Statista.

de Albuquerque Gouveia, C. (2021), 'Virtual kitchens: A new business model in the foodservice industry', *ISCTE* .

Deutsch, J. (2017), 'Should i open a delivery-only concept? the pros and cons of launching a headless restaurant.', *Restaurant Business* **116**(10), 22–25.

Gioia, D. A., Corley, K. G. & Hamilton, A. L. (2012), 'Seeking qualitative rigor in inductive research: Notes on the gioia methodology', *Sage* **16**(1), 15–31.

Grindy, B. (2021), 'Restaurant sales continue to trend higher'. National Restaurant Association.

Hakim, M. P., Libera, V. M. D., Zanetta, L. D., Nascimento, L. G. P. & da Cunha, D. T. (2022), 'What is a dark kitchen? a study of consumer's perceptions of deliver-only restaurants using food delivery apps in brazil', *Food research international* **161**.

Hamstra, M. (2021), 'Virtual brands reshape kitchen operations.', *Nation's Restaurant News* **55**(8).

John, K. T. (2020), 'Digital disruption: the hyperlocal delivery and cloud kitchen driven future of food services in postcovid india'.

Johnson, A. L. & Lee, C.-Y. (2012), 'Operational efficiency', *ResearchGate* .

Nigro, C., Iannuzzi, E., di Santo, N. & Sisto, R. (2022), 'Food delivery, ghost kitchens and virtual restaurants: temporary or long-lasting game changers?', *Emerald Publishing Limited* .

Osterwalder, A. & Pigneur, Y. (2010), *Business Model Generation*, John Wiley Sons, Incorporated.

Roaminghunger (2020), 'Guide to ghost kitchens: All you neew to know'.

Strand, E. (2021), 'Barndomsvännerna öppnar spökkök i lund'. Sydsvenskan.

Tajvidi, R. & Tajvidi, M. (2021), 'The growth of cyber entrepreneurship in the food industry: virtual community engagement in the covid-19 era', *British Food Journa* **123**(10), 3309–3325.

Talamani, G., Li, W. & Li, X. (2022), 'From brick-and-mortar to location-less restaurant: The spatial fixing of on-demand food delivery platformization', *Elsevier ltd* .

A Appendix

Hello, our names are Anton, Morgan and Nathan and we are currently doing a thesis in our bachelor degree in entrepreneurship and innovation with the context of Virtual kitchens. In the thesis we are assessing the possibility to adapt a business model to a virtual context, and more specifically virtual restaurants. The reason why we want to interview you at Bite is because of your knowledge in this market and also of running a virtual restaurant. We will now ask questions regarding your internal operations, feel free to speak as much as you would like and tell us if there are any questions you do not want to answer. It is also fine to stop the interview at any time.

1. For how long have you been operating this restaurant?
2. Was it clear from the beginning which path you wanted to take in the restaurant business?
3. How did you choose the menu for each of the restaurant ideas?
4. What was the biggest obstacle in initiating this kind of business?
5. How do your partnerships work/look?
6. What do you consider being the key resources in your business?
7. Do you have some activities that you consider being different from running a traditional restaurant with a storefront?
8. How did the funding of the business occur?
9. What was the biggest investment in initiating the business?
10. How did you develop the application?
11. How is the application connected to your internal processes like seeing what food is being ordered?
12. What is your next step in growing the business?
13. What do you consider being your USP as a virtual restaurant compared to a traditional restaurant with a storefront?
14. How effective are your internal processes? Do you consider that virtual restaurants are more efficient compared to a traditional restaurant?