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Virtual Kitchens: A new business model in the foodservice industry

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Master in Hospitality and Tourism Management

Supervisor: Professor Ana Oliveira Brochado, ISCTE Business School, Department of Marketing, Operations and Management

September, 2021



BUSINESS
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Marketing, Operations and General Management
Department

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*“When you're running a restaurant, you have to change with the times; otherwise, the times
will change you.”*
— *Gordon Ramsay*

“Never stop learning, because life never stops teaching.”
— *Unknown*

Acknowledgments

First, I would like to thank my supervisor Ana Brochado, for all the support, guidance and motivation throughout the process of writing my master's thesis. Your words in our meetings gave me the strength to push further.

I would also like to deeply thank André Albuquerque, for all the information and help provided from day one to write this pedagogical case study about Kitch. Your advice and constant feedback were essential to end this chapter of my life (as well as your patience). Thank you André, you were tireless with me.

A sincere thank you to my family, especially to my parents and brother. Thank you for the opportunity to get this far and for always believing in me. Your love, friendship and tolerance to my mood swings were vital. Without you this would not be possible.

A word of appreciation to my roomie Jorge Natividade, for never letting me doubt what I was capable of during these five years and for always saying the right words when things seemed to be dark. You are a true friend.

Last but not least, a big thank you to Francisco Paixão that shared closely this experience with me, for his unconditional support and patience in the most discouraging moments and for making me laugh in the midst of this stressful and challenging journey. Thank you for always showing me the bright side of things.

Finally, I would like to thank all of my friends and family that, in some way, helped me to achieve this milestone in my academic career. Now, it is time to start another chapter.

Abstract

Over the last years, restaurants have been forced to adapt to new circumstances. Changing eating trends, technological advancements and fierce competition made it harder for some to stay afloat. On top of that, a global pandemic compelled everyone to shut their doors overnight, posing extra pressure on the sector. The latest consumer trend indicates strong affluence to online food delivery services and many restaurants are struggling to respond to this shift and evolve accordingly.

This pedagogical case study focuses on a business model that emerged to support restaurants to optimise off-premise operations and thrive in the digital space, known as *Virtual Kitchens*. As the object of study, it was chosen the start-up *Kitch*, one of the first companies to introduce the concept in Portugal. Thus, this paper allows to verify how innovative businesses models can arise on long-established markets and have a great impact on the evolution of supply chains. It also enables to verify the potential of VKs in the Portuguese context through the use of a Dynamic SWOT and an adapted statistical model (UTAUT). To collect the necessary data, the research combined a questionnaire to Portuguese restaurateurs (n=55), an interview with *Kitch*'s Product Manager and desk research.

The present case is expected to be a useful tool for students and companies attracted to emerging market areas, especially in the hospitality scope, providing theoretical and practical approaches to uncover new value through unforeseen partnerships and innovative business models that defy the ordinary to fit the latest market needs.

Keywords: Virtual Kitchens, Restaurants, Online Food Delivery, Business Model, Food Supply Chain, UTAUT

JEL classification system:

- Z310 - Tourism: Industry Studies
- M130 - New Firms; Start-ups

Resumo

Nos últimos anos, os restaurantes têm sido forçados a adaptarem-se a novas circunstâncias. A mudança nas tendências alimentares, os avanços tecnológicos e a concorrência intensa tornaram mais difícil para alguns manterem-se à tona. Além disso, a pandemia obrigou todos a fecharem as portas, colocando uma pressão extra no sector. A última tendência dos consumidores indica uma forte afluência aos serviços online de entrega de alimentos e muitos restaurantes estão a lutar para responder eficazmente a esta mudança e evoluir em conformidade.

Este caso de estudo pedagógico centra-se num modelo de negócio que surgiu para apoiar os restaurantes a otimizar operações de takeaway no espaço digital, designado por *Cozinhas Virtuais*. Como objeto de estudo, foi escolhida a start-up *Kitch*, uma das primeiras empresas a introduzir o conceito em Portugal. Assim, este caso permite verificar como modelos de negócios inovadores podem surgir em mercados consolidados e ter um grande impacto na evolução das cadeias de abastecimento. Permite também verificar o seu potencial no contexto português através da utilização da SWOT Dinâmica e de um modelo estatístico adaptado (UTAUT). Para a recolha de dados, a pesquisa combinou um questionário a restaurantes portugueses (n=55), uma entrevista com o Gestor de Produto da *Kitch*, e pesquisa de dados secundários.

O presente caso adivinha-se útil para estudantes e empresas interessados em áreas de mercados emergentes no âmbito da hospitalidade, facultando abordagens teóricas e práticas para descobrir novos produtos através de parcerias e modelos de negócios que desafiam o comum para se adaptarem às necessidades do mercado.

Palavras-chave: Cozinhas Virtuais, Restaurantes, Entrega Online de Alimentos, Modelo de Negócio, Cadeia de Abastecimento Alimentar, UTAUT

Sistema de classificação JEL:

- Z310 - Turismo: Estudos da Indústria
- M130 - Novas Empresas; Start-ups

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Glossary

B2B – Business-to-business

B2C – Business-to-consumer

BOH – Back-of-House

BOS – Blue Ocean Strategy

C2C – Consumer-to-consumer

Covid-19 or Covid – Coronavirus

EPOS or POS – (Electronic) Point of Sale

ERRC – Eliminate-Reduce-Raise-Create

EU – European Union

F&B – Food and Beverage

FOH – Front-of-House

FSC – Food Supply Chain

IT – Information Technology

M – Million

OFD – Online Food Delivery

PLS-SEM – Partial Least Squares Structural Equation Modelling

Q2 – Second Quarter

UK – United Kingdom

US – United States

UTAUT – Unified Theory of Acceptance and Use of Technology

VK or VKs – Virtual Kitchen(s)

Introduction

“Hospitality implies welcoming and looking after guests, assuring their comfort, satisfying their needs in accommodation and in food and drink.” (Santich, 2004, p.19). Encompassed by this definition, we perceive the restaurant and food sector as an integrative part of the hospitality industry. The Food and Beverage (F&B) services sector covers business activities that provide meals or drinks suitable for direct consumption, whether in traditional restaurants, self-service or takeaway-only establishments, with a dine-in area or not¹. Across the EU27, there are 1,5M (million) businesses in this sector, representing a collective turnover of €381 billion and responsible for €154 billion in value-added². Beyond fulfilling a basic human need, restaurants have, historically, provided ways to experience culture through cooking, shape social relations and benefit local communities’ economies (Madeira et al., 2021). Recently, this sector has been affected by several changes driven by fast-paced consumer trends, unforeseen economic forces and rapidly advancing technology, impacting how supply chains and businesses evolve and interact with customers (Deloitte, 2019). The latest consumer trend in the F&B sector lies in the increased preference for more convenient and faster ways to source a simple meal. To meet these needs, consumers are increasingly resorting to online food delivery (OFD) services. With the rise on on-demand food services, for restaurants to remain relevant in people’s lifestyles, operators have responded with several options to meet customers’ off-premise needs through enhanced operating models and more digital experiences. In 2019, 78% of US restaurant operators already claimed that off-premise programs were a strategic priority, now, it became imperative³. Still, not all restaurants are equipped to face the manifold challenges that come along with this parallel side of the business, especially under the digital scope.

This work presents a pedagogical case study about a start-up in the hospitality scope - *Kitch* - which addresses, as the main theme, a new business model for the foodservice industry - *Virtual Kitchens* (VKs). *Kitch* is a Portuguese-based start-up with the mission of empowering restaurants with physical and digital tools to simplify takeaway operations. The start-up allows restaurants to cook from specially designed kitchens for food delivery/pickup services (VKs),

¹ Eurostat. (2013, April). Archive: Food and beverage services statistics- NACE REV. 2. Retrieved April 12, 2021, from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Archive:Food_and_beverage_services_statistics_-_NACE_Rev._2

² Idem.

³ National Restaurant Association and Technomic. (2019). *Harnessing Technology to Drive Off-premise Sales* [White Paper]. Retrieved from https://restaurant.org/downloads/pdfs/research/research_offpremises_201910.pdf

and to support the VKs' operations, Kitch offers technology tools to streamline delivery orders and deliver business insights concerning the restaurants' performance. With the advent of Covid-19, OFD was even more sought by consumers accentuating the difficulties that restaurants were already experiencing regarding the off-premise operation. Thus, Kitch's digital tools have undergone further development to help restaurateurs effectively respond to the latest market needs. Rather than limiting the use of their proprietary technology only to the VKs, Kitch made it available to all restaurants that wanted to own a more simple and affordable business online and nail the off-premise operation. The troubled times that we are witnessing only came to stress the need to introduce more digitalised processes to improve businesses' resilience. This progressive digital transformation of industries is causing a reform on long-established supply chains and market rules, fomenting new business models built upon digital methods and tools (Sestino et al., 2020). The arrival of the VK model came to further prove that the F&B market is no exception to digital revolution. Thus, this case study's research objectives are the following: (1) introduce the concept of VKs; (2) understand the impact of VKs in the Food Supply Chain (FSC) as a new digitally-enabled player; (3) explore VKs' attractiveness in the Portuguese F&B market resorting to the analysis of Kitch's model.

This thesis is structured in four main chapters. The first chapter starts with the identification of the problem and with an overview of the F&B sector and OFD market. An analysis of the increasing consumer preference to eat off-premise and its impact on restaurants are also included. Then, the VK concept and its emerging market are described. Chapter one ends with a description of the start-up and the type of business model used. The second chapter refers to the methodology applied to attain the research goals, which consist of primary data (interview with Kitch's Product Manager and a survey directed to Portuguese restaurateurs) and secondary data (Kitch's website and others). The third chapter includes the pedagogical note with the target audience and the relevant academic objectives. Then, the literature review is presented to support and contextualise the case resolution. This section covers digital transformation and supply chain concepts adapted to the foodservice sector, the description of the restaurant experience and the technological system that supports it (Point of Sale) and the explanation of two key models regarding strategic marketing (Blue Ocean Strategy) and technology adoption (Unified Theory of Acceptance and Use of Technology). Chapter three ends with the presentation of the case questions and each proposed answer to consolidate and relate the theoretical and practical information of the case. The last chapter of this thesis includes the research conclusions, limitations and some suggestions for future studies.

1. Case

1.1. Problem Identification

The restaurant industry is an important source of growth, employment, and it represents a valuable cultural asset that has shaped several cities around the world. However, it is also extremely affected by recurrent pressures on consumer disposable incomes, shifts in eating trends, and like any other industry, changes in technology. The advent of online food delivery (OFD) companies is an excellent example of one of the main disruptions in this market, which further accentuated the consumers' expectations for convenience and speed regarding the consumption of restaurant meals. Owing to the success of online platforms, many restaurants have adopted an omnichannel strategy, i.e., at the same time they offer the traditional on-premise dining experience, they also provide delivery and/or pickup services using food delivery digital marketplaces. Nevertheless, this phenomenon has brought several challenges to restaurateurs that were not entirely ready to handle the off-premise demand growth, especially under the digital scope. The Covid-19 has also severely impacted hospitality services. For instance, in Portugal, at the beginning of the pandemic, 75% of restaurants ceased operations, and only 25% resorted to takeaway services (AHRESP, 2020, as cited in Madeira et al., 2021). This only came to stress out the urgent need to build more digitised business models focusing especially on streamlining takeaway operations. With the boom on off-premise consumption, several European start-ups emerged to support restaurants to expand their takeaway capabilities with a new business model known as VKs ⁴. In Portugal one of the most successful start-ups in this market segment is Kitch. The start-up Kitch stands out from other companies by showing restaurants that it is possible to offer takeaway services through digital channels, for lower costs and with greater efficiency, without losing their true identity and control over their businesses. Given the importance of restaurants to our economy, it is worth understanding how this model is reshaping the F&B sector as we know it.

1.2. A glimpse at the F&B Sector

Over the last decade, the Portuguese restaurant industry has experienced huge progress, associated with the growth of tourism, and with the increased international recognition of wines, cuisine and chefs that add value to our gastronomic culture. The restaurant industry represents 27.4% of the enterprises in the Accommodation and Food Service Activities sector, with over

⁴ Also known as cloud kitchens, ghost kitchens or dark kitchens.

32,000 businesses, and employing 170,790 people in all country. It is also responsible for €2M in value-added for our economy, adding 42% for the sector's turnover (table 1.1) ⁽¹⁾ ⁵. The majority of restaurants are located in central urban areas, mostly in Lisbon where we can find about 30% of the establishments representing 40% of the sector's total turnover (table A.1) ⁽¹⁾. This concentration of restaurants in central areas stems from the access to consumers with increased spending power characterised by diverse eating habits. Although several small and medium-sized restaurants fail during their first four years of activity (Gnonlonfoun, 2017), as table 1.1 shows, the number of restaurants in Portugal has been gradually increasing. Yet, as the density of restaurants in urban areas increases, the levels of competitiveness also intensify, saturating the market and shrinking their profit margins. Sun and Lee (2021) use the concept of hyper-competitive outlined by D'Aveni (1998) to describe the restaurant industry. They argue that this industry relies on intense competition and rapidly changing business environments, in which advantages are rapidly formed and eroded.

Table 1.1- Main indicators of the Portuguese restaurant industry.

	Empresas (nº) Enterprises (ner)			Pessoal ao Serviço (Nº) Persons employed (ner)			VVN / Turnover (M€)			VABpm / GVA (M€)		
	CAE	% na Divisão	% na Secção	CAE	% na Divisão	% na Secção	CAE	% na Divisão	% na Secção	CAE	% na Divisão	% na Secção
	NACE	% in Division	% in Section	NACE	% in Division	% in Section	NACE	% in Division	% in Section	NACE	% in Division	% in Section
	561	56	I	561	56	I	561	56	I	561	56	I
2007	30 779	37,0%	34,4%	122 469	52,3%	42,2%	4 028	54,5%	40,6%	1 457	50,4%	34,7%
2010	29 737	37,6%	34,6%	126 143	53,1%	43,0%	4 226	55,9%	42,5%	1 499	52,1%	37,8%
2017	30 748	40,5%	29,3%	146 113	57,6%	42,2%	5 562	62,4%	40,6%	2 092	61,6%	36,1%
2018	31 363	41,4%	27,7%	157 643	58,9%	42,0%	6 156	63,6%	41,4%	2 333	62,5%	36,9%
2019	32 293	42,4%	27,4%	170 790	60,3%	42,8%	6 846	64,8%	42,1%	2 620	63,8%	37,9%

Source: GEE (2021), p.1

1.3. Food Delivery Market: A growing trend

The expansion of e-commerce to the food industry and the emergence of third-party platforms focused on delivery gave rise to the OFD market. By the end of this year, the OFD market is expected to reach over €200,000M, globally ⁽²⁾. This market comprises two focal solutions for meal delivery: restaurant-to-consumer (e.g.: Domino's) and platform-to-consumer (e.g.: Uber Eats). The global market's largest segment is currently platform-to-consumer, mainly influenced by China, which experienced the fastest market growth in the world. In Europe, OFD started to excel in late 2013 ⁽³⁾. As table 1.2 demonstrates, Europe presents one of the highest

⁵According to the European Classification of Economic Activities (NACE), Section I refers to the Accommodation and Food Service Activities which includes the Food and Beverage Service Activities (division 56) and its sub-division of Restaurants and Mobile Food Service Activities (NACE 561), the relevant division for this study. The European reference framework is available on https://ec.europa.eu/competition/mergers/cases/index/nace_all.html

annual growth rates compared to the other regions of the world (11.24%), expecting to reach a market volume of €42,222M by 2025. The restaurant-to-consumer segment is the leading category in Europe, with a projected market volume of €20,461M by the end of this year ⁽²⁾. In Portugal, the OFD culture is still emerging. Yet, Portugal experienced the highest growth since Q2 (second quarter) 2018, where usage of these services has risen by 60% ⁽³⁾. For this year, the market is projected to achieve €144M in revenues (table 1.2). Portugal’s leading market segment is the platform-to-consumer delivery, reckoning an estimated revenue volume of €72M and a user penetration rate of 11%. The restaurant-to-consumer market is expected to reach a slightly lower volume of revenues (€71M), however, the percentage of active customers using this model (15.1%) is projected to exceed the platform segment this year ⁽²⁾.

Table 1.2- Revenue of the OFD market in countries/regions of interest.

Region/ Country	Projected revenue in 2021 (in million €)	Annual Growth Rate (CAGR 2021-2025)	User penetration rate in 2021	Market’s Largest Delivery Segment	Volume of Market’s Largest Delivery Segment in 2021 (in million €)
Europe	27,574	11.24%	19.6%	Restaurant-to-consumer	20,461
China	167,827	8.34%	81.6%	Platform-to-consumer	120,426
UK	9,831	9.38%	32.1%	Restaurant-to-consumer	6,919
US	28,255	9.18%	33.8%	Restaurant-to-consumer	19,959
Portugal	144	11.03%	11%	Platform-to-consumer	72

Source: Adapted from <https://www.statista.com/outlook/dmo/eservices/online-food-delivery/worldwide>

The OFD market progress has been attracting a lot of investors to capitalise on the foodservice sector’s recent digital transformation. In 2018, over €800M was injected into these companies, with Asia receiving almost 60% of funds ⁽⁴⁾. Europe is also home to some successful food delivery companies: Just Eat, Delivery Hero, Deliveroo, Takeaway.com, Glovo, among others. Most of these players emerged less than a decade ago. Deliveroo was founded in 2013, Glovo in early 2015, and Uber Eats arrived in Europe only in 2016. Uber Eats, the US-based company launched in 2014, is Europe’s most disrupting market player, being present in more than 250 cities with over 600,000 partner restaurants ⁽⁵⁾. This company skyrocketed in a short amount of time, thanks to venture capitalists that continue to have an appetite for the sector, enabling food delivery businesses to expand to other countries and reinforce their competitive position ⁽⁵⁾. This is the case of Portugal, where, for many, home food delivery is instantly

associated with Uber Eats and Glovo. These two companies hold more than 50% of the market share in the platform-to-consumer segment ⁽⁶⁾. However, the Portuguese market is quite competitive including two more international players - Takeaway.com⁶ and Bolt Foods⁷ - and several local players – Please.⁸, Bring Eat!⁹, Comeremcasa¹⁰, among others. Overall, these companies have allowed restaurants to connect more easily with customers that now can conveniently receive meals at their homes or workplaces.

1.3.1. Off-premise Consumption

Many people who do not want to cook at home, either for lack of time or convenience, have embraced the OFD services. According to a Nielsen study, one-third of global consumers are now using restaurant or meal delivery services, and 7% do so weekly ⁽⁷⁾. The consumers' restaurant occasions are increasingly off-premise using the drive-thru, pickup and delivery formats. These new preferences on eating habits have encouraged some restaurants to implement more technology-driven processes into their operating models – 79% of consumers report that restaurant technology increases convenience ⁽⁸⁾. Off-premise meal consumption is a millennial-driven trend, particularly the OFD segment (fig. B.1).

Millennials represent the largest portion of the workforce, and compared to previous generations, they have more disposable personal income, thus being the most important consumer group for the restaurant industry ⁽⁹⁾. Also, millennials tend to spend a great portion of their income on restaurant meals (Nyheim et al., 2015). In 2019, households in the EU27 spent over €500,000M on restaurant services, representing 6.9% of their total consumption expenditure. Portugal is the sixth country spending more on restaurant meals, accounting for household expenditure of 9.6% of their total consumption (fig.1.1) ⁽¹⁰⁾.

Meanwhile, the current pandemic has also accelerated the consumers' willingness to consume off-premise. Accordingly, 23% of Portuguese consumers report having used more restaurant food delivery since the pandemic started, experiencing a 25% growth in customers' usage of online channels to do so ⁽¹¹⁾. More broadly, 67% of European consumers said to have ordered food takeout online during Covid-19. However, less than half intend to stick with restaurant pickup and delivery once the health crisis subsides, demonstrating the growing desire to return to dining rooms and have a true restaurant experience ⁽¹²⁾.

⁶ <https://www.takeaway.com/pt>

⁷ <https://food.bolt.eu/pt-pt/>

⁸ <https://www.please.com.pt/>

⁹ <https://www.bringeat.pt/>

¹⁰ https://www.comeremcasa.com/?locale=pt&cookie_localok#1

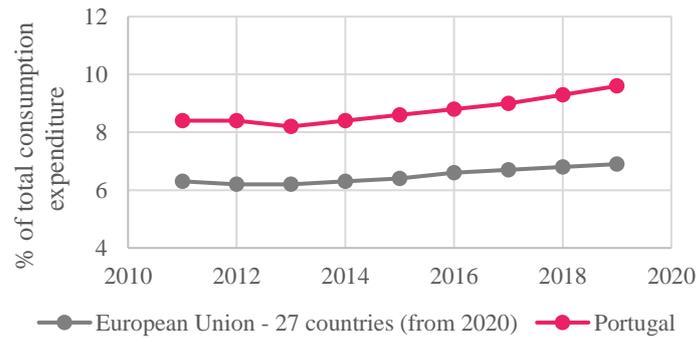


Figure 1.1- European and Portuguese spending on eating out. **Source:** Adapted from <https://ec.europa.eu/eurostat/web/products-datasets/-/tec00134>

1.3.2. Off-premise Sales: A bottleneck for restaurants

As seen, the demand for off-premise food options increasingly represents a large bulk of business for restaurants. However, in some cases, the traditional restaurant layout fails to meet these needs, since it was primarily designed to offer a complete in-person dining experience⁽¹³⁾. Thus, we decided to better understand how this activity affects the normal operation of a restaurant as well as its main hindrances. To that end, a representative sample of 55 Portuguese restaurateurs, characterised by different backgrounds (table C.1) and with diverse food concepts (fig. C.1), participated in a survey.

Of all respondents, 42 reported to offer takeaway services as opposed to 13 that do not offer this type of service (fig. C.2)¹¹. Considering the operators that offer delivery and/or pickup, just one reported to prepare the takeaway orders in another premise, benefiting 50% of sales. Though, the mainstream (41 restaurateurs) is to use the restaurant's original kitchen to prepare on- and off-premise orders (fig. C.3)¹². When asked about the drawbacks in doing so in the same premise, 9 said to not found any inconveniences. However, the majority claimed the opposite (31 respondents) (fig. C.4). According to the drawbacks revealed by the restaurateurs, it was possible to categorise the problems at operational, logistical and service quality levels regarding the most mentioned (fig.1.2)¹³. In annex C, it is also possible to see the most mentioned disadvantages by type of restaurant (fig. C.5).

¹¹ In the conducted survey, the term "takeaway services" included delivery and/or meal pickup by the customer.

¹² From the 41 restaurateurs which fulfil their on- and off-premise orders from the same kitchen, 40 of them shared the implications in doing so.

¹³ Most of the respondents answered more than one inconvenience.

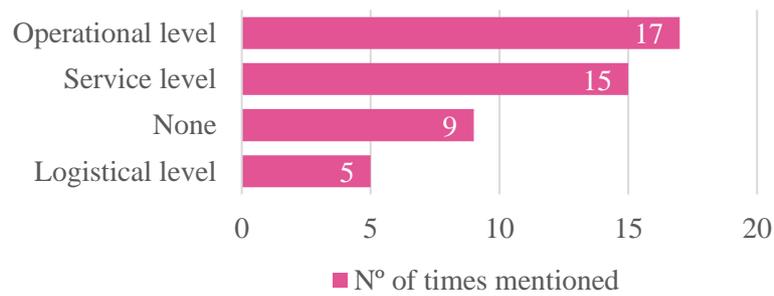


Figure 1.2- Drawbacks of preparing meals intended for takeaway in the restaurant's original kitchen. **Source:** Own elaboration

First, more than half of the operators referred having constraints mainly at an operational level, such as the lack of kitchen capacity to cope with the unpredictable volume of takeaway and on-premise orders and managing both operations from the same premise during peak hours, which requires greater productivity to satisfy both demands seamlessly. A restaurateur shared, “Basically if you have a full restaurant and a lot of online orders from Uber Eats, you practically ‘double’ the seats you have in the restaurant, and the kitchen cannot handle receiving so many orders at the same time. [...]” (Owner; World restaurant). In contrast, only 5 respondents specified the coordination of the delivery operation and the restaurant’s location as their main difficulties at a logistical level, for instance: “[...] the restaurant’s location doesn’t have a viable delivery radius with great reach.” (Manager; World restaurant).

Having an additional sales channel often means greater organisation between the back of house (BOH) and front of house (FOH) staff to ensure service quality in both order contexts. Still, as a result of the aforementioned drawbacks, 15 restaurateurs confirm a direct impact in offering takeaway services on the quality of the service given to on- and off-premise customers. On one hand, it increases the waiting time for seated customers due to the overload of work in the kitchen - “Managing requests from seated customers with the need to respond to takeaway orders, when we are at full capacity, the kitchen can take longer than ideal.” (Manager; Specific dietary restaurant). On the other hand, since many restaurants lack a planned logistical operation to accurately forecast prep and delivery times, and most of the times do not control the delivery travel, off-premise customers receive poor quality food: “Loss of quality given the time it takes between the moment it is packed and the moment it is actually consumed at the customer's home.” (F&B Director; Luxury restaurant); “Ensuring temperature and appearance during the travel” (Operations Director; Luxury restaurant). Interestingly, these answers are in line with Lan et al. (2016) study, where it was found that the restaurants which outsource third-party logistics for delivery, 47% of negative comments are related to food presentation and

temperature. In addition, when customers have these sorts of issues, ultimately blame the restaurant rather than the delivery partner ⁽¹³⁾.

Regarding to the 13 restaurateurs that do not offer takeaway services (fig. C.2), many agreed that providing off- and on-premise services at the same time jeopardises the dining experience as a whole: “Because our business is not only about the food, but also about the service and ambiance we provide to customers.” (Manager; Luxury restaurant). Some operators also revealed that the type of food produced is often inadequate for delivery. Lastly, motives related with the lack of space to organise takeaway orders and problems associated with the restaurants’ location were also mentioned (fig.1.3). In annex C it is possible to visualise the main reasons to not offer takeaway services by type of restaurant (fig. C.6).

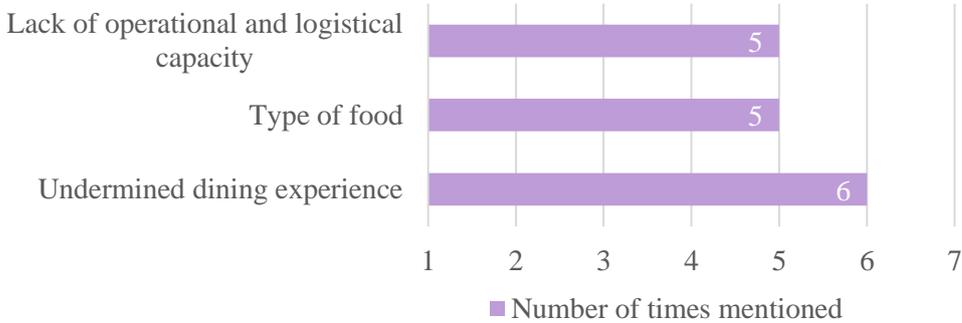


Figure 1.3- The reasons for not offering takeaway services. **Source:** Own elaboration

Despite these barriers, restaurants should be able to offer both experiences to consumers without feeling that they are losing control over their business and identity as a true hospitality service. Therefore, as off-premise continues to grow, restaurateurs need to reconsider strategies to capture this opportunity, while providing the highest standard experience to their customers.

1.4. Virtual Kitchens

As seen, the rise of the OFD market, the increased preference for off-premise consumption along with the Covid-19 pandemic further triggered the need to optimise takeaway operations for restaurants. Adding to that, the integration of digital resources has become imperative, as many restaurants saw their profits shift from offline to online. As a result, the industry realised that restaurants do not necessarily need both BOH and FOH to be profitable. Instead, an entirely new business model focused on delivery emerged, known as VK. A VK is a BOH concept purposely built to enhance the restaurants’ takeaway capabilities. In this model, virtual or existing restaurants use already equipped facilities to satisfy their takeaway orders, which are normally placed through delivery platforms, or by the VK or restaurant’s websites (Koll-Schretzenmayr, 2019). By operating through a delivery-only model, some of the traditional

restaurant's costs are eliminated. Since there is no dine-in area, FOH staff and décor are no longer an expense, as well as the equipment. Further, most VKs are located in low traffic streets where rents tend to be cheaper, but strategically positioned to serve large residential areas. The technology used by these companies is what powers the entire operation. These are extremely 'smart' kitchens built to optimise processes through data-driven approaches and tech stack development, decreasing lead times for delivery, forecasting demand to order supplies accordingly and minimising waste. Another crucial value of VKs lies on its flexibility to test new dishes and quickly adapt to changing trends, unlike regular restaurants.

VKs operate in a two-sided market, acting as a tool to ease the interactions between players. On one hand, it creates value for restaurants by offering an affordable solution to streamline their takeaway operations – B2B. On the other hand, it creates value for customers by providing them with more convenient and diverse food options for takeaway, faster deliveries and fresher food – B2C. The VK companies can also choose to partner with multiple food delivery platforms to integrate already established marketplaces and, ultimately, rely on their fleet for last-mile delivery – B2B. However, when operating in a market where there are several parties involved, it can hinder supply chain management, posing some challenges to the business. If the VK outsources to OFD companies to deal with logistics and/or digital marketing, restaurants still have to share 15%-30% of the meal price with these companies, as well as pay for the kitchen rental space and additional services. Consequently, restaurants end up having little control over delivery and marketing, which could affect the food quality and the restaurant's reputation. Moreover, the dining experience will be judged exclusively on the quality of the food delivered, as opposed to an on-premise experience that could be assessed by considering other attributes.

According to Euromonitor projections, the global VK market could be worth \$1 trillion by 2030. Asia, with the consolidation of the OFD market and the emergence of several start-ups, experienced a massive growth in delivery-only kitchens from 2019 to 2020 (fig.1.4), accounting for more than 7500 VKs in China and more than 3500 in India ⁽¹⁴⁾. Due to the presence of successful restaurants and food delivery companies in the US and Europe, the VK model has taken a considerable leap in value in the last few years. At the same time OFD companies were expanding their portfolio by building their VKs – as Deliveroo did with Deliveroo Editions ⁽¹⁵⁾ -, smaller start-ups started to arise. This generated the surge of several business models focused on covering specific market gaps on the food ecosystem. In 2019, it was invested over €2,000M in European food-tech enterprises (fig. D.1) ⁽¹⁶⁾. Still, it was in 2020 that restaurateurs were forced to embrace delivery as one of their main revenue sources and VKs experienced an

increase in popularity. The different VK models helped some operators to quickly increase their delivery capacity by using an additional kitchen space, while others saw an opportunity to create virtual-only food brands through lower overheads ⁽¹⁴⁾.

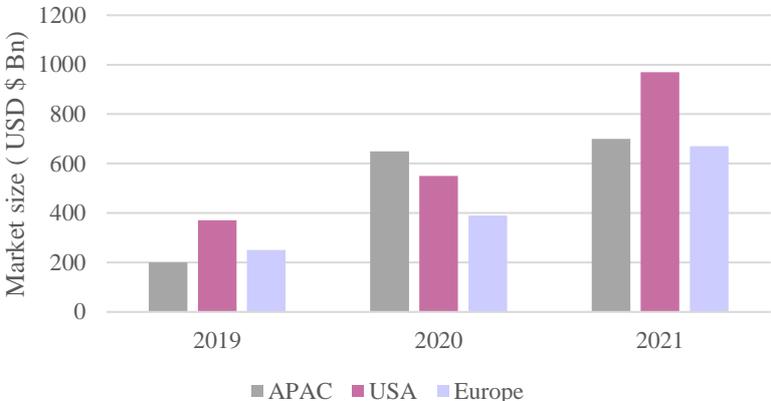


Figure 1.4- VK market size from 2019 to 2021 per world region. **Source:** Adapted from <https://www.statista.com/statistics/1078732/cloud-kitchen-market-size-us/>

1.5. Kitch: Delivering Change

1.5.1. History

In 2019, two former Uber executives responsible for the company’s launch in Portugal founded the start-up *Kitch* (fig. 1.5). Rui Bento and Nuno Rodrigues were determined to help the city’s favourite restaurants to seize the delivery growth and enable everyone to have the best food delivered to the comfort of their homes. In March 2020, at the brink of the pandemic, the food-tech start-up was launched to the public. The commitment to build delivery-only kitchens assured them the first round of investment (€1M), dictating the scalability of the business. The co-founders saw that there was too much offer of fast-food dishes on the existing platforms, and a lack of complete meals from the people’s favourite restaurants in Lisbon – either these restaurants did not see delivery as essential to their business, or they had too many barriers that could not overcome on their own. To fix this, they created three base products: (1) a *Food Marketplace* present in Uber Eats, focused on building a strong online presence with the brand *Kitch* featuring all the partner restaurants in which customers could order items and receive them in a single delivery; (2) two large spaces located in Campo Grande to host their VKs, providing an affordable infrastructure to simplify takeaway service for restaurants in need of extra capacity to respond to digital and in-house demands; (3) and *Kitch Tech*, their exclusive technology to help independent restaurants to own and make the most of their online deliveries and support the VKs’ operations.

As the atypical year of 2020 unfolded, the pandemic forced long periods of lockdown and restaurants were required to keep their doors closed, operating solely through takeaway and digital spaces. Subsequently, restaurants no longer had the capacity problem and the demand for VKs reduced. Still, as all restaurants became virtual, it only worsened their struggles of operating in the digital world. The struggles to support the high fees charged by third-party delivery apps, to retain a direct relationship with their customers, and have their food delivered on their terms. The co-founders saw an opportunity to develop their technology further and made it available to more restaurants across the cities of Lisbon and Porto.

This led Kitch to change its mission: *empower restaurants to sell their food online on their terms, through simple technology*. To achieve this goal, they developed a technology platform that focuses on providing control and simplicity to digital operations, while maximizing sales and reducing costs – all managed through a single tablet provided by the start-up. The platform has three integrated features that can be tailored to the restaurants' needs: (1) *Connect*: an app consisting of one single place to manage all delivery orders, track couriers, update menus across all delivery apps and record performance. This feature is also connected to the restaurant's POS system, avoiding unnecessary manual work; (2) *Store*: the restaurant's independent online shop to sell dishes for takeaway, while Kitch handles payments, deliveries, and customer support; (3) *Deliver*: restaurateurs decide where their meals get delivered in the city and can extend the delivery radius, reaching up four times more than delivery apps. The evolution of Kitch's technology secured them the second round of investment of €3,25M in May 2021, which helped them to serve more restaurants.



Figure 1.5- The Kitch logo. **Source:**
<https://www.kitch.io/>

1.5.2. The Market

In Portugal, the VK concept started to emerge in 2019 with the company Cookoo ⁽¹⁷⁾. When Kitch entered the market in 2020, it already had some players working on commercial kitchens for takeaway purposes and/or software to help restaurants to streamline their digital operations. In the VK segment, the most significant Portuguese companies are Cookoo, Weat and the international player Cooklane. Cookoo is a kitchen hub housing various food concepts, where people can order different meals in a single delivery. Similarly, Weat works as an incubator for new food businesses renting already equipped and certified kitchens to entrepreneurs and providing a cheaper way to test new concepts. The company Cooklane is present in several

European countries and adds to its VK business a software to manage the partners' digital presence. In the technology segment, Kitch tackles a considerable number of international players competing for each functionality of their software. For instance, the Deliverect and Otter companies, offer solutions to restaurants succeed in food delivery through the integration of delivery platforms to the restaurants' POS and the creation of personalised insights regarding customer and revenues data, being a direct competitor to the *Connect* software feature. In addition, for the *Store* functionality, the Dublin-based start-up Flipdish is the main competitor. As Kitch, Flipdish sells an ordering system for restaurants to take and manage their online orders, enabling them with greater control over their orders, brands and save on commission fees. When Kitch started to work directly with partners, they came across with some market deficiencies. Most independent restaurants are not used to technology, so they required close support to use the start-up's software and many of them demanded very specific customisations, being extremely time-consuming to put them active on the platform. Also, restaurants have difficulty in marketing their online presence, being necessary a close follow-up so that they can take advantage of their online store. On top of these constraints, VKs are expensive and take too long to be built.

1.5.3. Business Model

The recent need to digitally transform the foodservice sector has led many restaurants to feel neglected in this transition. Therefore, Kitch focuses on helping them by providing the right tools to go digital and seize the off-premise growth. The start-up's tools are based on the infrastructure and technology that they provide to partners. On one hand, they have the VKs targeting restaurants that are overwhelmed with the volume of orders and need extra capacity to serve off-premise customers (fig. E.1). On the other hand, their proprietary technology aiming restaurants that want to join the digital world without having to lose control over their business (fig. E.2).

To help the first customer segment, Kitch's VK model allows restaurants to increase their kitchen capacity or even open new locations to meet their growing off-premise demand in a much cheaper and quicker way than traditional brick-and-mortar (table E.1). The start-up offers a ready-to-go kitchen, centrally located, with all the base equipment required to start cooking immediately, and the necessary technology integrated with the restaurants' billing and POS systems to manage digital orders. Kitch also supplies restaurants with appropriate packaging for delivery and gives logistical support to partners that cook from this space. Additionally, as opposed to other VKs' models, the operators choose the chefs that work in these kitchens.

Concerning the revenue streams from VKs, Kitch charges a commission per order which may vary between 5% and 10%. Even though the partners have no costs with rent and equipment, they still have to pay for the delivery app fees in case they depend on their marketplace and delivery fleet to sell the meals, which can cost 15% to 30%.

Since the VK model is relatively new for most Portuguese restaurateurs, we went to find out what characteristics are really advantageous and important for potential users. As such, 54 restaurateurs were requested to assess whether Kitch's VK model features are in line with their actual needs regarding the off-premise operation. The results are displayed in figure E.3. Accordingly, all the presented features were found to be important or very important for their off-premise operation. The advantages regarding operational efficiency, location and the use of technology to simplify internal processes were found to be very important for Portuguese operators. Although the last two advantages show an inferior level of importance, restaurateurs still value the fact that in case of outsourcing to this model they would be able to employ their own staff to work in these delivery-only kitchens. Further, respondents also value that it would require only a small investment to join this new foodservice model and have their kitchen capacity increased almost instantly.

For the second customer group, Kitch creates value through the integrated and customisable functionalities of their software, which empowers restaurants to launch and manage multiple (direct and/or indirect) sales channels and increase their delivery radius in the different apps with just a click of a button. In this case, revenues are based on a subscription model charging 49€ a month with additional fees for the partner's independent online store and extended delivery radius (table 1.3).

Table 1.3 - Additional fees for the Store and Deliver features.

Store	→ 5.9% + 3€ /order (with delivery) → 5.9% /order (without delivery: pickup only or delivery fulfilled by the partner).
Deliver	→ 3.9% + 3€ + delivery apps fees/order (with delivery) → no extra fees (without delivery).

Source: Adapted from <https://www.kitch.io/>

The price that Kitch charges to partners and the transparency with which they operate are what sets them apart from food delivery companies and other food-tech businesses. This means that, despite the monthly investment in subscribing the service, Kitch offers restaurants more data and greater control over their costs and information, allowing them to earn more with their additional sales channel in the medium to long term (fig.1.6).

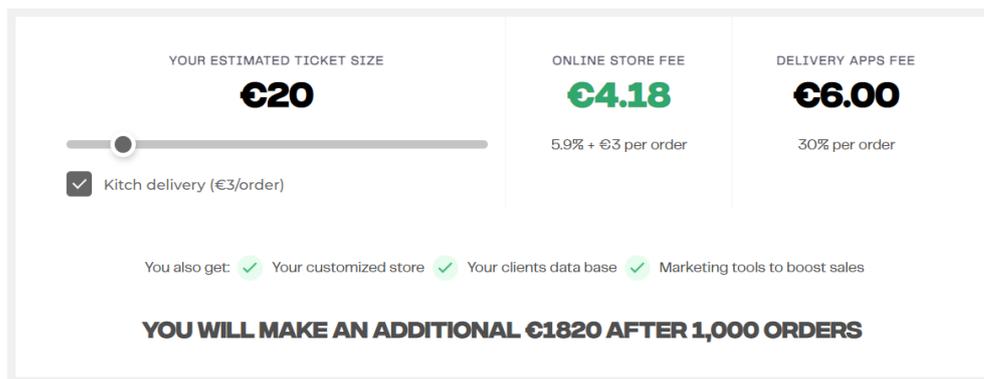


Figure 1.6- “How much can you save with your own online store?” **Source:** <https://www.kitch.io/>

As a two-sided business, Kitch depends on some key actors to effectively distribute their offerings and quickly expand. In this market, restaurants blend as both customers and partners. The more restaurants they raise, the more customers will order from their partner restaurants leading to the start-up’s sustainability. Furthermore, Kitch collaborates with other parties to deliver their services, such as delivery platforms (Uber Eats and Glovo), professionals with contacts in the restaurant sector, companies involved in the distribution of F&B equipment and POS systems’ providers to integrate with Kitch’s software and simplify digital operations for restaurants.

1.5.4. Future Plans

After a year and a half later, Kitch has more than 100 partners using its technology and more than 350 thousand meals delivered in Lisbon and Porto. Now it is gearing up to expand to other European countries. Recently, Kitch entered the Spanish market to help restaurants in Madrid to regain their independence ⁽¹⁸⁾. VKs, backed by their technology system, started to be the start-up’s focal product to solve the restaurateurs’ operational issues regarding food delivery. However, the pandemic boosted the operators’ demand for more technological tools to survive and stand out on digital marketplaces. This need marked the scale up of Kitch’s technology. Currently, besides the access to ‘smarter’ kitchens for takeaway orders, operators have the possibility to lower commissions by using a direct channel with their own brand to communicate with customers, have a wider delivery coverage and a greater control over their digital operations – and the partners’ numbers have been compelling. For instance, through the start-up’s digital tools, the restaurant Boa Bao, increased delivery sales by 80% in the first week after joining Kitch. The Asian restaurant Umikai achieved €500,000 annualized sales after three months of operations in the start-up’s VK.

For now, as revealed by the start-up's Product Manager, with all kitchens taken, the next steps are to expand internationally by making their technology suitable to multiple countries in Europe, incorporate more channels in their software (POS systems, delivery partners), and improve the overall experience for restaurants, so they can concentrate on cooking great food. Meanwhile, according to BestStartup.eu, Kitch is in the top 20 delivery companies in Portugal for its excellent performance this year and shows no signs of slowing down ⁽¹⁹⁾.

1.6. Problem Review

The variety of challenges that restaurant businesses need to tackle to stay ahead of competition have only worsened with the expansion of technology. Rethinking business strategies to thrive against competitive and economic market forces has become imperative for restaurateurs, and embracing takeaway services using a more digital approach might be a way forward. Therefore, this pedagogical case study reports the emergence of a new business model in the food ecosystem – *Virtual Kitchens* – which urges to solve the various obstacles that restaurants are experiencing today. For a more accurate analysis, we resorted to the Portuguese-based start-up *Kitch* to explore this phenomenon and understand this business model's present and future implications in the foodservice market. With that purpose, five key questions are presented:

- (i) Explain how the food ecosystem has evolved in the last decade, identifying the new beneficial downstream and upstream relationships that stemmed from VKs. Resort to the characteristics of operating in two-sided markets to base your answer and indicate where this new market player fits using figure 3.2 in chapter 3 (Literature Review).
- (ii) Considering the BOS, describe the restaurant industry and the advent of VKs. Which attributes of the restaurant industry were eliminated, reduced, raised, and created to unlock the uncontested market space of VKs? Please represent these market changes in the ERRC grid.
- (iii) Develop a Dynamic SWOT for Kitch.
- (iv) Considering the drawbacks of takeaway services posed by Portuguese restaurateurs, discuss whether Kitch's VK model is a viable solution for them. What type of restaurants should adopt this model and how can they benefit from it? Base your answer on the data available on this case study.
- (v) What might motivate Portuguese restaurateurs to use Kitch's VKs to streamline their takeaway operations? Please resort to the UTAUT model results to answer this question.

Case Annexes

Annex A: The F&B Sector

Table A.1 - Regional structure of the restaurant industry in Portugal.

	Empresas Enterprises		Pessoal ao Serviço Persons employed		VVN / Turnover		VABpm / GVA		Empresas/ Enterprises por / by NUTS II
	Nº / ner	Estrutura Regional Regional Structure (%)	Nº / ner	Estrutura Regional Regional Structure (%)	M€	Estrutura Regional Regional Structure (%)	M€	Estrutura Regional Regional Structure (%)	Peso da CAE 561 na Secção I Share of NACE 561 in Section I
Portugal	32 293	100,0%	170 790	100,0%	6 846	100,0%	2 620	100,0%	27,4%
Continente	30 671	95,0%	162 693	95,3%	6 563	95,9%	2 517	96,1%	27,6%
Norte	8 430	26,1%	44 193	25,9%	1 710	25,0%	638	24,4%	25,4%
Centro	5 904	18,3%	23 864	14,0%	983	14,4%	360	13,7%	28,3%
Lisboa	9 938	30,8%	67 274	39,4%	2 793	40,8%	1 057	40,3%	29,6%
Alentejo	2 213	6,9%	7 463	4,4%	297	4,3%	112	4,3%	28,0%
Algarve	4 186	13,0%	19 899	11,7%	780	11,4%	351	13,4%	26,7%
R. A. Açores	598	1,9%	2 725	1,6%	99	1,4%	38	1,5%	20,9%
R. A. Madeira	1024	3,2%	5372	3,1%	184	2,7%	65	2,5%	26,0%

Source: GEE (2021), p.3

Annex B: Off-premise Consumption

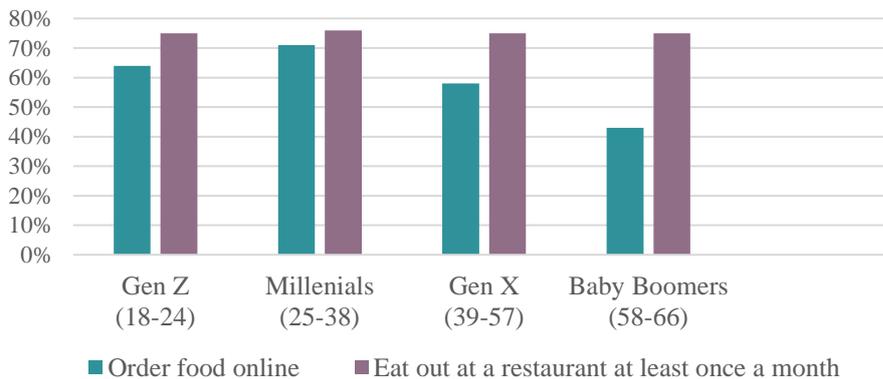


Figure B.1- Percentage of internet users in the UK and US who order food online and eat at a restaurant by generation. Source: Adapted from GlobalWebIndex (2020), p.20

Annex C: Portuguese restaurateurs

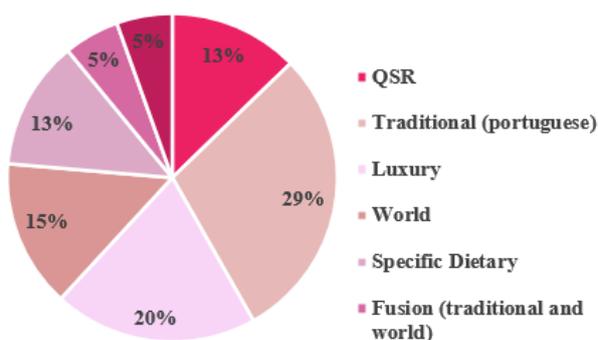


Figure C.1- Respondents' restaurant concepts. Source: Own elaboration

Table C.1- Restaurateurs' profile.

Demographic Characteristics		Restaurateurs	Percent (%)
Gender	Female	17	31%
	Male	37	67%
	N/A	1	2%
Experience in the F&B sector	<6 years	12	22%
	6-10 years	18	33%
	11-20 years	16	29%
	>20 years	9	16%
Job Position	F&B staff	9	16%
	Restaurant Managers	29	53%
	Owners/Administration	15	27%
	N/A	2	4%
Total		55	100%

Source: Own elaboration

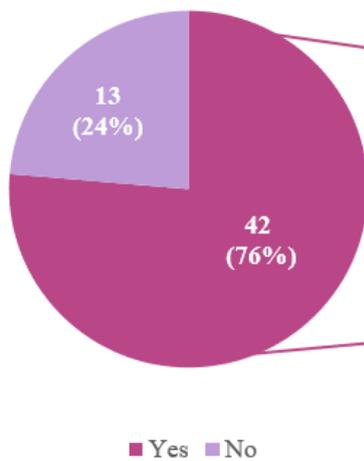


Figure C.2- Do you offer takeaway services? (n=55). Source: Own elaboration

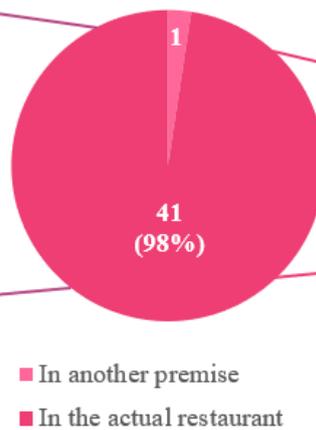


Figure C.3- Where do you prepare the meals intended for takeaway? (n=42). Source: Own elaboration

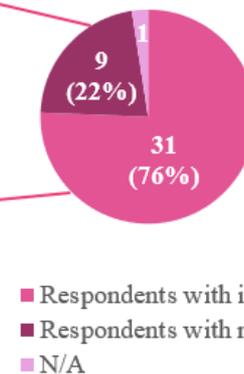


Figure C.4- Number of respondents with and without inconveniences regarding takeaway services (n=41). Source: Own elaboration

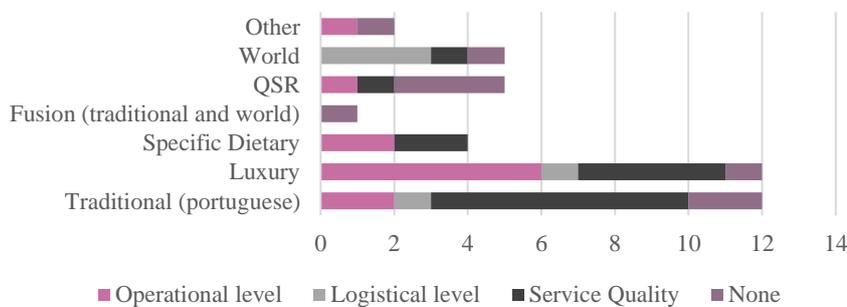


Figure C.5- Drawbacks of offering takeaway services by type of restaurant. Source: Own elaboration

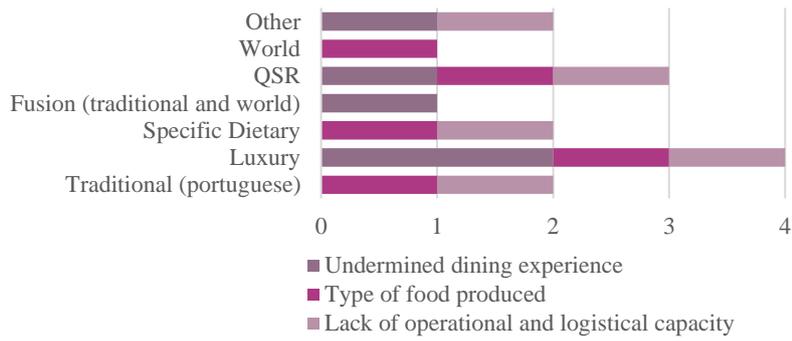


Figure C.6- Main reasons for not offering takeaway services by type of restaurant. **Source:** Own elaboration

Annex D: The Virtual Kitchen Market

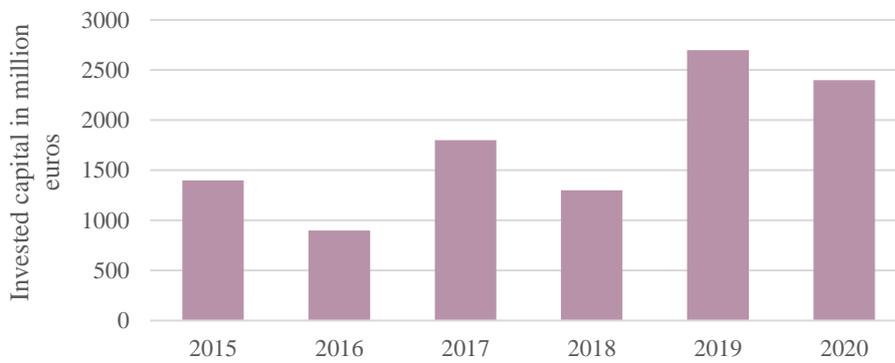


Figure D.1- Funding into food-tech businesses in million euros. **Source:** Adapted from Dealroom.co. (2021), p.6

Annex E: The start-up Kitch

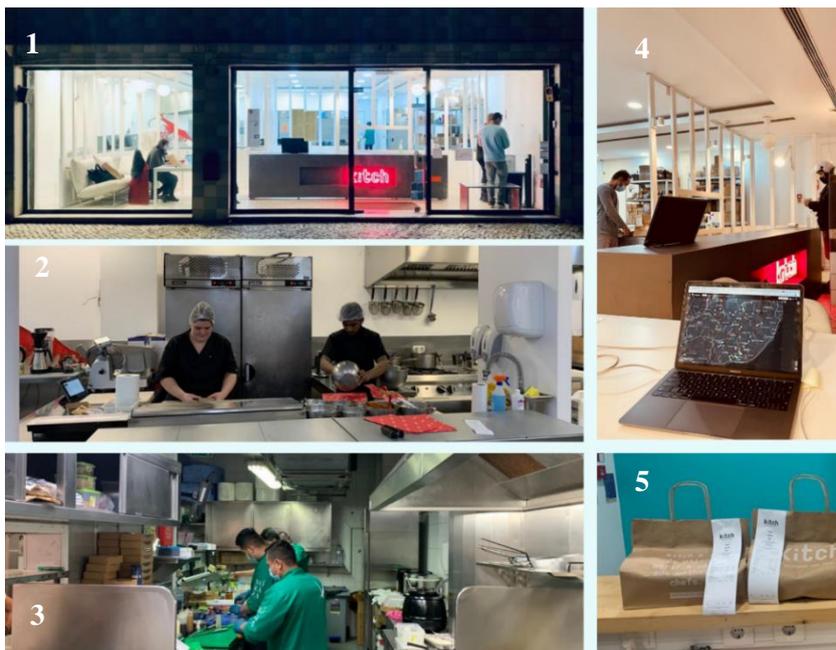


Figure E.1- Kitch's facilities: (1) Frontage; (2) Packaging area; (3) Kitchens; (4) Pickup area; (5) Bags. **Source:** Own elaboration

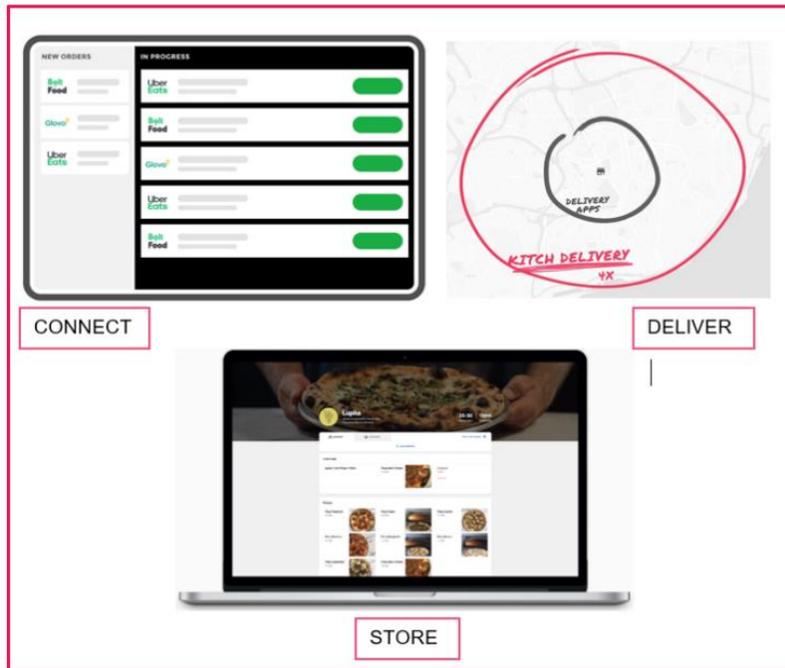


Figure E.2- Kitch technology features: Connect, Deliver, Store.
Source: Adapted <https://www.kitch.io/>

Table E.1- Traditional restaurant vs Virtual Kitchen.

	Traditional Restaurant¹	Virtual Kitchen²
Real estate	≈ 325 m ²	12 m ² (each individual kitchen)
Staff required	15 + (mostly allocated to FOH)	3 – 5 (only BOH required)
Initial investment for new location	€1M +	0% -10% of traditional restaurants (depends on custom equipment)
Time to open	≈ 1 year	2-8 weeks
Delivery time	30-40 mins	15-20 mins
Launching or testing new concepts	Difficult/ high risk	Easy/ low risk

Notes: ¹ The values of the traditional restaurant may differ according to its size.
² The displayed VK's values are related to Kitch's model.

Source: Adapted from <https://cooklane.com/pt-pt/>



Figure E.3- Kitch's VK model features according to its level of importance to Portuguese restaurateurs (average scoring; n=54): 1= "Not important" to 5="Extremely important". **Source:** Own elaboration

2. Methodology

Case studies constitute a useful tool to teach and learn in academic and organisational contexts (Lee & Saunders, 2017). Through its analysis, students and organisations can share, discuss and transfer knowledge and experiences in a structured process to find creative solutions to a specific given situation (Graham, 2010). The present pedagogical case study describes the advent of a new business model in the Portuguese foodservice industry, introduced by the start-up Kitch – *Virtual Kitchens*. In order to gather the most accurate and updated data, the case study was based on secondary and primary data.

The secondary data was used to have a wider overview of the F&B and OFD markets, and the subsequent emergence of VKs. Also, it was possible to describe its impact on the restaurant industry, providing facts and figures to support the case elaboration. For that purpose, internal – Kitch’s website – and external sources were analysed.

For the primary data it was used a mixed concurrent approach (Veal, 2018). The qualitative data was collected through an interview to the start-up’s Product Manager, with the objective of collecting key information about the start-up’s history and business model (Annex F). Regarding to the quantitative data, an online survey directed to Portuguese restaurant owners and/or employees that work hand in hand with owners was conducted (Annex G). This population was chosen since, apart from consumers who order food online, restaurants constitute the main customer target for this type of business. Thus, the survey was framed bearing in mind three main objectives: (1) *to understand the main barriers for restaurants when offering takeaway services*; (2) *to assess VKs as a potential solution to overcome those barriers*; (3) *to understand restaurateurs’ perception regarding the intention to use a VK to streamline takeaway operations*. As suggested in the literature, a pre-test of the survey was presented to experts in the foodservice sector (one Kitch’s manager and two restaurateurs), improving the layout and clarity of the final questionnaire (Kothari, 2004). After validation, the survey was uploaded on the 1st of March using Google Forms. A convenience sampling method was selected to gather the required data, reaching restaurateurs over social media and email where they could access the survey through an URL. Due to the current pandemic and subsequent restrictions, the Portuguese restaurant industry was severely hit, forcing many restaurants to cease on-premise operations and rely only on takeaway services. For that reason, an initial disclaimer was included, asking restaurateurs to imagine a pre-pandemic situation, that is, when they operated without restrictions. The final survey was structured in four sections. First, two

screening questions were used (1. *Does your restaurant offer takeaway services?* / 2. *Where do you prepare the meals intended for takeaway?*) aiming to address the respondents who do not offer takeaway services and the respondents who offer takeaway services but prepare the food in their dine-in establishment. Then, three possible open-ended questions were presented which allowed to gather insights on the main issues regarding the takeaway operation. The second section's objective was to identify what characteristics the elected potential restaurant partners' value more in Kitch's VK model. This section was outlined to support the second goal of this survey. Section three arises from the Unified Theory of Acceptance and Use of Technology (UTAUT) and its extended version (UTAUT2) proposed by Venkatesh et al. (2003) and Venkatesh et al. (2012). Since its establishment, the UTAUT model has been applied in various studies regarding the use of technology systems in the hospitality and tourism sector (table 2.1).

Table 2.1- Adoption Models (UTAUT and UTAUT2) applied to the hospitality and tourism context.

Reference	Research Context	Sample	Model	Statistical Method	Variables
San Martín & Herrero (2012)	Rural Tourism, Spain	N= 1083	Modified UTAUT	SEM (EQS 6.1 program)	PE; EE; SI; FC; Innovativeness.
Escobar-Rodríguez & Carvajal-Trujillo (2013)	Airline tickets, Spain	N=1360	Modified UTAUT-2	SEM and CFA (AMOS 20.0)	PE; EE; SI; FC; HM; PR Innovativeness; Price-saving orientation; Trust; Information Quality; Perceived Privacy; Perceived Security;
Okumus et al. (2018)	Smartphone diet apps when ordering food at restaurants, USA	N=395	UTAUT	PLS-SEM (SPSS 22.0 and Smart PLS 3.0)	PE; SI; EE; Degree of user innovativeness.
Palau-Saumell et al. (2019)	Mobile apps for restaurant reservations, Spain	N=1200	Modified UTAUT	SEM and CFA (EQS 6.1 program)	PE; EE; FC; HM; SI; Habit; Price Saving Orientation; Perceived Credibility
Lee et al. (2019)	Food delivery apps, Korea	N=340	Modified UTAUT-2	CFA and SEM (SPSS 22.0 and AMOS 22.0)	PE; EE; FC; SI; HM; Habit; PV; Information Quality
Khalilzadeh et al. (2017)	Mobile payment in restaurant industry, USA	N=412	Extended UTAUT model	SEM (SPSS 22.0 and AMOS 22.0)	Security, Trust, Risk, SI, EE, Self-Efficacy, FC, BI, Hedonic PE, Utilitarian PE

Source: Own elaboration

As a result of the pre-test made, the original UTAUT model constructs were not entirely displayed in this research, in particular, the Social Influence construct was removed, and another hypothesis was established considering a possible influence of Facilitating Conditions on Effort Expectancy of restaurateurs. Thus, the proposed framework includes as independent variables Performance Expectancy (PE) - the degree to which a restaurateur believes that using a VK will improve the restaurant's takeaway operation; Effort Expectancy (EE) - the degree of ease associated with the implementation of the restaurant's takeaway operation in a VK; Facilitating Conditions (FC) - the restaurateur's perception of the available resources to support the implementation of a VK to streamline the off-premise operation; and Price Value (PV) - the trade-off between the perceived benefits and the monetary cost associated with the use of a VK to streamline takeaway operations. The dependent variable of the research model is the Intention to use a VK (fig. 2.1).

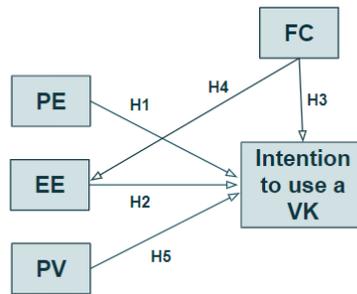


Figure 2.1- Proposed Research Model. **Source:** Adapted from Venkatesh et al. (2003) and Venkatesh et al. (2012)

To provide a value assessment towards the features of this VK model and to the constructs that might influence the intention to use it, the answers follow a five-point Likert scale concerning the level of importance (1=“Not important” to 5=“Extremely important”), and the level of agreement (1=“Strongly disagree” to 5=“Strongly agree”), respectively (Ferguson, 1941). All UTAUT model’s constructs used were addressed by a minimum of three questions in order to maximize potential explanatory variables concerning the hypothesis posed (Trochim, 2001) (table G.1). The last section was dedicated to the demographic aspects, and to a brief characterisation of the restaurant. Annex H exhibits the explanation of the proposed research model including the associated hypothesis. To assess the results, content analysis techniques (Word Cloud) were used to analyse the qualitative questions presented in section one of the questionnaire (Annex I). This analysis was after used to describe the drawbacks concerning off-premise operation in chapter 1. In the remaining quantitative questions, through the SPSS and XLSTAT programs, descriptive statistics (Annex J) and Partial Least Squares Structural Modelling (PLS-SEM) (Annex K) were employed for data analysis and hypothesis testing purposes (Hair et al., 2017). This stage of the analysis was used to support the development of the case in chapter 1, and subsequently, the answers to questions 4 and 5. The PLS-SEM has been used in previous studies regarding technology usage in tourism and hospitality contexts, proving its relevance for this research (do Valle & Assaker, 2016; Yeo et al., 2017). PLS-SEM was selected rather than covariance-based SEM, because the sample size is small (n=54), the data is distribution-free, there is multicollinearity between variables and the 10 times rule was verified (Hair et al., 2017). The PLS-SEM comprises two steps. First, the measurement model needs to be assessed based on the indicators’ reliability to ensure useful results (Hair et al., 2017). The indicators of reliability and the values that it should comply with are presented in table 2.2. The second step implies an evaluation of the structural model equation, defining the significance and relevance of the model’s relationships via bootstrapping procedures. Whether a path coefficient is relevant or not depends on the significance level (α) chosen and the generated t-values and p-values (Hair et al., 2017). In this case it was used a

significance level of 5% ($\alpha = 0.05$) to test the hypotheses. The influence of each construct can be assessed through its coefficient, where a higher value corresponds to a greater effect on the dependent variable (Hair et al., 2017).

Table 2.2- Indicators of reliability for reflective constructs.

Indicators of reliability	Criterion
Composite reliability	$0.6 \leq \text{Cronbach's alpha} \leq 0.7$ (acceptable in exploratory research) $0.7 \leq \text{Cronbach's alpha} \leq 0.9$ (satisfactory) Cronbach's alpha > 0.95 (not desirable) Cronbach's alpha < 0.6 (lack of internal consistency)
Convergent reliability	Average extracted Variance (AVE) > 0.5 Standardized outer loadings > 0.708
Discriminant reliability	Fornell-Larcker: The square root of each construct's AVE should be higher than its highest correlation with any other construct.

Source: Adapted from Hair et al. (2017)

3. Pedagogical Note

3.1. Target Audience

The present pedagogical case study is mainly targeted to undergraduate, master students and executive education programs in the field of Hospitality and Tourism Management. However, it can also be analysed by other areas, such as students from Services and Technology Management. This case study provides theoretical and practical approaches to students who want to expand and develop their knowledge on emerging market areas, especially in the F&B context. Further, it can be a useful tool for companies, entrepreneurs and restaurant operators who want to learn and get valuable insights into the evolving market of VKs in Portugal. Additionally, companies and restaurateurs can use it as an example to encourage the introduction of more technology-enabled solutions in their businesses.

3.2. Pedagogical Objectives

The main focus of this pedagogical case study is to present and analyse an emerging business model in the F&B industry based on the study of the Portuguese start-up Kitch. For that reason, this case study was developed with the following pedagogical objectives:

- Introduce the concept of VKs;
- Understand the evolution of the F&B market;
- Recognise the challenges and opportunities that technology has brought to the restaurant industry;
- Understand the new relationships stemmed by VKs as well as its position in the current food ecosystem resorting to theoretical supply chain concepts and two-sided markets' characteristics;
- Implement marketing strategies to assess the emergence of new business models in well-established markets, as the case of Blue Ocean Strategy;
- Explore the potential of VKs in the Portuguese market;
- Develop students critical and analytical thinking.

3.3. Literature Review

3.3.1. Digital Transformation

Due to the outbreak in the use of information technology (IT), companies had to rethink how to boost their initial concepts and the way they deliver value to customers (Kathuria et al.,

2020). This often includes technological transformations of crucial business operations that have strong implications on products, services, processes, sales channels and supply chains (Matt et al., 2015). Matt et al. (2015) define digital transformation as the integration of digital technology to support firms' ability to adapt quickly to supply chain disruptions, market pressures, and rapidly changing customer preferences. Additionally, digital transformation can unfold various potential benefits: increase in sales and profitability (Zhang et al., 2019), innovations in value creation (Matt et al., 2015), new forms of interactions with suppliers and customers, reduction of owned physical infrastructures and assets (Ruggieri et al., 2018), and the improvement of the overall company's competitiveness (Attaran, 2004).

3.3.1.1. Digital Platforms

The rapid spread of digital and mobile technologies leveraged the use of web-based services with the main purpose of connecting producers and users more simply and cheaply (Korhonen et al., 2017). The development of digital platforms challenged existing ecosystems with unsettling business models, however, it also enabled the removal of frictions between the different players, fomenting more interactions between them (Evans, 2003a). Ruggieri et. al (2018) defines a digital platform as “the ability to connect people, organisations and resources with the aim of facilitating the core interactions between businesses and consumers as well as assuring a greater efficiency for the business management.” (p.1210). Another study addresses this concept as a technological architecture that works as a hub, organizing information, resources, transactions and key interactions among the actors of the ecosystem (Sedera et al., 2016). Digital platforms have been recognized with different terms, such as multi-sided platforms (Evans, 2003a), two-sided platforms (Evans, 2003b) or online intermediaries (Oncini et al., 2020). Before the Platform Revolution, the dominant business model was pipeline-type companies (Parker et al., 2016). Pipelines operate on single-sided markets creating value in a linear managerial way (Oncini et al., 2020). Alternatively, digital platforms, by operating in two or multi-sided environments, facilitate various interactions and connections through the co-creation of value, working as a mediator between B2C, C2C and B2B markets (Oncini et al., 2020; Rysman, 2009). This new model decreases transactions costs between market sides, mainly due to its flexibility, rapid scale-up and ability to capture value (Abdelkafi et al., 2019; Ruggieri et al., 2018). The success of digital platforms gave rise to the concept of sharing economy, where collaborative consumption encourages better use of goods, skills and information (Szetela & Mentel, 2016). So far Airbnb and Uber are the two greatest successes of sharing economy, both create additional value for producers and consumers. As Costa (2016)

highlights in his review, “Airbnb creates value by matching private hosts with guests, facilitating payment between them through a trustworthy online system. Uber creates logistic value for drivers and passengers through its matching and pricing technology.” (p.380).

3.3.1.1.1. Operating in two-sided environments: Digital Platforms’ Characteristics

Winning platforms share some common characteristics such as network effects, co-creation of value, high scalability, strong dematerialisation and an important role in the intermediation between market sides (Korhonen et al., 2017; Oncini et al., 2020; Parker et al., 2016). Network effects refer to the importance of user participation in digital platforms. In two-sided markets, this is a necessary condition to rise the platform value, in which, every new participant creates extra value for every other member (Kathuria et al., 2020; Oncini et al., 2020). Once a critical mass of users is reached, the phenomenon becomes self-reinforcing creating a source of competitive advantage and leading to the platform survival (Korhonen et al., 2017). Ruggieri et al. (2018) prioritise the community of users/providers and their participation in value creation as one of the main features of digital platforms. This synergy enables the creation of products that are convenient and valuable for both parts of the ecosystem through their interactions. While the consumer generates data in the form of information for the firm, the company acquires the data through the digital platform. In the end, the company will not only benefit from low cost and detailed information to make the right business decisions, but will also create a product that will suit the consumers’ expectations and requirements (Troisi et al., 2018). The high scalability characteristic is highlighted in Nambisan (2017) study, defining it as “the ability to rapidly enhance the capabilities and performance at low cost and with ease” (p.1033). This means that there are no boundaries for the development in digital economy since these ecosystems are deeply oriented towards easing a continuously evolving value proposition (Nambisan, 2017). Concerning the strong dematerialization of businesses, this event has been boosted by IT, allowing more cost-effective and faster processes and interactions between supply and demand (Ruggieri et al., 2018). Regarding the intermediation of market sides characteristics, this concept will be further discussed in the next section about digital marketplaces, since it is considered to be one of the main elements to encourage greater efficiency in business processes and interactions (Costa, 2016).

3.3.1.1.2. Digital Marketplaces

Digital Marketplaces, a rapidly emerging category of platforms, is characterised by supporting and allowing transactions between two or more independent supply and demand-side members (Täuscher & Laudien, 2018). Digital marketplaces are socio-technical infrastructures that

digitally mediate market transactions between sellers and buyers on a digital platform (Kirchner & Schübler, 2019). Digital marketplaces create value in three main ways: by expanding market reach, generating lower prices and cutting operational costs (Lu & Antony, 2003). Consequently, this provides an opportunity to offer new value propositions, apply innovative business models, or even allow private individuals to create value from underused assets (Parker et al., 2016). Marketplaces, such as Airbnb and Uber, are great examples of successful matchmaker businesses that foment mutual beneficial interactions between parties (renters and apartments; taxis and riders) (Sussan & Acs, 2017). Digital marketplaces do not respect the standard market rules. Instead, the provided services are generally cheaper and transactions are performed in the form of unregulated and customised market relationships that quickly scale up thanks to network effects (Kirchner & Schübler, 2019; Langley & Leyshon, 2017). Digital marketplaces operate through algorithms. The use of algorithms helps to effectively mediate communications between players by keeping a transparent trust system and deliver services at competitive prices (Kirchner & Schübler, 2019). For instance, Airbnb uses an evaluation system based on user reviews and ratings to encourage a reliable and trustworthy atmosphere in the marketplace (Langley & Leyshon, 2017). Hence, evaluations become a key mechanism to boost network effects (Kirchner & Schübler, 2019). Due to the need in raising a mass of users to be sustainable, digital marketplaces face more complex pricing problems than regular businesses, thus creating different incentives to each side is extremely important to attract/keep them on board (Sussan & Acs, 2017). Yeo et al. (2017) highlight strategic discounts and promotions to attract the demand-side players, whereas McIntyre and Srinivasan (2017) stress customised technological tools and subsidised product development to attract suppliers.

3.3.2. Foodservice sector's digital transformation

The food industry is being taken to another level as a result of evolving technology, shift in consumer preferences and globalisation. The era of digital transformation is creating a more diverse food ecosystem, experiencing changes in the food supply chain with the rise of more players offering additional value and options for consumers with constantly evolving preferences (Kittipanya-ngam & Tan, 2020). Moreover, globalisation is encouraging food operators to adapt innovations to fit current market trends such as sustainability, healthy-eating, convenience and extremely customized food products/services (Kathuria et al., 2020). These trends, especially the rise in demanding convenience, are fomenting the emergence of new disruptive business models that go against the traditional linear process to buy food or having a meal. As Kathuria et al. (2020) state, convenience is now the “organizing principle co-

evolving with the emergence of platforms that facilitate repeated, low value, and novel transactions.” (p.397). An example of a new way to connect businesses to consumers and that meets the convenience criterion are digital platforms that offer OFD services.

3.3.2.1. Online Food Delivery (OFD)

The traditional model of food delivery used to rely mainly on this process: the customers’ did the food ordering by phone for local delivery and waited for a restaurant’s courier to carry the food to their doorstep (Kapoor & Vij, 2018). Pizza and other fast food products have been the most common type of food to order using this delivery model (Yeo et al., 2017). This type of restaurant-to-consumer delivery model owns the whole process from cooking to last-mile delivery, allowing absolute control over the customer experience (Statista, n.d-a). However, Zhang et al. (2019) state that in this case, it is required meaningful investments to design all the processes of operations since cooking, pickup point and coordination of their ordering platform as well as their own delivery fleet, without greatly enlarging the customer base. On-demand food delivery businesses started to search for ways to improve and innovate the process. This search fomented the emergence of food start-ups eager to create practical platform-to-consumer delivery models (Statista, n.d-b). The first to appear were food aggregators, easing order management and providing customer support for restaurants in return for a fee (e.g.: Zomato). These food operators allowed people to check out menus, compare prices, ratings, and place orders (Kapoor & Vij, 2018). The rest was handled by the partner restaurant that owned their delivery fleet. As users demand more practicality and speed in services, the food aggregators were forced to evolve. More players joined the delivery food market with different business models in which they incorporated payment and tracking systems and created a network of couriers stimulating the known sharing economy (e.g.: Uber Eats, Glovo, Deliveroo) (Chern & Ahmad, 2020). These restaurant intermediaries are extremely logistic focused in which the platform enables the connection between customers to local services (restaurants) in a more convenient, transparent, and rewarding manner for each side. For customers, it helps to identify the nearby restaurants, go through the menus, select the type of cuisine they want to eat, order the food and pay by just pressing a button (Kapoor & Vij, 2018; Yeo et al., 2017). For restaurants, it constitutes a new sales channel that expands their consumer base, by providing food to a wider sales territory (Kathuria et al., 2020). Also, Kapoor and Vij (2018) state that joining this new channel enhances brand awareness and brand experience, resulting in higher sales. Alternatively, it may also carry out some threats such as managing the unpredictable volume of platform orders which might affect the restaurant’s on- and off-premise coordination

(Kathuria et al., 2020), and the lack of restaurant's control on the delivery process which might harm the restaurant's evaluation due to late/missed deliveries, cold food or even unpleasant delivery personnel (He et al., 2019). Finally, Kathuria et al. (2020) note the impact of high coordination costs, conceptualized as the "effort required of a supplier to manage platform dependency" (p. 401), that may lead to cannibalization of the on-premise dining experience and subsequent attenuation of their value proposition (Zhang et al., 2019).

3.3.3. Supply Chain

Mentzer et al. (2001) define a supply chain as "a set of three or more entities (organisations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer" (p.4). Encompassed by this definition, we can identify two dimensions of a supply chain: the supply-side (upstream) which refers to the relationships maintained with suppliers; and the demand-side (downstream), which refers to the processes of sale, distribution and delivering the products/services to the final customer (Mentzer et al., 2001). The growing use of technology led companies to create synergies with other players, to reduce operating costs, increase revenues, and expand their marketplace footprint while better using their resources. This is known as a collaborative supply chain (Ross, 2010). Academics argue that collaboration through proper partnerships and information sharing in the initial stage of supply chains operations (upstream side) will reduce uncertainties and market complexities (Gunasekaran et al., 2015) and will, consequently, compensate some of the company's operational deficiencies and leverage supply chain agility - the ability to adapt quickly to market's shifts (Swafford et al., 2006). Only with the alignment of collaboration and agility, firms will be able to achieve resilience in the long run. Supply chain resilience refers to a company's ability to recover from a disruption (Craighead et al., 2007). The application of technology into supply chain models is creating more agile and scalable organisations capable of delivering convenient, reliable and personalised services to customers through advantageous partnerships and turning firms more resilient to market complexities (Inaam et al., 2016).

3.3.3.1. Food Supply Chain (FSC)

Historically, each player in the FSC was different and operated independently (Gunter et al., 2012). There was a clear and linear process to get food from the farm to the consumers' plate (fig.3.1). The process included production, processing, retailing, distribution, and consumption, which were deeply linked suffering from domino-effect (Murphy & Smith, 2009). More

recently, due to technological advancements and changes in consumer preferences, the supply chain is evolving to a more integrative and collaborative ecosystem, improving quality, reducing costs, and ensuring on-time delivery (fig.3.2) (Murphy & Smith, 2009). According to Gunter et al. (2012), the food ecosystem is better expressed as a value-based supply chain, where each element is seen as a partner that values long-term relationships and benefits from a vast exchange of information. This environment of cooperation between players results in an incremental value for the product/service along the chain (Jablonski et al., 2011). Therefore, what differentiates this new supply chain from the traditional one is its focus on the value added to the product along the chain through shared processes, rather than the scale efficiency approach that has dominated the past supply chain (Gunter et al., 2012).

The predominance of the FSC characterised by its high interdependence is blurring the traditional boundaries between players, producing more convenient alternatives for customers. For instance, restaurants currently rely on multiple parties to distribute their offerings to customers: food delivery platforms, delivery riders (Chern & Ahmad, 2020). These intermediaries appeared due to the need for constant upstream linkages between firms to meet rapidly changing consumer needs and to keep up with the globalisation phenomenon (Menkhaus et al., 2004). Although these new players created novel opportunities for innovation and competition, they also caused more challenges, since this industry deals with highly perishable food supplies and with short time windows to manage the products' flow (Murphy & Smith, 2009). Thus, changing the restaurant's offerings (e.g.: simpler menus, sustainable packaging, adapt food for delivery) or even alter the channels of distribution (e.g.: curbside pickup, add online food ordering, partner with third-party platforms) will enable them to remain competitive and relevant in a mutually beneficial business environment (Chern & Ahmad, 2020; Ketchen & Craighead, 2020). Most restaurants now operate through an omnichannel strategy, that is, restaurants now offer both online and offline service elements to become more agile and resilient to possible disruptions (Ketchen & Craighead, 2020; Teichert et al., 2020). The concept of omnichannel, according to Verhoef et al. (2015), is defined as "the synergetic management of the numerous available channels and customer touchpoints, in such a way that the customer experience across channels and the performance over channels is optimised." (p. 176). Although this dual-channel approach may make the restaurant's resources management more complex, it may also create new opportunities to win value from those resources (Ketchen & Craighead, 2020).

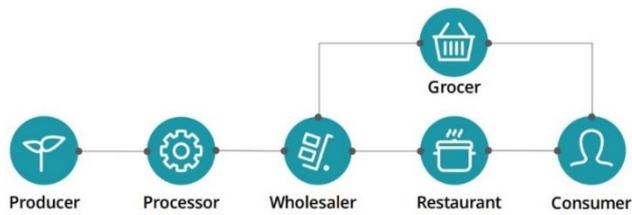


Figure 3.1- The former food ecosystem. **Source:** Deloitte (2019), p.1

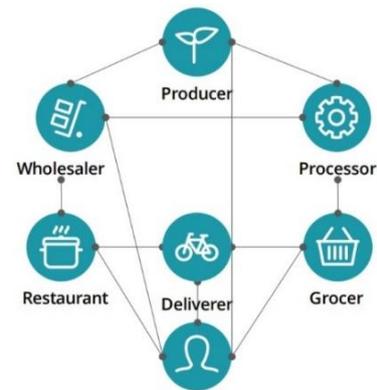


Figure 3.2- The current food ecosystem. **Source:** Deloitte (2019), p.1

3.3.4. Restaurant

3.3.4.1. Dining experience

Usually, when deciding where to eat out, consumers base their choice on the type of experience that is sought (Jensen & Hansen, 2007). One of the first attempts to describe the meal experience was developed by Campbell-Smith (1970). Accordingly, the key restaurant components influencing the dining experience are food, atmosphere, and service. Before this study, meal research was scattered, lacking solid frameworks to accurately evaluate this experience. Through a deconstruction of restaurant-related attributes, scholars were able to come up with a variety of results to help restaurateurs understand the decision-making process of consumers and, subsequently taking a step closer to achieve their optimal aim – customer satisfaction (Andersson & Mossberg, 2004; Harrington et al., 2012; June & Smith, 1987). For instance, June and Smith (1987) used liquor availability, service, food quality, atmosphere, and price to break down the dining experience. In contrast, Andersson and Mossberg (2004) approached eating at a restaurant as a multidimensional experience, assessing the relative importance of food, service, cuisine, restaurant interior, company and other guests. Nevertheless, the level of importance given to each depends on various socio-cultural factors (Longart et al., 2018), though scholars seem to agree on three main attributes: food quality, service and physical environment (Susskind, 2000).

One of the most recent research was conducted by Longart et al. (2018). The authors presented a systematic review of the past meal frameworks comparing and contrasting with the results of six focus group interviews. The new model was devised with seven categories of restaurant attributes: Food and Drink, Atmosphere, Facilities, Service, Location, Image and Price. The first category, *food and drink*, is fairly a broad concept that can be divided into distinct attributes and sub-attributes (see table 3.1). The restaurants' *atmosphere* is as well of great importance and includes mostly intangible attributes (décor and lighting, noise, music and dancing, and the ambience created by other customers) that could impact the customers' dining

experience. In contrast, the attributes in the *facilities* category are mostly tangible: parking availability, restaurant architecture, cleanliness hygiene, and restaurant tableware. The results of Longart et al. (2018) study support Harrington et al. (2012) research, where it is stated that service quality relies greatly on employee behaviour, as such, the *service*-related attributes include friendliness of staff, speed of service, attentiveness, and knowledge. *Location* also exerts a significant effect on the restaurant’s success, since it will determine its convenience and how many customers are attracted (Tzeng et al., 2002). Longart et al. (2018) identified four attributes in this category: driving distance, convenience to meet up, vicinity to the entertainment area, and public transport availability. When choosing a restaurant, its image and price range play a critical role in the customers’ decision influencing not only the intention to go, but also creating a sense of loyalty (K. C. Chang, 2013; Gupta & Cooper, 1992). This leads us to the last two categories deemed by Longart et al. (2018), *image* comprised by the chef reputation, awards, and branding, and *price* which includes the sales incentives programs used.

Table 3.1– Food and Drink related-attributes and sub-attributes.

Category	Attributes	Sub-Attributes
Food and Drink	Quality	freshness, taste
	Nutritional Aspects	salt, sugar, calories content
	Type of Cuisine	authenticity
	Variety of food	vegetarian and specials dishes
	Alcohol availability	n. a
	Presentation	n. a
	Portion size	n. a

Source: Adapted from Longart et al. (2018)

3.3.4.2. *Restaurants’ Operations: Electronic Point of Sale System (E-POS)*

Before the introduction of technological systems to ease restaurateurs lives, they relied on cash registers to manage day-to-day operations, from sales, and inventory to payrolls (Lal et al., 2018). To maintain the operation, it was necessary a vast amount of time to analyse and control the activities that support it. Often, this would create mismanaged data that was useless to help managers solve problems and foresee the next stage of their business (Manion & Demicco, 2004; Muller, 1999). According to Hughes and Weller (1989) E-POS “is a computerised system of registering customer’s purchases, collecting sales data, analysing it and using the information to make the business more efficient and effective.” (p.42). Lal et al. (2018), adds that the system manages a seamless execution of retail transactions reducing time, cost and improving supply chain performance. The authors also pointed out some benefits in adopting this system such as enhanced inventory management, improved customer relationship management and access to real-time information. In the restaurant industry, the use of the E-POS is crucial to collect valuable data at a financial and customer level (Manion & Demicco, 2004). Mandabach et al.

(2003) found that most restaurant managers report the E-POS system as the focal point of how they managed their business. A major motivator for its use, besides the absolute integration of their operations with technology, is the opportunity to increase personalisation through the obtained customer data. The stored data helps operators to make decisions about food products, pricing, promotions and channels of distribution, but also to accurately forecast consumers' eating habits or even design new strategies to offer their services (Thomas, 2011). The latest upgrade was the introduction of cloud-based POS, where restaurateurs can access all the data and manage the restaurant using any device (mobile, tablet, computer) with an internet connection (Adewumi et al., 2015).

3.3.5. *Blue Ocean Strategy (BOS)*

The concept of BOS was devised by Kim and Mauborgne (2004) in one of the most impactful books in the field of strategic marketing. Several scholars and managers have addressed this concept to find sources of sustainable competitive advantages in the hospitality and tourism domain (Priilaid et al., 2020; Yang, 2012). The authors use two types of oceans as a metaphor to describe the market universe – *red* and *blue oceans*. The red ocean represents the known market space. In this environment, companies compete in industries where boundaries and rules are already defined. This often involves overcoming an intense level of competition by pursuing low cost or differentiation strategies to grab a bigger share of existing demand and, ultimately, outperform the other players. As the market gets crowded, prospects for growth and profits decrease. Thus, the term red ocean symbolizes the “bloodbath” that an extremely competitive market can sometimes feel like (Kim & Mauborgne, 2005). In contrast, the blue ocean stands for all the industries not in existence today, i.e., an unexplored market space where there are no rules and boundaries yet. The expression of ‘blue ocean’ was selected to describe the wider potential of a market that is vast, profound and powerful in terms of opportunity and progress. The BOS works under the premise of creating new demand by making the competition irrelevant through simultaneously pursuing low cost and differentiation strategies (Kim & Mauborgne, 2005). Commonly, blue oceans are created within red oceans by challenging existent market boundaries. However, a completely new industry can also emerge as a blue ocean, as eBay did with online auctions (Jeon et al., 2008). In an attempt to make BOS an actionable strategic tool to unlock new markets within the red oceans, Kim and Mauborgne (2005) followed a reconstructionist view - “market boundaries are not given and can be reconstructed by the actions and beliefs of industry players” (p.108). To reconstruct new value for buyers and unlock new demand, the authors outlined a *Four Action Framework* (Eliminate,

Reduce, Raise, Create) that asks four basic questions to challenge an industry’s strategic logic and business model (table 3.2). The first two questions encourage a company to obtain insights on how to enhance a low-cost advantage against competitors. The second two actions allow a company to gain awareness into how to leverage its differentiation advantage (Yang, 2012). Further, the application of this tool can be displayed through the Eliminate-Reduce-Raise-Create (ERRC) grid which supports companies to examine every component that the industry competes on, pushing them to simultaneously follow low-cost (eliminate and reduce) and differentiation (raise and create) strategies to unlock a new blue ocean (Kim & Mauborgne, 2005).

Table 3.2- The Four-Action Framework Questions presented in the ERRC Grid.

Eliminate	Raise
Which factors that the industry has long competed on should be eliminated?	Which factors should be raised well above the industry’s standard?
Reduce	Create
Which factors should be reduced well below the industry’s standard?	Which factors should be created that the industry has never offered?

Source: Adapted from Kim and Mauborgne (2005)

3.3.6. The Theory of Acceptance and Use of Technology and its extended version

The UTAUT model was proposed by Venkatesh et al. (2003) as an improved version of the Technology Acceptance Model (TAM) (Davis, 1989), integrated with human behaviour theories, such as Theory of Planned Behaviour (Ajzen, 1991), Theory of Reasoned Action (Fishbein & Ajzen, 1975), Diffusion of Innovation (Rogers, 2003), among others. This model was devised to predict technology acceptance in organisational settings (A. Chang, 2012). The UTAUT framework includes five constructs that influence the dependent variable use behaviour (UB): behavioural intention (BI), PE, EE, SI, and FC. More specifically, BI is defined as the degree to which a person formulates a mindful plan to perform or not some specific future behaviour (Warshaw & Davis, 1985). Regarding PE, it is defined as the degree to which an individual believes that using an innovative system can improve his/her task performance (Venkatesh et al., 2003). EE stems from the perceived ease of use in TAM, which is associated with the degree of ease related to the individual’s use of a system (Davis, 1989). Regarding SI, Venkatesh et al. (2003) defined it as the degree to which an individual perceives that it is significant for others to believe that s/he should use a new technology. Lastly, the FC variable refers to the user’s perception of the available resources and organisational support for the use of a technological system (Venkatesh et al., 2012). In the original framework, PE, EE, and SI influence the BI to use new technology, unlike BI and FC which have direct positive relations

with UB. Moreover, these variables are moderated by age, gender, experience, and voluntariness of use (Venkatesh et al., 2003). The extended version UTAUT2 was designed to fit the consumer use context by adding three more variables: *hedonic motivation* (HM), *habit*, and *price value* (PV). HM is related to the enjoyment and fun derived from the use of technology (Brown & Venkatesh, 2005). Habit refers to the extent to which an individual believes the behaviour is automatic or based on prior learning (Venkatesh et al., 2012). Finally, according to Venkatesh et al. (2012), PV is defined as the consumers’ cognitive trade-off between the perceived benefits of the new technology and the monetary costs associated with its usage. When the perceived benefits are higher than the monetary costs, PV exerts a positive influence on the intention to use a technology (Palau-Saumell et al., 2019). Concerning the moderators, UTAUT2 eliminates the voluntariness of use (A. Chang, 2012). Therefore, as displayed in figure 3.3, the extended framework incorporates seven antecedents of an individual’s intention to use a technology, which is, in turn, moderated by age, gender and experience (Venkatesh et al., 2012).

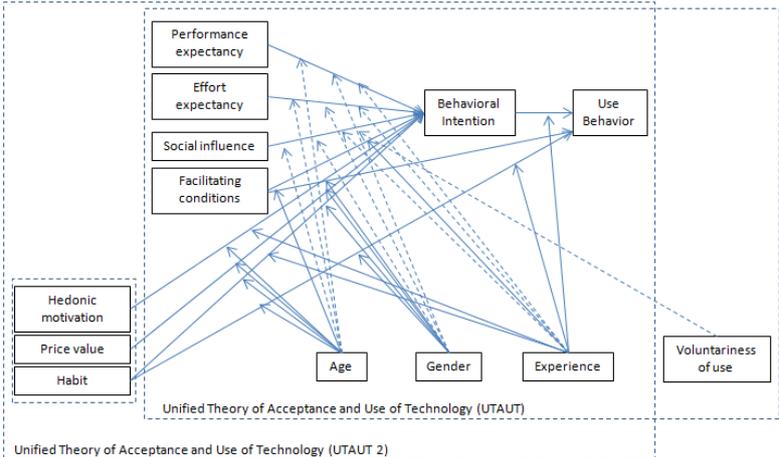


Figure 3.3– UTAUT and UTAUT2 model. Source: Adapted from Venkatesh et al. (2003) and Venkatesh et al. (2012)

3.4. Animation Plan

Session	Objectives and Tasks	Time
1 st Session	→ Introduction and development of students’ interest in the case: <ul style="list-style-type: none"> • Distribution of the case and creation of group works (4-5 students); • Professor’s explanation of key theoretical concepts and models for the case resolution; • Show videos to elucidate the VK concept and introduce Kitch (optional). 	90 min
Out of Session	→ Individual reading and comprehension of the case study.	60 min
2 nd Session	→ Answer Question 1: <ul style="list-style-type: none"> • Discussion of the digital transformation of businesses and its impact on FSC; • Identify upstream and downstream relationships; • Understand the relationships in two-sided markets’ context. → Answer Question 2: <ul style="list-style-type: none"> • Discussion of the BOS and the restaurant dining experience evolution; • Understand the emergence of VKs considering BOS tools. 	90 min

Out of Session	→ Elaboration of a PowerPoint presentation for questions 1 and 2.	60 min
3rd Session	→ Presentation of each group resolutions: <ul style="list-style-type: none"> • Oral presentations with 10 min to each group and class discussion; • Feedback and suggestions by the professor. → The teacher should present the resolution slides to consolidate information and present alternative results for questions 1 and 2.	90 min
4th Session	→ Analysis of Kitch and their VK model in the Portuguese context. → Answer Question 3: <ul style="list-style-type: none"> • Identify Kitch’s strengths, weaknesses, opportunities and threats; • Discussion of potential strategies for Kitch considering the Dynamic SWOT. → Answer Question 4: <ul style="list-style-type: none"> • Analysis of the practical information present in the case (survey results); • Identify the potential Kitch’s VK users; • Discussion of how a VK could help operators to overcome their difficulties; • Suggest possible types of restaurants that would benefit from this VK model. 	90 min
5th Session	→ Explore the main motivators for the use of a VK through statistical analysis. <ul style="list-style-type: none"> • Discussion of the UTAUT model by the professor and students; • Presentation of the research model and hypothesis by the professor; • Provide table K.1 and K.2 (Annex K) with results to students. 	60 min
6th Session	→ Analysis of the results by the students: <ul style="list-style-type: none"> • Identify the significant paths and main motivators to use a VK; • Discussion of results. 	90 min
Out of Session	→ Elaboration of a PowerPoint presentation of the resolution of questions 3, 4 and 5.	60 min
7th Session	→ Presentation of each group resolutions: <ul style="list-style-type: none"> • Oral presentation with 15 min to each group; • Class discussion on the obtainable answers and results; → Feedback and suggestions by the teacher, based on the previous presentations of each group. → The teacher should present the resolution slides to consolidate information and present alternative results for questions 3, 4 and 5.	90 min + 90 min

Source: Own elaboration

3.5. Animation Questions

Question 1: Explain how the food ecosystem has evolved in the last decade, identifying the new beneficial downstream and upstream relationships that stemmed from VKs. Resort to the characteristics of operating in two-sided markets to base your answer and indicate where this new market player fits, using figure 3.2 in chapter 3 (Literature Review).

Question 2: Considering the concept of BOS, describe the restaurant industry and the advent of VKs. Which attributes of the restaurant industry were eliminated, reduced, raised, and created to unlock the uncontested market space of VKs? Please represent these market changes in the ERRC grid.

Question 3: Develop a Dynamic SWOT for Kitch.

Question 4: Considering the drawbacks of takeaway services posed by Portuguese restaurateurs, discuss whether Kitch’s VK model is a viable solution for them. What type of restaurants should adopt this model and how can they benefit from it? Base your answer on the data available on this case study.

Question 5: What might motivate Portuguese restaurateurs to use Kitch's VK model to streamline their takeaway operations in the future? Please resort to the UTAUT model results to answer this question.

3.6. Case Resolution

Question 1: Explain how the food ecosystem has evolved in the last decade, identifying the new beneficial downstream and upstream relationships that stemmed from VKs. Resort to the characteristics of operating in two-sided markets to base your answer and indicate where this new market player fits, using figure 3.2 in chapter 3 (Literature Review).

Before the food ecosystem undergoes a digital transformation, the supply chain was set by linear and steady processes with well-defined players which operated independently in single-sided markets. This means that, although the processes are deeply linked, each entity operated through a scale efficiency approach, neglecting ways to be more agile and create efficient collaborations that, ultimately, could raise the products' value for the end consumer (Gunter et al., 2012). In single-sided markets, the food or service was produced, manufactured and placed on sale for customers on a single-track shape (Oncini et al., 2020). In such a linear and fixed environment, players are more exposed to possible disruptions putting at risk the rest of the chain (domino-effect) (Murphy & Smith, 2009). Consequently, the result was a fragile food ecosystem characterised by its lack of resilience to market complexities.

The development of digital platforms, leveraged from the ease of access to technology and constantly shifting consumer preferences changed the past food ecosystem creating more interactions between the different players (Kathuria et al., 2020). Today, food no longer has to follow its linear path and the possibility to extract value from unusual connections are endless. For example, now the end consumer can source their food directly from the producer, or even buy it in large quantities from a wholesaler, which was typically only sold to retailers (restaurants and supermarkets). Another example is the availability of already prepared meals in supermarkets, which in the past were only sold at restaurants or prepared by the consumer at home. Still, as mentioned in section 3.3.2, the main transformation in the foodservice sector in the last decade was the advent of OFD companies ("Deliverer" on fig. 3.4). These supply chain players are extremely logistical-focused and were formed to support restaurants to expand customer reach through delivery services and enhanced omnichannel strategies. For customers, OFD companies meet the convenience criterion by providing ease of order and payment, broader food options and the possibility of getting the food where and when they want (Kapoor & Vij, 2018). Unlike the past food ecosystem, the players are not seen as merely individuals,

but rather as partners which operate in two-sided markets. As explained in section 3.3.1.1, the rise of web-based services helped to remove barriers in the FSC, enabling a greater exchange of information and transparency along the chain, creating more rewarding relationships between sides (B2B, B2C, C2C), and ultimately, providing new value and experiences to the end consumer (Oncini et al., 2020). It is a self-reinforcing phenomenon, in which to meet rapidly changing market trends, there is a constant need for further upstream linkages (Menkhaus et al., 2004). For instance, due to the growing preference for food delivery services, the consumers' expectations for seamless omnichannel fulfilment and delivery implied mounting productivity and logistical pressures for restaurants. As a result, a new food player emerged to ease the interactions between restaurants, OFD companies and consumers: VKs (fig. 3.4). The maturity of OFD services and the stagnation of the restaurant business has enabled VKs to be used to eliminate operational hindrances and lower supply chain costs. To illustrate, since these kitchens resort to data-driven approaches to forecast demand, they are able to buy only the necessary supplies from producers and wholesalers, decreasing the volume of inventory held in storage. This not only reduces waste but also cuts inventory costs. In integrating a more collaborative food ecosystem defined by the interdependency of two-sided markets, VKs developed some valuable upstream (B2B) and downstream (B2C) relationships on the current FSC. However, this mutually beneficial environment, in which VKs are included, is only possible if there are tools to efficiently intermediate market sides, foment co-creation of value, and subsequently develop network effects (Korhonen et al., 2017; Parker et al., 2016).

The relationships created with OFD companies and restaurants refer to the upstream side of the chain. Concerning restaurants, this player consists of the main customer target for VKs' companies. By operating in a two-sided market, VKs strongly depend on network effects to scale up. Thus, raising a considerable number of restaurant partners becomes essential to this business model's sustainability – a good community of restaurants will attract more customers to order from these delivery-only kitchens, improving value for both restaurants and VKs. Other important traits are the co-creation of value and the intermediation role between market sides. Regarding the co-creation of value, VKs' providers design the kitchen space specifically to accommodate and optimise the takeaway operation, an issue largely shared by several operators in section 1.3.2. Depending on the restaurateurs' problems regarding this activity, VKs have the flexibility to adapt to the restaurants' requirements, whether in custom equipment, technology or even in personalised packaging. Concerning the intermediation role, VKs work as a complement to make a digital marketplace more effective and rewarding for all the parties involved. Through its technology, they can aggregate data on consumer preferences and sales,

supporting restaurants to better target different segments, adjust the menus accordingly and have better control over their business. Offering customised tools to suppliers is essential to ease the proximity between sides (McIntyre & Srinivasan, 2017). The start-up Kitch offers a set of technological tools to empower greater connections between restaurants, customers and OFD companies. For example, through the *Deliver* feature Kitch enables restaurants to maximise their customer reach by extending their delivery radius four times more than regular OFD companies. This feature is particularly relevant to allow the proximity to some otherwise non-customers for the partner restaurant. Moreover, the *Connect* app, in aggregating all data regarding digital orders in one single place enables a simpler management of the digital operation and a better transparency and exchange of information between restaurants and OFD companies. Regarding to the relationships with OFD companies, if restaurants choose to fulfil their own deliveries or have their own online store, or if the VK possesses a delivery fleet, the connections between these parties are mitigated. In contrast, as in the start-up Kitch, VKs can use already established OFD marketplaces and delivery fleets to leverage the brand online and ease their logistical process, since it is these companies' expertise. For OFD companies, the VKs' restaurant partners consist of extra platform users, and hence, on extra revenues – benefiting also from network effects.

The downstream relationships are the ones maintained with the end consumer (Mentzer et al., 2001). This new food player creates value for customers by providing them with convenient, faster and better takeout food from restaurants. The network effects and co-creation features have also important implications on the demand side of the chain. In raising more diverse restaurants to join the VK concept, customers will benefit from more options to consume food through improved takeaway services. For VKs this means a wider customer base to ensure sustainable growth, furthering network effects. Additionally, through the use of technology, these companies can enhance the co-creation of value given that they have access to the clients' information and past purchases. As such, VKs allow chefs to fully concentrate on food preparation, enabling more time and focus to personalise customers' orders, adapt promotions to specific targets and create dishes that will suit the consumers' expectations. For instance, the *Store* feature from the start-up Kitch, not only allows restaurants to communicate directly with their customers, but also to acquire customer data to create better marketing campaigns. This particular feature helps to stimulate customer loyalty which in the digital world is extremely demanding to achieve.

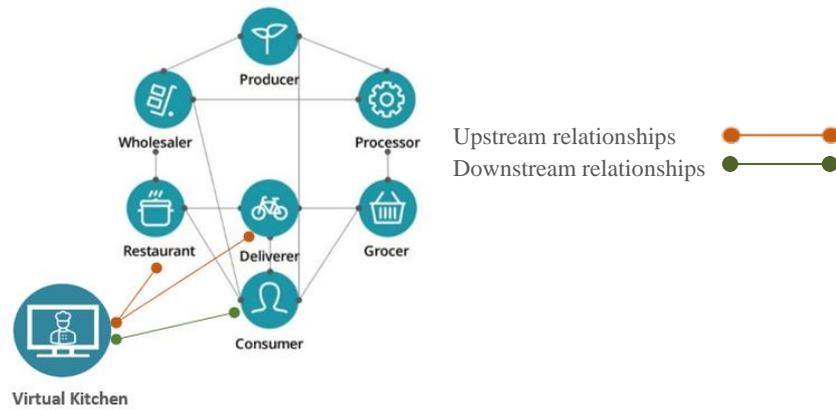


Figure 3.4– Downstream and upstream relationships stemmed from VKs in the current food ecosystem. **Source:** Adapted from Deloitte (2019), p.1

Question 2: Considering the BOS, describe the restaurant industry and the advent of VKs. Which attributes of the restaurant industry were eliminated, reduced, raised, and created to unlock the uncontested market space of VKs? Please represent these market changes in the ERRC grid.

According to Kim and Mauborgne (2004) BOS theory, the market universe is divided into two types of oceans. On one hand, the *red ocean* market space, defined by its increased number of players and intense level of competition, where companies, to win market share, have to outcompete their rivals through differentiation *or* low-cost strategies. On the other hand, the *blue ocean* market space, an unknown yet to be discovered market denoted by its endless potential for growth. In this market, the new demand is created by pursuing at the same time differentiation *and* low-cost strategies. Considering the context of this case study, the traditional restaurant industry can be seen as the red ocean market space, i.e., an industry that is far long consolidated due to its increasing number of competitors (Sun & Lee, 2021) and well-defined market rules. In the EU27, there are around 1,5M restaurants, being mostly concentrated in large capital cities. For instance, in Portugal, about 30% of the companies are located in Lisbon, which is also the largest contributor to the sector’s total turnover (40%). In such saturated markets, companies compete for a greater share of existing and limited demand. Hence, to survive in this red ocean, restaurants have to choose between differentiation or low-cost strategies. Luxury restaurants are good examples of the use of a differentiation strategy, providing unique and exclusive dining experiences to customers. In contrast, QSRs offer more convenient dining experiences through low-priced and faster meals to attract and serve more demand, following a low-cost strategy.

Nowadays, due to the consumers’ rapidly changing preferences and to the wide variety of restaurants that they can choose from, restaurants suffer from an extremely volatile demand.

This volatility poses additional challenges to the industry, which already struggles with high fixed costs, low-profit margins, and a record of high failure rates (Gnonlonfoun, 2017). As shown in table E.1, the traditional restaurant business can be fairly a capital-intensive model. Its infrastructural elements such as the physical space, décor (furniture, lighting...) and kitchen equipment entail a great deal of investment. Staffing costs can also be high since they need to hire both BOH and FOH employees. Moreover, if the restaurant is located on high traffic streets the rental costs are often expensive. Although traditional restaurants require high initial investments, the amount of effort and capital invested can make or break the customers' in-house dining experience, and eventually, the restaurant's success. In section 3.3.4.1, it is laid out the main attributes which might affect the on-premise dining experience. Following Longart et al. (2018) classification, the attributes are related to food and drink, atmosphere, facilities, service, location, price and the restaurant's image. When choosing to go to a restaurant, the type and quality of the food, the kind of service, the restaurant's atmosphere shaped by its décor and overall ambience often constitute eliminatory factors. Yet, the importance given to each attribute may differ according to the occasion or other cultural motives (Longart et al., 2018). To illustrate, the restaurant's location and the availability of nearby parking areas (facilities) can determine the level of convenience for some busier customers. Others may value restaurants with Michelin stars to celebrate specific occasions (image). While others, who eat out more regularly, may appreciate restaurants with set menus or meal discounts (price).

The globalisation phenomenon allied with the recent technological advancements have been fomenting new consumer trends on how to eat and interact with food businesses (Kathuria et al., 2020). Currently, as shown in section 1.3.1, there are more people prone to consume restaurant meals off-premise. This trend is particularly common among the millennial generation which is known for having good restaurant affluence. Though, their time-poorer schedules during the week require easier and faster options to have a restaurant meal. For this reason, the food delivery and pickup formats ordered through digital means have been continuously rising. Just in Portugal, the use of these services has risen by 60% since 2018. With off-premise outperforming on-premise sales, some restaurants were not entirely prepared to face this market alteration and truly explore the potential of these customers' needs. Further, the hyper-competitiveness that characterises this industry, along with its volatile demand and its capital-intensive model sets extra barriers to operators to scale up and navigate in this market. Consequently, rethinking foodservice business models becomes essential. By following a reconstructionist view on the current state of the industry some questions arise: *How can the market rules be reconstructed? How can we make competition irrelevant while driving costs*

down and build something exciting at the same time? As explained by Kim and Mauborgne (2005), blue oceans are often created by reassessing red oceans' existing market boundaries, that is, often new market spaces are found within already established ones. The emergence of VKs shows how a blue ocean can arise through the adjustment of some elements that the restaurant industry has long competed on. A VK is a new business model entirely focused on improving restaurants' takeaway capabilities to seize the growing millennial preference for off-premise meal consumption. To understand what factors were changed, it is possible to apply the *Four Actions Framework* (Kim & Mauborgne, 2005). This strategic tool allows us to identify what factors were eliminated, reduced, raised and created to unlock the uncontested market space of VKs (table 3.3).

Table 3.3– Four Actions Framework applied to the traditional restaurant industry for the advent of VKs.

LOW-COST STRATEGY	DIFFERENTIATION STRATEGY
<p style="text-align: center; background-color: #0056b3; color: white; margin: 0;">Eliminate</p> <ul style="list-style-type: none"> Dine-in area Décor, furniture (atmosphere-related attributes) FOH staff (service-related attributes) 	<p style="text-align: center; background-color: #0056b3; color: white; margin: 0;">Raise</p> <ul style="list-style-type: none"> Takeout food quality (food and drink- related attributes) Technology usage Logistical efficiency Branding and sales incentives (price and image-related attributes)
<p style="text-align: center; background-color: #0056b3; color: white; margin: 0;">Reduce</p> <ul style="list-style-type: none"> Fixed costs BOH staff Need for popular location (location-related attributes) Operational inefficiencies 	<p style="text-align: center; background-color: #0056b3; color: white; margin: 0;">Create</p> <ul style="list-style-type: none"> BOH- only concept Quick and affordable way for expansion Flexibility Resilient to disruptions

Source: Own elaboration

The first column indicates how this business model pursues a low-cost strategy through the elimination and reduction of attributes that are no longer relevant to the industry regarding the latest shifts. With the growing consumers' willingness to eat off-premise, this model eliminates the need for a dine-in area as well as the need to create an atmosphere with attractive décor. Also, with no seated customers to serve, FOH service is no longer required. The elimination of these elements helps restaurateurs to systematically reduce the struggles to manage the restaurants' operations (hiring staff, coordinate takeaway operations from the same premise as presential service) and to minimise the costs that setting up a restaurant involves. This delivery-only model does not need to be in a high footfall area. Ideally, VKs must be located far from busy streets but with easier access to large residential areas that centrally or even peripheral situated restaurants cannot reach so well. These areas have typically cheaper rents. In contrast, the second column provides operators insights on how to build a leap in value for both restaurants and customers through a differentiation strategy. The enhanced technology in these

kitchens helps restaurants to adopt data-driven approaches to create appropriate menus and packages for takeaway, accelerate fulfilment processes and delivery. In the VK market, restaurateurs must raise their branding strategies to stand out on digital marketplaces. To support this, restaurants can resort to sales incentives to attract more customers. In short, this model created an affordable and less risky way to open new restaurants or even expand existing brands to new locations in just 2-8 weeks. Its flexibility represents an exciting option for operators who now, more than ever, look for more resilient alternatives to market disruptions. Thus, by confronting the known restaurant attributes and simultaneously pursuing low-cost and differentiation strategies, it was possible to uncover the blue ocean market space of VKs, which now could be worth \$1 trillion by 2030 according to Euromonitor projections.

Question 3: Develop a Dynamic SWOT for Kitch.

The fragile and dynamic environment in which a start-up operates, demands a constant analysis of the external and internal forces that can positively and negatively impact the start-up’s performance. Hence, the identification of Kitch’s internal strengths and weaknesses as well as its external opportunities and threats are of great importance to accurately guide the allocation of resources and plan future strategic actions to ensure sustainable growth. For that purpose, a SWOT analysis was initially employed to list out the start-up’s main factors (table 3.4).

Table 3.4– SWOT Analysis of Kitch.

STRENGTHS (S)	WEAKNESSES (W)
<p>S1: Founders with experience in emerging markets (Uber/ Uber Eats).</p> <p>S2: Faster and cheaper way to open/ expand restaurants through VKs.</p> <p>S3: Easily increases the restaurants’ ability to sell more meals through customisable software features (<i>Store and Deliver</i>).</p> <p>S4: Provides integrations with the most prominent delivery marketplaces in the Portuguese market (Uber Eats/ Glovo).</p> <p>S5: Provides more information and control over digital operations to restaurateurs (<i>Connect</i>).</p> <p>S6: Agile and resilient business model due to its digital dimension.</p> <p>S7: Solid base of partner restaurants in Portugal (+100).</p>	<p>W1: Too dependent on POS systems’ providers and OFD companies for integrations.</p> <p>W2: VKs are expensive and time-consuming to build.</p> <p>W3: High OFD platforms fees (15%-30%).</p> <p>W4: Lack of control on last-mile delivery (OFD couriers).</p> <p>W5: High H&R costs (tech engineers).</p> <p>W6: Long onboarding process to bring new restaurants into the system.</p>
OPPORTUNITIES (O)	THREATS (T)
<p>O1: Growth of the OFD market in Europe and Portugal (CAGR ₂₀₂₁₋₂₀₂₅ of 11.24% and 11.03%, respectively).</p> <p>O2: Rise on off-premise consumption.</p> <p>O3: Investors keen on more tech-enabled food businesses (more than € 4000M invested in the last two years).</p>	<p>T1: Well established OFD companies building their own VKs in Portugal.</p> <p>T2: Independent restaurants building their own VKs.</p> <p>T3: Increased number of competitors for each functionality of Kitch’s technology.</p> <p>T4: Alleviation of lockdowns reducing food delivery orders’ volumes.</p> <p>T5: Restaurants’ financial sustainability.</p>

<p>O4: The majority of restaurateurs struggle with takeaway operations (delivery and/or pickup).</p> <p>O5: Covid-19 lockdowns accelerated the need to digitally transform restaurants.</p> <p>O6: Few competitors in the VK segment in Portugal.</p> <p>O7: Development of international market.</p>	<p>T6: Changing consumers' preferences.</p>
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Source: Own elaboration

To convert this framework into an actionable tool, we addressed each quadrant using the Dynamic SWOT, which involves a simultaneous analysis of the opportunities and threats of the environment along with the start-up's strengths and weaknesses. As a result, possible actions were suggested to Kitch use its strengths to capitalise on opportunities, avoid potential threats and mitigate weaknesses.

Strengths – Opportunities: Like any successful organisation, Kitch needs to embrace its strengths to benefit from external opportunities. Kitch's founders are two talented individuals with vast experience in emerging markets. Their past experience in Uber/ Uber Eats allows them to have a clear knowledge of crucial aspects of the VK market: food delivery, logistics and technology. This experienced leadership, which transmits to 'hungry' food-tech investors a sense of security, can drive more funding to capture the evolution of the OFD market through the construction of more VKs and through the development of further digital solutions for restaurants. Although the start-up's VKs were not getting the demand they expected, Kitch's leveraged technology helps to depend less on the success of their primary product. As the restaurateurs' need for more technological tools – also potentiated by the pandemic – continue to increase, the chances to extend operations to more cities in Portugal are favourable. Additionally, the projected growth on OFD user penetration in Europe (19.6%) stimulates a possible global market expansion as well. To capitalise on the aforementioned opportunities, Kitch's solid base of partners that use the technology and that are presenting good results could function as enablers to develop more VKs in Portugal and in other countries. The negotiation with these types of partners for a potential expansion of their kitchen capacity to cope with the large influx of online orders could be a way forward for VKs. If Kitch is able to ensure that a certain number of restaurants want to use these delivery-only spaces, it will be easier to rationalise the number of kitchens to be built and demonstrate to venture capitalists that this segment has room to grow in Portugal and in other European countries. Nevertheless, Kitch should always consider expanding first through their technology product due to its agility and ease to scale up.

Strengths – Threats: With the surge of Covid-19 in the early days of Kitch's launch, the start-up experienced a great influx of orders from forced "stay at home" customers. However, with

the successive attenuation of restrictions there is a possibility of decreasing delivery food volumes, threatening the success of VKs. In spite of the impossibility to have full capacity on on-premise service, restaurants still have a considerable number of off-premise orders, especially from digital marketplaces. Hence, the founders saw an opening to boost their technology and made it available as a SaaS (Software as a Service) model to other restaurants in need of more technological tools to stand out on the digital world, charging a monthly fee of 49€. By improving the digital dimension of the business, Kitch demonstrated the ability to quickly adapt to market disruptions and changing customers' needs, minimising other potential market pressures that may appear in the future. Another prominent threat is the possible competitors in both market segments (VKs and technology). Concerning the VKs, if well-established OFD companies (Uber Eats, Glovo, Bolt Foods, etc) engage in expanding their services through a VK model in Portugal it could negatively reflect on Kitch's market share. Still, the close relationship of the founders with Uber and the current integrations between Kitch's software and OFD delivery marketplaces mitigates the risk of this possible event in the short term. Kitch also faces several competitors in the technology segment. To cope with this imminent threat, Kitch should continuously improve each of the functionalities providing more integrations with certified POS systems and join delivery marketplaces with a consistent number of users. Further, the start-up should advertise the vast base of successful restaurants (independent and chains), emphasising cases of success and stressing out their personalisation capabilities. As seen, restaurants constitute the main target customer for Kitch. However, restaurants are known to work with very thin margins, often falling into financial hardships on their first years of operation (Gnonlonfoun, 2017). To mitigate this threat Kitch should focus on attracting big restaurant brands with a consolidated background of loyal customers to avoid the loss of consumers and partners due to their financial debilities. Also, the start-up could offer to smaller restaurants' brands development programs (webinars, workshops...) to support and acquire more skills regarding the rising digital side of the restaurant industry, boosting the possibility to increase digital sales and cope with large restaurant chains (E.g.: adapt menus for delivery, train culinary staff, create marketing campaigns).

Weaknesses– Opportunities: The Portuguese restaurateurs' need for more practical solutions to simplify takeaway operations (especially the online delivery format) and the small number of competitors in the Portuguese VK market generates a wider market gap that could be capitalised by the growing interest of investors in food-tech businesses. To fill this gap, Kitch needs to entice venture capitalists' funding to expand their real estate footprint and increase their operational and engineering teams to evolve the VKs' backup technology. Moreover, this

funding could be used to expand Kitch’s logistical capabilities through the formation of their own network of couriers. This service expansion would empower a better control of last-mile delivery, decrease coordination costs with OFD companies and enable restaurant partners to save on heavy delivery commission fees.

Weaknesses– Threats: To minimise weaknesses and avoid some of the external threats Kitch could potentiate some internal activities. First, to decrease the dependency on the OFD network of couriers and to avoid seeking more funding from investors, the start-up could encourage partners to fulfil their own deliveries or even promote pickup format through the offer of items or discounts to consumers. Second, the high commission fees from OFD marketplaces are still a burden for the financial health of restaurants and, ultimately, for Kitch as well. Thus, Kitch should boost the advantages of using the *Store* feature, demonstrating its gains in terms of customer retention and costs reduction. Besides, the preference for restaurant-to-consumer delivery is gaining track (15.1% of user penetration) against platform-to-consumer (11% of user penetration) in Portugal, indicating a possible consumers’ willingness to order directly from the restaurants’ online store rather than delivery marketplaces. Third, to minimise the intense level of competition in the technology segment, Kitch could leverage the *Deliver* feature, since it seems to be the differentiation factor from OFD companies and other food-tech start-ups. Though, this feature could be exclusively employed for restaurants who use the *Store* feature, rather than on OFD marketplaces to avoid the high fees. In addition, through this feature restaurants can reach a more diverse and wider audience supporting the restaurants’ financial performance by selling more meals. To sum up, some of the potential strategies for Kitch to consider are displayed in table 3.5.

Table 3.5– Dynamic SWOT of Kitch.

	Opportunities	Threats
Strengths	<p>S-O potential strategies:</p> <ol style="list-style-type: none"> Expand to foreign markets through their proprietary technology first. (S3, S5, S6, S7, O1, O2, O3, O7) Use the consolidated base of partner restaurants to expand the VKs product. (S2, S7, O3, O6, O7) 	<p>S-T potential strategies:</p> <ol style="list-style-type: none"> Meet competition by promoting success cases and offering more personalised services to restaurants. (S5, S6, S7, T1, T2, T3) Raise more big restaurant brands to avoid a large loss of customers. (S1, S5, S7, T2, T1, T4, T5, T6) Create development programs to support smaller restaurants to overcome their financial debilities. (S3, S4, S5, S7, T2, T5, T6)
Weaknesses	<p>W-O potential strategies:</p> <ol style="list-style-type: none"> Resort to funding to hire more engineers to build more VKs to meet the current market needs in Portugal. (W2, W5, O2, O3, O4, O6) 	<p>W-T potential strategies:</p> <ol style="list-style-type: none"> Encourage partners to fulfil their own deliveries or/and promote pickup format. (W1, W3, W4, T1, T5) Support restaurants to build more traffic into their independent online store (<i>Store</i>) through special offers to consumers. (W1, W3, T4, T5)

	2. Form their own network of couriers. (W1, W3, W4, O1, O2, O3)	3. Leverage the <i>Deliver</i> feature exclusively for Store users. (W3, T3, T5)
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Source: Own elaboration

Question 4: Considering the drawbacks of takeaway services posed by Portuguese restaurateurs, discuss whether Kitch’s VK model is a viable solution for them. What type of restaurants should adopt this model and how can they benefit from it? Base your answer on the data available on this case study.

Before Covid-19, restaurant operators were already witnessing a shift in consumer preference towards off-premise dining due to the success of OFD platforms. However, the lack of financial and logistical capabilities to adapt and quickly react to this market shift led many restaurants to outsource delivery operations to OFD companies (Uber Eats, Glovo...). With most restaurants adopting delivery services through an omnichannel approach, the pressure to keep up with competition led many operators to overlook the several problems that could arise with an additional sales channel. In section 1.3.2, it was possible to understand the main operational, logistical and service quality related difficulties that Portuguese restaurants face when offering takeaway services, as well as the main reasons why others do not engage in this side of the business at all. According to the data gathered through the survey, we can identify two potential sorts of restaurants that could benefit from the use of Kitch’s VK model: the restaurants that do not have an off-premise operation at all (13 respondents) (fig C.2); and the restaurants which already offer takeaway services and prepare the food intended for takeaway in the same premise (41 respondents) (fig. C.3). Apart from the respondents that shared their struggles in managing both operations from the same premise (31 restaurateurs), the 9 restaurateurs who reported to not found any inconveniences, can as well be considered as potential users (fig. C.4). For this type of operators, the VK model could be used to expand their brand to a different location in a cheaper and faster way than regular businesses expansions. Thus, this case study’s survey gathered a total of 54 possible VK users. Still, the restaurateurs that shared their limitations deserve a special focus to assess the viability of Kitch’s VK model as a possible solution to overcome those barriers as well as understand for what type of restaurants its adoption would be more beneficial. For that purpose, the analyses of figures E.3 from section 1.5.3, where it is displayed what potential users value in this VK model, and figures C.5 and C.6 from section 1.3.2, where it is shown the main inconveniences by type of restaurant, are particularly helpful.

First, it was found that restaurateurs strongly value that this VK would be able to simplify their restaurant’s overall coordination (fig. E.3). As identified in the case, from the respondents

who said to offer takeaway services, more than half referred that the size of the kitchen is inadequate to organise and effectively respond to offline and online orders at the same time, especially in peak hours. This disadvantage regarding the increased customers' off-premise consumption was also confirmed in Kathuria et al. (2020) study demonstrated in section 3.3.2.1. To mitigate this operational hindrance, the use of a VK would allow restaurateurs to differentiate each operation to its designated space, alleviating the kitchen staff from the unpredictable volume of orders and enabling a smoother operation thanks to the additional space to balance the influx of orders. Another interesting tool that Kitch provides to support the management of takeaway operations is the use of a technology which integrates the restaurants' online orders to their existent POS, enabling a seamless alignment between on- and off-premise operations from processing incoming orders to analysing their business performance. According to the feedback obtained from Portuguese restaurateurs, the integration of this technology with their POS system would be very important (fig. E.3). As presented in section 3.3.4.2, this result was also established in Mandabach et al. (2003) study, where it was found that most restaurateurs agreed that the use of technology, especially the POS system, removed the complexity of managing a restaurant. This feature would be particularly useful for restaurants that have a large volume of online orders interfering with the registration of on-premise orders in the POS system and delaying the FOH staff service. Through this integration, the FOH staff would not have to manually type the online orders into the system, avoiding wasting time on unnecessary work that could be employed more in customers' service. These two advantages of Kitch's VK model could be beneficial for restaurants that present constraints mainly at an operational level that end up having a great impact on customer service.

According to figure C.5, from the operators who offer takeaway services, the operational problems are more prevalent among luxury restaurants. Although these are known to be largely eat-in concepts characterised by unique gastronomic experiences and with strong brand images, the use of a VK and its associated technology would not only speed up and improve their operational flow but also reduce the negative impact that delivery/pickup services can have on customer service. The operators from luxury restaurants also highlighted the negative effects that having two completely different operations to coordinate and different customers to please can have on their on-premise service quality (fig. C.5). On one hand, they have the dine-in customers eager to have a complete restaurant experience, where the food, service, atmosphere and other attributes have to be seamlessly aligned with their high expectations. On the other hand, they have the off-site customer in which the only aspect in common with the latter is the expected food quality. Consequently, in trying to accommodate both operations in the same

kitchen creates productivity pressures for BOH and FOH staff, which often leads to unsatisfied on-premise customers due to longer waiting times, and to displeased off-premise customers who receive cold or visually unattractive food. As displayed in figure C.6, this is also one of the major reasons why some luxury restaurants do not offer takeaway services at all. Nonetheless, the operators of traditional restaurants, which provide off-premise services, were the ones who mentioned more times the problems related to the service given to on and off-premise customers as their main hindrance (fig. C.5). In these restaurants, the space is typically smaller than the others and the type of food prepared requires suitable packaging to preserve its appearance and temperature. As a result, the coordination of both services becomes challenging, increasing the possibility of disturbing on and off-premise customer service and overlooking possible ways to innovate their dishes to capture new trends due to the excessive workload. Further, as identified in figure C.6, traditional restaurants justified the absence of takeaway services due to the type of food produced and the lack of operational capacity mostly associated with their limitations regarding the kitchen space. Therefore, traditional Portuguese restaurants could also benefit from the use of a VK. It would not only enable them to use a kitchen dedicated to produce exclusively takeaway orders but also provide them with an affordable opportunity to have a space where they could test new ideas and easily adapt their food to delivery without impacting the existing operation.

According to Tzeng et al. (2002), location can determine the success of a restaurant. As such, the second most valued feature in Kitch's VK model was related to location and its cheaper rental cost (fig. E.3). Renting a space in the centre of the city with appropriate accesses, either to build an entire restaurant or just a BOH concept, is for most an unconceivable option in the short term, but crucial to successfully capture the delivery revolution that we are now witnessing. In the same way, an "efficient location to reduce delivery time" was also found to be very important to potential customers (fig. E.3). With the growing consumers' adoption of food delivery services, restaurants need to optimise this service to offer them faster and fresher food. However, there are several challenges that they face when engaging in delivery. As stated in section 3.3.3.1, this industry deals with highly delicate supplies and with short time windows to get the food until the end consumer (Murphy & Smith, 2009). As a result, the restaurant's location becomes a key factor to determine lead times for customers and the subsequent success of their off-premise process. As showed in section 1.3.2, the logistical constraints are mainly linked to the restaurant's location and with the coordination of the delivery process. From the restaurants which offer takeaway services, world restaurants were the ones who seem to face

this disadvantage the most (fig. C.5). Yet, from the restaurants which do not offer takeaway services, this obstacle was evenly shared (fig. C.6).

The restaurants located in the centre of the cities, apart from the high rental costs, usually have difficulties reaching residential areas due to their inappropriate delivery radius and tough accesses full of traffic. For that reason, most cannot encompass the audience that it needs to cover the delivery costs. In Kitch's business model, the partners that use their VKs do not have to pay a rental fee but rather a 5% or 10% commission per meal sold. Charging a commission, rather than taking a monthly fee, helps to motivate partners to get more orders and to alleviate the successive financial burdens that they have to deal daily. Besides, it is a cheaper way to expand operations for a more central location. Kitch's VKs are located in Campo Grande, a central area set with easy and faster access to more peripheral parts of the city of Lisbon and with a large audience of potential consumers of food delivery/pickup (university students/millennials). Also, Kitch handles the delivery process, removing the complexity of its coordination for partners. Therefore, even though any type of restaurant situated in places with difficult accesses would probably benefit from this extra location to expand their operations and provide delivery services to a wider audience, according to this research it would be particularly useful for world restaurants to improve their delivery process and extend their reach in a more convenient and cheaper way.

Overall, Kitch's VK model seems to be a viable solution to overcome Portuguese restaurateurs' obstacles presented in this case study, as all of its features were found to be mostly very important. The traditional restaurants struggling with the lack of kitchen capacity to organise the off-premise operation and simultaneously serve on-premise customers, as well as the world restaurants with difficulties in reaching "at home" customers due to its location, seem to be a great fit to join Kitch and benefit from this additional kitchen space with a central location. However, a special focus should be given to luxury restaurants since it may be more valuable for both parties (restaurants and Kitch). For luxury restaurants, as previously seen, the relocation of their takeaway operations to a VK would minimise the challenges regarding the growth of off-premise consumption and its impacts on on-premise customer service. It would also foment an easy and cheaper diversification of their business by including more takeaway food options or even create different tenants of delivery-only brands associated with the restaurant's famous chef. In raising more luxury restaurants Kitch could build a stronger image on digital marketplaces, working as a slipway to get more loyal customers to order from their partner restaurants.

Question 5: What might motivate Portuguese restaurateurs to use Kitch's VK model to streamline their takeaway operations? Please resort to the UTAUT model results to answer this question.

The Covid-19 pandemic caused several lockdowns around the world severely impacting hospitality services. In Portugal, all restaurants were forced to stop on-premise service and rely only on takeaway to distribute their offerings. With no in-house customers to serve, restaurants no longer had the constraints of managing both operations (on- and off-premise) from the same premise and recovered the capacity to effectively respond to the off-premise demand growth. Although Kitch was able to manage this change on the customers' needs by shifting the focal product to their exclusive technology, the start-up's primary product (VKs) still plays an important role in the Portuguese foodservice market. As restrictions start to be slowly lifted and people vaccinated, the longing to return to restaurants is undeniable. This desire may not be expressed by the food itself, because customers can as well conveniently get it through takeaway, but for the indulgence of having someone else serving the food while they can enjoy the atmosphere that it is created around the dining experience. Besides, as demonstrated in the case, the OFD market in Portugal shows no signs in slowing down. With an expected annual growth rate (CAGR₂₀₂₁₋₂₀₂₅) of 11.03% and user penetration rates of 11% for platform-to-consumer segment and 15.1% for restaurant-to-consumer for this year, it only demonstrates favourable conditions for further expansion. As such, with OFD on the rise and with customers returning to physical spaces, restaurateurs could have the same struggles as before the pandemic and the need for VKs can increase brutally. Thus, determining what might influence the operators' intention to use this model in the future is of great interest for the start-up Kitch.

By employing the UTAUT model to the present context we resorted to four main constructs: PE, EE, FC and PV. As such, the individuals' willingness to adopt a VK depends on usefulness and how well this model can improve the restaurant's off-premise operation and maintain an ideal level of performance (PE). VKs are technology-enabled kitchens built to optimise delivery. Yet, its operation is similar to a normal kitchen in which the staff is used to work. So, it should be easy to understand how to work in this kitchen and use its technology (EE). Moreover, Kitch supports operators by creating favourable conditions to expand their business towards a more efficient delivery model, dealing with issues related to space, equipment, technology, and logistics. Hence, restaurateurs will only develop intentions if they feel that these conditions are ideal to adopt this VK model (FC). Further, the use of VKs bear a monetary cost. Though, to seize the delivery opportunity operators often have to choose between the steep costs of selling through delivery marketplaces and the complexity of

managing their own delivery operations. In contrast, Kitch provides an improved way to offer takeaway services through lower overheads. Therefore, individuals will develop intentions to use a VK if they believe that this model provides more benefits at a better price to offer takeaway services in comparison to setting up and manage their own takeaway operation (PV). The results show that factors related to price (PV) and performance (PE) have relevant roles as direct drivers of the intention to use Kitch’s VK model, with PV exerting the strongest influence. In comparison to setting up their own delivery operation, operators prioritise the monetary benefits of using a VK instead – lower initial expenses, less staff, lower costs with rent and, subsequently, the opportunity to increase the profit margin per meal. In addition, restaurateurs perceive this delivery-only model as useful to leverage their performance regarding off-premise sales, especially in the fulfilment of online orders. Since most individuals referred to have constraints in offering takeaway and presential services from the same premise, it was expected that PE would have a positive impact on the INT to use a VK to streamline off-premise operations. In moving delivery and/or pickup orders to another premise, restaurants can balance the volume of workload without affecting customer service. Also, due to the model’s efficiency and central location, restaurants can deliver faster food, decrease logistics costs and boost average sales. Finally, the results also indicate that the restaurateurs’ perception of the presence of ideal conditions (FC) – fully equipped and ready-to-use space, an incorporated POS system in the kitchen to simplify order management, a dedicated pickup zone for couriers and appropriate packaging for delivery - positively influences their expectations about the degree of effort (EE) required to implement their operation in a VK. In fact, restaurateurs feel that Kitch’s VK model offers the ideal conditions that would enable them to implement their operation effortlessly. However, the conditions do not seem to be sufficient to develop the intention to actually use it in the future. Annex J and K exhibits the descriptive statistics and the statistical analysis regarding this research proposed model, respectively.

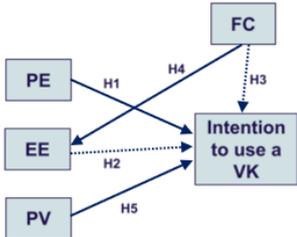


Figure 3.5- Results of the proposed research model. **Source:** Own elaboration
 _____Significant path - - - - - Non-significant path

3.7. Case Resolution Slides

The case resolution slides can be found on Annex L.

4. Conclusion

As consumers demand more convenient and seamless digital experiences, companies need to integrate technology in every step of supply chains and business operations to ensure that evolving customers' needs, and expectations are met. Due to the increasing weight on off-premise meal consumption, the VK model emerged to help restaurants better capitalise on this trend. This case study aims to add value in two main ways. First, describe the VK business model and further its analysis in the F&B market. Secondly, stimulate students and firms to search for better ways to unlock new potential revenue sources through unexpected partnerships and business model innovation. The analysis of the start-up Kitch helped to materialise the concept of VK and perceive its present and future potential in the Portuguese F&B market. Thus, through the resolution of this pedagogical case, it was possible to reach the following conclusions:

(1) As companies become more tech-savvy, the prominence of an FSC characterised by two-sided relationships is inevitable. The introduction of the VK model arose due to the need of easing connections between OFD companies, restaurants and the end consumer. This model demonstrates that to support mutually beneficial relationships and leverage FSC resilience companies should: engage in co-creation of value through information sharing, develop intermediation tools to boost proximity between the different players, and ultimately, leverage network effects to ensure sustainable growth. Additionally, the application of the BOS helped to uncover a possible successive natural evolution of the restaurant business, given the latest emphasis on off-premise, to a more flexible and cheaper digitally-enabled BOH model.

(2) Kitch is one of the first companies to integrate the Portuguese VK market. Despite having entered the market during difficult times, this start-up showed that frequently, to expand market reach, adjusting the initial business model may be vital to overcome threats and weaknesses. Thanks to the further development of their digital services, Kitch now holds a diversified revenue model that brings agility and speed to exploit evolving restaurants' needs and possible market expansions. The novelty of Kitch's VK model implied the assessment of its compatibility with the market needs. Overall, this model reveals to be relevant to overcome the Portuguese restaurateurs' barriers regarding operational, logistical and service-related problems of offering takeaway services. The potential users who provide takeaway and dine-in services from the same premise would benefit from this additional kitchen space to boost the delivery operation without interfering with the on-premise working flow. For the ones who still

do not offer takeaway services, it would allow them to obtain an additional sales channel for fewer costs and complexity. A special focus should be given to luxury restaurants, since reciprocally valuable partnerships may occur. As such, the perceived degree of usefulness of this VK model to streamline takeaway processes (PE), along with its monetary benefits (PV) are the main aspects that will motivate operators to use a VK in the future. Although there is little literature on this business model, the obtained results are consistent with prior studies on technology acceptance in the hospitality scope (Escobar-Rodríguez & Carvajal-Trujillo, 2013; Palau-Saumell et al., 2019). To conclude, it is suggested that Kitch intensifies the perception of improved PE stressing out the VKs' advantages, especially the convenience in setting apart each operation to improve not only service quality but also their productivity and performance regarding the off-premise demand. Most importantly, the start-up should continuously monitor VKs' cost structure and OFD companies' fees to offer competitive prices and consider possible sales incentives to attract more restaurants.

This case study includes some limitations. First, there is still limited scientific literature on the VK business model, thus this research consists of a preliminary study. Second, although the obtained sample was small (n=54), it can be considered representative (Hair et al., 2019). Yet, a larger sample would create even more reliable results. Third, there are several different VK's models currently in the global market however, this case was written specifically focused on Kitch's model. Thus, the questionnaire outlined considers the services provided by Kitch. The survey results may alter according to the type of VK model. Additionally, the lack of consensus in the literature regarding restaurants' classification made it difficult to create clear categories for respondents to choose from. Hence the ones exhibited were obtained based on the interviews conducted in the pre-test. So, the results may also differ according to other types of restaurants that were not showed to respondents.

Lastly, further research is required to explore the potential of VKs and its impact on the current state of the F&B market. The emergence of this more cost-effective model came to challenge the restaurant industry standards of how to operate and connect with customers. Studies regarding the possible prominence of this model to create new restaurants over the traditional one may be relevant to predict future market changes. The lack of scientific categorisation regarding VKs' models creates a gap that also may be pertinent to address. Lastly, the OFD market is still under-regulated, though some countries are starting to implement fee caps and employment regulations for OFD companies which may have an impact on how VKs operate and connect with the different stakeholders.

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Methodology and Pedagogical Note Annexes

Annex F: Interview to Kitch's Product Manager

What triggered the emergence of virtual kitchens in the market? Why do restaurants need a virtual kitchen?

It's the growth of food delivery that makes virtual kitchens a solution to a problem. Because you need capacity in the kitchen. Because you want to take couriers out of restaurants. Because you want to optimise the operation, because you want to test new things, because you want to optimise economic costs, etc. If it wasn't for food delivery, it wouldn't make sense.

How do you help restaurants to streamline their takeaway operations? What conditions do you offer them?

Equipment included and installed; POS/ Software integrated in the kitchen; Ready to use kitchen (no work required); Logistics to receive couriers included; Easy access to packaging.

What is Kitch's competitive advantage?

Regarding to virtual kitchens, we allow restaurants to open new spaces in a much more affordable and quicker way to deal with the increasingly volume of takeaway orders, offering an already prepared kitchen with all the base equipment and technology (integrated with the POS system) required. We allow a simplification of the overall restaurants' management. We also give the chance for partners to employ their own staff to ensure consistency on food quality. Besides, since these kitchens are only for takeaway orders, restaurants need less staff to operate, and there is no need for premium locations (where rents tend to be high). In fact, our strategic location allows partners to have more efficient deliveries. So, the monthly costs are much lower than a traditional restaurant. This is mostly our value proposition for the virtual kitchens. Regarding to the software, it is important to refer that we built it primarily for online ordering and not as an add-on to other technologies. It is a tailor-made product, meaning that we can leverage some features to fit the partner's needs. Our software handles everything online in an integrated manner: the direct sales channels (each restaurant's online store) and indirect sales channels (food delivery marketplaces). With just a click of a button you can launch multiple sales channels and increase your delivery radius. In other words, you can increase your ability to sell more almost effortlessly.

Can we say that Kitch operates in a two-sided market?

Yes. B2C, virtual kitchens that prepare food especially made for takeaway (consumers). B2B, infrastructure and software for restaurants and partnerships with other companies that help us to deliver our offerings.

What benefits does Kitch deliver to partners (B2B)?

Lower costs on tablets. More time to focus on the business since we simplify managing channels. Lower commissions using direct channel. Wider coverage using our delivery process. More control of the business through our dashboard.

Who are Kitch's main competitors?

We have two segments of competitors. On one hand, we have the competitors in the virtual kitchen segment such as: Weat, Cookoo, Cooklane, and all the restaurants that decide to open their own virtual kitchen. On the other hand, we have competitors for each functionality of our software. For example, the companies Deliverect and Otter for the software in general, for the online store we compete against Flipdish, and other companies that focus specifically on POS for restaurants.

What are the main challenges you have encountered in the Portuguese market?

First, most restaurants use the POS and that's where they do their accounting. To take advantage of our product, they needed to have our product integrated into the POS and, at first, it did not work. Second, restaurants need a very close support to use a new software, so it takes a long time to get them active on the platform. Third, big restaurants brands need very specific customisations, which can be difficult and time consuming. Fourth, restaurants have a hard time marketing their own virtual shop, thus it is necessary a very close follow-up so that they can get the most out of their online shop. Fifth, building virtual kitchens takes a long time.

How many virtual kitchens do you have?

Two large spaces with a total of seven kitchens (located in Campo Grande, Lisbon).

How does the operation in a virtual kitchen works?

Restaurant owns the logistic operations of ingredients and preparation. They store in our freezers. After getting orders they cook. As soon as done, they tell our team, and we organize packaging and wait for couriers. Our team delivers the food to couriers and tracks the delivery.

Do you have customized equipment for each concept/ restaurant?

We have base equipment (counters, cabinets, freezers, fridge) everything else is from the restaurant.

What type of technology do you integrate in the kitchen to make it "a delivery-focused kitchen"?

Screens, tablets, printers, computers.

Do you outsource the delivery fleet?

The partners integrate with our delivery marketplace and receive orders on demand. We don't employ couriers.

What costs arise from your business?

Technology (people building it); Hardware (tablets); Support to our partners (people).

Could you give an example of success in using your services (virtual kitchen and/or software)?

Boa Bao increased their delivery sales by 80% in the first week. Umikai was achieving €500k annualized sales after 3 months of operation.

Considering all the challenges that this pandemic has caused to the restaurant sector, what were the main difficulties you have come across so far?

With the lockdown, the need for virtual kitchens reduced because restaurants no longer had the problem associated with managing the volume of takeaway and in-person orders at the same time, in the same space. On the other hand, all restaurants became virtual and needed help to manage the online part, hence we saw an opportunity to develop the technology part further. Another challenge we encountered was, as the online demand increased, the kitchens were not prepared for so much volume. Additionally, with the exponential rise on food delivery, there was an increase on the fees and commissions charged by the delivery platforms (Uber Eats, Glovo, etc). Regarding to the software, we have to many competitors working on specific functionalities of our product.

What are KITCH's next steps in terms of development/strategy?

Grow internationally by making our technology fit multiple countries in Europe. Incorporate more channels in our system (POS, delivery partners), and improve the experience for partners, so that they focus on making great food.

Annex G: Questionnaire

Section 1



Potencial utilização de uma Cozinha Virtual

O meu nome é Carlota Gouveia e estou a frequentar o 2º ano no Mestrado em Gestão Hoteleira e Turismo no ISCTE - Instituto Universitário de Lisboa. Este questionário surge no âmbito do meu projeto final de mestrado, tendo como objeto de estudo Cozinhas Virtuais - um novo modelo de negócio com a finalidade de tornar a prática de 'food delivery' mais eficiente e acessível para os restaurantes.

Este inquérito de carácter anónimo, não demorará mais do que 8 minutos a ser preenchido e é de grande importância para finalizar a minha pesquisa.

Peço que responda da forma mais honesta possível e que preencha todas as perguntas.

Quero agradecer antecipadamente pela sua ajuda.

Caso tenha alguma dúvida, pode contactar-me através do e-mail: Carlota_Gouveia@iscte-iul.pt

Seguinte

Cozinhas Virtuais

Este estudo foca-se em Cozinhas Virtuais, um espaço de 'coworking' destinado à produção de refeições exclusivamente para entrega. Este novo modelo de negócio, estimulado pela crescente procura de serviços de entrega ao domicílio, permite que o seu próprio staff prepare as refeições destinadas a 'takeaway' numa cozinha totalmente equipada, inserida numa infraestrutura que dispõe de toda a tecnologia necessária para implementar esta operação. Esta designação deriva do facto de este espaço apenas aceitar encomendas através da internet e não incluir uma área física dedicada aos clientes como nos restaurantes convencionais.

Antes de começar, imagine a situação em que o seu restaurante está a operar como se não tivesse qualquer tipo de restrição, isto é, tem o mesmo número de clientes e o mesmo volume de trabalho na cozinha do que antes da pandemia.

O seu restaurante oferece serviços de 'takeaway' aos clientes? Note que os serviços de 'takeaway' incluem entrega ao domicílio e/ou recolha da refeição pelo cliente no restaurante. *

Sim

Não

Anterior

Seguinte

- If the respondent's answer was "No, I do not offer takeaway services."

Porque não oferece o serviço de 'takeaway'? *

A sua resposta

Anterior Seguinte

- If the respondent's answer was "Yes, I offer takeaway services."

Confeção de refeições 'takeaway'

Onde confeciona as refeições destinadas a 'takeaway'? *

No próprio restaurante

Noutro espaço

Anterior Seguinte

- If the respondent's answer was "In my own restaurant."

Confeção dos pedidos 'takeaway' no próprio restaurante

Quais os principais inconvenientes que encontra ao confecionar as refeições destinadas a 'takeaway' no próprio restaurante? *

A sua resposta

Anterior Seguinte

- If the respondent's answer was "In another space."

Confeção dos pedidos 'takeaway' noutro espaço

O que ganha ao confecionar as refeições destinadas a 'takeaway' noutro espaço? *

A sua resposta

Anterior Seguinte

Section 2

The respondents who answered "No, I do not offer takeaway services" and the respondents who answered "Yes, I offer takeaway services" and "prepare the meals for takeaway in my own restaurant" proceed to section 2 and 3. The others proceed directly to the last section.

Uma cozinha 100% dedicada a entregas

Se tivesse acesso a uma cozinha 100% dedicada a entregas e transferisse a confeção dos pedidos para esse espaço, quão importante seria cada um dos seguintes itens para o seu negócio? Considere 1= Nada importante e 5= Extremamente importante. *

	1	2	3	4	5
Baixo investimento inicial necessário para aumentar a capacidade da cozinha.	<input type="radio"/>				
Utilizar o meu próprio staff nesta cozinha.	<input type="radio"/>				
Localização mais eficiente para reduzir o tempo de entrega.	<input type="radio"/>				
Localização com uma renda mais acessível.	<input type="radio"/>				
Permitir uma operação mais eficiente, mantendo o restaurante original mais fácil de gerir.	<input type="radio"/>				
Tecnologia integrada com os meus sistemas de faturação e POS.	<input type="radio"/>				

Anterior

Seguinte

Section 3

Expetativa de desempenho

Este conjunto de questões pretende perceber qual a sua expetativa sobre a forma como esta cozinha poderá ajudar a potenciar a operação de 'takeaway' do seu restaurante.

Indique, por favor, o seu grau de concordância para cada uma das seguintes afirmações, assumindo 1= Discordo totalmente e 5= Concordo totalmente. *

	1	2	3	4	5
A utilização de uma Cozinha Virtual pode ser útil para satisfazer os pedidos online de 'takeaway'.	<input type="radio"/>				
Considero que ao confeccionar as refeições destinadas a 'takeaway' noutro espaço será mais conveniente para a minha operação do que utilizar a cozinha do restaurante.	<input type="radio"/>				
Acredito que a utilização deste espaço vai ajudar-me a satisfazer os pedidos de entrega mais rapidamente.	<input type="radio"/>				
Acredito que a utilização de uma Cozinha Virtual para satisfazer os pedidos online de takeaway, vai aumentar a produtividade do meu restaurante.	<input type="radio"/>				

[Anterior](#)

[Seguinte](#)

Condições facilitadoras

Este conjunto de questões pretende perceber qual a sua perceção relativamente à existência dos recursos que o/a apoiam na implementação deste novo modelo.

Indique, por favor, o seu grau de concordância para cada uma das seguintes afirmações, assumindo 1= Discordo totalmente e 5= Concordo totalmente. *

	1	2	3	4	5
Acredito que todo o equipamento e espaço disponibilizado nesta cozinha seria adequado à minha operação.	<input type="radio"/>				
Acredito que o sistema POS integrado na cozinha seria conveniente para a minha operação.	<input type="radio"/>				
Considero que as embalagens disponibilizadas por uma Cozinha Virtual possibilitaria a entrega de refeições com qualidade.	<input type="radio"/>				
Acredito que este modelo dispõe de uma operação logística que me facilitaria a interação com os estafetas.	<input type="radio"/>				

Anterior

Seguinte

Expetativa de esforço

Este conjunto de questões tem como objetivo avaliar a sua percepção quanto à implementação deste novo modelo.

Indique, por favor, o seu grau de concordância para cada uma das seguintes afirmações, assumindo 1= Discordo totalmente e 5= Concordo totalmente. *

	1	2	3	4	5
Penso que seria fácil transferir a confeção das refeições destinadas a 'takeaway' para uma Cozinha Virtual.	<input type="radio"/>				
Acredito que o meu staff facilmente aprenderia a trabalhar numa Cozinha Virtual.	<input type="radio"/>				
Acredito que não demoraria muito tempo a aprender a trabalhar com a tecnologia disponibilizada na Cozinha Virtual.	<input type="radio"/>				

Anterior

Seguinte

Preço/Qualidade

Este conjunto de questões pretende perceber qual a sua percepção relativamente aos benefícios monetários que uma Cozinha Virtual poderá proporcionar.

Indique, por favor, o seu grau de concordância para cada uma das seguintes afirmações, assumindo 1= Discordo totalmente e 5= Concordo totalmente. *

	1	2	3	4	5
Acredito que este modelo exige um investimento inicial mais baixo para aumentar a capacidade da minha cozinha.	<input type="radio"/>				
Acredito que conseguiria poupar dinheiro em renda mensalmente se utilizasse uma Cozinha Virtual.	<input type="radio"/>				

Ao utilizar uma Cozinha Virtual, acredito que conseguiria poupar dinheiro nos custos associados ao staff.

Acredito que ao utilizar esta cozinha, conseguiria aumentar a minha margem de lucro por refeição.

Anterior

Seguinte

Intenção de utilização

Este conjunto de questões pretende perceber qual a possibilidade de utilizar uma Cozinha Virtual no futuro.

Indique, por favor, o seu grau de concordância para cada uma das seguintes afirmações, assumindo 1= Discordo totalmente e 5= Concordo totalmente. *

1 2 3 4 5

Tenciono transferir a confeção de

Tenciono utilizar uma Cozinha Virtual para satisfazer os pedidos online de 'takeaway' no futuro.

Logo que possível, tenciono utilizar uma Cozinha Virtual uma vez que será uma mais valia para o meu negócio.

Anterior

Seguinte

Section 4

Perfil

Por uma questão de análise de perfil, por favor responda às seguintes questões.

Idade *

- <21
- 22-29
- 30-44
- 45-54
- 55-64
- >65

Género *

- Feminino
- Masculino
- Prefiro não dizer

Há quanto tempo trabalha no setor da restauração? *

- <1ano
- 1-5 anos
- 6-10 anos
- 11-20 anos
- >20 anos

Qual o atual cargo que desempenha? *

A sua resposta _____

Anterior

Seguinte

restaurante

Para finalizar, por favor responda às seguintes questões relativamente ao restaurante.

Número de anos do estabelecimento *

- <1 ano
- 1-5 anos
- 6-10 anos
- 11-20 anos
- >20 anos

Indique em que intervalo de preços se insere uma refeição incluindo bebidas (por pessoa). *

- <10€

Considerando as plataformas de reserva online (The Fork, Zomato, etc), em qual dos intervalos de ratings o seu restaurante se encontra? Assuma a avaliação de 0 a 5. *

- <4,5
- >4,5

Indique qual(ais) se identifica(m) mais com o conceito do seu restaurante. *

- Restaurante de serviço rápido: caracterizado pela confeção de alimentos facilmente preparados em grande escala através de métodos de produção padronizados, com o objetivo de servir rapidamente o cliente.
- Restaurante tradicional: caracterizado pela confeção de pratos tradicionais portugueses. Distingue-se pelo ambiente familiar e descontraído.
- Restaurante de luxo: distingue-se dos de mais pelo seu menu inovador proporcionando uma experiência gastronómica única e de alta qualidade. Normalmente está associado a um chefe de renome.
- Restaurante do mundo: caracterizado pela valorização do património gastronómico de uma região do mundo em específico. Distingue-se pela autenticidade dos pratos e da decoração.
- Restaurante de alimentação específica: caracterizado por oferecer um menu baseado numa dieta específica como vegan, macrobiótica, vegetariana ou paleo.
- Outro

Se assinalou "Outro", por favor indique qual.

A sua resposta

Anterior

Submeter

Table G.1 - The items of the proposed research model.

Constructs	Items	Description	Source
Performance Expectancy (PE)	PE1	- I would find a VK useful to fulfil the online orders for takeaway.	Adapted from Venkatesh et al. (2003), Venkatesh et al. (2012), Tran et al. (2019)
	PE2	- I think using a VK to fulfil the online orders would be more convenient than using my existing kitchen.	
	PE3	- I believe that using a VK would help me to fulfil the delivery orders more quickly.	
	PE4	- I believe using a VK to fulfil the online orders for takeaway would increase my restaurant's productivity.	
Effort Expectancy (EE)	EE1	- I think it would be easy for me to transfer the preparation of the takeaway orders to a VK.	Adapted from Venkatesh et al. (2003), Venkatesh et al. (2012)
	EE2	- I believe that my staff would easily learn how to work in a VK.	
	EE3	- I believe that it would not take me long to learn how to use the technology provided by the VK.	
Facilitating Conditions (FC)	FC1	- I believe that the equipment and space provided in this kitchen would be appropriate for my operation.	Adapted from Venkatesh et al. (2003), Venkatesh et al. (2012)
	FC2	- I believe the POS system integrated into the kitchen would be convenient for my operation.	
	FC3	- I believe that the packaging provided by the VK would enable me to deliver better quality food to customers.	
	FC4	- I believe that this model has a logistical operation that would make it easier for me to interact with the couriers.	
Price Value (PV)	PV1	- I believe that this model requires a lower initial investment to increase the capacity of my kitchen.	Adapted from Venkatesh et al. (2012), Palau-Saumell et al. (2019)
	PV2	- If I use a Virtual Kitchen, I believe I would be able to save money in rent every month.	
	PV3	- By using a VK, I believe I would be able to save money on staff.	
	PV4	- I believe I would be able to increase my profit margin per meal if I use a VK.	
Intention to use a VK (INT)	INT1	- I intend to relocate the takeaway operation to a VK.	Adapted from Venkatesh et al. (2003), Venkatesh et al. (2012)
	INT2	- I intend to use a VK to fulfil the online orders for takeaway.	
	INT3	- As soon as possible, I intend to use a VK as it will add value to my business.	

Source: Own elaboration

Annex H: Proposed Research Model - Virtual Kitchens' Potential in the Portuguese restaurant industry

Intention to use a VK

According to Ajzen (1991), intentions are assumed to capture motivational aspects that affect a specific behaviour. In fact, this intention indicates how much people are willing to perform a behaviour, being conscient of the required resources to do so (Ajzen, 1991). Hence, restaurateurs must understand the resources that a VK can offer to streamline their takeaway operations, to perceive this model as a possible solution for their operational issues. To ensure that, the advantages and tools that Kitch's VK model can provide to restaurants were distributed within each construct. Keeping this in mind, it is expected that the intention to use a VK to streamline takeaway operations will be positively influenced by PE, EE, FC, and PV.

Performance Expectancy

Based on Venkatesh et al. (2003), the proposed PE construct shows the degree to which a restaurateur believes that using a VK will improve the restaurant's takeaway service. For instance, in a study about the acceptance of carsharing systems, PE relates to the link between the system characteristics and the users' expectations, suggesting that the individual needs to understand the benefits from sharing vehicles (Tran et al., 2019). In the context of VKs, the features of this particular business model rely on making the delivery and/or pickup processes as efficient and convenient as possible for both parties (restaurants and customers) by moving all delivery orders preparation to one single place. In Kitchen United's webinar on how to evaluate a VK, it was shown that these models can help restaurants to enhance their takeaway capabilities by using a complementary kitchen space to balance pickup and delivery orders with the on-premise operation (Green et al., 2020). Similarly, besides supporting restaurants to take advantage of the off-premise dining opportunities, Kitch's VK model can also help restaurants to prepare and deliver the order more quickly, and ultimately, increase the overall restaurant's productivity. This, in turn, can leverage the performance of their takeaway operation. Therefore, it is expected that restaurateurs perceive VKs as useful to prepare and deliver takeaway orders more efficiently. In the end, PE is expected to influence their intention to use a VK in the future.

H1: PE positively influences the intention to use VK to streamline takeaway operations.

Effort Expectancy

Considering this research object of study and Venkatesh et al. (2003), the proposed EE construct indicates the degree of ease associated with the implementation of the restaurant's takeaway operation in a VK. This concept was previously operationalized as perceived ease of use in TAM (Davis, 1989). Former studies in the hospitality context have proven a positive impact of EE on the intention to use a new system (Okumus et al., 2018; Palau-Saumell et al., 2019). Therefore, it is expected that restaurateurs are more likely to express intention to use a VK, when they perceive that its implementation is simple, understandable, and suitable to meet their off-premise demand efficiently.

H2: EE positively influences the intention to use VK to streamline takeaway operations.

Facilitating Conditions

Considering Venkatesh et al. (2003) definition and the context of this research, the proposed FC construct designates the restaurateur's perception of the available resources to support the implementation of a VK to streamline the off-premise operations. To clarify, when an individual perceives that the conditions are ideal for adopting a certain system, that behaviour is more likely to occur (Chung et al., 2015). In this case, Kitch supports restaurant operators by creating favourable conditions to expand their business, dealing with issues related to space, equipment, technology, and logistics. To illustrate, this start-up provides a fully equipped and ready-to-use space, an incorporated POS system in the kitchen to simplify order management, a dedicated pickup zone for couriers and appropriate packaging for delivery. Although the original framework does not comprise a direct relationship between FC and the subsequent intention to use a system, several studies have proven the opposite (Palau-Saumell et al., 2019; Venkatesh et al., 2008). That said, higher FC are expected to lead to a higher intention to use a VK. On the other hand, there have been studies that also revealed a positive influence of FC on EE (Chung et al., 2015; Khalilzadeh et al., 2017; Saprikis et al., 2021). For instance, Teo (2009) outlines that FC is related to beliefs regarding a technology since they enhance a person's desire to perform a specific task. Consequently, if the individuals perceive the described conditions provided by Kitch as enablers to expand their business, it is expected that they will find it easy to transfer the operations to a VK.

H3: FC positively influences the intention to use a VK to streamline takeaway operations.

H4: FC positively influences the restaurateurs' EE to use a VK to streamline takeaway operations.

Annex J: Descriptive Statistics

Table J.1 – Respondents’ Demographic Characteristics.

Demographic Characteristics (n=55)		Respondents	Percent (%)
Age group	22-29	14	25%
	30-44	25	45%
	45-54	13	24%
	≥ 55	3	6%
Gender	Female	17	31%
	Male	37	67%
	N/A	1	2%
Experience in the F&B industry	<6 years	12	22%
	6-10 years	18	33%
	11-20 years	16	29%
	>20 years	9	16%
Job Position	F&B Staff	9	16%
	Restaurant Managers	29	53%
	Owners/Administration	15	27%
	N/A	2	4%

Source: Own elaboration

Table J.2 - Characteristics of the respondents’ restaurants.

Restaurants' Profile (n=55)		Restaurants	Percent (%)
Number of years in business	<1 year	7	13%
	1-5 years	33	60%
	6-10 years	6	11%
	11-20 years	1	2%
	>20 years	8	15%
Price range	<10€	1	2%
	10€-20€	31	56%
	25€-45€	20	36%
	>45€	3	5%
Rating*	<4,5	18	33%
	>4,5	37	67%

Note: * Assuming a 1 to 5 scale.

Source: Own elaboration

Table J.3 – Screening Questions.

Screening Questions		Respondents	Percent (%)
Do you offer takeaway services?	Yes	42	76%
	No	13	24%
	Total	55	100%
Where do you prepare the meals intended for takeaway?	In the actual restaurant	41	98%
	In another premise	1	2%
	Total	42	100%
Potential VK users	Restaurateurs who do not offer takeaway services	13	24%
	Restaurateurs who offer takeaway services and prepare the food in their actual restaurant	41	76%
	Total	54	100%

Source: Own elaboration

Annex K: PLS-SEM

The PLS includes two models (Hair et al., 2017):

1. Measurement Model

To evaluate the measurement model's results we resorted to the indicators' reliability: composite reliability (Cronbach's alpha), convergent validity (average variance extracted [AVE]) and discriminant validity (square root of AVE) (Hair et al., 2017) (table K.1). Regarding composite reliability, the constructs generated satisfactory values for the Cronbach's alpha, varying between 0.763 (EE) and 0.934 (INT). The standardised outer loadings and the AVE meet the threshold criteria of 0.708 and 0.5, respectively (Hair et al., 2017). Further, the Fornell-Lacker criterion is verified, so the model holds discriminant validity.

2. Structural Model

Then, PLS-SEM was used to test the hypotheses posed in the proposed model and examine the structural model's path coefficients (table K.2). The results demonstrated that H1, H4 and H5 were supported. PV has the greatest positive and significant influence on the intention to use a VK ($\beta^{\wedge}=0.577$) followed by PE ($\beta^{\wedge}=0.409$). Although the path FC-EE is statistically significant, there is no relationship between EE and intention to use a VK.

Table K.2 - Structural Model's Results.

Path	Coefficient (β)	Standard Error	t-value	P-value
PE → INT*	0.409	0.136	3.012	0.004
EE → INT	-0.042	0.139	-0.471	0.64
FC → INT	-0.066	0.129	-0.325	0.747
FC → EE*	0.623	0.108	5.744	0.000
PV → INT*	0.577	0.113	5.122	0.000

Note: * Paths statistically significant ($\alpha=0.05$)

Source: Own elaboration

Table K.1 - Outer Model's Specifications.

Constructs	Item	Mean	Std. Deviation	Loading	Cronbach's alpha	rho_A	AVE
PE	PE1: "I would find a VK useful to fulfil the online orders for takeaway."	3.500	1.077	0.862	0.866	0.911	0.713
	PE2: "I think using a VK to fulfil the online orders would be more convenient than using my existent kitchen."	3.259	1.348	1.174			
	PE3: "I believe that using a VK would help me to fulfil the delivery orders more quickly."	3.481	1.161	0.964			
	PE4: "I believe using a VK to fulfil the online orders for takeaway would increase my restaurant's productivity."	3.519	1.145	0.965			
EE	EE1: "I think it would be easy for me to transfer the preparation of the takeaway orders to a VK."	3.426	1.368	1.236	0.763	0.867	0.651
	EE2: "I believe that my staff would easily learn how to work in a VK."	3.852	1.219	0.789			
	EE3: "I believe that it would not take me long to learn how to use the technology provided by the VK."	3.870	1.150	0.743			
FC	FC1: "I believe that the equipment and space provided in this kitchen would be appropriate for my operation."	3.833	1.194	1.148	0.835	0.891	0.666
	FC2: "I believe the POS system integrated into the kitchen would be convenient for my operation."	3.037	1.373	0.998			
	FC3: "I believe that the packaging provided by the VK would enable me to deliver better quality food to customers."	3.685	1.096	0.869			
	FC4: "I believe that this model has a logistical operation that would make It easier for me to interact with the couriers."	3.926	0.968	0.978			
PV	PV1: "I believe that this model requires a lower initial investment to increase the capacity of my kitchen."	3.130	1.245	0.982	0.853	0.901	0.696
	PV2: "If I use a Virtual Kitchen, I believe I would be able to save money in rent every month."	3.074	1.226	1.079			
	PV3: "By using a VK, I believe I would be able to save money on staff."	2.926	1.286	1.020			
	PV4: "I believe I would be able to increase my profit margin per meal if I use a VK."	3.167	1.209	1.017			
INT	INT1: "I intend to relocate the takeaway operation to a VK."	2.333	1.213	1.150	0.934	0.959	0.884
	INT2: "I intend to use a VK to fulfil the online orders for takeaway."	2.500	1.299	1.243			
	INT3: "As soon as possible, I intend to use a VK as it will add value to my business."	2.519	1.225	1.088			

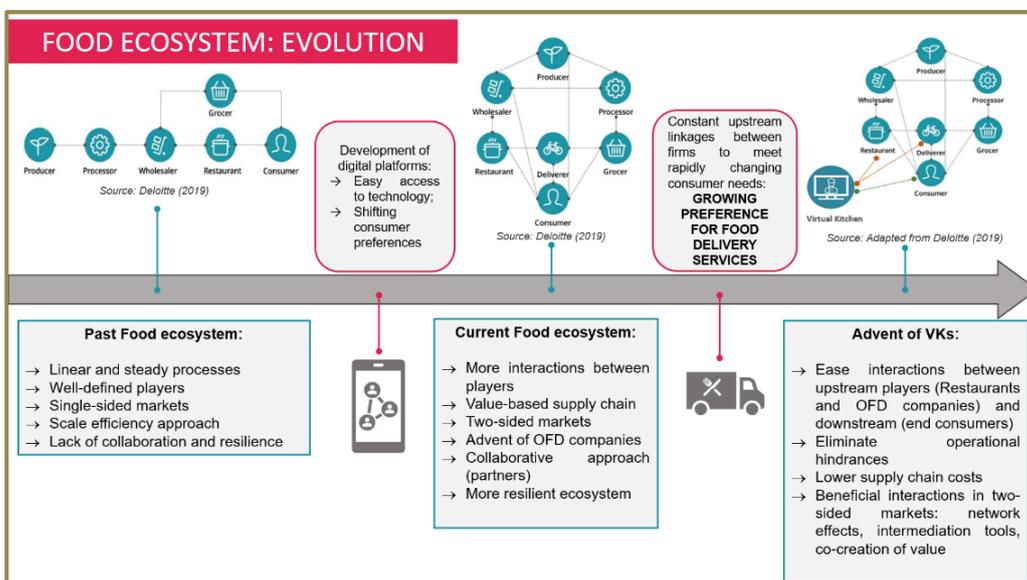
Source: Own elaboration

Annex L: Case Resolution Slides



Question 1

Explain how the food ecosystem has evolved in the last decade, identifying the new beneficial downstream and upstream relationships that stemmed from VKs. Resort to the characteristics of operating in two-sided markets to base your answer and indicate where this new market player fits, using figure 3.2 in chapter 3 (Literature Review).



UPSTREAM AND DOWNSTREAM RELATIONSHIPS THAT STEMMED FROM VKs : TWO-SIDED MARKET CHARACTERISTICS

UPSTREAM RELATIONSHIPS

1. VK ↔ Restaurants

- **Network effects:** A good community of restaurants will attract more customers to order from these delivery-only kitchens, improving value for both restaurants and VKs.
- **Intermediation tools:** VKs work as a complement to make a digital marketplace more effective and rewarding for all the parties involved. Through its technology, they can aggregate data on consumer preferences and sales, supporting restaurants to better target different segments, adjust the menus accordingly and have better control over their business.
- **Co-creation of value:** VKs have the flexibility to adapt to the restaurants' requirements, whether in custom equipment, technology or even in personalised packaging.

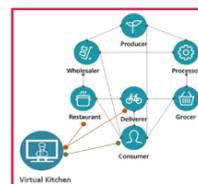
2. VK ↔ OFD companies ("Deliverer")

- **Network effects:** VKs can use already established OFD marketplaces and delivery fleets to leverage the brand online and ease their logistical process. For OFD companies, the VKs' restaurant partners consist of extra platform users, and hence, on extra revenues.

DOWNSTREAM RELATIONSHIPS

3. VK ↔ Consumers

- **Network effects:** In raising more diverse restaurants to join the VK concept, customers will benefit from more options to consume food through improved takeaway services. For VKs this means a wider customer base to ensure sustainable growth, furthering network effects.
- **Co-creation of value:** Through the use of technology VKs can access to the clients' information and past purchases allowing chefs to fully concentrate on food preparation, enabling more time and focus to personalise customers' orders, adapt promotions to specific targets and create dishes that will suit the consumers' expectations.



Question 2

Considering the BOS, describe the restaurant industry and the advent of VKs. Which attributes of the restaurant industry were eliminated, reduced, raised, and created to unlock the uncontested market space of VKs? Please represent these market changes in the ERRC grid.

Red Ocean: Traditional restaurant industry

- 1.5M restaurants in EU27 concentrated mostly in large capital cities (saturated market);
- Hyper-competitive;
- Compete for existing and limited demand;
- Pursue of low-cost (e.g.: QSR restaurants) or differentiation strategies (e.g.: Luxury restaurants).

- Volatile demand (changing consumer preferences, wide variety of restaurants)
- High failure rates business
- Capital-intensive model (high fixed costs: staff, rent, décor, equipment,...)

- Traditional restaurant dining experience attributes related to:

- food and drink *	- location
- atmosphere*	- price
- facilities	- Image
- service*	

*most important

Current market:



- Millennials more prone to order food delivery/ pickup online
- Off-premise outperforming on-premise sales
- Restaurants unprepared

Reconstructionist view:

How can the market rules be reconstructed?

How can we make competition irrelevant while driving costs down and build something exciting at the same time?

VK Market: a blue ocean created within the restaurant industry red ocean

The Four Actions Framework

Eliminate	Raise
Which factors that the industry has long competed on should be eliminated?	Which factors should be raised well above the industry's standard?
Reduce	Create
Which factors should be reduced well below the industry's standard?	Which factors should be created that the industry has never offered?



The ERRC Grid

Low-cost strategy	Differentiation strategy
Eliminate	Raise
<ul style="list-style-type: none"> o Dine-in Area o Décor, furniture (atmosphere-related attributes) o FOH staff (service related attributes) 	<ul style="list-style-type: none"> o Takeout food quality (food and drink-related attributes) o Technology usage o Logistical efficiency o Branding and sales incentives (price and image-related attributes)
Reduce	Create
<ul style="list-style-type: none"> o Fixed costs o BOH staff o Need for popular location (location-related attributes) o Operational hindrances 	<ul style="list-style-type: none"> o BOH-only concept o Quick and Affordable way for expansion o Flexibility o Resilient to disruptions

Question 3

Develop a Dynamic SWOT for Kitch.

STRENGTHS (S)

- S1: Founders with experience in emerging markets (Uber/ Uber Eats).
- S2: Faster and cheaper way to open/ expand restaurants through VKs.
- S3: Easily increases the restaurants' ability to sell more meals through customisable software features (Store and Deliver).
- S4: Provides integrations with the most prominent delivery marketplaces in the Portuguese market (Uber Eats/ Glovo).
- S5: Provides more information and control over digital operations to restaurateurs (Connect).
- S6: Agile and resilient business model due to its digital dimension.
- S7: Solid base of partner restaurants in Portugal (+100).

WEAKNESSES (W)

- W1: Too dependent on POS systems' providers and OFD companies for integrations.
- W2: VKs are expensive and time-consuming to build.
- W3: High OFD platforms fees (15%-30%).
- W4: Lack of control on last-mile delivery (OFD couriers).
- W5: High H&R costs (tech engineers).
- W6: Long onboarding process to bring new restaurants into the system.

OPPORTUNITIES (O)

- O1: Growth of the OFD market in Europe and Portugal (CAGR 2021-2025 of 11,24% and 11,03%, respectively).
- O2: Rise on off-premise consumption.
- O3: Investors keen on more tech-enabled food businesses (more than € 4000M invested in the last two years).
- O4: The majority of restaurateurs struggle with takeaway operations (delivery and/or pickup).
- O5: Covid-19 lockdowns accelerated the need to digitally transform restaurants.
- O6: Few competitors in the VK segment in Portugal.
- O7: Development of international market.

1. SWOT

THREATS (T)

- T1: Well established OFD companies building their own VKs in Portugal.
- T2: Independent restaurants building their own VKs.
- T3: Increased number of competitors for each functionality of Kitch's technology.
- T4: Alleviation of lockdowns reducing food delivery orders' volumes.
- T5: Restaurants' financial sustainability.
- T6: Changing consumers' preferences.

	OPPORTUNITIES	THREATS
S T R E N G T H S	S-O potential strategies: <ol style="list-style-type: none"> Expand to foreign markets through their proprietary technology first. (S3, S5, S6, S7, O1, O2, O3, O7) Use the consolidated base of partner restaurants to expand the VKs product. (S2, S7, O3, O6, O7) 	S-T potential strategies: <ol style="list-style-type: none"> Meet competition by promoting success cases and offering more personalised services to restaurants. (S5, S6, S7, T1, T2, T3) Raise more big restaurant brands to avoid a large loss of customers. (S1, S5, S7, T2, T1, T4, T5, T6) Create development programs to support smaller restaurants to overcome their financial debilities. (S3, S4, S5, S7, T2, T5, T6)
	W-O potential strategies: <ol style="list-style-type: none"> Resort to funding to hire more engineers to build more VKs to meet the current market needs in Portugal. (W2, W5, O2, O3, O4, O6) Form their own network of couriers. (W1, W3, W4, O1, O2, O3) 	W-T potential strategies: <ol style="list-style-type: none"> Encourage partners to fulfil their own deliveries or/and promote pickup format. (W1, W3, W4, T1, T5) Support restaurants to build more traffic into their independent online store (Store) through special offers to consumers. (W1, W3, T4, T5) Leverage the Deliver feature exclusively for Store users. (W3, T3, T5)

2. Dynamic SWOT

Question 4

Considering the drawbacks of takeaway services posed by Portuguese restaurateurs, discuss whether Kitch's VK model is a viable solution for them. What type of restaurants should adopt this model and how can they benefit from it? Base your answer on the data available on this case study.

Survey results analysis

Figure C.2 – Do you offer takeaway services? (n=55).
Source: Own elaboration

Response	Count	Percentage
Yes	42	76%
No	13	24%

Figure C.3 – Where do you prepare the meals intended for takeaway? (n=42).
Source: Own elaboration

Location	Count	Percentage
In the actual restaurant	41	98%
In another premise	1	2%

Figure C.4 – Number of respondents with and without inconveniences regarding takeaway services (n=41).
Source: Own elaboration

Category	Count	Percentage
Respondents with no inconveniences	31	76%
Respondents with inconveniences	9	22%
N/A	1	2%

1. Potential users of Kitch's VK model

- 13 restaurateurs do not offer takeaway services.
- 41 restaurateurs offer takeaway services and prepare the on- and off-premise orders from the same premise:
 - 9 stated to not found any inconveniences;
 - 31 stated to found inconveniences.

Total of potential users gathered through the survey:
54 restaurants

Survey results analysis

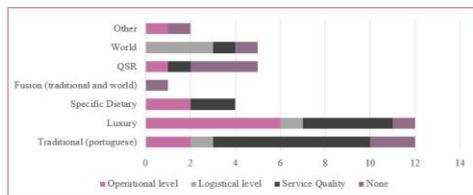


Figure C.5 – Drawbacks of offering takeaway services by type of restaurant. Source: Own elaboration

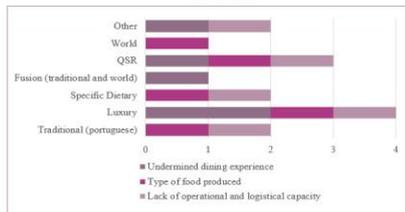


Figure C.6 – Main reasons for not offering takeaway services by type of restaurant. Source: Own elaboration

2. Inconveniences of offering takeaway services and reasons for not offering by type of restaurant

- **Luxury restaurants:** operational inconveniences more prominent, with great impact on on- and off-premise customers' service.
 - in trying to accommodate both operations in the same kitchen creates productivity pressures for BOH and FOH staff, which often leads to unsatisfied on-premise customers due to longer waiting times, and to displeased off-premise customers who receive cold or visually unattractive food.
- **Traditional restaurants:** service-related inconveniences more prominent.
 - the space is typically smaller than the others and the type of food prepared requires suitable packaging to preserve its appearance and temperature.
- **World restaurants:** logistical-related inconveniences more prominent (location and coordination of the delivery process)

- **Luxury restaurants:** undermined dining experience
- **Traditional restaurants:** absence of takeaway services due to the type of food produced and the lack of operational capacity mostly associated with their limitations regarding the kitchen space.

Survey results analysis



Figure E.3 – Kitch's VK model features according to their level of importance to Portuguese restaurateurs (average scoring; n=54): 1= "Not important" to 5= "Extremely important". Source: Own elaboration.

3. Kitch as a solution

- **To mitigate operational and service-related hindrances:**
 - Restaurateurs strongly value that this VK would be able to simplify their restaurant's overall coordination. The use of a VK would allow restaurateurs to differentiate each operation to its designated space, alleviating the kitchen staff from the unpredictable volume of orders and enabling a smoother operation thanks to the additional space to balance the influx of orders.
 - The integration of Kitch's technology with their POS system would be very important. Through this integration, the FOH staff would not have to manually type the online orders into the system, avoiding wasting time on unnecessary work that could be employed more in customers' service.
- **To mitigate logistical hindrances:**
 - The second most valued feature in Kitch's VK model was related to location and its cheaper rental cost. In the same way, an "efficient location to reduce delivery time" was also found to be very important to potential customers.
 - In Kitch's business model, the partners that use their VKs do not have to pay a rental fee but rather a 5% or 10% commission per meal sold. Charging a commission, rather than taking a monthly fee, helps to motivate partners to get more orders and to alleviate the successive financial burdens that they have to deal daily. Besides, it is a cheaper way to expand operations for a more central location. Kitch's VKs are located in Campo Grande, a central area set with easy and faster accesses.
 - Also, Kitch handles the delivery process, removing the complexity of its coordination for partners.

MAIN CONCLUSIONS

- Overall, Kitch's VK model seems to be a viable solution to overcome Portuguese restaurateurs' obstacles presented in this case study, as all of its features were found to be mostly very important (level of importance $\geq 3,54$)
- The traditional restaurants struggling with the lack of kitchen capacity to organise the off-premise operation and simultaneously serve on-premise customers, as well as the world restaurants with difficulties in reaching "at home" customers due to its location, seem to be a great fit to join Kitch and benefit from this additional kitchen space with a central location.
- A special focus should be given to luxury restaurants since it may be more valuable for both parties (restaurants and Kitch).

Question 5

What might motivate Portuguese restaurateurs to use Kitch's VK model to streamline their takeaway operations? Please resort to the UTAUT model results to answer this question.

PROPOSED RESEARCH MODEL

Definition of each construct

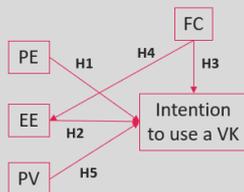
PE: The degree to which a restaurateur believes that using a VK will improve the restaurant's takeaway operation.

EE: The degree of ease associated with the implementation of the restaurant's takeaway operation in a VK.

FC: The restaurateur's perception of the available resources to support the implementation of a VK to streamline the off-premise operation.

PV: The trade-off between the perceived benefits and the monetary cost associated with the use of a VK to streamline takeaway operations.

Hypothesis



H1: PE positively influences the intention to use VK to streamline takeaway operations.

H2: EE positively influences the intention to use VK to streamline takeaway operations.

H3: FC positively influences the intention to use a VK to streamline takeaway operations.

H4: FC positively influences the restaurateurs' EE to use a VK to streamline takeaway operations.

H5: PV positively influences the intention to use a VK to streamline takeaway operations.

Questionnaire statements of each construct

PE1: I would find a VK useful to fulfil the online orders for takeaway.

PE2: I think using a VK to fulfil the online orders would be more convenient than using my existing kitchen.

PE3: I believe that using a VK would help me to fulfil the delivery orders more quickly.

PE4: I believe using a VK to fulfil the online orders for takeaway would increase my restaurant's productivity.

EE1: I think it would be easy for me to transfer the preparation of the takeaway orders to a VK.

EE2: I believe that my staff would easily learn how to work in a VK.

EE3: I believe that it would not take me long to learn how to use the technology provided by the VK.

FC1: I believe that the equipment and space provided in this kitchen would be appropriate for my operation.

FC2: I believe the POS system integrated into the kitchen would be convenient for my operation.

FC3: I believe that the packaging provided by the VK would enable me to deliver better quality food to customers.

FC4: I believe that this model has a logistical operation that would make it easier for me to interact with the couriers.

PV1: I believe that this model requires a lower initial investment to increase the capacity of my kitchen.

PV2: If I use a Virtual Kitchen, I believe I would be able to save money in rent every month.

PV3: By using a VK, I believe I would be able to save money on staff.

PV4: I believe I would be able to increase my profit margin per meal if I use a VK.

INT1: I intend to relocate the takeaway operation to a VK.

INT2: I intend to use a VK to fulfil the online orders for takeaway.

INT3: As soon as possible, I intend to use a VK as it will add value to my business.

DATA ANALYSIS AND HYPOTHESIS TESTING

1. SPSS: Descriptive Statistics

Demographic Characteristics (n=55)		Respondents	Percent (%)
Age group	22-29	14	25%
	30-44	25	45%
	45-54	13	24%
	> 55	3	6%
	N/A	1	2%
Gender	Female	17	31%
	Male	37	67%
Experience in the F&B industry	<6 years	12	22%
	6-10 years	18	33%
	11-20 years	16	29%
	>20 years	9	16%
	N/A	1	2%
Job Position	F&B Staff	9	16%
	Restaurant Managers	29	53%
	Owners/Administration	15	27%
	N/A	2	4%

Restaurants' Profile (n=55)		Restaurants	Percent (%)
Number of years in business	<1 year	7	13%
	1-5 years	33	60%
	6-10 years	6	11%
	11-20 years	1	2%
	>20 years	8	15%
Price range	<10€	1	2%
	10€-20€	31	56%
	25€-45€	20	36%
	>45€	3	5%
Rating* (1 to 5 scale)	<4,5	18	33%
	>4,5	37	67%

Screening Questions		Respondents	Percent (%)
Do you offer takeaway services?	Yes	42	76%
	No	13	24%
	Total	55	100%
Where do you prepare the meals intended for takeaway?	In the actual restaurant	41	98%
	In another premise	1	2%
	Total	42	100%
Potential VK users	Restaurateurs who do not offer takeaway services	13	24%
	Restaurateurs who offer takeaway services and prepare the food in their actual restaurant	41	76%
	Total	54	100%

DATA ANALYSIS AND HYPOTHESIS TESTING

2. XLSTAT Program: PLS-SEM

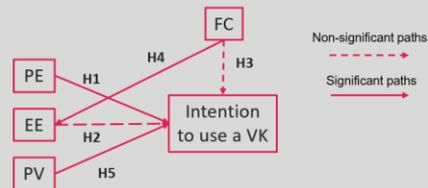
2.1 Measurement Model

Constructs	Items	Mean	Std. Deviation	Loading	Cronbach's alpha	rho_A	AVE
PE	PE1	3,500	1,077	0,862	0,866	0,911	0,713
	PE2	3,259	1,348	1,174			
	PE3	3,481	1,161	0,964			
	PE4	3,519	1,145	0,965			
EE	EE1	3,426	1,368	1,236	0,763	0,867	0,651
	EE2	3,852	1,219	0,789			
	EE3	3,870	1,150	0,743			
FC	FC1	3,833	1,194	1,148	0,835	0,891	0,666
	FC2	3,037	1,373	0,998			
	FC3	3,685	1,096	0,869			
	FC4	3,926	0,968	0,978			
PV	PV1	3,130	1,245	0,982	0,853	0,901	0,696
	PV2	3,074	1,226	1,079			
	PV3	2,926	1,286	1,020			
	PV4	3,167	1,209	1,017			
INT	INT1	2,333	1,213	1,150	0,934	0,959	0,884
	INT2	2,500	1,299	1,243			
	INT3	2,519	1,225	1,088			

2.2 Structural Model

Path	Coefficient (β)	Standard Error	t-value	P-value
PE \rightarrow INT*	0,409	0,136	3,012	0,004
EE \rightarrow INT	-0,042	0,139	-0,471	0,64
FC \rightarrow INT	-0,066	0,129	-0,325	0,747
FC \rightarrow EE*	0,623	0,108	5,744	0,000
PV \rightarrow INT*	0,577	0,113	5,122	0,000

Note: * Paths statistically significant ($\alpha=0,05$)



MAIN CONCLUSIONS

- \rightarrow H1, H4 and H5 were statistically supported.
- \rightarrow PV has the greatest positive influence on Portuguese restaurateurs intention to use a VK ($\beta^A= 0,577$) followed by PE ($\beta^A= 0,409$):
 - In comparison to setting up their own delivery operation, operators prioritise the monetary benefits of using a VK instead – lower initial expenses, less staff, lower costs with rent and, subsequently, the opportunity to increase the profit margin per meal. In addition, restaurateurs perceive this delivery-only model as useful to leverage their performance regarding off-premise sales, especially in the fulfilment of online orders.
- \rightarrow Although the path FC-EE is statistically significant ($\beta^A= 0,623$), there is no relationship between EE and Intention to use a VK:
 - Restaurateurs feel that Kitch's VK model offers the ideal conditions that would enable them to implement their operation effortlessly - fully equipped and ready-to-use space, an incorporated POS system in the kitchen to simplify order management, a dedicated pickup zone for couriers and appropriate packaging for delivery . However, the conditions do not seem to be sufficient to develop the intention to actually use it in the future.