Operation Efficiency In The F&B Enterprise Through Digitalization and Cloud Kitchen Integration: A Systematic Literature Review

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Abstract

The global industries have undergone a transformative evolution in response to technological changes, fostering greater flexibility, reactivity, and productivity. However, contemporary industry conditions present novel challenges, including rapid technological shifts, heightened complexity, shifting consumer preferences, and evolving legal mandates. This paper explores the impact of these factors in the context of the Food & Beverage (F&B) sector, particularly among Micro, Small, and Medium Enterprises (MSMEs). Recent technological advancements have catalyzed the digitization of various sectors, including F&B, giving rise to an online retail marketplace. This shift has significantly altered consumer behavior, fostering the emergence of online food purchases. Digitalization has empowered F&B establishments, especially Enterprises, to streamline their operations, leading to enhanced service quality and expeditious deliveries, thereby elevating customer satisfaction. The ongoing process of globalization and digitization has ushered in opportunities to engage in online food sales, with delivery and offline pickup options. Within this digital transformation, the concept of cloud kitchens has gained prominence. Cloud kitchens, also known as ghost kitchens, represent a virtual culinary venture designed for takeaway and delivery services, devoid of traditional dine-in facilities. This model substantially reduces operational costs compared to conventional restaurants, offering scalability without the financial risks of physical expansion. Businesses operating within this framework can continually adapt to market dynamics, maximizing customer satisfaction and revenue. This study employs a systematic literature review approach, analyzing various sources to delve into the business development of brands implementing the "Cloud Kitchen" concept. It aims to identify critical success factors, technology integration, and consumer perspectives while acknowledging the evolving post-pandemic dining landscape. The research underscores the potential for cloud kitchens to reshape the culinary industry, provided they address the challenge of meeting consumers' desire for communal dining in a post-pandemic era. By comprehending the factors influencing consumer perspectives, technology adoption, and product innovation within cloud kitchens, this study contributes valuable insights to guide businesses operating in this domain.

Keywords: *Digitalization, Operation Efficiency, Sustainability, Enterprises, Cloud Kitchen*

1. Introduction

Over the past few decades, the conditions of the global industries are no longer limited into facing technological changes that leads to develop the greater flexibility, reactivity, and greater productivity. The current state of the industry additionally shows new challenges such as rapid technological change, increasing complexity, customer preferences and new legal requirements. On the side of all the conveniences, the impact of globalization also creates a new challenging situation in a corporate context: manifold new technological opportunities are perceived, but people are uncertain how to use and implement them simultaneously in terms of product and service offers (Lerch and Gotsch, 2015).

The progress of technology in recent years has shown a better results, this can be seen from the growth of the digitization process in all sectors and industries. Correspondingly, the consumer behavior also has swiftly evolved alongside with the transformations the of technology, creating the emergence of an online retail marketplace. The growth of opportunities in the Food & Beverage sector encouraged by mobile technology and wireless internet access has been transforming the way consumers purchase food. Digitalization has also enabled F&B establishments especially MSMEs (Micro, Small and Medium Enterprises) to streamlin their internal operations for more efficient delivery. This leads to improved service quality and faster deliveries, thereby enhancing customer satisfaction.

The current condition of globalization in digitization process has opened up opportunities for MSMEs (Micro, Small and Medium Enterprises) to engaged in the sale of food and beverages to promote and sell their products online, with delivery or offline pickup options. One of the popular concepts in the digitization process in operating the current food sales method that we will be discussing now is the cloud kitchen.

Cloud kitchen or also known as ghost kitchen is a concept of commercial kitchen space that provides facilities and services in running a food and beverage business virtually. The concept of this kitchen is creating the outlet that does not provide Dine-in facilities and solely focuses on takeaway and delivery for their business (Choudhary, 2019). This concept is made to help business owners to create a system that will serve customer demands with flexibility in time and space. The cloud kitchen concepts are made by using a minimal capital investment model, low risk, high margins, and endless opportunities. With this kind of concept cloud kitchens are becoming one of the safest food business formats (Beniwal and Marthur, 2021).

The main advantage of cloud kitchen for MSMEs is its ability in reducing the operational costs compared to traditional restaurants. A physical dining room requires a significant investment in property rental or purchase, interior design, utilities, and staff for operating the kitchen and front of the house. However, cloud kitchen eliminates these costs by focusing solely on food production and delivery. This reduction in overhead costs makes it more financially feasible for MSMEs to enter the competitive food and beverage sector or expand their existing operations.

Cloud kitchens also offer scalability, allowing MSMEs to test new market areas without the financial risks associated with opening physical stores. With cloud kitchen, businesses can explore different locations and adapt their strategy based on real-time data from food delivery platforms. For example, if a cloud kitchen finds that a certain dish is performing well in a certain location, they can adapt its menu to meet more needs in that area, thereby optimizing its offering for maximum customer satisfaction and revenue.

2. Methods

This study employs a systematic literature review with a descriptive and qualitative approach. The primary objective is to examine various literature sources pertaining to the business development of brands implementing the "Cloud Kitchen" concept.

In academic research, regardless of the specific field of study, the process of constructing and connecting existing research knowledge serves as a foundational pillar. The integration of existing knowledge holds paramount importance in academic endeavors, underscoring the need for accurate and rigorous integration practices by scholars. This underscores the growing relevance of the literature review as a research method.

The literature review, as a research methodology, can be characterized as a systematic and methodical approach to collecting and synthesizing prior research. This approach is supported by esteemed scholars such as Baumeister and Leary (1997) and Tranfield, Denyer, and Smart (2003). A proficiently executed literature review lays a robust foundation for advancing knowledge and facilitating the development of theoretical frameworks, as emphasized by Webster and Watson in 2002.

To initiate this literature review, a set of keywords was employed in the database research, which is indexed by Scopus. These keywords include “Digitalization” OR “Operation” “Efficiency” OR “Sustainability” OR “Enterprises” OR “Cloud Kitchen”. The query was structured as follows: Digitalization OR Operation AND Efficiency OR Sustainability OR Enterprises OR Cloud AND Kitchen.

3. Results

3.1. The Characteristics of Research

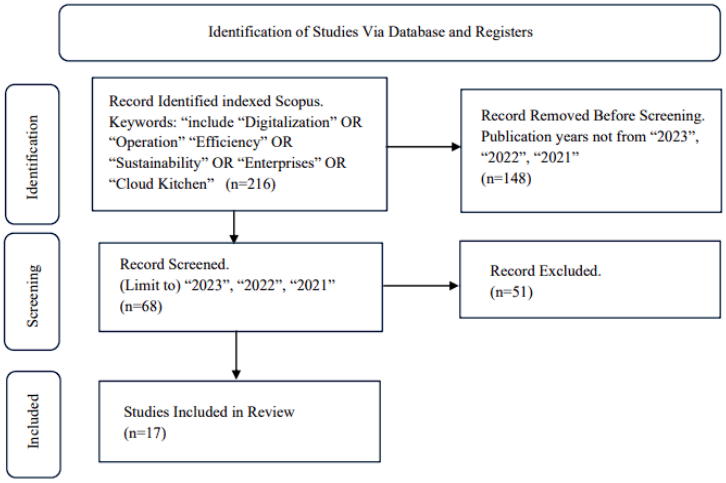

Figure 1. Calculation of the Coefficient

A total of 216 documents related to the keywords “Digitalization” OR “Operation” “Efficiency” OR “Sustainability” OR “Enterprises” OR “Cloud Kitchen”. the last three years (2021-2023) from the Research database were considered. Screening was prefer to limit exact keywords with 68 document results. Limiting journal reviews to the last 3 years offers several advantages in the context of academic research with the latest developments in a particular field Relevance, Accuracy, Emerging Concepts, Publication Trends and also this research is issued to this topics.

Several possible reason for the development in research was can provide insights into how consumer preferences and behavior are changing with the rise of cloud kitchens. This information can help MSMEs align their offerings with market demands, contributing to long-term viability. Also, by exploring cloud kitchen sustainability, researchers can contribute to the body of knowledge in entrepreneurship, sustainability studies, and the broader food industry domain.

3.2. Development Operation Cloud Kitchen

Operation Cloud Kitchen efficiency has rapidly evolved, transforming the food industry's landscape. Cloud kitchens, also known as ghost kitchens, have harnessed technology and innovative business models to optimize efficiency in the culinary realm. By focusing on delivery and takeout services without the constraints of a traditional dine-in space, these kitchens streamline operations, reduce overhead costs, and minimize wastage. The integration of advanced ordering platforms. With the ongoing shift in consumer preferences towards convenient and contactless dining experiences, the continuous development of efficiency in operation cloud kitchens stands as a testament to the industry's ability to adapt, innovate, and cater to modern demands.

This is a sustainability innovation requires less investment, can make different opportunitys, with carrying lower threat (Juliana et al., 2020). The cloud kitchen model, emphasizing delivery services to ensure social distancing, enables collaboration with numerous brands and diverse concepts. It boasts affordability, swift and hygienic delivery, contributing to it has become a trend. which is growing globally (Süzer et al., 2021).

Operating a cloud kitchen brings various advantages for MSME operations, including cutting down fixed expenses, reducing operational costs, eliminating rent payments, saving time, and enabling expansion opportunities. (Sulistyowati, 2020). Based on previous research, two main reasons hinder small businesses from embracing online platforms. The first concern is related to technological barriers, while the second is rooted in the perception that the benefits of online marketing are overshadowed by the difficulties it entails. (Shimomura, 2020).

3.3. Technology Integration on Operation Cloud Kitchen

Previous studies discussed consumers readiness to embrace food delivery online, taking into account factors like food selection, convenience, reliability, and the impact of the pandemic as contextual factors (Troise et al., 2020). Many research studies have utilized the technology readiness theory to analys how consumer characteristics such as innovation, optimism, discomfort, and insecurity influence their intentions and real-world usage of delivery ordering services. (Ali et al., 2021).

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.645[a]	.416	.404	2.02326

a. Predictors: (Constant), Perceived Usefulness (X2), Perceived Ease of Use (X1)

b. Dependent Variable: Behavioral Intention (Y)

Figure 2. Calculation of the Coefficient Determination

From this calculation Perceived Ease of Use and Perceived Usefulness is accepted, meaning that Perceived Ease of Use and Perceived Usefulness has significancy impact on Behavioral intention to use Technology on Enterprise. The calculation results presented in the table below, it becomes evident that the combined effect of Perceived Ease of Use (X1) and Perceived Usefulness (X2) on Behavioral Intention to Use (Y) is 41.6%

The convenience and perceived practicality of the technology significantly influence the attraction of Micro, Small, and Medium Enterprises (MSMEs) owners towards adopting Cloud Kitchen models. These results imply that small business proprietors are well-informed about Cloud Kitchens, a positive observation. Given the challenges posed by the COVID-19 pandemic, business owners have been actively seeking ways to ensure their sustainability. Cloud Kitchens have emerged as a viable entrepreneurial option.

	Relationship	Std. Beta	Std. error	t value	p value	Decision
H1	Perceived usefulness → intention to use	0.369	0.072	4.271	0.000	Supported
H2	Perceived ease of used → intention to use	0.259	0.061	5.428	0.000	Supported
H3	Perceived usefulness x perceived ease of use → intention to use	0.395	0.069	4.746	0.000	Supported

Figure 2. Path Analysis

3.4. The Determinants of Cloud Kitchen Success

The growth and development of this cloud-based kitchen culinary business is projected to continue even after the COVID-19 pandemic. In fact, a study conducted by research institute Grand View Research (2021) projects the growth CAGR of this industry to reach 12.4% with a market value of 139.37 billion US Dollars in 2018. Meanwhile, in Indonesia, the CAGR of this industry is projected to reach 20.7% per year until 2028 with an estimated total market of 2.8 trillion rupiah. There is no doubt that the cloud kitchen business has promising growth prospects.

The expansion of online food delivery services has proof to be effective in maintaining the sustainibility of F&B sector, the concept of cloud kitchen has began to emerge as an inevitable need to progress. Cloud kitchens are virtual food service establishments that provide delivery, without dining-in facilities (Juliana, et.al, 2020).

Direct Effects	Estimates	p-value
Total PR - Total RI	0,113	<0,001
Total RM - Total RI	0,061	0,006
Total CR - Total RI	0,129	<0,001
Total OR - Total RI	0,058	0,0011
Total PP - Total RI	0,067	0,003
Total K - Total RI	0,020	0,443
Indirect Effects		
Total PR - Total CS - Total RI	0,041	<0,001
Total RM - Total CS - Total RI	0,030	<0,001
Total CR - Total CS - Total RI	0,038	<0,001
Total OR - Total CS - Total RI	0,028	<0,001
Total PP - Total CS - Total RI	0,028	<0,001
Total K - Total CS - Total RI	0,026	0,004
Total Effects		
Total PR - Total RI	0,154	<0,001
Total RM - Total RI	0,091	<0,001
Total CR - Total RI	0,166	<0,001
Total OR - Total RI	0,087	<0,001
Total PP - Total RI	0,094	<0,001
Total K - Total RI	0,046	0,091

Figure 3. Meditation Analysis Results

Identifying critical success and priority factors is essential for practitioners. By knowing critical success factors, business actors get an overview to business actors about a number of factors that will ensure the competitive level of a business against their competitors, market gain and success (Tadic &; Boljevic, 2015).

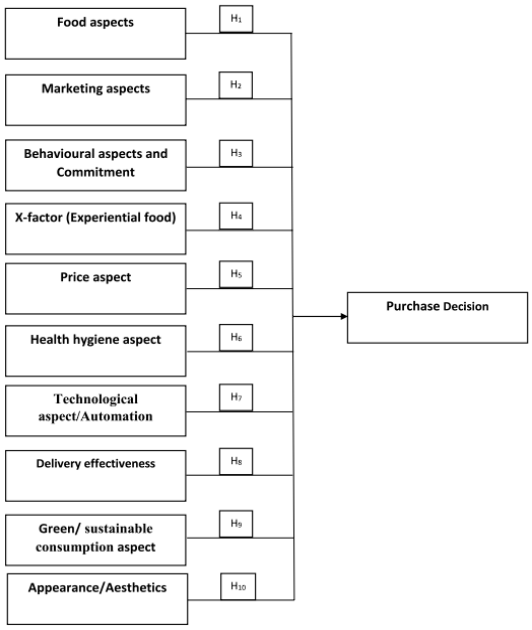

Figure 4. Conceptual model for Purchase decision

On previous research that we used to conduct several hypotheses that related to customer satisfication and product on F&B sutainability. Critical success factors for cloud-based kitchen culinary businesses from the perspective of business actors are sales promotion, food taste, brand reputation, rating in the application, product packaging, and also food hygiene. The six critical success factors will be used as independent variables. In this research, the variable being examined as the outcome as future repurchase intention, while the intervening variable in this study is customer satisfaction. (Christian Ryan, et al. 2023).

This previous research is designed to achieve research objectives; namely to identify the characteristics of culinary businesses that use cloud kitchens in Indonesia today, identify the experience of business actors in managing cloud-based culinary businesses and to identify critical success factors in cloud-based culinary business (from the perspective of business actors and consumer perspectives). There are three characteristics of a cloud-based culinary business, namely low costs in terms of capital, risk, and more efficient operations, simpler operations, and a unique branding process because the cloud kitchen culinary business does not have a physical place as a promotional medium and interaction with consumers is also minimal.

The Results of the research critical success factors identified from the perspective of cloud-based kitchen culinary business actors are sales promotion, food taste, brand reputation, rating in the application, food hygiene and product packaging. (Christian Ryan, et al. 2023)

These above results are also determine by outcomes researchs. The focus of the preceding study was on Generation Z, individuals born from 1995 to 2010 (Eberhardt, 2017; Seemiller and Grace, 2016). The participants, consisting of 576 respondents aged 14 to 24, were selected to understand the food preferences, particularly pertaining to cloud kitchens. (K. Kulshreshtha and G. Sharma, 2022)

Summary results of hypothesized model testing.

Hypotheses	Path coefficient (β)	Significance (p 0.05)	Decision
H1. Food Aspects→Purchase Decision	0.17	Yes (0.000)	Supported
H2. Marketing Aspects→Purchase Decision	0.071	Yes (0.024)	Supported
H3. Behavioural Aspects→Purchase Decision	0.462	Yes (0.000)	Supported
H4. X-factor (Experiential food)→Purchase Decision	0.065	Yes (0.039)	Supported
H5. Price →Purchase Decision	0.081	Yes (0.012)	Supported
H6. Hygiene→Purchase Decision	0.068	Yes (0.050)	Supported
H7. Technology → Purchase Decision	0.082	Yes (0.013)	Supported
H8. Delivery →Purchase Decision	0.073	Yes (0.035)	Supported
H9. Green Aspects →Purchase Decision	0.075	Yes (0.011)	Supported
H10. Aesthetics →Purchase Decision	0.115	Yes (0.001)	Supported

Figure 5. Model Testing Hypothesized

Therefore, maintaining high levels of cleanliness within operational cloud kitchens is extremely important to uphold food safety standards and ensure customer satisfaction. Since there isn't a visible dining area, focusing on cleanliness becomes even more crucial, as it directly affects how people perceive the quality of the food. These kitchens need to follow strict cleanliness guidelines, making sure that all areas where food is prepared, utensils, and equipment are consistently cleaned and sanitized. The kitchen staff must regularly wash their hands and wear appropriate protective gear to prevent the spread of germs and cross-contamination. It's also vital to store ingredients at the right temperatures to stop bacteria. Cloud kitchens need to implement successful strategies for pest control to prevent infestations. By giving importance to hygiene throughout the cooking and delivery process, cloud kitchens can earn consumers' trust, protect public health, and maintain a reputation for providing safe and delicious food. (K. Kulshreshtha and G. Sharma, 2022)

3.5. Advantages of Cloud Kitchens for Enterprises

The benefits of adopting a cloud kitchen model are substantial and have reshaped the landscape of the food industry. Cloud kitchens offer a lower barrier of entry for aspiring entrepreneurs, circumventing the high initial costs associated with traditional restaurants. By eliminating the need for prime location rents and front-of-house operations, such as waitstaff and seating, cloud kitchens provide a cost-effective avenue for culinary ventures. Additionally, these kitchens capitalize on lower operating expenses, allowing them to concentrate exclusively on food quality without the burden of extensive overhead costs. The flexibility of cloud kitchens stands out as a remarkable advantage, as they can swiftly adapt to evolving consumer preferences by adjusting menus and operating hours, ensuring alignment with changing market trends. The accessibility to user data in this digital era empowers cloud kitchens to optimize various aspects, from process efficiency to user interface design, tailored to real-time consumer behavior. This model's resilience during the COVID-19 pandemic, catering to the surge in delivery demand, further highlights its pertinence in the modern culinary landscape. With lower customer acquisition costs, competitive pricing, and a heightened emphasis on food quality, cloud kitchens are revolutionizing the way culinary businesses operate, emphasizing efficiency, adaptability, and consumer satisfaction at the forefront. (Twinkle Beniwal, et al. 2021)

4. Discussion

Looking ahead to future research directions, there are several compelling areas for exploration that warrant attention. Investigating the evolving dynamics of consumer preferences and behaviors in response to changing market landscapes remains a pivotal topic. Exploring solutions that bridge the gap between virtual convenience and the desire for social engagement could yield valuable insights for the industry. As the field of cloud kitchens continues to evolve, each of these areas presents an exciting opportunity to contribute to the growing body of knowledge and to drive innovation in F&B entrepreneurship.

4.1 Product Development Perspectives

This research advances the previous studies by comprehending a range of factors influencing consumer perspectives and enterprise actors and a comprehensive exploration of technology adoption. As this innovative culinary model continues to reshape the food industry, there exists a noteworthy gap in understanding the nuanced factors that drive successful product innovation within cloud kitchens. Exploring this area in upcoming research holds the promise of unraveling insights that can shape strategies for businesses operating in this space. By investigating how cloud kitchens can harness their unique operational dynamics, technology integration, and consumer preferences, researchers can illuminate pathways to enhance product offerings, streamline processes, and elevate customer experiences.

4.2. Post-Pandemic Challenge

In the pandemic era, cloud kitchens have emerged as a resilient solution to the challenges faced by traditional dining establishments. However, a noteworthy aspect that warrants exploration in future research is the post-pandemic challenge of meeting the consumer desire for a dining experience that cloud kitchens inherently lack. As restrictions ease and people seek a return to social dining experiences, the absence of a physical dining area in cloud kitchens becomes more pronounced. Investigating this aspect can shed light on the evolving consumer preferences and the ways in which cloud kitchens can adapt to cater to these desires. Researchers could delve into creative approaches such as collaborative pop-up spaces, virtual dining experiences, or hybrid models that incorporate limited seating arrangements alongside the core delivery-focused operations. By addressing this challenge head-on, the research can contribute to shaping the strategies of cloud kitchens in a way that honors the need for communal dining while leveraging their core strengths in efficiency, convenience, and diverse culinary offerings. This nuanced exploration stands to provide insights that bridge the gap between evolving consumer expectations and the operational realities of cloud kitchens in a post-pandemic world.

5. Conclusion

The exploration of the topics discussed sheds light on the intricate dynamics and potential of cloud kitchens within the culinary landscape. The study has unveiled the multifaceted advantages of cloud kitchens, showcasing their capacity to revolutionize traditional restaurant paradigms. The integration of technology, alongside the understanding of consumer perspectives and enterprise actors, has emerged as a critical driver of success. However, as the post-pandemic era introduces new challenges and evolving consumer preferences, future research avenues beckon. Addressing the desire for communal dining experiences and navigating the intricacies of the ever-changing market remain central to the continued evolution of cloud kitchens. With an eye toward innovation and adaptation, cloud kitchens are poised to further reshape the culinary industry, embodying resilience, efficiency, and the potential for dynamic growth. As this field continues to develop, the insights presented in this study provide a foundation for informed decision-making, strategic planning, and the advancement of both research and practice within the realm of cloud kitchens. Therefore, the research encompassed factors influencing purchasing choices in the context of cloud kitchens. As the best of our understanding the research, there is limited existing research on consumer preferences

specific to cloud kitchens, which has gained importance, particularly in the era of COVID-19 and new-normal (Marinkovic and Lazarevic, 2021).

5.1 Limited and Future Research

The existing of several research on the subject has certainly affects many facets of cloud kitchens, offering valuable insights into their operational advantages, economic implications, and technological integration. However, it is important to acknowledge the limitations that persist within this field. Some areas, such as the nuanced intricacies of customer behavior in the context of cloud kitchens, the long-term sustainability of this business model, and the cultural influences on its adoption, remain relatively underexplored. Furthermore, as the culinary and technological landscapes continue to evolve, there is a pressing need for future research to keep pace with these changes. Future investigations could delve deeper into the challenges posed by market saturation, the impact of emerging technologies like Artificial Intelligence and automation, and the development of innovative strategies for enhancing customer engagement and loyalty. By addressing these gaps and proactively anticipating the challenges that lie ahead, researchers can contribute significantly to the ongoing evolution of cloud kitchens, ensuring that they remain relevant and effective in meeting the dynamic needs of consumers and businesses alike.

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