



UNIVERSIDADE CATÓLICA PORTUGUESA

E-commerce and Digital Marketing in Post-Covid: A Review Integrating the PRISMA Methodology with Clustering Analysis

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by

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Abstract

This thesis examines the significant impact of the COVID-19 pandemic on global e-commerce and digital marketing strategies, focusing on how businesses in different sectors adapted to these unprecedented challenges. The study aims to answer two key questions: How did e-commerce and digital marketing evolve post-pandemic, and what factors influenced these changes?

This research identifies the practical strategies businesses employed during the pandemic by reviewing the literature published between January 2020 and 2024. The PRISMA method is rigorously applied to ensure a thorough and transparent analysis of relevant academic papers. The key findings underscore the swift adoption of new technologies, consumer behavior shifts, and impact of government policies.

The study identifies three major themes: the need for businesses to invest in advanced e-commerce technologies, the importance of adapting to evolving consumer habits, and the drive for digital transformation. Despite some limitations, the insights provide a valuable understanding of the digital transformation trends post-pandemic.

This research does not just offer insights and actionable recommendations for businesses to construct robust, forward-thinking models that can excel in an increasingly digital world, it also enhances our comprehension of the digital marketing and e-commerce shifts triggered by the pandemic.

Keywords: COVID-19, E-Commerce, Digital Marketing, Consumer Behavior, Cluster Analysis, PRISMA Method

Resumo

Esta tese examina o impacto significativo da pandemia de COVID-19 no e-commerce global e nas estratégias de marketing digital, focando-se em como as empresas em diferentes setores se adaptaram a estes desafios. O estudo visa responder a duas questões principais: Como é que o *e-commerce* e o marketing digital evoluíram após a pandemia, e quais foram os fatores que influenciaram essas mudanças?

Esta pesquisa identifica as estratégias práticas que as empresas empregaram durante a pandemia através da revisão da literatura publicada entre janeiro de 2020 e 2024. O método PRISMA é aplicado de forma rigorosa para garantir uma análise completa e transparente dos artigos académicos relevantes. As principais conclusões destacam a rápida adoção de novas tecnologias, mudanças no comportamento dos consumidores e o impacto das políticas governamentais.

O estudo identifica três temas principais: a necessidade de as empresas investirem em tecnologias avançadas de *e-commerce*, a importância de se adaptarem aos hábitos em evolução dos consumidores e o impulso para a transformação digital. Apesar de algumas limitações, as percepções fornecem uma compreensão valiosa das tendências de transformação digital pós-pandemia.

Esta pesquisa não só oferece conhecimento e recomendações para que as empresas construam modelos robustos e inovadores que possam destacar-se num mundo cada vez mais digital, também aprimora a nossa compreensão das mudanças no marketing digital e no *e-commerce* desencadeadas pela pandemia.

Palavras-chave: COVID-19, *E-commerce*, Marketing Digital, Comportamento do Consumidor, Análise de Cluster, Método PRISMA

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Abbreviations

CRM: Customer Relationship Management

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

SJR: Scientific Journal Rankings

SSE: Sum of Squared Errors

WCSS: Within-Cluster Sum of Squares

SMEs: Small and Medium-Sized Enterprises

Chapter 1

Introduction

This section presents the essential framework of the dissertation topic and emphasizes its significance and importance. It also includes an organized paper summary, a complete description of the selected methodological approach, and a clear statement of the research objectives.

1.1. Context

The business world has seen extraordinary changes due to the COVID-19 pandemic, with many companies relying heavily on digital transformation as a strategy for development and viability. Particularly e-commerce and digital marketing have changed significantly due to companies' need to adjust swiftly evolving consumer behavior and market dynamics. Businesses' desire to make quick decisions has sped up the adoption of digital technologies and changed how they interact with customers.

Businesses had to reconsider their digital marketing tactics and e-commerce operations to remain competitive as the pandemic caused personal relationships to shift online. This change has brought to light the significance of digital channels as well as weaknesses in current approaches, particularly when it comes to incorporating new technology, conforming to regulations, and ethical issues. To effectively navigate the post-pandemic digital landscape, firms must comprehend these shifts and their ramifications.

1.2. General Framework

This section presents the overall framework of the dissertation topic, detailing its definition and rationale. It outlines the study's macrostructure, research objectives, and the methodologies employed for its development.

Specifically, the study employs a systematic review technique to evaluate changes in e-commerce and digital marketing strategies across some sectors or industries following the COVID-19 pandemic.

A systematic review was chosen because it provides a rigorous and transparent method for synthesizing current literature, allowing for a comprehensive analysis of the research topics. This methodology provides an in-depth understanding of the changes in e-commerce and digital marketing following the pandemic by painstakingly discovering, assessing, and synthesizing information from numerous studies.

1.3. Objectives and Research Methodology

The COVID-19 pandemic drastically affected global economies, forcing businesses to pivot towards e-commerce and digital marketing. This study examines how these strategies have evolved across different sectors, identifies effective practices, and offers insights for businesses aiming to grow in the post-pandemic world. Despite the challenges, the primary aim is to understand the transformation in e-commerce and digital marketing since the pandemic began and the factors driving these changes, highlighting the opportunities for growth in the post-pandemic world.

The study specifically looks at how e-commerce and digital marketing techniques have changed in response to the pandemic, with a focus on the factors affecting changes in consumer behavior, technological adoption, and modifications to ethical and legal requirements.

Our research questions explore how e-commerce and digital marketing evolved in different sectors and activities after the COVID-19 outbreak and the factors influencing these changes. To help researchers and businesses navigate and benefit from these developments for long-term growth in the dynamic digital ecosystem, the study also attempts to offer practical recommendations. The research wishes to provide insightful advice for thriving in the post-pandemic era and adjusting to it through this thorough investigation.

1.4. Macrostructure

This thesis is organized into six chapters, each addressing the research's problems and objectives methodically.

The first chapter presents the dissertation topic, lists the main goals, discusses the study's importance, describes the research methods, and outlines the thesis format.

The second chapter provides a literature review, explaining the main concepts of COVID-19, e-commerce, and digital marketing and elaborating on the connection between each topic.

Chapter number three defines the problem and research questions.

Chapter four discusses the research method. It explains the data collection and analysis methodology, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Method, and the steps to guarantee the results' reliability.

The data collection, analysis, and findings are presented in Chapter 5. It starts with an overview of gathering data, such as finding and evaluating scholarly publications. The chapter next goes over the procedures for gathering data and concludes with a detailed examination of the results. It contains the dataset's description, a descriptive analysis, and the results of the experiments. The study questions are also taken into consideration when discussing the findings.

Finally, Chapter 6 presents the study's main conclusions, summarizing key findings and discussing their implications. It also identifies possible directions for future study to explore the rapidly developing fields of digital marketing and e-commerce more deeply.

Chapter 2

Literature Review

This section provides a comprehensive overview of existing research on this dissertation's topic. By examining previous studies, theoretical frameworks, and empirical findings, this chapter seeks to identify the current state of knowledge, highlight significant advancements, and uncover research gaps that this study aims to address.

Furthermore, this study examines the global effects of the COVID-19 pandemic on digital marketing tactics and e-commerce. By carefully evaluating accessible knowledge, it seeks to synthesize significant results and provide helpful advice for businesses navigating the changing digital terrain in a post-pandemic world.

2.1. COVID-19

The COVID-19 pandemic, beginning in late 2019, disrupted global business sectors, necessitating structural changes, and altering consumer purchasing patterns (Agus et al., 2021). This varied across product categories, some experiencing significant impacts while others were less affected. (Bhatti et al., 2020). The pandemic accelerated the growth of e-commerce platforms, reshaping customer review dynamics and purchasing behavior (Agus et al., 2021). However, it provided difficulties for the creative industries, leading to a move toward digital technologies and online platforms for long-term revenue sustainability (Khlystova et al., 2022).

Economically, businesses faced declines in sales and revenue, necessitating adaptation to digital marketing strategies to connect with consumers amid increased digital media consumption (Hongky Dyrgo, 2023; Pandey, 2021; Galhotra & Dewan, 2020). In addition, concerns appeared regarding the spread of fake news during the pandemic, impacting public health and consumer behavior (Sarraf et al., 2024).

The surge in digital media disruption consumption during the pandemic propelled the growth of digital marketing and advertising, fostering a fundamental shift in consumer behavior towards online platforms (Galhotra & Dewan, 2020). This shift has been particularly significant for small and medium-sized enterprises (SMEs), necessitating adaptive responses to navigate the evolving landscape effectively (Gao et al., 2023).

The COVID-19 pandemic has brought about profound changes across industries, highlighting the importance of agile marketing strategies and adaptation to digital platforms in response to dynamic market conditions (Destina Paningrum et al., 2023).

2.2. Consumer Behavior during the Pandemic

The COVID-19 pandemic has intensified consumer vulnerability. Developing effective mitigation techniques will require a more profound knowledge of the mechanics of this susceptibility. Demographic variables such as age and income are crucial in shaping consumer vulnerability, indicating that customized approaches are needed.

Research indicates that, in the digital economy, digital marketing techniques can improve customer happiness and purchase intention despite the difficulties brought about by the pandemic (Limna et al., 2022). However, product categories have been impacted by the pandemic's significant influence on customer behavior (Bashar et al., 2023).

It is critical to recognize the lack of focus on the impact on customers and the market as companies adjust to virtual operations (Kim, 2020). E-commerce companies, in particular, need to adapt to shifts in consumer purchasing habits by including products on their websites that draw visitors in, keep them interested, and encourage purchases.

Businesses must recognize and respond to customer susceptibility during pandemics to effectively navigate the changing market environment. By utilizing digital marketing methods and aligning with evolving consumer behavior, businesses may effectively reduce the effects of health crises on consumer satisfaction and purchase decisions.

In addition, Limna et al. (2022) also mention the importance of a more profound comprehension of customers, their behavior, their preferences for interacting with companies, and the delivery of essential and engaging personalized experiences. This up-to-date interactive marketing approach is vital for meeting consumer needs and fostering enduring brand relationships in dynamic market conditions.

2.3. E-commerce Technology

The COVID-19 pandemic has accelerated the adoption of digital technologies, particularly in e-commerce, as businesses seek efficient means to manage the crisis (Pandey, 2021). E-commerce platforms have shown relative stability and predictability despite significant demand uncertainty and changing consumer choices brought on by the pandemic (Sarraf et al., 2024). This has been especially noticeable in the times when digital platforms have become essential connectors, enabling essential deliveries to doorsteps, and acting as significant ways for the purchase and sale of goods and services, such as groceries, masks, sanitizers, and other necessities (Galhotra & Dewan, 2020).

Several studies demonstrate how important digital technology is to SMEs' performance, especially in e-commerce (Afridi et al., 2021; Lestari et al., 2021). The process of buying and selling digitally through online platforms—e-commerce—has several benefits for both buyers and retailers, including low operating costs, a large selection of products, ease of management, and flexibility in purchasing (Lestari et al., 2021; Ghandour & Woodford, 2020).

The conversation also touches on a few other aspects of Internet marketing, stressing the benefits of digital marketing over conventional techniques, such as cost-effectiveness, more extensive reach, real-time tracking, and more targeted customer journeys (Astari, 2021). Research on the pandemic's effects on the global e-commerce business focuses on significant players—such as Amazon, Alibaba, Rakuten, Zalando, and ASOS—and highlights the necessity of specialized tactics to meet obstacles and exploit possibilities given the changing environment (Elrhim & Elsayed, 2020).

Highlighting how e-commerce technology, with its durability, stability, and potential to drive growth and innovation in the digital era, had a revolutionary role in responding to and navigating the obstacles faced by the COVID-19 epidemic, Wang et al. (2023) Recognize that some investigators have recognized customers' need to order food online during the pandemic and explored the adoption behavior of online food delivery services.

Moreover, Limna et al. (2022) Emphasize that businesses are constantly adopting techniques for developing business models that incorporate organizational change caused by the digital economy as core principles. This induces a response to reorganizing organizational procedures, marketing and communication, and organizational strategies. This emphasizes the need for organizations to change and grow in response to the changing landscape caused by digitalization and the difficulties provided by the pandemic.

2.4. E-commerce Amount

The COVID-19 pandemic has catalyzed a remarkable surge in e-commerce utilization, driven by shifts in consumer behavior and increased reliance on online shopping platforms. During the pandemic's peak, there was a significant rise in e-commerce and e-service utilization, particularly for purchasing food, groceries, cooked meals, fast food, hygiene products, and subscribing to online meeting services (Witczyńska, 2022). This flow is reflected in the exponential growth of online sales, which exceeds in-store retail by five times, prompting businesses to innovate their digital sales initiatives to adapt to the rapidly transforming market landscape (Kim, 2020).

The pandemic has brought about significant changes in consumer purchasing patterns, with a noticeable rise in the percentage of credit card transactions made online, particularly during lockdown procedures and times when the government gave financial support (Afridi et al., 2021). Nevertheless, when financial assistance declines and mobility limitations relax, evidence indicates a return to pre-pandemic e-commerce purchasing patterns (Alhababy, 2016).

Due to the need for transactions during lockdowns, e-commerce became quite popular during the pandemic, demonstrating its importance as a lifeline for consumers and businesses (Ghandour & Woodford, 2020). Because of e-commerce's scalability in COVID-19, online shopping has become essential to daily life. As a result, it is now necessary to comprehend the underlying forces driving its rise as well as the dynamics of changing customer behavior (Dinesh & MuniRaju, 2021).

Surveys and analysis show that the pandemic has increased online shopping frequency, emphasizing the need for online and offline retailers to invest in cutting-edge technologies and improve customer engagement to stay competitive in the quickly changing e-commerce market (Dinesh & MuniRaju, 2021). Opportunities exist, but to maintain and take advantage of e-commerce's

scalability during and after the pandemic, issues like infrastructure development, quality concerns, cooperation with offline retailers, social influence, and growing customer mindshare must be addressed (Dinesh & MuniRaju, 2021).

Furthermore, it is essential to note that the terms 'e-commerce' and 'online shopping' are frequently used together. However, at its core, e-commerce represents a concept for conducting business online, which includes a variety of services such as making online payments and booking flights (Meena & Chaturvedi, 2020). Additionally, the pandemic enhanced the use of contactless delivery methods, and consumers' maintenance motives influenced habit development for both e-commerce and self-collection (Wang et al., 2023). E-commerce has an impact on both demand and user behavior, as well as on services and delivery, which are progressively moving away from retailers and towards the end user directly (Campisi et al., 2023).

2.5. Digitalization

Digitalization has emerged as a transformative force, reforming industries through innovative technologies and business models. Aggregators, in particular, have played a pivotal role in facilitating the adaptation of record companies to digital distribution channels, underscoring the transformative power of digital platforms (Hongky Dyrigo, 2023).

According to Limna et al., (2022) the increasing use of digital technology in marketing communication channels has highlighted the significance of adopting technological innovations to promote organizational transformation and create customized communication plans. The importance of digitalization in today's corporate environment is further highlighted by the fact that digital technologies are now essential for creating new goods, values, and competitive advantages across a range of markets (Limna et al., 2022).

Limna et al. (2022) Argue that the digital revolution of marketing tactics has escalated competition and impacted consumers' purchasing intents, underscoring the dynamic character of digital marketing relative to conventional approaches. Incorporating digital media into organizational operations includes various aspects, like digitalization and integrating telecommunications, internet, and mobile technology to enhance interactions with consumers, suppliers, and channel partners.

Companies can engage with potential customers in real time and gain vital insights into the effectiveness of their plans by utilizing digital platforms that offer interactive, targeted, and quantifiable content strategies (Oliveira et al., 2021).

Without question, digitalization profoundly impacts the consumer and industrial marketing landscapes. As such, researchers and practitioners need to have a detailed grasp of this phenomenon (Tabuena et al., 2022). Businesses are using software and internet-based solutions more frequently to innovate and adapt to the present environment (Astari, 2021).

According to Beckers & Cant (2024)the internet's function as a global marketplace has transformed business and given companies access to previously unheard-of possibilities for connecting with and engaging with customers worldwide. Technology's profound impact on businesses extends to finding, targeting, serving, and communicating with customers, fundamentally altering traditional business paradigms (Destina Paningrum et al., 2023).

In addition, in this age of the Internet of Things, digital technologies have become the foundation for generating new products, values, and assets and gaining a competitive advantage in most markets. This highlights the critical importance of digital technology in encouraging innovation, value creation, and competitive advantage across various industries, emphasizing the need for organizations to include digitalization in their strategic goals.

Digital technology presents enormous potential for adding value for clients and companies alike, bringing in a new phase of creativity and opportunity in the digital age (Destina Paningrum et al., 2023).

2.6. Digital Marketing

Digital marketing has become an indispensable tool for businesses attempting to succeed in today's competitive environment. Online marketing and digital branding have become popular tactics since the emergence of the digital era, particularly highlighted during the COVID-19 pandemic (Hongky Dyrgo, 2023). Leveraging digital platforms, businesses can better identify and address client needs, fostering trust and loyalty (Tabuena et al., 2022).

Online marketing encompasses utilizing the internet to promote and sell products or services, complemented by digital branding strategies to establish a robust online presence and reputation (Hongky Dyrgo, 2023). The pandemic has accelerated the adoption of these tactics, owing to increased internet usage and the necessity to alleviate the crisis's economic effects (Hongky Dyrgo, 2023).

Notably, digital marketing has various advantages over traditional techniques, including faster distribution, simplicity of evaluation, greater reach, cost-effectiveness, and the capacity to establish brand equity (Redjeki & Affandi, 2021). These characteristics have contributed to a rise in digital marketing investments, as firms recognize its effectiveness in increasing engagement and sales (Limna et al., 2022) .

Furthermore, the pandemic has highlighted the importance of digital sales and online transactions, resulting in the growth of online shops and changes in customer behavior. As firms negotiate these changes, integrating digital marketing into overall business strategy becomes increasingly important, providing chances for innovation and growth (Franca et al., 2020).

The transformational potential of digital marketing exceeds traditional boundaries, allowing businesses to compete globally and communicate with customers in real-time (Oliveira et al., 2021). This real-time involvement enables quick choices based on information gained from customer behavior and market KPIs (Núñez & Miranda, 2020).

Moreover, with improved social media engagement and a craving for digital content, digital media platforms have given marketers numerous opportunities to profit (Wang et al., 2023). Digital marketing has transformed how organizations interact with customers, providing new reach, efficacy, and efficiency. As businesses adapt to the changing digital world, they must develop their digital marketing capabilities to ensure long-term growth and success (Sudarmiatin et al., 2023; Destina Paningrum et al., 2023).

2.7. Ethical and Legal Issues

Building brand trust and putting efficient online marketing tactics into practice is crucial for navigating complicated market conditions in today's digital economy, where organizations must deal with a plethora of ethical and regulatory problems (Hongky Dyrigo, 2023). Furthermore, businesses now have a chance to match their marketing tactics with societal values as a result of the COVID-19 pandemic's paradigm shift towards more moral and socially conscious marketing practices (Alshaketheep et al., 2020).

The spread of false information online, which presents severe moral and legal dilemmas, is one urgent issue made worse by the pandemic. In addition to endangering public health, the quick spread of unreliable information—such as incorrect claims on COVID-19 treatments—also impacts consumer behavior (Sarraf et al., 2024). Businesses should exercise caution when disseminating information online and ensure that it is accurate and credible to prevent the spread of false information.

Moreover, e-commerce businesses have a range of obstacles, such as extended delivery durations, operational constraints among mobility limitations, and compliance with social distancing protocols and lockdowns (Bhatti et al., 2020). These difficulties highlight the necessity for companies to prioritize ethical issues in their operations, guaranteeing honest and open procedures that prioritize the well-being of their customers.

The ethical and legal aspects of digital marketing are crucial in today's globalized world. To successfully navigate the changing digital landscape, businesses need to prioritize consumer trust, take proactive measures to solve difficulties, and respect ethical standards. By implementing ethical marketing strategies and abiding by the law, businesses in the digital era can cultivate long-term sustainability and strengthen their ties with customers.

2.8. Cluster Analysis

Cluster analysis is an effective method of statistical analysis for categorizing data based on similarities to organize a collection of items into separate groups in which items within the same group are more similar than those in other groups (V & Bratchell, 1989).

This method is beneficial for analyzing data with many variables, in which multiple measurements are made without a previous understanding of the data's grouping structure. Cluster analysis has recently acquired interest in digital marketing and e-commerce due to severe disruptions such as the COVID-19 pandemic. The pandemic has highlighted the need for innovative ways to understand and respond to rapidly changing customer behaviors. Recent research emphasizes the importance of cluster analysis in optimizing marketing strategies and improving e-commerce success during these challenging times (Scutariu et al., 2022).

2.8.1. The Change in E-commerce

The COVID-19 pandemic accelerated the shift to online shopping, profoundly altering consumer behavior and global retail environments. Scutariu et al. (2022) They looked at how companies in 31 European countries adapted to these changes. Their study uses hierarchical cluster analysis to assess the effect of digital preparation—measured by cloud computing and safe e-commerce systems—on e-commerce performance during the pandemic.

According to their findings, e-commerce performed better in nations with higher degrees of digital competence. For instance, Denmark and Sweden have led the way regarding e-commerce sales. At the same time, Belgium, Ireland, and the Czech Republic excelled in implementing Customer Relationship Management (CRM) systems and secure transaction procedures. The hierarchical clustering technique highlighted the crucial role that digital transformation plays in maintaining efficient online operations by illuminating the relationship between digital maturity and e-commerce success.

2.8.2. Integration in Digital Marketing

Cluster analysis has proven essential in digital marketing for creating targeted and successful campaigns (Khomenko et al., 2021). Optimized digital marketing techniques for blood donation by segmenting individuals based on demographic and behavioral data using K-Means clustering. Five separate clusters were found in the study:

1. Cluster 1: Adults, primarily women, most without previous blood donation experience, working a full-time job, and having either nuclear or extended family.

2. Cluster 2: Younger people studying live alone or with parents, and most have never donated blood.

3. Cluster 3: Similar to Cluster 2, but with more experience donating blood.

4. Cluster 4: Men in their twenties who live alone or with their parents, work full-time, and frequently donate blood.

5. Cluster 5: Adults, primarily female, who are unmarried, have children work either full- or part-time, and most have never donated blood before.

According to Khomenko et al. (2021) Using these clusters to tailor marketing methods could significantly increase engagement. While retention measures targeted people with a prior donation history, recruitment efforts were concentrated on clusters without prior donation experience. This strategy emphasizes the value of segmentation in digital marketing by facilitating more efficient and tailored outreach.

2.8.3. Incorporation into E-commerce and Digital Marketing

Khomenko et al. (2021) and Scutariu et al. (2022) provide insights that highlight the significance of cluster analysis. Segmenting customers to understand their behaviors better enables companies to target their marketing campaigns more accurately. Businesses that used digital preparation for targeted marketing during the COVID-19 pandemic saw increased performance and engagement. Similarly, segmentation based on behavioral and demographic data enabled more effective and targeted efforts in digital marketing for health services.

Thus, cluster analysis provides a framework for determining and addressing various consumer categories' unique requirements and characteristics to optimize marketing tactics. This focused strategy increases overall marketing effectiveness across several industries and improves engagement.

Cluster analysis is a crucial digital marketing and e-commerce tool, offering insightful information for creating focused campaigns. It highlights the significance of digital ability and may identify patterns in e-commerce

performance, as Scutariu et al. (2022) showed. Khomenko et al. (2021) demonstrated the efficacy of K-Means clustering in optimizing digital marketing tactics related to healthcare services. When taken as a whole, these studies demonstrate how cluster analysis improves the capacity to target marketing campaigns towards particular customer segments, resulting in higher engagement and success in a digital environment that is changing quickly.

Chapter 3

Problem Definition & Research Question

3.1. Objectives

The COVID-19 pandemic intensely impacts global economies, pushing businesses to adapt to new environments. To survive and thrive during lockdowns and social distancing, several organizations relied on e-commerce and digital marketing. This change has sped up the adoption of digital techniques across a variety of industries, each of which is uniquely handling the pandemic's issues.

Analyzing e-commerce and digital marketing changes across different sectors and industries can help identify successful strategies and provide valuable lessons for businesses in a post-pandemic world.

This comprehensive study investigates how e-commerce and digital marketing strategies have evolved since the COVID-19 pandemic began and what influenced those changes.

3.2. Research Question

In this thesis, we aim to answer the following research questions:

1. How did e-commerce and digital marketing evolve in different sectors following the COVID-19 outbreak?
 - This question intends to explore the specific changes and developments in e-commerce and digital marketing strategies in distinctive sectors, exploring the extent of digital adoption, the

types of strategies implemented, and the outcomes within these industries.

2. What factors influenced these changes?
 - This question identifies the key drivers behind these changes in e-commerce and digital marketing. It attempts to identify what factors are driving these changes, including adaptations to ethical and legal norms, advances in technology, and changes in consumer behavior.

3.3. Problem Definition and Statement

Businesses worldwide face severe issues due to the COVID-19 pandemic, disrupting established practices and accelerating digital transformation. Companies had to make quick decisions to survive, and many found that e-commerce and digital marketing were essential for continuing business operations and connecting with customers. However, for various reasons, the efficacy of these techniques can be different among various businesses.

During the COVID-19 pandemic, there was a sudden movement towards e-commerce and digital marketing, which has resulted in different outcomes for firms worldwide. Some people have easily made the shift, while others have found adjusting difficult. Building robust and resilient business models for the future requires understanding how these strategies have evolved and the variables influencing their success or failure.

Chapter 4

Methodology

This study uses a systematic review methodology to examine the changes in e-commerce and digital marketing methods across various sectors following the COVID-19 pandemic. A systematic review is chosen because it is a rigorous and transparent method of synthesizing existing literature, allowing in-depth analysis of the study questions.

4.1. Research Design

This dissertation's study strategy uses a systematic review methodology to examine how e-commerce and digital marketing methods have changed in different sectors after the COVID-19 outbreak. The systematic review technique's methodical and transparent procedure led to its selection, allowing for an objective and careful synthesis of the most available literature.

This study benefits significantly from the systematic review methodology, which makes it possible to gather, evaluate, and synthesize a substantial amount of data carefully. By following established standards for study selection and analysis, the systematic review maximizes the reliability of the results while reducing bias. This methodical approach is necessary to comprehend the complicated and numerous changes in digital marketing and e-commerce brought about by the pandemic.

In addition, the systematic review approach works well for finding gaps, patterns, and trends in the existing body of research—all of which are essential for creating a detailed grasp of the topic. Combining results from several

investigations, this research design can provide insightful analysis and valuable suggestions for managing the post-pandemic digital environment.

The PRISMA methodology is crucial to perform an accurate and objective synthesis of the body of research by carefully analyzing the literature on the evolution of e-commerce and digital marketing after COVID-19. Using PRISMA to collect relevant research, clustering analysis is then used to find patterns and trends in the data, putting related studies in groups according to similar characteristics. Combining two techniques improves the analysis's depth: PRISMA offers an organized framework for gathering data, and clustering highlights gaps and underlying trends, giving researchers a deeper knowledge of the post-pandemic digital environment.

With that, the primary objectives of this review are fourfold:

- It investigates how worldwide e-commerce and digital marketing techniques have evolved in response to the challenges posed by the COVID-19 pandemic.
- It attempts to identify the key factors that have influenced these changes.
- The evaluation will examine the strategies businesses employ in different sectors or areas to mitigate the pandemic's impact on digital marketing and e-commerce activities.
- It aims to provide governments and companies with practical knowledge about efficient post-pandemic actions.

4.2. The PRISMA Method

Distinct from traditional reviews, systematic reviews utilize scientific methods to analyze existing literature on a particular topic thoroughly (Lame, 2019).

This allows for collecting and organizing a large amount of material, which is extremely important for understanding what we already know and have researched about a specific issue.

PRISMA is used to carry out a Systematic Review effectively, allowing one to observe how the articles that will be analyzed have been chosen.

We utilized the PRISMA guidelines to ensure an effective systematic review. PRISMA provides standards to enhance the transparency and completeness of systematic reviews and meta-analyses (Lame, 2019). Initially designed for systematic health assessments, the PRISMA method has proven its adaptability by being successfully applied in various non-health sectors. This demonstrates its versatility and potential to improve research transparency and consistency.

This approach enables collecting and organizing substantial material, crucial for understanding current knowledge and research on a particular issue.

4.3. Key Steps of the PRISMA Method

The PRISMA method is to carry out a systematic literature review effectively. This tool allows one to observe how the articles that will be analyzed have been chosen.

The eligibility criteria for including studies in this systematic review are as follows.

1. *Types of documents: articles, chapters, and books.*

An enormous amount of material could be reviewed for this Systematic Literature Review, including books, articles, reviews, conference papers, etc. Since articles, book chapters, and books are already extremely comprehensive documents, it was decided to use those solely.

2. *Defining the period of the analysis*

The goal is to gather as much data as possible about these topics throughout COVID-19 and beyond. Therefore, papers published between January 2020 and 2024 were chosen to cover the period after the COVID-19 pandemic started.

3. *Languages: English and Portuguese*

These two languages were included in the search parameters. However, the universe of written documents in Portuguese is considerably smaller than in English.

4. *Study area: digital marketing and e-commerce*

Although there have been many studies on e-commerce and digital marketing over the years, that was not the purpose of this dissertation. Considering this, only the documents addressing these topics during and after COVID-19 were examined.

5. *Keywords: digital marketing, e-commerce, covid-19*

As exact keywords as possible were utilized to locate the appropriate papers, which let us find interesting articles and books as soon as feasible.

6. *Location*

Publications from different countries and localities were considered, to provide a broad, global perspective on e-commerce and digital marketing trends.

7. *Sectors*

Publications from different sectors and areas were considered.

8. *Identify the Study Pool*

After selecting and assessing the articles, they were organized in an Excel spreadsheet and categorized according to the following criteria: year of publication, country of origin, sector, authors' department affiliation, and journal sector. Furthermore, each article was evaluated for the existence and evolution of the following topics: digital marketing, consumer behavior, e-commerce volume, e-commerce technology, ethical and legal issues, and digitalization.

To ensure the quality and trustworthiness of the evidence, only articles ranked Q1 or Q2 on the Scientific Journal Rankings (SJR) were selected for inclusion in the study. Articles not fulfilling the Q1 or Q2 rating criteria were removed from further consideration.

Ultimately, this comprehensive study offers insights into how digital marketing and e-commerce methods changed due to the COVID-19 pandemic.

The review will synthesize recent research to illuminate the diverse strategies employed by businesses in various sectors and the significant factors influencing these shifts.

The review's findings are anticipated to enhance understanding of the post-pandemic environment and significantly impact businesses and policymakers navigating this shifting environment.

4.4. Elbow Method

When it comes to K-Means clustering, the Elbow Method is a well-known visual method for determining the ideal number of clusters in a dataset (Nainggolan et al., 2019; Saminan et al., 2021). With this method, the dataset is analyzed using K-Means clustering for a range of values of "k", and the SSE (Sum of Squared Errors) is determined for each value of "k". The objective is to reduce this variation without over-fitting by employing an excessive number of clusters, as the SSE represents the degree of uncertainty within each cluster.

The SSE is displayed against the number of clusters, k, in this method. Because adding more clusters reduces the variability within each cluster, the SSE drops as "k" grows. But after a while, this SSE drop usually becomes less noticeable, resulting in an "elbow" in the plot where the rate of decrease suddenly changes (Firdose, 2020). This "elbow" represents the ideal number of clusters, balancing the risks of overfitting and oversimplifying the data if there are too few clusters.

Researchers often begin clustering investigations by selecting the initial cluster centers at random. However, because the algorithm may need to repeat the process multiple times before it identifies the optimal clusters, this random selection may make it take longer to accurately group the data (Umargono et al., 2020).

A more beneficial strategy would be to carefully select the first cluster centers based on certain data features, including the lowest value, the median, the average, and the highest value, to increase process efficiency (Umargono et al., 2020). Starting from these determined centers allows the algorithm to locate the best clusters faster, which saves time and improves the accuracy of the results.

Using this approach instead of just selecting random beginning points expedites and improves the reliability of the process (Umargono et al., 2020)

This improved approach makes it possible to identify the number of clusters more efficiently, which ensures that each cluster's common pattern can be determined faster and more precisely than with approaches that only use random initialization (Umargono et al., 2020; Firdose, 2020).

4.5. Justification to use the Elbow Method

When using K-Means clustering, the Elbow Method is a frequently used technique to analyze the Within-Cluster Sum of Squares (WCSS) and estimate the ideal number of clusters.

Plotting the WCSS versus the number of clusters, "k," is the approach's method of finding the "elbow" point or the point at which adding more clusters does not significantly reduce the WCSS.

According to the theory, a desirable location for the number of clusters is where the WCSS decline rate abruptly changes, generating an elbow-shaped pattern (Abiola, 2024).

So, how can we use the Elbow Method?

1. Adjust the clustering algorithm (such as K-Means) for a range of “k” values in the data.
2. Calculate the WCSS for each “k”.
3. Plot the “k” cluster count against the associated WCSS values. Find for the plot's "elbow" point. The elbow's location represents the recommended ideal cluster count (Abiola, 2024).

Usually, the ideal k is determined at the point where the plot resembles an elbow, with WCSS decreasing fast up to that point and then beginning to fall more slowly (Abiola, 2024).

Determining the WCSS for each of the many values of “k”, which can range from 1 to 10, is a must when utilizing the Elbow Method. If the WCSS values are plotted versus “k”, we should usually see an elbow-shaped curve. This form results from WCSS first declining dramatically before leveling out. According to (Vidhya, 2021), the optimal “k”, or the ideal number of clusters for your data, is represented by the "elbow" in the graphic.

It's important to remember that the elbow might be subjective and hard to measure precisely at times. When deciding on the final number of clusters, it's crucial to take other aspects like cluster accessibility and specialist knowledge into account (Vidhya, 2021).

4.6. Clustering and Its Application in Literature Review

Clustering is a machine-learning technique that groups similar data points into clusters based on their characteristics. Each cluster contains data points that are more similar to each other than to those in other clusters. Clustering aims to identify natural groupings within the data without knowing the group labels. Standard clustering algorithms include K-Means and hierarchical clustering.

Clustering can provide significant value in organizing and analyzing literature for a literature review. Several ways in which it can be beneficial are:

- **Identifying Research Trends**

Clustering is pivotal in identifying and categorizing papers that discuss topics or exhibit similar characteristics. For instance, papers focusing on changes in consumer behavior and digitalization in recent years can be effectively grouped. This helps researchers understand prevalent trends and how research focus has evolved.

- **Classifying Research Focus**

Researchers can classify literature into distinct themes or topics by clustering papers based on their focus areas. In the example above, clusters focused on digital marketing, e-commerce technology, and legal issues were identified, allowing researchers to quickly see which areas have been heavily studied and which may need more attention.

- **Identifying Gaps in Research**

Clustering can help identify under-researched areas. For example, if a cluster shows that few papers discuss the intersection of digital marketing and ethical issues, it highlights a potential gap for future research.

In this thesis, we use clustering to analyze literature, helping researchers identify gaps, trends, and future research directions.

We utilize the K-Means clustering algorithm and the elbow method to determine the optimal number of clusters. The K-Means algorithm is a popular and widely used clustering technique in machine learning (MacQueen, 1967). Its primary goal is to partition a given dataset into K distinct, non-overlapping subsets (clusters), where each data point belongs to the cluster with the nearest mean (centroid). The Elbow method determines the optimal number of clusters in a clustering algorithm, such as K-Means (Thorndike, 1953).

4.7. PRISMA Methodology and Clustering Analysis

This study employs a hybrid methodological approach integrating the PRISMA methodology for systematic literature review with clustering analysis for data segmentation and pattern identification. The process is structured as follows:

- **PRISMA Methodology:** The research commences with a meticulous systematic literature review using the PRISMA framework. This method ensures a comprehensive, transparent, and replicable process for identifying, selecting, and critically appraising relevant studies published between January 2020 and 2024. The PRISMA process involves defining explicit inclusion and exclusion criteria, systematically searching multiple databases, screening the identified studies, and synthesizing the findings.
- **Clustering Analysis:** After completing the PRISMA-based review, the study applies clustering analysis to the data or findings from the selected studies. Clustering analysis, a quantitative technique, groups the studies or data into clusters based on shared characteristics or patterns. This method allows for identifying thematic patterns, trends, or subgroups within the literature that might not be evident through traditional qualitative synthesis.

By integrating these two methods, the study not only provides a systematic and comprehensive review of the literature but also uncovers underlying patterns and trends in the data. This combined approach offers deeper insights into the evolution of e-commerce and digital marketing strategies in the post-COVID era, highlighting key factors that have shaped these developments across different sectors and contexts. These insights can inform future e-commerce and digital marketing strategies.

Chapter 5

Data Collection, Analysis, and Findings

The method of collecting data is critical to the success of this research since it serves as the foundation for the analysis and findings. This chapter describes the approach used to collect the necessary information to answer the research questions raised in this thesis. This chapter seeks to provide a complete overview of the data-gathering process by explaining the research design, sample procedures, data collection methodologies, and ethical considerations. The following sections will explain the measures used to ensure the accuracy and veracity of the obtained data, the obstacles encountered, and how they were addressed.

5.1. Data Collection Summary

For this study, a comprehensive literature review was conducted to gather relevant data. The initial data collection phase involved identifying and reviewing academic papers aligned with the research objectives. Sixty papers were selected based on specific inclusion and exclusion criteria to accomplish the literature review. The selection criteria included papers published within the time interval from January 2020 to 2024, ensuring that the research is grounded in recent and relevant findings.

Various academic databases, like Google Scholar, were utilized to identify these papers. Keywords and phrases related to the research topic, such as "e-commerce," "digital marketing," and "COVID-19," were used to conduct the searches. Each paper was evaluated for its relevance, methodology, and

contribution to the field. Papers that did not meet the defined criteria or lacked rigorous methodology were excluded from the review.

The detailed process of data collection involved:

1. Defining the search terms and keywords.
2. Setting the inclusion and exclusion criteria.
3. Conducting searches across multiple academic databases.
4. Review the abstracts and full texts of the identified papers.
5. Selecting the final set of papers based on relevance and quality.

This systematic approach ensures that the data collected is comprehensive, relevant, and high quality, providing a robust foundation for this thesis's subsequent analysis and discussion sections.

5.2. Steps of Data Collection

The data-gathering approach for this study was rigorously planned to guarantee that the data collected was relevant and of high quality. The primary data source was an extensive research analysis focused on scholarly papers published between 2020 and 2024. Based on established standards and inclusion parameters, 60 papers were chosen for a comprehensive examination, where, later, 30 of them fit the criteria to be analyzed.

The following steps were taken during the data collection process:

1. **Time Context:** The literature review concentrated on publications published between January 2020 and December 2023 to ensure timely and relevant data. For this analysis the years will be coded to 1-4, being 1 the year 2020 and 4 the year 2023.
2. **Selection Criteria:** Papers were chosen based on their digital marketing and e-commerce focus, place of origin, and department or academic institution association, which helped provide a broad dataset.

3. Defined Features: The independent variables were digital marketing, consumer behavior, e-commerce amount, e-commerce technology, ethical issues, legal issues, and digitalization. For these features, the following codes were used: 0 indicates "Not changed," 1 indicates "Changed," and 2 indicates "Not mentioned." Also, the sectors were coded as follows: 1 for Music, 2 for Healthcare, 3 for Retail and 4 for Digital Marketing and E-commerce. In this context, the sector refers to the industry or domain the paper focuses on or discusses.

4. Geographical Coding: For the simplicity of the analysis, countries were numerically coded; for example, Portugal was coded as '1'. This coding technique was used consistently across all selected papers to ensure uniformity. The geographical coding can be found in the figure in the Appendix.

5. Data Management: A detailed Excel file was constructed to manage and organize the data in a structured way. Each row in the Excel file represented a paper, with columns for attributes such as publication year, country code, sector/ industry department, study emphasis, and main findings. This structured technique allowed efficient data organization, filtering, and analysis.

6. Excel File: The Excel file served as the basis for the data analysis phase, giving a clear and organized framework for managing the obtained data. Each submission was carefully reviewed and coded to guarantee accuracy and uniformity. This careful method allowed for an in-depth study, resulting in a comprehensive grasp of trends and patterns in digital marketing and e-commerce research across sectors and institutions.

7. Data Analysis: For data analysis and to ensure the quality and trustworthiness of the evidence, only articles ranked Q1 or Q2 on the SJR were selected for inclusion in this analysis. Articles not fulfilling the Q1 or

Q2 rating criteria were removed from further consideration. In total, 30 out of 60 papers were selected based on these criteria. In Figure 1, we can find the selected ones and then analyze them according to the SJR. The code related to the countries can be found in the Appendix.

Year	Country	Sector	Digital Marketing	Consumer Behavior	E-commerce Amount	E-commerce Technology	Ethical Issues	Legal Issues	Digitalization	IT and software business	Cluster
4	3	1	1	2	2	0	2	2	1	2	2
4	6	1	1	1	0	0	2	2	2	2	2
2	2	4	1	1	2	1	2	1	2	1	3
3	9	4	2	1	1	1	2	2	1	2	2
3	10	1	2	0	2	2	2	2	2	2	1
1	5	4	1	1	1	1	2	2	2	2	2
2	4	4	1	1	0	1	2	2	2	2	2
4	11	4	1	1	1	1	2	2	2	2	2
4	12	4	1	1	1	1	1	1	2	2	2
4	7	4	2	2	0	1	2	2	2	2	2
4	13	1	1	1	1	1	2	2	2	2	2
1	5	4	1	1	1	1	2	2	2	2	2
2	12	4	1	1	1	1	2	2	2	2	2
2	4	4	1	1	1	1	2	2	2	2	2
4	18	4	1	1	1	1	2	2	2	2	2
4	21	4	2	2	1	1	1	1	2	2	1
2	4	4	1	1	2	2	0	2	2	2	2
4	5	4	2	1	1	1	2	2	2	2	2
2	7	4	2	1	1	1	1	2	2	2	2
2	4	4	1	1	2	2	2	2	2	2	2
1	7	4	1	1	1	1	2	2	2	2	2
3	23	4	1	1	1	1	2	2	2	2	2
4	24	4	1	1	1	1	2	2	2	2	2
2	25	3	1	1	1	0	2	2	2	2	2
4	13	4	1	1	1	1	2	2	2	2	2
3	28	4	1	1	1	1	2	2	2	2	2
1	33	2	2	1	2	2	1	1	2	2	1
2	25	2	2	1	2	2	1	1	2	2	1
2	27	4	2	1	2	2	1	1	2	2	1
1	2	2	2	1	2	2	1	1	2	2	1

Figure 1 - Coding for the 30 articles that are included in the analysis. The year is divided into 1-4, where 1 is equivalent to 2020 and 4 to 2023. The meaning of the rest of the number is explained above and the coding for the countries can be found in the Appendix.

This study ensured that the data obtained was relevant and easily analyzed by selecting a specific time interval and using systematic coding and data management approaches.

5.3. Findings

The Elbow method and K-means clustering algorithm are implemented in MATLAB. If we analyze Figure 2, we can see:

- WCSS steadily decreases as the number of clusters increases from 1 to 10.
- The graph may not show a distinct bend or elbow, which can make it challenging to pinpoint the optimal number of clusters precisely.

Although the Elbow Method does not always clearly indicate a specific number of clusters, such as 3, this number is often chosen for its practical benefits. Selecting a smaller number of clusters, like 3, balances simplicity, interpretability, and strategic alignment, making it easier to communicate and apply clustering results effectively. This approach is beneficial in contexts where clarity and actionable insights are crucial for decision-making.

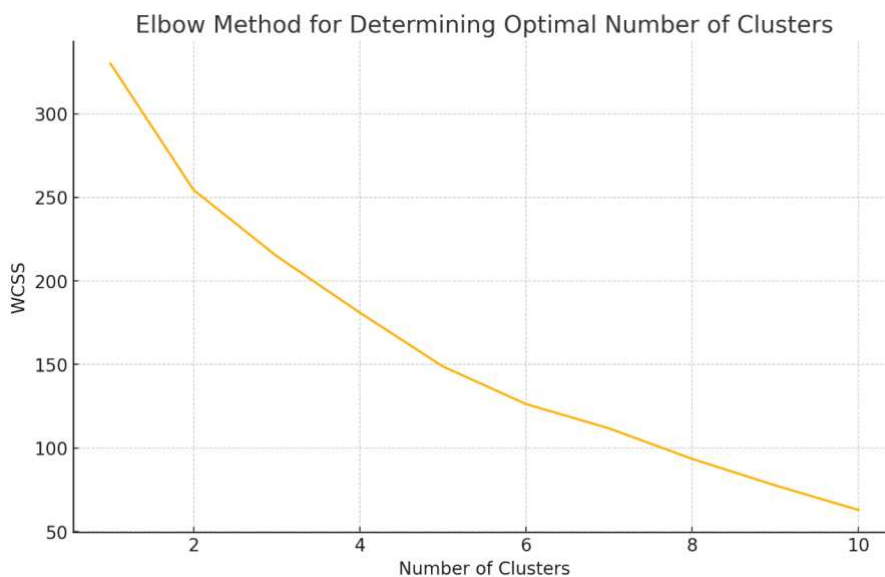


Figure 2 - Identify the number of clusters using the Elbow method.

The Elbow method suggested that the optimal number of clusters could be 3 or 4.

We define the inputs of the clustering analysis as in year, country, sector, digital marketing, consumer behavior, e-commerce amount, e-commerce technology, ethical issues, legal issues, digitalization, and software business and we were given the output (clusters), based on the features that are used as inputs. We performed the clustering analysis using 3 clusters to evaluate and compare the results, and the outputs are as follows:

Cluster 1: Stable Entities

The characteristics of cluster 1 are as follows:

Digital Marketing: Not mentioned.

Consumer Behavior: Changed

E-commerce Technology: Not Mention

Ethical and Legal Issues: Changed.

Digitalization: Changed

Sectors: Music, Healthcare, Digital Marketing & E-commerce

Year: 2020, 2021, 2023

Cluster 1, labeled "Stable Entities," encompasses literature papers primarily from 2020-2021 that focus on the music and healthcare sectors. These entities have experienced significant changes in consumer behavior, ethical and legal issues, and digitalization while not mentioning directly digital marketing and e-commerce. Researchers should prioritize understanding and adapting to evolving consumer behaviors, investing in cutting-edge e-commerce technologies, and advancing digital transformation efforts to drive growth and innovation.

Cluster 2: Dynamic Adopters

The characteristics of cluster 2 are as follows:

Significant changes across Digital Marketing, Consumer Behavior, E-commerce Technology, Ethical and Legal Issues

Consistent focus on Digitalization and IT and software business

Sectors: Music, Healthcare, Retail, Digital Marketing & E-commerce

Years: 2021-2023

This cluster represents literature from 2021-2023 that focuses on significant transformations in digital marketing, consumer behavior, e-commerce technology, and ethical and legal issues, consistently emphasizing digitalization and IT/software development. The music, healthcare, and retail sectors are the primary areas of study, indicating significant changes and innovations within these industries. Researchers should explore how these changes shape industry practices, regulatory environments, and consumer interactions, providing a roadmap for future research and practical applications.

Cluster 3: Steady Performers

The characteristics of cluster 3 are as follows:

Moderate changes across features

Stable Ethical and Legal Issues

Sectors: Digital Marketing & E-commerce

Years: 2021

Cluster 3, "Steady Performers," encompasses literature from 2021 focusing on the digital marketing and e-commerce sectors. The characteristics include moderate changes across various features and stable ethical and legal issues. Researchers should investigate how these sectors have achieved steady growth and stability, particularly during the challenging period of the COVID-19 pandemic. This analysis can offer valuable insights into practical strategies for gradual adaptation and consistent compliance in dynamic environments.

In total, we have 11 inputs, where similar futures go to the same cluster, and by observing Figure 3, we can note that there is a dominating pattern in the literature, that is cluster 2, where most of the papers of the literature are in this trend, and where were everything has changed.

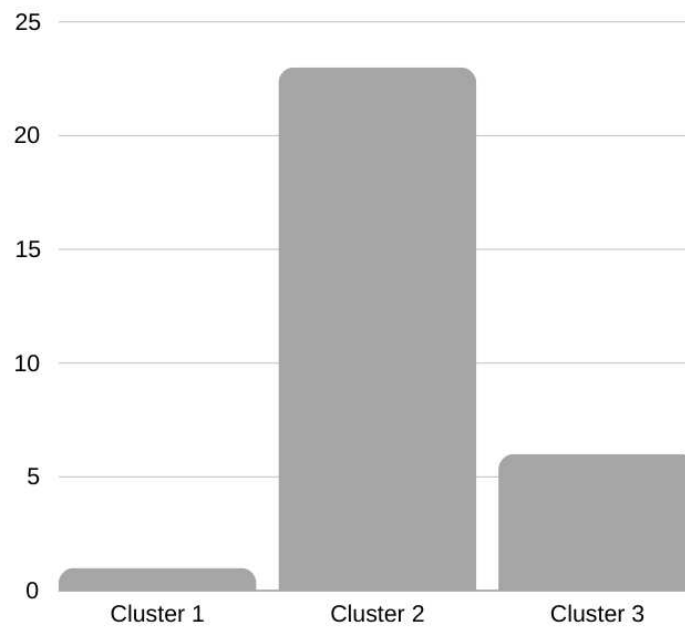


Figure 3 - Papers distribution across clusters.

5.4. Discussion of Findings

The clustering analysis revealed three post-Covid digital marketing and e-commerce patterns. These patterns highlight digital transformation's varied pace and focus across different sectors and periods.

Entities identified as "Stable Entities" have rapidly adopted new technologies and adapted to evolving consumer needs while maintaining stable regulatory practices. This indicates a trend towards swift technological integration in stable environments.

"Dynamic Adopters" showcase significant transformations, especially in digital marketing and consumer behavior, with a strong focus on digitalization and IT development. This reflects an industry-wide push towards embracing and integrating new technologies and adapting to regulatory changes, particularly in the healthcare and retail sectors.

"Steady Performers" demonstrate a measured approach to change, achieving steady growth and stability during challenging times like the COVID-19 pandemic. This group highlights practical strategies for gradual adaptation and compliance, particularly in the music and retail sectors.

These insights offer a comprehensive understanding of how different sectors navigate digital transformation, providing a roadmap for future research and practical applications in a rapidly evolving post-Covid world.

Chapter 6

Conclusion

This section provides an overview of the subjects discussed in each chapter of the dissertation, addresses the study's limitations, and discusses the results' implications for management.

This research aimed to understand how e-commerce and digital marketing strategies have evolved since the onset of the COVID-19 pandemic and what factors influenced these changes.

To achieve this, we conducted a systematic review and analyzed relevant papers that met specific criteria. The systematic review method ensured the reliability and accuracy of the results by providing a comprehensive and transparent mechanism for synthesizing the existing body of literature. Using the PRISMA technique, we carefully selected and examined publications from January 2020 to 2024, focusing on key elements such as adopting new technologies, changes in consumer behavior, and implementing e-commerce and digital marketing strategies.

6.1. Summary of Key Findings

The clustering analysis conducted in this study identified three distinct patterns in the literature on post-COVID digital marketing and e-commerce:

Stable Entities: These entities experienced significant changes in consumer behavior, digitalization, and ethical and legal issues. This trend is particularly observed in the music, healthcare, digital marketing, and e-commerce sectors in 2020-2023

Dynamic Adopters: Representing literature from 2021-2023, this group showed major transformations across digital marketing, consumer behavior, e-

commerce technology, and ethical/legal issues, with a strong focus on digitalization and IT/software development. The music, healthcare, retail and digital marketing and e-commerce sectors are at the forefront of these changes.

Steady Performers: This cluster covers the period of 2021 and includes the digital marketing and e-commerce sectors. These sectors are characterized by moderate changes across various features and stable ethical and legal issues. They have achieved steady growth and stability, particularly during the challenging period of the COVID-19 pandemic.

These findings provide a comprehensive understanding of how different sectors navigate digital transformation, offering insights into effective strategies for gradual adaptation and consistent compliance in dynamic environments.

6.2. Implications for Practice and Service Management

This research has different practical implications for general management and service management, especially in light of the COVID-19 pandemic's speed of digital transformation.

Adaptation to Digitalization and Consumer Behavior: Companies should place a high priority on comprehending and adjusting the rapidly changing consumer habits that the epidemic has greatly impacted. Service managers now need to adapt to a new era when client contacts are increasingly performed through digital media since this change has accelerated the shift towards digitalization. To stay competitive, businesses must concentrate on improving their digital customer service capabilities.

Investment in E-commerce and Service Technologies: Modern e-commerce technology investments are essential for improving consumer experiences and efficiency in operation. Comparably, companies need to make investments in modern technologies for service management, like chatbots driven by artificial intelligence, integrated CRM systems, and easy online payment methods. These

expenditures assist firms remain flexible and adaptable to changes in the market in addition to enhancing service delivery.

Advancing Digital Transformation: Companies that want to stay flexible and adaptable to the changing market landscape should keep pushing their digital transformation initiatives. The swift adoption of digital platforms and tools has changed the way services are provided and used, calling for constant advancements in digital capabilities.

Using Data for Service Optimization: There is a great deal of potential for improvement in service management given the volume of data produced by online interactions. Managers may maximize service offerings, improve operational efficiency, and learn more about client preferences by utilizing data analytics. In the era of digitalization, maintaining competitiveness requires a data-driven strategy.

Respect for Ethical and Legal Norms: Maintaining respect for ethical and legal norms is essential to earning the credibility and trust of consumers. Companies must make sure that their procedures follow these guidelines as they progress with their digital transformation, especially when it comes to managing client data and online transactions.

Training and Development for Digital Competency: Employees must receive ongoing training and development in order to use the newest digital tools and technology in an efficient manner. In order to stay ahead of the digital curve and provide excellent customer service, companies need to encourage a culture of flexibility and ongoing education among their staff members.

Businesses can improve their competitiveness and service delivery in the ever-evolving market environment by making technology investments, leveraging data, and guaranteeing ongoing personnel development.

6.3. Managerial for Post-COVID-19

The COVID-19 pandemic has sped up the transition to digitalization by causing significant changes in consumer behavior and business operations. Previously reliant on traditional offline approaches, businesses have quickly embraced e-commerce platforms, digital marketing, and remote working technology to keep up with the increase in online interaction and minimize operational disruptions. To properly handle the growth in online purchases, firms have had to quickly change the way they source goods, incorporate digital payment methods, and create new logistical plans.

The expectations from customers have also changed significantly, with an increasing demand for digital experiences that are personalized, quick and easy and convenient. Furthermore, ethical behavior and sustainability are becoming more and more important. To adapt to these developments, managers need to make technology investments that improve the digital customer experience and guarantee a smooth transition between online and offline touchpoints. It is imperative to fulfill the modern expectations of consumers to preserve client loyalty and foster trust.

The importance of adaptability and flexibility in business strategies has been highlighted by the pandemic. Businesses that swiftly adopted digital tools were in a better position to handle the pandemic's disruptions. Managers should keep emphasizing the usage of digital tools to enhance customer interactions and efficiency in operations going forward. Maintaining competitive advantage and assuring long-term resilience against future disruptions will require developing agile systems that can react quickly to changing conditions and utilizing information-driven conclusions to guide process and marketing strategy adjustments.

6.4. Limitations

This study faced several limitations that could affect the results:

- **Scope of Literature:** The study included a limited number of papers. Including more papers could have provided a more comprehensive analysis.
- **Sampling Method:** Sampling papers could be more systematic to ensure a broader and more representative literature sample.
- **Feature Utilization:** Despite being available in the dataset, features such as the papers' department and country of origin were not utilized for interpretation. Future research should investigate the relationships between various features of the papers using statistical methods.

Future research will address these limitations by including more papers and employing a more systematic method for sampling and selecting literature. This will enhance the robustness and generalizability of the findings, providing a more detailed and accurate representation of trends, gaps, and directions in the literature.

The clustering analysis provided valuable insights into the post-COVID digital marketing and e-commerce landscape, highlighting significant trends and potential future research directions. While current trends were identified, the analysis also pointed to potential research gaps, such as the need for more systematic inclusion of diverse features like department and country of origin. Addressing these gaps in future studies will ensure a comprehensive understanding of the evolving landscape, helping researchers and practitioners navigate the complexities of digital transformation in various sectors.

6.5. Future Works

The present study offers a fundamental comprehension of how digital marketing and e-commerce tactics have changed in reaction to the COVID-19

epidemic. However, several topics call for additional study to improve the breadth and complexity of research in this dynamic subject. Expanding the range of the literature review to include a wider range of sources beyond the prestigious academic papers used in this study could greatly improve future research. A deeper awareness of the advancements and developments taking place in digital marketing and e-commerce might be obtained by including case studies, industry reports, and grey literature.

Additionally, performing comparisons in various industries may provide valuable data. Although this study found distinct patterns across industries, including music, retail, healthcare, digital marketing, and e-commerce more research might focus on the unique problems and approaches that each industry faces. By analyzing how various industries have responded to the pandemic's changes, experts can identify patterns and ideal methodologies for their field. Comparative analysis can show how different industries' approaches differ from one another and point out effective modifications that could be used in other industries.

Adding other characteristics that were not the main focus of this study is a viable direction for future investigation. Emerging technologies like blockchain and artificial intelligence, for instance, could greatly impact digital marketing and e-commerce. Investigating these technologies may lead to discovering new aspects of the digital revolution and how they affect business strategies. Analyzing legal developments and data privacy issues can also show how companies manage changing customer expectations and compliance mandates.

Another interesting direction for future research is to include targeted surveys for customers and business owners. These surveys can offer personal information about how the COVID-19 outbreak has affected specific consumer behavior and corporate initiatives, as well as additional points of view. Through collecting customer feedback regarding changes in buying habits, preferences, and digital

involvement, together with business owners' challenges and adaptations, researchers can enhance their comprehension of current trends and potential areas for improvement. This approach provides a comprehensive viewpoint that enhances the body of existing research and provides useful advice for modifying tactics and spotting new chances in the field of digital marketing and e-commerce.

Concluding, these studies will ensure that strategies stay relevant and effective in a rapidly changing digital ecosystem by assisting firms and governments in adapting to new trends and challenges.

References

- Abiola, T. (2024). *Clustering, WCSS, and Elbow Method*.
- Afridi, F. E. A., Jan, S., Ayaz, B., & Irfan, M. (2021). The impact of Covid-19 on E-business practices and consumer buying behavior in a developing country. *Revista Amazonia Investiga*, 10(38), 97–112. <https://doi.org/10.34069/ai/2021.38.02.9>
- Agus, A. A., Yudoko, G., Mulyono, N., & Imaniya, T. (2021). E-Commerce Performance, Digital Marketing Capability and Supply Chain Capability within E-Commerce Platform: Longitudinal Study Before and After COVID-19. *International Journal of Technology*, 12(2), 360–370. <https://doi.org/10.14716/ijtech.v12i2.4122>
- Alhababy, A. M. (2016). *Back to trend: covid effects on e-commerce in 47 countries*. 14(5), 1–23.
- Alshaketheep, K. M. K. I., Salah, A. A., Alomari, K. M., Khaled, A. S. D., & Jray, A. A. A. (2020). Digital marketing during COVID 19: Consumer's perspective. *WSEAS Transactions on Business and Economics*, 17, 831–841. <https://doi.org/10.37394/23207.2020.17.81>
- Astari, N. (2021). A Literature Review: Digital Marketing Trends in Indonesia During the COVID-19 Pandemic. *CHANNEL: Jurnal Komunikasi*, 9(2), 125. <https://doi.org/10.12928/channel.v9i2.20836>
- Bashar, A., Nyagadza, B., Ligaraba, N., & Maziriri, E. T. (2023). The influence of Covid-19 on consumer behaviour: a bibliometric review analysis and text mining. *Arab Gulf Journal of Scientific Research*. <https://doi.org/10.1108/AGJSR-12-2022-0281>
- Beckers, J., & Cant, J. (2024). Half a decade in two years: household freight after COVID-19. *Transport Reviews*, 44(2), 544–565. <https://doi.org/10.1080/01441647.2023.2266859>

- Bhatti, A., Akram, H., Basit, H. M., Khan, A. U., & Raza, S. M. (2020). *E-commerce trends during COVID-19 Pandemic*. *13(2)*, 1449–1452.
- Campisi, T., Russo, A., Basbas, S., Bouhouras, E., & Tesoriere, G. (2023). A literature review of the main factors influencing the e-commerce and last-mile delivery projects during COVID-19 pandemic. *Transportation Research Procedia*, *69*, 552–559. <https://doi.org/10.1016/j.trpro.2023.02.207>
- Destina Paningrum, Andry Mochammad Ramdan, Tri Febrina Melinda, Okta Karneli, & Tito Irwanto. (2023). Analysis of Online Marketing Strategies Post Pandemic COVID-19. *Quantitative Economics and Management Studies*, *4(1)*, 61–65. <https://doi.org/10.35877/454ri.qems1381>
- Dinesh, S., & MuniRaju, Y. (2021). Scalability of E-Commerce in the Covid-19 Era. *International Journal of Research -GRANTHAALAYAH*, *9(1)*, 123–128. <https://doi.org/10.29121/granthaalayah.v9.i1.2021.3032>
- Elrhim, M. A., & Elsayed, A. (2020). The Effect of COVID-19 Spread on the E-Commerce Market: The Case of the 5 Largest E-Commerce Companies in the World. *SSRN Electronic Journal*, 1–14. <https://doi.org/10.2139/ssrn.3621166>
- Firdose, T. (2020). *Understanding the Elbow Method: Finding the Optimal Number of Clusters*. <https://tahera-firdose.medium.com/understanding-the-elbow-method-finding-the-optimal-number-of-clusters-68319d773ea3>
- Franca, M. V. de A., Silva, A. D. F. da, & Fernandes, N. da C. M. (2020). the Strategy of Digital Marketing in the Context of the Physical Retail Marketing: the Case of the Tania Company in the City of Vitoria De Santo Antao /a Estrategia Do Marketing Digital No Contexto Do Mercado De Varejo Fisico: O Caso Da Empresa Tania Na C. *Caderno Profissional de Marketing*, *8(2)*, 22.
- Galhotra, B., & Dewan, A. (2020). Impact of COVID-19 on digital platforms and change in E-commerce shopping trends. *Proceedings of the 4th International Conference on IoT in Social, Mobile, Analytics and Cloud, ISMAC 2020*, 861–866. <https://doi.org/10.1109/I-SMAC49090.2020.9243379>

- Gao, J., Siddik, A. B., Khawar Abbas, S., Hamayun, M., Masukujjaman, M., & Alam, S. S. (2023). Impact of E-Commerce and Digital Marketing Adoption on the Financial and Sustainability Performance of MSMEs during the COVID-19 Pandemic: An Empirical Study. *Sustainability (Switzerland)*, 15(2). <https://doi.org/10.3390/su15021594>
- Ghandour, A., & Woodford, B. J. (2020). COVID-19 Impact on E-Commerce in UAE. *Proceedings - 2020 21st International Arab Conference on Information Technology, ACIT 2020*. <https://doi.org/10.1109/ACIT50332.2020.9300077>
- Hongky Dyrgo. (2023). Building Online Marketing and Digital Branding in The Middle of The COVID-19 Pandemic. *Indonesian Journal of Business Analytics*, 3(3), 729–738. <https://doi.org/10.55927/ijba.v3i3.4130>
- Khlystova, O., Kalyuzhnova, Y., & Belitski, M. (2022). The impact of the COVID-19 pandemic on the creative industries: A literature review and future research agenda. *Journal of Business Research*, 139(September 2021), 1192–1210. <https://doi.org/10.1016/j.jbusres.2021.09.062>
- Khomenko, L., Saher, L., Letunovska, N., & Jasniewski, A. (2021). Segmentation as a base for digital marketing strategies in blood service: A cluster analysis for classifying healthy regional subjects. *E3S Web of Conferences*, 307. <https://doi.org/10.1051/e3sconf/202130703001>
- Kim, R. Y. (2020). The Impact of COVID-19 on Consumers: Preparing for Digital Sales. *IEEE Engineering Management Review*, 48(3), 212–218. <https://doi.org/10.1109/EMR.2020.2990115>
- Lame, G. (2019). Systematic literature reviews: An introduction. *Proceedings of the International Conference on Engineering Design, ICED, 2019-Augus(AUGUST)*, 1633–1642. <https://doi.org/10.1017/dsi.2019.169>
- Lestari, D., Zainurossalamia, S. Z. A., Maria, S., Wardhani, W., & Yударuddin, R. (2021). The impact of COVID-19 pandemic on performance of small enterprises that are e-commerce adopters and non-adopters. *Problems and*

Perspectives in Management, 19(3), 467–477.
[https://doi.org/10.21511/ppm.19\(3\).2021.38](https://doi.org/10.21511/ppm.19(3).2021.38)

Limna, P., Siripipatthanakul, S., Jaipong, P., Sitthipon, T., & Auttawechasakoon, P. (2022a). A Review of Digital Marketing and Service Marketing during the COVID-19 and the Digital Economy. *Advance Knowledge for Executives*, 1(5), 4. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4177509

Limna, P., Siripipatthanakul, S., Jaipong, P., Sitthipon, T., & Auttawechasakoon, P. (2022b). A Review of Digital Marketing and Service Marketing during the COVID-19 and the Digital Economy. *Advance Knowledge for Executives*, 1(5), 4. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4177509

MacQueen, J. B. (1967). Some Methods for Classification and Analysis of Multivariate Observations. In *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability, Volume 1: Statistics* (pp. 281–297). University of California Press.

Meena, O., & Chaturvedi, A. (2020). ISSN NO : 0022-1945 Volume XII , Issue VIII , August / 2020 Page No : 1046 *Journal of Interdisciplinary Cycle Research* ISSN NO : 0022-1945 Volume XII , Issue VIII , August / 2020 Page No : 1047. XII(1046), 1046–1060.

Nainggolan, R., Perangin-Angin, R., Simarmata, E., & Tarigan, A. F. (2019). Improved the Performance of the K-Means Cluster Using the Sum of Squared Error (SSE) optimized by using the Elbow Method. *Journal of Physics: Conference Series*, 1361(1). <https://doi.org/10.1088/1742-6596/1361/1/012015>

Oliveira, M., Santos, T., Sousa, M., & Lopes, J. M. (2021). Covid 19 Impacts on Digital Marketing Strategies: the Case of Catering Smes in Portugal. *Academy of Entrepreneurship Journal*, 27(5), 1–9.

Pandey, N. (2021). Digital Marketing Strategies for Firms in Post COVID-19 Era: Insights and Future Directions. *Bloomsbury Publishing, January*, 107–124.

https://www.researchgate.net/publication/348417568_Digital_Marketing_Strategies_for_Firms_in_Post_COVID-19_Era_Insights_and_Future_Directions

Redjeki, F., & Affandi, A. (2021). Utilization of Digital Marketing for MSME Players as Value Creation for Customers during the COVID-19 Pandemic. *International Journal of Science and Society*, 3(1), 40–55. <https://doi.org/10.54783/ijssoc.v3i1.264>

Saminan, Rabbany, N., Aini, Z., Zulkarnain, & Murzalina, C. (2021). Open access Open access. *Citizen-Based Marine Debris Collection Training: Study Case in Pangandaran*, 2(1), 56–61.

Sarraf, S., Kushwaha, A. K., Kar, A. K., Dwivedi, Y. K., & Giannakis, M. (2024). How did online misinformation impact stockouts in the e-commerce supply chain during COVID-19 – A mixed methods study. *International Journal of Production Economics*, 267(January 2023), 109064. <https://doi.org/10.1016/j.ijpe.2023.109064>

Scutariu, A. L., Șușu, Ștefăniță, Huidumac-Petrescu, C. E., & Gogonea, R. M. (2022). A cluster analysis concerning the behavior of enterprises with e-commerce activity in the context of the covid-19 pandemic. *Journal of Theoretical and Applied Electronic Commerce Research*, 17(1), 47–68. <https://doi.org/10.3390/jtaer17010003>

Sudarmiatin, S., Fitriana, F., & Hidayati, N. (2023). The Implementation of Digital Marketing in SME's: Opportunities And Challenges During The Covid-19 Pandemic. *Indonesian Journal of Business and Entrepreneurship*, 9(1), 72–80. <https://doi.org/10.17358/ijbe.9.1.72>

Tabuena, A. C., Necio, S. M. L., Macaspac, K. K., Bernardo, M. P. E., Domingo, D. I., & De Leon, P. D. M. (2022). Asian Journal of Management Entrepreneurship and Social Science A Literature Review on Digital Marketing Strategies and Its Impact on Online Business Sellers During the

- COVID-19 Crisis. *Asian Journal of Management, Entrepreneurship and Social Science*, 2(01), 141–153. <https://ajmesc.com/index.php/ajmesc>
- Thorndike, R. L. (1953). Who Belongs in the Family? *Psychometrika*, 18(4), 267–276.
- Umargono, E., Suseno, J. E., & S. K., V. G. (2020). *K-Means Clustering Optimization using the Elbow Method and Early Centroid Determination Based-on Mean and Median*. 474(Isstec 2019), 234–240. <https://doi.org/10.5220/0009908402340240>
- V, E. S. P. B., & Bratchell, N. (1989). *Cluster Analysis*. 6, 105–125.
- Vidhya. (2021). *In-depth Intuition of K-Means Clustering Algorithm*.
- Wang, X., Wong, Y. D., Kim, T. Y., & Yuen, K. F. (2023). Does consumers' involvement in e-commerce last-mile delivery change after COVID-19? An investigation on behavioural change, maintenance and habit formation. *Electronic Commerce Research and Applications*, 60(October 2022), 101273. <https://doi.org/10.1016/j.elerap.2023.101273>
- Witczyńska, K. (2022). The development of e-commerce during Covid-19 pandemic . *Scientific Papers of Silesian University of Technology Organization and Management Series*, 2022(167). <https://doi.org/10.29119/1641-3466.2022.167.40>

Appendix

1	Portugal
2	Uk
3	Netherlands
4	Indonesia
5	USA
6	China
7	India
8	Thailand
9	Saudi Arabia
10	Republic of Korea
11	ireland
12	Spain
13	South Korea
14	Pakistan
15	Jordan
16	Malasya
17	UAE
18	Bangladesh
19	Trinidad and Tobago
20	Egypt
21	Belgium
22	Philippines
23	Columbia
24	Singapore
25	Belgium
26	Russia
27	Italy
28	Palestine
29	poland
30	Ukraine
31	Iraq
32	Iran
33	Australia

Figure 4 - Geographical Coding for the countries.

The geographical coding is used to simplify the analysis, countries were numerically coded; for example, Portugal is coded as '1'; The United Kingdom is coded as '2', and so on.