

**SMEs E-commerce Adoption in Outermost Regions: Cases  
from Madeira**

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# Abstract

Digital economy is growing day by day, and e-commerce plays an important role in this growth. Its importance cannot be ignored, and while markets become global, transactions become digital, and new digital business models arise, organizations must react and adapt to this new reality.

Small and Medium Enterprises (SMEs) play an important role in society, as they represent most of the existing organizations and are important contributors to the economy. Factors that affect E-commerce adoption in SMEs has been widely studied, nonetheless, it has not been studied in the context of the Outermost Regions, acting as motivation for this study, with the purpose of identifying the influencing factors and benefits, of the E-commerce adoption by SMEs in the Outermost Regions.

Outermost regions are European regions geographically distant from the mainland, thus, affected by several constraints that brings them limitations. The lack of knowledge acts as subject of interest to conduct this study that will be conducted thru case study research methodology to collect data, and TOE Framework to analyse data.

# Keywords

e-commerce, outermost regions, technology adoption, innovation, benefits, enablers, inhibitors



# Resumo

A economia digital cresce de dia para dia e o comércio eletrônico tem um papel importante neste crescimento. A sua importância não pode ser ignorada, e, enquanto os mercados tornam-se globais, as transações tornam-se digitais, e novos modelos de negócio surgem. Devido a isto as organizações têm de reagir e adaptar-se a esta nova realidade.

Pequenas e Médias Empresas (PMEs) têm um papel importante na sociedade, uma vez que representam a maioria das empresas existentes, com contributos importantes para a economia. Os fatores que influenciam a adoção de comércio eletrônico nas PMEs já foram estudados anteriormente, no entanto, não foi até à data analisada no contexto das regiões ultraperiféricas. Surge assim como motivação para este estudo, que tem o objetivo de identificar os fatores que influenciam a adoção do comércio eletrônico e os benefícios, nas PMEs das regiões ultraperiféricas.

Regiões ultraperiféricas são territórios europeus geograficamente distantes do continente, e por isso, afetadas por diversas condicionantes que trazem limitações. A falta de conhecimento age como sujeito de interesse para prosseguir este estudo, conduzido através da metodologia de caso de estudo, para recolha de dados e pela Framework TOE, para análise dos mesmos.

# Palavras Chave

Comércio eletrônico, regiões ultraperiféricas, adoção de tecnologia, inovação, benefícios, facilitadores, barreiras



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# List of Acronyms

|              |  |
|--------------|--|
| <b>ACEPI</b> | Digital Economy Association (Associação da Economia Digital) |
| <b>CSRM</b>  | Case Study Research Methodology                              |
| <b>EC</b>    | Electronic commerce, E-commerce                              |
| <b>OECD</b>  | Organization for Economic Co-operation and Development       |
| <b>SMEs</b>  | Small and Medium Enterprises                                 |

# 1. Introduction

Digital and technological revolutions are a reality and are part of our daily life. The business environment is rapidly changing mainly because of innovation, technological breakthroughs, and globalization that forces companies to respond [1].

Digital economy, or internet economy, being an online based economy, has e-commerce as one of its major drivers, and its growth is visible. New and improved business models are being implemented, physical marketplaces are being replaced or supplemented by digital ones, global level competing markets are a reality, and because of digital and internet-based innovations fast pace, the obsolescence level rate is also fast [1].

Regardless of size, businesses are unlikely to survive if they don't adopt and use information technologies, especially SMEs. The current competitive challenges faced by many businesses, create the necessity SMEs to adopt E-commerce and other innovative information technologies.

In literature, many papers approach the topic of e-commerce adoption on SMEs (Small and medium enterprises), and there is the common view that E-commerce and other technological innovations have a positive impact on companies, providing them benefits [2].

E-commerce opens a range of opportunities for SMEs [3] and allows them to access the digital and global economy, which, apparently seems an important driver for adoption, but still, not all SMEs have adopted e-commerce. Technology adoption means that the company has adopted technology as part of their business, not just using it [3].

SMEs represent 99% of all businesses in European Union [4], symbolizing a major force of employment. In Madeira Autonomous Region SMEs represent 99,9% of companies [5], and they are the major driver of regional economy, and employment, similarly to Europe's mainland. This study focusses on E-commerce adoption in SMEs from Madeira Autonomous Region, as being one of the Outermost Regions (ORs) of Europe.

Outermost regions of Europe, are known to have several constrains, arising from the geographical remoteness of these regions, and, while there are many studies related to e-commerce adoption in developed or in developing countries, none is related to the Outermost Regions.

Even though most regional SMEs are local businesses, digital and technological adoption is becoming more and more part of their strategy and the COVID-19 pandemic accelerated this process in many of them, forcing them do adopt technologies at a fast pace, allowing them to survive in this "new" business environment. However, there is no empirical evidence on how these SMEs are affected by known Outermost Region constrains, which, by itself, is a driver for interest in this study.

Having identified this gap, and consequent lack of knowledge, that the researcher aims to explore in this study, case studies will be conducted in 4 Madeira Autonomous Region based SMEs, with the goal to

describe how their E-commerce adoption is affected by factors, gaining insights on if and how the Outermost Region status influences adoption, and what benefits were gained. This study, therefore, seeks to explore the factors affecting E-commerce adoption among SMEs in outermost regions, with cases from Madeira Autonomous Region.

## 1.1. Research questions

Knowing that SMEs have a significant weight in Madeira Autonomous Region, where the Outermost Region status, and associated constraints are a reality, this study intends to answer the following question – **How is E-commerce adoption by SMEs influenced by factors in the outermost regions?**

Based on this, the following research questions were developed:

- RQ1: How can the factors that influence E-commerce adoption in SMEs from outermost regions be described?
- RQ2: How can the benefits of E-commerce adoption by SMEs in the outermost regions be described?
- RQ3: How can the outermost region status effect on E-commerce adoption by SMEs be described?

## 1.2. Document structure

This thesis contains six chapters that begin with an introduction, and each section of the chapter highlights the areas in order to achieve the objectives of the study. They are summarized as follows:

The first part of the document starts with **chapter 1 – Introduction**: The first chapter of this thesis presents the introduction of the research followed by the research context of Madeira Island as an Outermost Region. The research questions and objectives to be achieved are also described in this section. **Chapter 2 – Research Background**: In this chapter, concepts directly related to the study are approached, namely, outermost regions, innovation, E-commerce, and E-commerce adoption. Also, a list of findings, thru a literature review, of the benefits, enablers and barriers of e-commerce adoption is presented. **Chapter 3 – Research Methodology**: In the third chapter, the chosen research methodology is explained, and the chosen framework for analyzing data is also described.

The second part of the document starts with **chapter 4 – Data Collection**: This chapter is dedicated to present data collected in the interviews and documentation. **Chapter 5 – Data Analysis**: In the fifth chapter, previously collected data will be analysed under the TOE Framework. **Chapter 6 – Conclusion**: The final chapter included the author's conclusions of the study, where the research questions are answered, and the identified limitations and future work.



# 2. Research Background

In this section, and as result of a literature review, some concepts related to this research will be presented. We'll start by presenting the concept of outermost regions, followed by studies that define SMEs, innovation, E-commerce, and its adoption, while trying to build a bridge between these concepts. The benefits, enablers and inhibitors of E-commerce adoption will also be addressed in this section. Enablers and inhibitors are factors that affect E-commerce adoption among SMEs, thus, understanding what has been made in past research, and its outcome is important for this study.

## 2.1. Outermost regions

Outermost regions (ORs) are EU members territories located in areas of the globe that are remote from Europe. These regions, deal with several difficulties related to their geographical characteristics, in particular: remoteness, insularity, small size, difficult topography and climate. They are economically dependent on a few products (often agricultural products or natural resources). These features act as constraints on their future development potential [6].

European Union supports the development of these regions, with specific programs (Regional and cohesion policy), with the purpose to compensate for the constraints arising from the geographical remoteness of these regions [7].

Madeira Autonomous Region, as an OR, suffers from these constrains, and thus, is affected by unexisting factors in European mainland, motivating the interest of this study.

## 2.2. Small and medium sized enterprises (SMEs)

According to the European Commission recommendation [4] micro, small and medium-sized enterprises (SMEs) can be generally defined by enterprises that employ fewer than 250 persons, with an annual turnover not exceeding 50 million euros and/or annual balance sheet not exceeding 43 million euros. Small enterprises are defined as having less than 50 employees, with an annual turnover and/or annual balance not exceeding 10 million euros. Microenterprise is defined as an enterprise which has less than 10 employees and with an annual turnover and/or annual balance does not exceed 2 million euros.

| Company category | Staff headcount | Turnover | or | Balance sheet total |
|------------------|-----------------|----------|----|---------------------|
| Medium-sized     | < 250           | ≤ € 50 m |    | ≤ € 43 m            |
| Small            | < 50            | ≤ € 10 m |    | ≤ € 10 m            |
| Micro            | < 10            | ≤ € 2 m  |    | ≤ € 2 m             |

Figure 1 - SMEs according to size. Source European Commission

## 2.3. Innovation

Markets are evolving and continuously shifting, with organizations facing competition at a global level, and this makes almost impossible for them to escape the reality that they must be innovative to survive [8].

In literature a great diversity of definitions for innovation can be found [9], as it is studied in many disciplines and has been defined from different perspectives [10]. Most definitions include the development and implementation of new ideas [8], that can be anything, from new products, processes, or services within the organization [8]. In innovation, the term implementation, means that the ideas are put into use [8], thus, made available for others to use, differentiating it from other concepts, such as invention [3]. In other words, to be considered innovation, it needs to be implemented, ensuring that is accessible to potential users, either internal (thru internal processes and proceedings) or external (clients) [3].

It is important to state that, innovation, viewed as an economic activity, requires resources that could be used for other purposes [3].

A study that intended to create a multidisciplinary definition of innovation, identified several attributes of innovation withdrawn from key definitions in existing literature [9]:

- Nature of innovation – if the innovation refers to something new or improved [9].
- Type of innovation – what type of output does the innovation refers to, for example, product or service [9].
- Stages of innovation – steps taken during the innovation process, usually going from idea generation until commercialization [9].
- Social context – any parts involved in the innovation process, whether they are social entities, system or group of people or environmental factors affecting it [9].
- Means of innovation – what resources are necessary to implement the innovation (e.g., technical, creative, financial) [9].
- Aim of innovation – the result that organizations intend to achieve with innovation [9].

The adoption of innovation is directly associated to change in the organization, either on its structure or functioning (or even both) [11]. It can act as a tool to influence the environment or as a reaction to changing environments [11].

The OECD, in the Oslo Manual, provides a general definition of innovation, stating that “innovation can be defined as a new or improved product or process (or combination thereof) that differs significantly from the unit’s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)” [3].

The basic requirement to be considered innovation, is that it must be significantly different from the company’s previous products or business processes, and to measure the novelty or “innovativeness”,

innovation can be considered new to the company only, new to the company's market or new to the world [3].

For the purposes of this study, the OECD definition of innovation will be considered.

## **2.4. E-commerce**

The term commerce is used to describe buying and selling transactions conducted between business partners [1]. If this definition of commerce was used to describe electronic commerce (e-commerce), it would be narrow [1]. There is no universally agreed definition of e-commerce, as many definitions can be found in existing literature, and they have been changing through time. E-commerce can generally be seen, as an environment to sell and buy products or activities online between customers and suppliers [12] or as a business model where transactions take place over electronic networks, mostly the internet [1]. But it's much more than that. E-commerce not only involves buying and selling as it also involves electronically innovating, communicating, collaborating, and discovering information [1]. Global markets, price transparency and high efficiency trading can be also attributed to EC [13].

According to Laudon & Traver [13], a formal definition of e-commerce can be digitally enabled commercial transactions between and among organizations and individuals. The authors also define that digitally enabled transactions include all transactions mediated by digital technology, over the internet, the web and/or mobile devices [13], and commercial transactions also involve the exchange of value in return for products or services [13].

Some authors also consider other concepts associated with e-commerce, stating that EC can be either pure or partial depending on the nature of its three major activities, namely ordering and payment, order fulfillment, and delivery [1]. Considering these three major activities, if there is at least one digital dimension, it is considered EC (partial EC), and if all dimensions are digital, it will be considered pure EC [1]. For a better understanding, if we buy a product from any website and it is physically delivered it is partial EC, but if we buy an e-book that is digitally bought and delivered it is pure EC [1].

Major E-commerce transaction types include business-to-business (B2B), business-to-consumer (B2C) and consumer-to-consumer (C2C) [13].

The way companies operate and conduct back-end operations is being redefined by e-commerce, as it changes the roles and relationship types between parties, encouraging new business models, services, and supply networks [14].

For the purposes of this study, EC will be considered as any type of commercial relationships between parties, involving products, services, or information exchange by electronic means with the intention of performing business.

### **2.4.1. E-commerce adoption**

E-commerce earliest adoption was in the early 1970s, when Electronic Data Interchange (EDI) became a standard to exchange data between companies providing them means to automate purchasing

procedures [15]. Adoption reflects the strategic orientation of the enterprise and can be measured by whether the enterprise currently uses or will soon use at least one form of the technology associated with an electronic network in their business process, for exchange of information, communication, distribution transactions and/or collaboration [16].

Studies demonstrate that SMEs are behind larger firms on e-commerce adoption, but, nevertheless, for SMEs to adopt e-commerce or e-business, benefits must outweigh investment and maintenance costs [17].

If it is new to the organization, the adoption of a system, policy, program, product, or service is considered as innovation [11,18], so, for the purposes of this study, EC adoption will be considered as innovation to the SME.

### **2.4.2. Benefits of E-commerce**

Prior studies reveal that, considering the benefits, EC adoption, along with other technological innovations provide positive impact on the organization [2]. EC provides many benefits, not only for organizations, but also for customers and society, and the number of benefits keep increasing over time [1]. Literature proposes a great range of benefits, but it also indicative that they are country-specific [19] and sector specific [20].

Some authors also state that EC benefits can be divided into intangible and tangible benefits, where tangible benefits are related to sales, cost reduction, new customers, and others, while intangible benefits are related to efficiency, improved customer relations and others [21].

The literature review provided empirical support that e-commerce provides many benefits for SMEs [22] as E-commerce is more convenient for the clients because it allows them to order and pay anywhere, anytime, from any connected device, reducing shopping time [12]. It may also enrich profits in reducing communication costs [12]. It is also suggested in the Literature, that perceived benefits are the main reason for e-commerce adoption [23], i.e., before adoption, understanding what E-commerce will provide to the SME is an enabler, and a greater understanding regarding e-commerce adoption's gained benefits will increase the SMEs owner's probability of allocating resources towards adoption [22].

Literature also suggests that it is worthwhile to adopt some form of e-commerce to achieve sales growth and operational efficiency (reduced operational costs) [20].

The literature review provided a set of benefits for SMEs that opted to adopt and implement EC systems, presented as follows:

- Sales, revenue, and profits growth
- Improved customer satisfaction
- Increased market reach
- Reduced communication/operational costs
- Improved processing and delivery speed
- Improved staff satisfaction/productivity

- Increased company productivity
- Improved internal communication
- Improved company Image
- Improved supplier relationship
- Improved competitive advantage
- Improved partner relationships
- Better internationalization opportunities
- Improved external communication
- Improved distribution channels
- Providing support for strategic decisions
- Innovative cooperation with clients and suppliers
- Improved business processes
- New customers

### **2.4.3.E-commerce adoption enablers**

Enablers are factors that are conducive of e-commerce adoption [24], and the literature demonstrates their importance. The adoption of e-commerce is affected by both internal and external organization factors [22], and their relative importance may vary depending on the local business conditions [22], and they both can act as enablers or inhibitors. Environmental pressures also influence managers decision into adoption [23].

In fact, literature shows that the mindset of the owner/manager is what will determine the ICT adoption by SMEs [25], as his characteristics and technological knowledge/expertise on the subject is a key factor for adoption [26], along with having a positive attitude and will to achieve the objectives [27]. SMEs working on a wider market (minimum regional market) suggests the existence of more ambitious and strategic aware owners, and thus, ready to sale on a bigger scale [28].

Some papers also show that younger and smaller enterprises have higher e-commerce related sales, suggesting that start-ups are more aware of ICT and e-commerce and more prepared to exploit them in comparison to older SMEs [28].

Organizational readiness is also very relevant to the level of e-commerce adoption [29], as it means that the SME must be technologically and financially prepared to the implementation [29]. Readiness and external pressure are also seen as important to achieve maximum benefit with adoption [30]. Implementation of e-commerce requires proper planning, and ICT policies for its use [31], and that, usually results in success [31]. Greater the focus on adoption, greater the benefits and acquisition of capabilities [32], but also greater the investment in IT and organizational resources, greater the benefits [32], nonetheless, competitive advantage depends on the SME effectively using the technology [33].

Mobile technology availability is an enabler in areas where ICT challenges regarding internet speed of fixed telephone line are a reality [24]. The availability of business resources (business relationships with foreign ICT companies) is also an enabler [24].

Perceived usefulness and perceived ease of use of innovation affect the company's attitude towards adoption [23] considering that perceived usefulness is the belief that the innovation to be adopted will improve the company's processes execution capabilities [23].

The literature review provided a set of enablers for EC adoption, presented as follows:

- Management/CEO characteristics/attitudes
- External pressures
- Organization readiness
- Competitive advantage
- Perceived benefits
- Planning and monitoring capacity
- Existing external technical knowledge
- Awareness
- Perceived marketing benefits
- Business nature
- Perceived barriers
- Human resources availability
- Adaptability
- Mobile technology availability

#### **2.4.4.E-commerce adoption barriers**

Scientific literature shows the effectiveness of e-commerce for SMEs, but also demonstrates that there are some barriers in applying it [12]. Barriers are inhibitors for the technology adoption.

Scientific literature shows that there are evident differences in adoption of ICT between developed and emerging economies [32], where the lack of a good and reliable communications infrastructure (ex. Internet speed) can act by itself as an inhibitor [34]. "Political instability", "lack of resources", "lack of adequate infrastructure", "shortage of skills", "privacy and security issues", "governmental issues" and "business characteristics" are other inhibitors commonly identified on emerging economies, however all other inhibitors can be found both on emerging as on developed. To overcome these barriers, it's also necessary to understand cultural factors (society awareness, purchasing behavior) and SMEs owners specific characteristics [32]. The lack of a practical and reasonable knowledge of ICT by owners and staff means that they don't have the skills to use and exploit any technology associated with e-commerce, and will act as an inhibitor for e-commerce awareness, and adoption [32]. Also, the IT complexity, of an adopted e-commerce solution, if not understood by the staff, could fall in disuse, and thus, potential failure of implementation. Nonetheless, lack of skills and awareness of owners (or staff) is an inhibitor, that can be solved with training [35].

It's also known that SMEs have the problem of shortage of funds [33] and cannot simply experiment and risk to make expensive mistakes [35], and on top of that, hardware acquisition, after-sale services, maintenance, and repair are also seen as a huge expenditure [33], and any system flaw caused by lack of investment in these areas could easily lead into client dissatisfaction [33].

Many inhibitors are attributed to a lack of strategic planning for the long term [31]. To avoid an increase of the resistance level for adoption, it is important, before the implementation to know the barriers [36], that can both motivate and dissuade SMEs from making e-commerce an innovation [32].

Culture, in emerging economies also has big influence as inhibitor, because face-to-face [35] sales and bargain while transacting [24], are considered cultural beliefs and assumptions [24], difficult to overcome, amongst consumer and partners.

There are reported situations where SMEs are aware that the market will become more dynamic, competitive, and global, agreeing that e-commerce adoption in today's business is essential, but still, they are hindered from adoption because of constrains [35].

However, it is noticeable that even though there are barriers, the benefits of adoption are worthwhile, and the barriers are not insuperable [31]. It is also seen on some papers that the perceptions of external pressures for adoption decreases the perception of barriers, helping SMEs overcoming them [23].

The literature review provided a set of barriers for EC adoption, presented as follows:

- Resources availability
- Lack of skilled IT labor
- Privacy and security issues
- Lack of external infrastructure readiness
- Cultural compatibility issues
- Costs (implementation & maintenance)
- Customer issues
- Legal/governmental concerns
- Business and owner characteristics
- IT complexity
- Lack of awareness of e-commerce benefits
- Lack of technological readiness
- Technology reliability (ex. ISP)
- Language barriers
- Product/service compatibility issues
- Risk measure
- Reluctance to change
- Staff training costs
- Usability
- Political instability





## 3. Research Methodology

Choosing the appropriate research methodology is very important, as it determines how the study will be conducted and how data will be collected. For this research, a qualitative approach with interpretative investigation was used, which allowed the researcher to collect, following a relativist perspective procedure, data from the interviewee's personal views, perspectives, attitudes [37], feelings, opinions, and experiences, that suggested explanation to behavioral events [37] related to a certain phenomenon in a certain context [38]. Case Study Research Methodology was the most suitable approach, as the main objective was to gain direct insights from interviewees and deeper understanding, of the factors affecting E-commerce adoption in outermost regions, more specifically in Madeira Island.

The responses were analysed, in a first part, to explore what benefits SMEs gained with E-commerce adoption, and in a second part, to categorize the factors affecting E-commerce adoption according to the Technology-Organization-Environment Framework, hereafter named TOE Framework. Throughout the literature review, several models, or frameworks to study the e-commerce adoption factors in SMEs were identified, having the TOE Framework distinguished from all others as the most used to describe various factors that can affect technological innovation adoption at firm level [24]. This was the framework used in this study to analyse and interpret collected data.

### 3.1. Case Study

The Case Study Research Methodology was chosen to investigate the factors affecting e-commerce adoption in SMEs on outermost regions, with cases from Madeira Island. To the best of our knowledge, there is no prior research in Madeira or any other outermost region about e-commerce adoption in SMEs and the factors affecting it, and as first of its kind, it could be considered exploratory by nature, but, taking into consideration that E-commerce adoption in SMEs has been widely studied in literature, this study is seen as an explanatory case study, as its main purpose is to provide explanation to a certain phenomenon in a certain context [38], more specifically, E-commerce adoption in the context of the outermost regions.

There is a common misconception that a hierarchical relation between research methods exists, and according to that hierarchy Case Study would be only suitable for the exploratory phase, but this view is refuted by some authors, such as Yin [37].

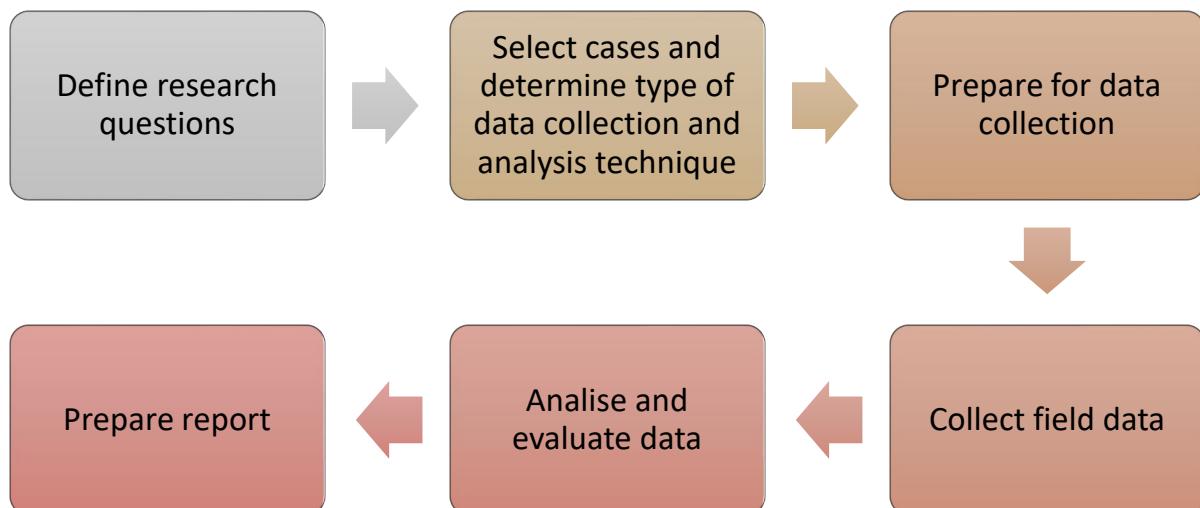
Case study can be either a qualitative or a quantitative methodology [37] that investigates in detail one (or more) contemporary phenomenon within its real-world context, providing a better understanding or to improve already existing knowledge on the subject [37]. It can use cumulative data from different sources (observations, enquiries, documentation, interviews, etc.). However, the analysis always takes place within specific limits, in a certain situation, in a certain environment.

In other words, when the research question objective is to explain a contemporary set of events through "how" and "why" questions, the researcher has no control (or little) over the events and assumes that

there are important contextual conditions but neither influences nor manipulates it, the case study research methodology would be the preferred method [37].

As a methodology, it must be well organized and structured for maximum validation of the results, and for that, there is a six-step proposal by Soy [39], based on Robert E. Stake, Helen Simons, and Robert K. Yin, that specifies the following steps:

1. Define research questions – In this step, the focus of the study is established by forming the question (or questions) that is intended to be studied, determining the purpose of the study.
2. Select cases and determine type of data collection and analysis technique – This is the design phase, crucial to ensure construct validity of the study. The researcher must decide between single and multi-case study, what approaches will be made, what cases will be selected, and how will the collected data be analysed.
3. Prepare for data collection – Preparation is key to prevent losing focus on the study. It is important to prepare procedures for field work, such as interview guides, questionnaires, templates, timelines, to assure that the data collection is valid and thorough.
4. Collect field data – The stage where data is collected from the previously identified multiple sources.
5. Analyse and evaluate data – With all data collected, according to the previously chosen techniques, the researcher should be able to analyse and interpret it, to find evidence that allows answering the research questions.
6. Prepare report – This step corresponds to documenting, sharing and communication of the findings of the study.



*Figure 2 - Six-step Case Study based on Soy's proposal*

Some critics mention that Case Study Research Methodology is a “selective choice” or that its results can’t be generalized, however, it is still a very common methodology and well accepted [39]. Can case studies be generalized or not? They are generalizable to theoretical prepositions, not to populations or

universes, thus, not representing a “sample” [37]. The purpose is to aim toward analytic generalizations, with the notion that they are not statistical (or numeric), and discussing it, not just stating it [37]. Analytic generalizations are the reasoning through which case studies findings can apply to situations beyond the original case study [37].

This research adopted a multiple-case study, where results from each individual case were examined and compiled, in a cross-case comparative approach, allowing to perceive patterns more easily, and develop a more solid theory [37]. The use of data triangulation is a mean to increase validity of the study [37], therefore, in this study, data will be collected from different sources, namely semi-structured interviews made to top executives of SMEs (CEOs - with decision making capabilities, including adoption decision), data will be also collected from media, such as the internet, and finally, data collected from a literature review will also be used. Data will be compared to identify patterns.

### **3.1.1.Data collection**

Data collection is a very important part of case study research methodology, and this section explains how data will be collected in this study.

#### ***Interviews***

Interviews are a very important source of evidence in case study research methodology, and as such, are commonly used in this methodology as interviewees provide valuable insights to the studied phenomenon or situation [37]. They can be very helpful in suggesting explanations to the “why” and “how” of the case study. Most case studies are related to human affairs or actions, and in such cases, interviewees can offer valuable insights and help the researcher to identify complementary sources of evidence [37], however, when studies are focused on actions, the interview responses are subject to possible bias, increasing the importance of having complementary sources of evidence to confirm findings [37]. Other case study situations (not focused on actions) usually follow a more relativist path, and as such, the interviewees responses become the main evidence, as the researcher is directly interested in their personal views and perspectives in explaining behavioral events [37], making it less relevant to complement with other sources of evidence [37]. Unlike surveys, which are structured and rigid, case study interviews should follow a fluid and unstructured format, like a guided conversation [37].

For this study, interviews were the main data collection method to identify the factors affecting E-commerce adoption among SMEs in outermost regions. A semi-structured interview format, with open answer questions, was used, to provide the opportunity for interviewees to tell the story in their own words [37]. Interviews followed a previously established protocol (Annex A) and had the maximum duration of 45 minutes, having remained open-ended, in case complementary or follow up questions were necessary. Interview questions (Annex B) were previously prepared to cover main study topics. Interviewees had the liberty to choose time and date for the interview and interviews were scheduled via phone call or e-mail.

Several SMEs were identified for the study, having four of them responded positively to the invitation. The participants were CEOs of the respective companies, thus, decision makers, which allowed to

obtain relevant empirical information on all aspects of e-commerce adoption on SMEs. Madeira Island has a small geographic size, which made possible for interviews to be conducted on the SMEs premises, but one of the CEOs asked for an interview to be made thru digital platforms, namely, Google Meet. All interviews were audio recorded and later transcribed. Later, the researcher, when needed, contacted the interviewees through emails to complete some of the missing information.

### **Documentation**

In case study research, documentation is mostly used as a form to corroborate evidence from other sources [37], such as interviews, used in this case study research. They can be helpful in simple tasks like verifying correct spellings [37], or, as mentioned before, provide specific details to corroborate evidence from other sources [37], and they also allow the researcher to make inferences [37]. However, inferences should not be treated as evidence, but as clues for further investigation [37]. The abundance of available material (internet and other sources) can be time wasteful, as the researcher must filter and focus on the most pertinent information [37]. It is also important to note that not all kinds of documents contain the unmitigated truth [37], and that the researcher must be highly observant and be able to understand the context in which the document was created and used, the audience and its objective [37].

In this case study research, documentation was used as complementary source of evidence, to examine some of the statements collected during the interviews, such as names, implementation dates, strategies, and other useful information's.

## **3.2. TOE Framework**

In 1990, Tornatzky and Fleischer describe the entire process of innovation in a book called *The Processes of Technological Innovation*, where the TOE Framework is presented, as being part of the innovation adoption process, and representing the segment of how the enterprise context influences adoption and implementation of innovations [40], through three different elements that affect enterprise decision making (Technology, Organization and Environment) [40]. According to the literature, it is a suitable framework for examining adoption at firm level [24] and has been widely used to explain adoption of innovations [40]. It has been used to explain the adoption of interorganizational systems, e-business, EDI, open systems, and other IS applications [40]. It has been also used across different industries and in different contexts, such as European, Asian, developed or developing countries [40]. In each study, researchers have used slightly different factors for the 3 contexts of the framework, justified by the different industries and contexts [40]. It is one of the most widely used theories and has proven its usefulness in the innovation adoption investigation [40]. A model that covers many contexts, as TOE does, can offer greater explanatory capabilities [41], as it considers that changes (innovation adoption) in an organization are affected by individuals and characteristics of the organization.

### 3.2.1. Technology

Technology context includes all technologies that are relevant to the organization, whether they are internal or external, if they are currently in use or if they are available in the market, but currently not in use [40]. Technologies currently in the organization are important to define the pace of technological change that the organization can undertake [40]. Availability relates to technologies existing outside the organization that define the limits of what is possible and how the organization can evolve and adapt [40].

Adoption depends on those technologies, but also on perceived relative advantage, compatibility, and complexity [42]. Relative advantage is the degree of assumption that the innovation to be adopted is superior to what currently exists [42]. Compatibility refers to the level of compatibility, both technological and organizational, of the innovation within the organization's activity [42], considering elements such as, users experience, existing technological infrastructure, and work practices [43]. Complexity is the perception of how difficult the usage of the technology is [42], meaning that if users lack technical knowledge on e-commerce, can prevent adoption, but if they possess the technical knowledge, and find it easy to use, more likely is the adoption [43].

The importance of technological context is reflected in some studies that reveal that there is a significant influence in E-commerce adoption by SMEs [44,45]

*Table 1 - Technology factors based on literature findings*

| Technology Factors        | Description   | References |
|---------------------------|---|------------|
| <b>Relative advantage</b> | the extent to which e-commerce technology is perceived to provide greater benefits than currently used technology | [42–47]    |
| <b>Complexity</b>         | the extent of e-commerce's technology usage difficulty perception   | [42–45]    |
| <b>Compatibility</b>      | level of organizational and technological compatibility to the SME's current activity                             | [42–45,48] |

### 3.2.2. Organization

Organizational context refers to the characteristics and resources of the organization. Human resources (and qualifications), resources availability and size, top management support and organizational culture directly affect the adoption of innovation [42]. According to the literature, organizational context contains the variables most often investigated in terms of innovation adoption influence [44].

Top management support is one of the most important factors in innovation adoption in SMEs [25], as top management characteristics and technological knowledge/expertise on the subject are key

factors [26], but also, recognizing advantages in adoption, increases probability of allocating adequate resources into adoption [22]. Communication is also a key factor to promote or inhibit innovation, as the top managers leadership behaviors and communication processes can create a favorable context to innovation by indicating it's importance, making it part of the organizations strategy and rewarding it [40]. Resources availability (to allocate into adoption), also play an important role in adoption [29].

Table 2 - Organization factors based on literature findings

| Organization Factors            | Description  | References    |
|---------------------------------|--|---------------|
| <b>Top management support</b>   | the extent to which top managers characteristics and knowledge will allow allocation of adequate resources into adoption | [25,43,44,49] |
| <b>Resources availability</b>   | the extent to which there are available resources for adoption   | [29,44,49]    |
| <b>IT Knowledge &amp; Staff</b> | internal skills or knowledge to be able to use E-commerce  | [43,44,49]    |

### 3.2.3.Environment

Environmental context, usually external factors, relates to all factors that surround the organization's business operation area [42,44], such as competitive pressure, supplier and customer pressure, industry and market structure/characteristics, socio-cultural issues, external technological support infrastructures, and government support/regulations [42,44].

Opportunities and threats provided by environment such as rapidly growing industries (e.g., rapid innovation) or industries in decline (e.g., innovating through efficiency) increase the tendency of organizations to innovate [40]. Pressure from competitors also influences the adoption decision, as they are capable of encouraging organizations into adoption to gain competitive advantage [42]. Some studies point that higher the level of competition, more likely for SMEs to adopt e-commerce [42]. Market factors cannot be controlled by organizations, but they affect the way business is conducted [50]. The characteristics of suppliers that supply goods and services to the organization are also considered in the Market factors [3].

Spatial and locational factors, identified in the Oslo manual as external influential factors, were added in this study as a subject of interest, as they are related to the company's jurisdictional location and its proximity to product and labor markets [3], and as such, allowed the researcher to consider in the TOE Framework the factors associated to the outermost region status.

The Covid-19 pandemic is also considered in the environmental context. According to ACEPI, over 60% of consumers increased their online shopping rate, on average 3-5 times per month [51]. This alone

can act as a driver for e-commerce adoption by SMEs. Taking this into consideration, this will be a considered factor for adoption.

Table 3 - Environment factors based on literature findings

| Environment Factors           | Description   | References             |
|-------------------------------|---|------------------------|
| <b>Government support</b>     | the extent to which government directly or indirectly influences adoption (regulations, funds, etc.)          | [48–50,52]             |
| <b>Competitive pressure</b>   | the extent of pressure experienced by the SME from competitors who have adopted to gain competitive advantage | [42,44,45]             |
| <b>External support</b>       | external technology vendor support level  | [46,48,49]             |
| <b>Market characteristics</b> | The extent of how market characteristics influence adoption   | [49,52]                |
| <b>Spatial and locational</b> | The extent of how proximity to product and labor markets influence adoption                                   | [3] & Authors proposal |
| <b>Covid-19 pandemic</b>      | The extent of how the pandemic enabled adoption   | Author’s proposal      |

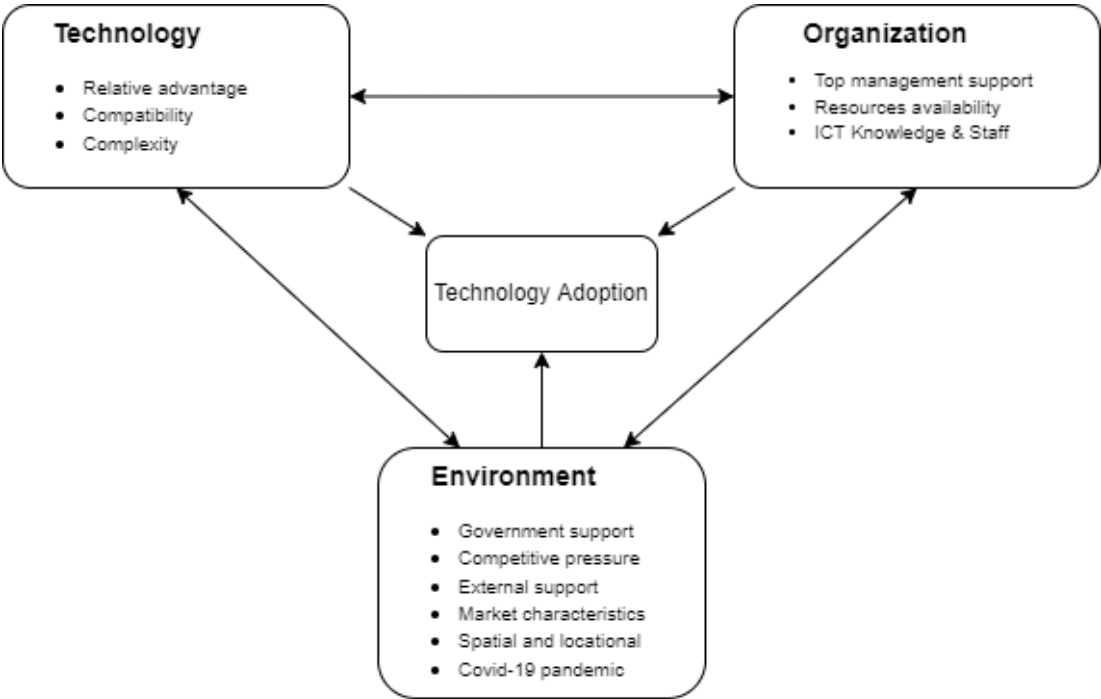


Figure 3 - TOE Framework based on Tornatzky and Fleischer’s proposal and literature findings

# 4. Data Presentation

In this chapter, data collected using interviews and documentation, as described in the previous chapter, is presented.

## 4.1. Interviews and Documentation

In this chapter, empirical data collected from the cases is presented. It consists of four case studies, separately presented, and in each case, it is possible to understand the insights on the factors influencing e-commerce adoption. Data collected from all SMEs was anonymized.

### 4.1.1. Case 1: Alpha

Alpha was represented by its CEO, son in law of the founder. It is a business-to-business retail company created in 2002 in Machico, a city in the east coast of Madeira, and currently employs 11 persons. The CEO has a background in economics and is 49 years old. The SME adopted e-commerce 1,5 years ago.

#### **E-commerce and innovation**

In the initial design, e-commerce was seen by the company exclusively as a new sales channel. Throughout the planning and looking into the fact that it would change part of the current internal tasks of the company, they started looking at E-commerce as innovation for the company itself. Consolidating online presence with a website with blog, and at the same time offering an online store, were seen as a step towards preparing the company to the future.

E-commerce indirectly forced the company into adopting other innovations, such as ERP (Enterprise Resource Planning) and warehouse digitalization and partial automation (barcodes and barcodes readers), changing, and improving their internal processes.

Resources had to be prioritized to adoption, as, according to the CEO, implementation would not be possible with the existing internal resources (financial and human). They applied to regional government funds to finance the E-commerce platform development, and, according to the CEO, without those funds, it would be a very financially demanding project for the company and would not happen at the time. He led the process, hired a company to prepare the marketing, another to develop the platform with integration with the ERP and internally, an internee was hired for this implementation, which afterwards, was included in the permanent staff of the company.

#### **E-commerce benefits**

Digital exposure is the main identified benefit. Online presence grew exponentially, reaching 200 direct keyword searches using the company's name, and nowadays, there are several phone calls, e-mails and web contacts originated thru digital platforms. It allowed them to create digital campaigns using newsletters, and to increase their market reach. They also were able to gain new clients. Improved



communication processes with clients are seen a great benefit, as now, it's possible to almost instantly, receive and respond to client inquiries, at a low cost.

### **E-commerce enablers**

At the moment of decision, the company considered itself ready for E-commerce. The CEO considers himself a "technological person" and is always trying to improve efficiency thru technology in the company. They don't have an internal IT team, but they have an external support team, as they currently possess an in-house Information System (IS) structure containing two servers, databases, and firewall to support current activities. This already existing infrastructure made the step towards e-commerce adoption simpler. Also, the CEO's IT knowledge led him into putting himself at work in some IT related issues.

Another identified enabler was the possibility of custom building a platform that would connect to the ERP, avoiding misinformation between the ERP and the online store databases. Their belief that there would be benefits also helped in the decision.

### **E-commerce barriers**

Local culture was the first identified barrier into adoption, but they only identified it after adoption. Their clients are used to a face-to-face business process, and even with the online store availability, their preference was still to have a salesman in person to proceed with business. Since the decision was using a custom-built platform, high implementation costs were also a barrier, factor that was minimized by applying to European funds to finance the implementation. The immediate necessity of cashflow availability is a barrier (European funds are not immediate). The "commercial culture" was also identified as a barrier, as their salesmen, at first, saw the online store as an unfair competition and threat to their jobs, but the company, to avoid that, prepared differential price tags for online store, so that it would not interfere with the way business was conducted by salesmen. The lack of internal IT staff was a belief that could limit the implementation, but the monthly agreement made with an external company, minimized the risk, but still, they had to create internal competences for simple tasks. Globally, their operational costs increased as consequence of E-commerce adoption. Alpha considers that E-commerce did not increase their online sales, as old and even new customers, that found Alpha on the internet, still use the telephone, and prefer to deal with salesmen directly.

### **Outermost region status**

From day one of implementation the company was aware that their target was to increase market reach, but still within the island. If the implementation of E-commerce is intended for regional market, the CEO of Alpha considers that there are high probabilities of success, other than that, it will be very difficult to survive. However, he considers that if the products are considered niche products (e.g., madeira wine), there is an opening for selling to outside the island. He even stated that, their digital campaign provided many calls from potential clients, from outside the island, much more than they anticipated, but they had to refuse any potential business due to excessive logistics costs. They would only consider having this type of business if they had a warehouse in the mainland.

## **Documentation**

The commercial report was one of the accessed documents. It was possible to verify the number of employees, the age of the company and sales evolution.

Through public documentation from “Portal da Justiça”, it was possible to verify the owner’s name, and areas of activity of the company.

Their website and social networks also provided some insights. Product prices were not publicly available. Only authorized users have access to prices (they are a business-to-business company). There are delivery options available, but no option to deliver outside the island was found. A chat bot was present, and a WhatsApp chat button was also present.

Their social networks had new posts on weekly basis, with product info, without referring prices, together with links to their online store.

It was also possible to have access to their application to Inicie+, an incentive system to support SMEs initiatives in Madeira Island, promoted by the Regional Government, using European funds for outermost regions. It was possible to verify that the company applied for it with a digital strategy initiative, asking funds to create digital image, social networks dynamization, and human resources related to digital marketing (which later became the online store responsible person). It also was possible to observe that there were budgets for the website with online store. It seems that there was no website prior to this application, submitted in 2019.

### **4.1.2. Case 2: Beta**

The CEO and founder of Beta, who has 38 years old, created the company in 2008 in Funchal, the island’s capital, and currently employs 11 persons full-time but has in total nearly 20 collaborators (9 part-time or for specific actions). His background is in physical education and sport, which motivated him into creating a business-to-consumer retail company, that sells health & sports supplements and food. The company adopted E-commerce a little over 2 years ago.

#### **E-commerce and innovation**

According to the CEO, Beta is always looking to evolve and grow, it is part of their internal culture. E-commerce was immediately seen as a chance to internally innovate and had been an objective of the CEO for some years back, but still, implementation was somewhat forced. The company, as business-to-consumer, was severely affected by the Covid-19 pandemic, where, during the lockdown, saw their clients decrease to unbearable values, making it a matter of survival (for company and staff). They innovated by implementing E-commerce (online store), but also implemented new services and internal processes to support this new business approach. They introduced delivery services to all clients, as they were legally obliged to stay at home. In this moment their main purpose was to still serve customers, but also through new services reach them at home. The CEO states that they optimized internal processes and implemented new ones directly related to E-commerce adoption. They now have Instagram, Facebook, and WhatsApp sales.

Regarding resources, by not having internal IT staff, he identified that he had to hire one new employee to handle the digital marketing and online store. Even though they did not use it to directly finance E-commerce adoption, applying to regional government funds, helped them to acquire some store equipment, which, later, allowed them to have enough resources to allocate into E-commerce adoption.

### **E-commerce benefits**

Betas sales immediately increased. Almost from 0% to 100% of their revenue was made through the online store. It was in a specific period, in a very specific situation, enabled by the Covid-19 pandemic, but that's what happened. It also improved their communication process with clients, as now, clients have an entire digital store on their hands, facilitating SMS marketing, that now, are sent with links (e.g., clients immediately have a direct link to the promotional product). The CEO also identified increased visibility and increased customer satisfaction. Customers still thank them for giving them an opportunity to keep buying products during the lockdown. They also increased their market reach and gained new customers. Their staff also grew during the pandemic, to be able to keep up with this new dynamic.

### **E-commerce enablers**

Covid-19 was seen as a huge enabler, as it forced them to re-think business. Having the risk of "disappearing" they immediately understood that they could benefit immensely with E-commerce adoption. The perceived competitive advantage also affected the decision process. The existence of technologically ready solutions, with short implementation time, was also seen as an enabler. The low cost of that technology was also an enabler, as they pay a monthly allowance under 30€ for a shopify account. Overall, the CEO believed that the company was ready for this implementation. The CEO considers himself a technology advanced user, and always believed that the company would someday embrace E-commerce.

### **E-commerce barriers**

The CEO doesn't believe that Beta provides an "excellence" level online store service, as they have some after implementation issues, such as not having real time synchronization between their stock management software and online store platform. For them, controlling stocks on the online store is a huge challenge. The technical complexity that was required for real time stock on the online store is overwhelming to them. They don't have dedicated IT staff, neither the required IT knowledge. They can't even calculate delivery costs on the shopping cart, what obliges them to call customers to confirm orders and to indicate delivery costs, and on top of that, as consequence of not having real time stock on the online store, sometimes, the customer orders product A, but they must call indicating that product A is out of stock. Those are all barriers to a proper implementation. Now that Covid-19 lockdown has passed, they began to identify other barriers. Local culture is one of them, as customers, now, don't buy online, but rather go directly to the store. There is the general idea, that everything is close by in Madeira, and there is no need to order online in local companies. The online sales did not go down to zero, but decreased a lot, after the lockdown, and the clients that still order are usually already company's customers. He finds interesting that customers mainly use the online store as a showcase. The CEO

identified that many customers enter the store with the cell phone in their hand and saying, “I saw this product online, I want to buy it”.

### **Outermost region status**

Beta’s CEO truly believes that the outermost region status is a limitation. It can be overcome, at a high cost, but is a limitation. Madeiran customers when ordering, as soon as they understand that the store is located at Madeira, stop the order and go to the store, and many customers from outside Madeira, as soon as they understand that they are ordering from a Madeira based company, or when they understand the high delivery costs associated, they don’t go through with the order (e.g., for a 8€ product, client pays minimum 10€ delivery, for the cheapest one week delivery). Still, the company sells to outside of Madeira, but very sporadically. Now, with all this new information, it is a belief of the CEO of Beta that online store is not a fantastic thing for local companies.

### **Documentation**

The commercial report was one of the accessed documents. It was possible to verify the number of employees, the age of the company and sales evolution.

Through public documentation from “Portal da Justiça”, it was possible to verify the owner’s name, and areas of activity of the company.

Their website and social networks also provided some insights. Product prices were available, but not product availability. There are delivery options available, including to outside the island. Free delivery for orders above 50€, but only within the island. There were no delivery prices for outside the island. No mention was made to the “custom delivery” that the CEO identified during interview.

Their social networks are very dynamic, mainly promoting services associated to their products (e.g., free workshops), and some product discount codes, for online or in store usage.

It was also possible to have access to their application to Inicie+, an incentive system to support SMEs initiatives in Madeira Island, promoted by the Regional Government, using European funds for outermost regions. It was possible to verify that the company applied for it with a store remodeling initiative, asking funds to improve store conditions and accessibility. There was also a social networks dynamization strategy, and human resources related to digital marketing (which, like Alpha, later became the online store responsible person). The creation of the online store was one of the planned initiatives in the strategy section, but not financially reflected in the application.

## **4.1.3. Case 3: Gamma**

Gamma was represented by its CEO and co-founder, who is 35 years old. The company was founded in 2007 in Calheta, in the western part of the island and currently employs 4 persons. It is a computer retail business-to-consumer store that started in a garage, and E-commerce was present since an early stage, as the company was born digital, with no physical store, selling exclusively online. Nowadays, they have a physical store.

## **Innovation in the organization**

They introduced market innovation in 2007 as they were the first computer equipment online store in Madeira. Innovation is a constant in the company, as they progressively innovate the technology associated to their online store, adding functionalities to improve internal processes (e.g., an internally developed script to automatically update, daily, product prices based on suppliers' prices and availability, always providing the cheapest price on the product). They also introduced drop shipping as a service to cut down delivery prices and costs. Therefore, their continuous improvement brought client fidelity. They have added other e-commerce sales channels such as Facebook and WhatsApp.

## **E-commerce benefits**

E-commerce allowed them to establish themselves on a competitive market with reduced costs. That is seen by the CEO as the biggest benefit. They also gained competitive advantage, as the first online computer store in Madeira, and in parallel, they immediately felt a sales boost and customer satisfaction, as they were able to process orders quickly, and had an extended market reach.

## **E-commerce enablers**

When they decided to start the company, with E-commerce, they perceived that they would have associated benefits, and that they would gain competitive advantage over other regional companies. And since they internally had all the necessary technological knowledge, mainly the CEO, with computer engineering background, they felt that they were ready for the challenge. Even though it was not considered as an enabler (the company had E-commerce many years before), COVID-19 pandemic was a booster to online sales, highly contributing for the financial health of the company during the lockdown.

## **E-commerce barriers**

The main and only identified barrier by Gamma's CEO was logistics cost, which he immediately associated to the outermost region status.

## **Outermost region status**

For the CEO, it is clearly a limitation. He believes that if his company was based within the mainland, he would not have (almost) any supplier's delivery costs, as the cost for delivery for 2 pallets full of equipment in the mainland would cost around 4/5€, or sometimes free (if they reach minimum purchase value), but for Madeira the same pallets cost almost 150€, transported by sea, which takes about one week to arrive. Some customers don't want to wait that long, and they lose the customer. He estimates that on average, they spend 1500€ per month in delivery costs, sum that is totally absorbed by the company, so that the prices can be competitive with the mainland companies, and with big tech players such as Worten and Fnac. These high costs, forces them to have much more stock than they would want to, to save on delivery costs, and to group orders by supplier. They cannot order to a supplier every time a customer orders them a product as the costs would be prohibitive. The CEO directly stated that the costs of being in an island are a huge "stab" in the company.

## **Documentation**

The commercial report was one of the accessed documents. It was possible to verify the number of employees, the age of the company and sales evolution.

Through public documentation from “Portal da Justiça”, it was possible to verify the owner’s name, and areas of activity of the company.

Their website and social networks also provided some insights. Product prices were available, and product availability was also visible. There are delivery options available, including to outside the island. There were no delivery prices for outside the island, stating that it was on demand.

Their social networks are very dynamic but used exclusively for new products and availability information’s.

They provided access to their Backoffice, where they demonstrated the custom-built scripts that were the basis of their online store prices and availability features. They also demonstrated their invoice system and how it connected to the online store.

No other documentation was provided by them.

### **4.1.4. Case 4: Delta**

Delta was founded 2010 in Funchal, by its CEO, who is 52 years old, and represented the company in the interview. Delta, business-to-consumer retail company, selling entertainment products for children (toys, games, puzzles, party artifacts), currently has 5 stores in the island and employs 22 persons, being 2 of them exclusively for marketing, events and animation. According to the CEO, they adopted E-commerce in October 2020, nonetheless, he stated that for nearly 10 years they have thought about implementing a website. He has a background in physical education and sees himself as a IT user, not expert.

#### **E-commerce and innovation**

The CEO saw E-commerce as an innovation for the company, but still, it was implemented as a failsafe for a potential Covid-19 lockdown and, he also considers that at the time they implemented the online store, no other innovations were being considered or implemented.

However, he considers that the company innovated in the first quarter of 2020, when the first COVID-19 lockdown occurred. They adapted their communication strategy, to maintain proximity with their clients. They started daily online live sessions, creating a new type of interaction with clients. On request they even created online customized activities, for birthday parties, for school classes, with the purpose of promoting interaction activities and cheer up their audience, deepening their proximity relation and creating empathy. Their social networks grew up immensely, up to 19000 followers, which, given the regional market dimension, is a very significative value.

Regarding resources, they always prioritize their physical stores, and the financial effort necessary for the creation of the online store, was seen, because of COVID-19, as a needed effort, towards survival, in case a second lockdown would occur. Nevertheless, the CEO indicated that the company applied to regional government funds to finance the website and online store.

### **E-commerce benefits**

It was hard for the CEO to identify any significant benefits. Initially, he even stated that he doesn't see any.

According to the CEO's words, the first COVID-19 lockdown was very hard, but the company's efforts in communication, and creating new channels, such as Facebook messenger or WhatsApp, allowed them to keep selling their products, to survive and pay their bills. This was not identified by the CEO as E-commerce, but, by definition, they sold products using digital means, which is a form of E-commerce. And this is a direct benefit.

Still, he identifies that the (few) orders that come in through their website, allowed them to create a new "proximity format", as they deliver orders themselves directly to the client's door, and not through a standard delivery company.

Having an online store that could be used to promote certain type of products, that are bigger and/or more expensive, and as such, not immediately available on physical stores, was also seen as a benefit.

### **E-commerce enablers**

Increase current online activity was identified as an enabler, but the main enabler was without a doubt, for the CEO, the COVID-19 pandemic. They spent years creating a proximity relation with clients and, suddenly, they were forced to break it. The solution was to create an online store, that allowed business to continue, surviving a potential second lockdown.

### **E-commerce barriers**

For Delta's CEO, there are 2 immediately identified barriers. The ocean (geographic location of the island) and his own view of the company's market.

To him, E-commerce is associated with efficiency, speed and price. Delta is a small company, working at a small scale, and to be present in the best physical location, such as shopping centers, they have to slightly increase their prices, to face the costs of being in those locations. For him, this immediately acts as a barrier to E-commerce, as their price tag would not be competitive in online markets, and that would be extremely visible and exposed. He cannot have different prices on the website and on physical stores, and he cannot balance prices with his online competition, as his company would not financially survive.

For this reason, he sees that the online sales will be dominated by the big names in the market, and he will never be able to compete with them, providing another barrier to E-commerce.

His vision of the future is also a clear barrier, as he believes that, and when everyone else is talking about selling online, he wants his company to be the one that differentiates and continues to offer

experiences, human contact, and interaction, rather than a simple online sale. As he believes that price and speed will be the main forces of online sales, that would force them to lose the current proximity with clients.

Selling on a small scale is a barrier to E-commerce to the CEO, as not selling on a larger scale makes the return of investment on the website almost impossible to recover.

The other big barrier identified by the CEO is directly related to Outermost Region status, the ocean.

### **Outermost region status**

Even before the interview started, the CEO had already mentioned the difficulties that the company faces just for being in the middle of the ocean. Being surrounded by sea is a visible obstacle.

It is clearly a limitation for Delta. The main limitation is cost. They have high costs in bringing the products into the island, and that immediately brings limitations to the final price. Their market is very competitive and slight price differences excludes them from the buyer's choice, and as such, selling to outside the island is something that is not considered as a benefit of having E-commerce.

He suggests that he has thought about drop shipping, but that also has problems, as sometimes, the product is not immediately available from suppliers, creating long delays, and buyer's disappointment, or even worse, "clients" disappointment (their major final clients are children). And as their vision consists in proximity relationship, empathy, and an experience, rather than a simple sale, any type of disappointment cannot be considered.

Another option would be to have a supplier or a warehouse in the mainland, that would facilitate shipping and delivery, but that has huge costs associated.

Having E-commerce with so many limitations for selling outside the island is a clear barrier to the CEO.

### **Documentation**

The commercial report was one of the accessed documents. It was possible to verify the number of employees, the age of the company and sales evolution.

Through public documentation from "Portal da Justiça", it was possible to verify the owner's name, and areas of activity of the company.

Their website and social networks also provided some insights. Product prices were available, and product availability was also visible. There are delivery options available, including to outside the island. There were no delivery prices for outside the island. It was possible to observe that their online store did not have all their products present, as some of the products seen in the social networks could not be found in the online store.

Their social networks are very dynamic, with posts showing new products arrivals, games for children, riddles, and other useful information's. No mentions to prices were made.



It was also possible to have access to their application to Adaptar RAM, an incentive system to support SMEs initiatives in Madeira Island, directly related to COVID-19 difficulties, promoted by the Regional Government, using European funds for outermost regions. It was possible to verify that the company applied for it with a COVID-19 protection strategy, asking funds to improve store conditions, adapting themselves to the new COVID regulations (Distancing, protection, etc). The application also included budget for the creation of website and online store.

# 5. Data Analysis

In this chapter data collected is analysed. The factors influencing E-commerce adoption, namely enablers and barriers, are analysed under TOE framework. The identified E-commerce benefits are also analysed in this chapter.

## 5.1. Cross-case factors affecting adoption

In this section, previously collected data, is presented in Table 5, which represents a summary of findings analysed under the TOE Framework. A descriptive explanation of the analysis of every factor is also presented.

Table 4 - Summary of findings analysed under TOE Framework

| Factors |                               | Alpha | Beta | Gamma | Delta |
|---------|-------------------------------|-------|------|-------|-------|
| T       | Relative advantage            | +     | +    | +     | +     |
|         | Compatibility                 | -     | +    |       | -     |
|         | Complexity                    |       | -    |       |       |
| O       | Top management support        | +     | +    | +     | -     |
|         | Resources availability (size) | -     | +    | +     | +     |
|         | ICT knowledge                 | -     |      | +     |       |
| E       | Government support            | +     | +    |       | +     |
|         | Competitive pressure          |       |      | +     | -     |
|         | External support              | +     | +    |       | +     |
|         | Market characteristics        | -     | -    |       | -     |
|         | Spatial and locational        | -     | -    | -     | -     |
|         | Covid19-Pandemic              |       | +    |       | +     |

### **5.1.1. Technology**

The technology context was categorized into three major factors influencing EC adoption: Relative advantage, Compatibility and Complexity.

#### **Relative advantage**

Findings show that, in all cases, E-commerce is perceived to bring relative advantages over traditional methods or was considered better than what currently is used by the company. The perceived benefits, such as sales, revenue and profits growth, cost reduction, customer satisfaction and commodity, were the considered elements related to Relative advantage factor.

Literature review demonstrates that several authors consider that perceived benefits is an enabler that influences E-commerce adoption in SMEs, and some studies even considered it as the main reason for e-commerce adoption [19,23,29,53].

The common denominator was that E-commerce adoption would bring benefits to the company, in a short term, increasing business performance, thus, positively influencing E-commerce adoption. Cost reduction was perceived by one of the companies, Gamma, as allowing them to be highly competitive in their market, affecting their adoption decision. Sales, revenue, and profit growth was perceived by three of the companies, Beta, Gamma, and Delta, as a channel where they immediately could start generating revenue, but for two distinct reasons, as one of them, Gamma, saw E-commerce as a way to easily enter in a competitive market, the other two, Beta and Gamma saw it as a way to sell products and survive COVID-19 lockdown.

E-commerce is highly digital, and that brings advantages related to customer satisfaction and commodity, especially when the customer needs to buy products, but cannot go into the store. These social aspects, take high importance in situations like the pandemic. Only one of the companies did not identify this specific element as an enabler, Alpha.

#### **Compatibility**

Regarding compatibility, two of the SMEs identified that there were product or services compatibility issues.

For Alpha and Delta, for different reasons, compatibility issues were a reality. Alpha, due to their business model, felt that the salesmen were threatened by E-commerce in the early stage, not supportive of it, creating incompatibilities. For Delta, compatibility issues came directly from the CEO, who believes that the mission of the company is to provide a human and direct contact, offer unique experiences and create empathy, which are incompatible with an online store. For these companies, compatibility negatively affected adoption, in accordance to literature findings where product or services compatibility is found to be a barrier for adoption [19,23,53].

For Beta, there were no compatibility issues identified, as they created an extension of their physical store, allowing customers to keep buying their usual products, through a digital channel, which for them, was a life saver. It had an enormous positive effect on their adoption decision.

For Gamma, due to their initial business model, which included selling online, compatibility was not considered.

### **Complexity**

IT complexity was the only element within the Complexity factor to be identified by the SMEs. Usability, another element related to complexity, was not considered by any of the SMEs.

Beta, even though they have acquired E-commerce through an already developed platform, they realized that they had limitations, and to fully adopt E-commerce with a more complete solution, that could communicate with all their internal and previously existing software, would be too complex and would require IT knowledge that they did not have. This potentially negative effect, acting as a potential barrier, is in line with literature findings, where several authors identified IT complexity as a barrier [12,19,23,53].

All other companies, and interpreting their CEO's words, did not consider complexity of the E-commerce systems during adoption. Alpha and Delta fully outsourced the development and implementation of the platform and has internal staff to manage it. Gamma had fully capable internal IT staff for all phases, development, implementation, and maintenance.

## **5.1.2. Organization**

The organization context was categorized into three major factors influencing EC adoption: Top management support, Resources availability and ICT knowledge & staff.

### **Top management support**

Owner or management characteristics/attitudes and perceived competitive advantage were the considered elements within Top management support, and it is perceived by SMEs to either act as enabler or barrier.

The analysis of data from Alpha, Beta and Gamma suggests that their CEOs, who are also top managers, considered themselves as "tech guys" and were very enthusiastic with E-commerce adoption, having positive effects on the adoption decision. This is in line with the literature findings, where the CEO's attitude, characteristics and IT knowledge would have a positive effect on adoption. In line with this, several authors have found that positive owner or management characteristics/attitudes are an E-commerce adoption enabler [30,32,53,54].

Delta, on the other hand, has a CEO not so enthusiastic with E-commerce adoption and his IT knowledge is user knowledge. He does not see himself as an anti-technology person, but believes that his company's business model, and mission can't exist online. The company was forced by COVID-19 into adoption, otherwise, he would not support adoption. Delta's CEO attitude has a negative effect on adoption. Some authors found that a less positive (or lack of IT knowledge) owner or management characteristics/attitudes are an E-commerce adoption barrier [19,23,32,35].

### **Resources availability**

Human and financial resources are the considered elements in the Resources availability factor, which was considered by all the SMEs.

Alpha immediately identified that with the currently existing resources, E-commerce adoption would probably not occur. They did not have internal staff, internal knowledge or financial resources for the adoption of E-commerce. This acknowledgement, by the CEO, can have a negative effect on adoption, and is in line with findings in literature, where the lack of resources availability acts as a barrier for EC adoption [23,32,53,54].

Gamma, internally, had all the necessary resources for adoption and implementation, thus, suggesting to having a positive effect on the decision of adoption, and in accordance with literature, where several authors considered that having financial (& IT) resources is an enabler for EC adoption [24,29,30].

For Beta and Delta, the adoption decision, was somewhat forced, and even considering that they had previously thought about creating website with online store, they still had not done it, and the pandemic, pushed them into adoption. Nonetheless, they considered to have the necessary resources for the adoption, or at least, to adopt at a level that would allow them to continue business processes. Both identified that more could be done, but it is not clear that if the pandemic did not happen, they would have planned the implementation differently. Still, having enough resources, is suggested to be important for adoption decision.

### **ICT knowledge & Staff**

Internal ICT knowledge or IT Staff were the considered elements within this factor. It can act both as enabler or barrier, depending on if the SME has ICT knowledge & staff or not.

The only company that had enough internal ICT knowledge, was Gamma. They had enough staff and skills. It is suggested that it had a positive effect on adoption. Having staff with ICT knowledge is found in literature to be an enabler for EC adoption [32].

Alpha, even though the CEO considered himself as having ICT knowledge, and felt comfortable with technology, he stated that the company did not have internal staff for the job. This was seen a potential drawback, suggesting having a negative effect on adoption decision, having several authors in literature also considered lack of skilled IT labor as a barrier for EC adoption [19,23,53,54].

Beta and Delta, for initial adoption, they did not consider any elements related to this factor. Beta, subscribed Shopify, which was seen as user friendly, not creating many technological difficulties to the staff. Still, they hired someone to be responsible for the marketing and online store maintenance. Delta did not hire anyone specifically for this function, but it is done internally by the CEO.

### **5.1.3. Environment**

The environment context was categorized into six major factors influencing EC adoption: Government support, Competitive pressure and External support, Market characteristics, Spatial and locational, and COVID-19 pandemic.

## **Government support**

Madeira Autonomous Region is a politically stable zone, and even though there are local regulations, most of existing regulations are National or even derived from European Union. Political instability and legal/governmental concerns are elements associated to the Government support factor. Several authors identified in literature that government support can positively or negatively influence EC adoption [48–50,52].

Government support, more specifically, government financial support, has been key in supporting regional companies, for a long time. There are several funds that directly support companies in innovating, or in a more recent period, funds to surpass difficulties created by the pandemic.

Alpha, Beta and Delta, have used these funds to develop their companies, allowing financial resources to be allocated into adoption. Delta applied directly to a fund to finance the website. This is suggested to have a positive effect on adoption.

In Gamma, this factor was not considered.

## **Competitive pressure**

SMEs did not identify any pressure from suppliers or competitors, elements associated to the Competitive pressure factor, but still, it was a considered factor.

Gamma saw an opportunity to gain competitive advantage over the competition, as being the first regional company to sell computer related hardware online. They did not directly feel competitive pressure, nonetheless, it is suggested to have a positive effect on adoption, as they understood that competitive advantage could be gained.

Delta, on the other hand, feels that competitive pressure demotivates them into having E-commerce, as they are aware that they cannot compete, in terms of online prices, with their current competition, who are national and international companies. E-commerce is seen by the CEO as a tool that would be a worldwide window for not so competitive prices and could possibly affect current in store business. It is suggested to have a negative effect on adoption decision.

## **External support**

The communications infrastructure in Madeira is very modern and reliable, whether mobile or fiber, thus not being considered elements in the External support factor. However, the existence of external providers, that could either help or fully implement EC systems, was a considered element.

The availability of regional companies that could develop, implement, and support E-commerce adoption is suggested to have a positive effect on Alpha and Delta's adoption.

Beta used an international level provider, specialized in E-commerce. They were not hired as developers, but as a service provider. The shopify platform is sold as SaaS (software as a service). The availability of such provider allowed them a very quick implementation and is suggested to have a positive effect on adoption.

Existing external technical knowledge and infrastructure according to literature, both act as an enabler for EC adoption [32,54].

### **Market characteristics**

Cultural compatibility issues are elements related to Market characteristics, considered by three of the SMEs, and in literature it was possible to observe that several authors consider it as a barrier for EC adoption [19,23,24,35].

Delta immediately identified that their market and target audience, together with their vision and mission, are not compatible with online sales. Not that their product cannot be sold online, but for other human elements that make buying in their physical stores a unique experience. This is suggested to have a negative effect on adoption.

For Alpha and Beta, this factor was not considered during adoption, but it was noticeable short after implementation that clients prefer to use the direct contact, face-to-face, sales process. Alpha noticed that clients kept asking for a salesman to do business directly and Beta noticed that clients started using the online store as a showroom, and afterwards, went to the store and asked for the same product using the cell phone, with the online store as identification of the product. Beta also noticed that clients, during the online process, when aware that the store was in the island, they cancelled online orders and went directly to the stores. This suggests that market characteristics can have negative effect, especially if the target audience is regional.

### **Spatial and locational**

All companies identified that being part of an outermost region, in the middle of the ocean and far away from any supplier has a negative impact on their companies. There are high costs associated and being competitive outside regional level is almost impossible. This is suggested to have a negative effect on adoption decision.

All companies stated that there are customers, from outside the island, reaching them through search engines or through their online stores, but establishing business is difficult. Alpha stated that they refuse to sell outside the island, due to the excessive logistics costs. Beta, Gamma and Delta, stated that they do sell to outside the island, but very sporadically, not reflecting in terms of significant revenue.

### **Covid-19 pandemic**

Beta and Delta's E-commerce adoption decision was clearly influenced by the COVID-19 pandemic, as it forced them to, almost without planning, implement an online store that could allow them to generate revenue, during a period where customers were not able to reach their stores because of general lockdown. It is suggested to have a positive effect on adoption decision.

In Beta's case, it also allowed improvements on process level, and new services were added.

## 5.2. Cross-case benefits of adoption

There is empirical support in literature that E-commerce adoption provides benefits for SMEs. Through the interviews, it was possible to understand that all the SMEs in this study have gained benefits from E-commerce adoption, still, not all identified the same benefits.

Using a compilation of benefits identified in literature as factors, Table 5 shows a comparison of those benefits compared with cross case identified benefits.

*Table 5 – Summary of E-commerce adoption benefits*

| Benefit                                   | Alpha | Beta | Gamma | Delta |
|---|-------|------|-------|-------|
| Sales, revenue, and profits growth        |       | +    | +     |       |
| Improved customer satisfaction            |       | +    | +     |       |
| Increased market reach                    | +     | +    | +     | +     |
| Reduced communication/operational costs   | +     | +    | +     |       |
| Improved processing and delivery speed    |       | +    | +     |       |
| Improved staff satisfaction/productivity  |       | +    |       |       |
| Increased company productivity            |       | +    | +     |       |
| Improved internal communication           |       |      |       |       |
| Improved company Image                    | +     | +    | +     | +     |
| Improved supplier relationship            |       |      |       |       |
| Improved competitive advantage            |       | +    | +     |       |
| Improved partner relationships            |       |      |       |       |
| Better internationalization opportunities |       |      |       |       |
| Improved external communication           | +     | +    | +     |       |
| Improved distribution channels            |       | +    |       | +     |
| Providing support for strategic decisions |       |      |       |       |



|  |   |   |   |   |
|--|---|---|---|---|
| <b>Innovative cooperation with clients and suppliers</b> |   |   |   |   |
| <b>Improved business processes</b>                       |   | + |   |   |
| <b>New Customers</b>                                     | + | + | + | + |

It was possible to understand, that all the SMEs felt that their global image had improved and that their market reach was increased. They all also identified that they gained new customers. These findings are in line with literature findings, where several authors identified that these were EC adoption benefits [12,19,22,23].

Surprisingly, only two of the four SMEs identified that their sales increased with E-commerce adoption, Beta and Gamma. The same SMEs also were the only ones identifying that there was an increase of client satisfaction, increased company productivity, improved processing and delivery speed, and, improved competitive advantage. Sales, revenue and profits grown is one of the most recurring benefits, according to literature findings [12,19,22,23].

Improved external communication was also identified as a benefit, but still, one of the SMEs, Delta, did not identify it as a benefit. Delta was also the only one not identifying reduced communications/operational costs as a benefit. This goes in the opposite direction of literature findings, where improved external communication and reduced communications/operational costs are perceived to be (almost immediately) gained benefits, with the online business processes of the SMEs [12,19,22].

According to Beta's CEO words, it was possible to understand that their staff satisfaction was increased, and that they also improved their business processes. No other SME identified these as benefits. Staff satisfaction is identified in the literature as benefit in cases where there is no reluctance to change in the SME [22,23]. In Beta's adoption process, their staff saw the EC platform as a way to keep selling and to keep their own jobs, due to the pandemic.

Beta and Delta have also improved their distribution channels with the implementation of "internal delivery systems", their staff of the company deliver orders directly to customers. Nonetheless, this is only possible due to the island's dimensions, and staff availability.

Some of the benefits identified in the literature, such as, improved internal communication, improved supplier relationship, improved partner relationships and better internationalization opportunities were not identified by any of the interviewed SMEs. Also, no other, non-existing in literature benefit, was identified.

# 6. Conclusion

This last chapter aims to provide an overall conclusion regarding the findings of this study, based on the findings presented in the previous chapter. Those findings will be connected to the research questions in the first section, and afterwards, the author's considerations on limitations and future work will be covered.

## 6.1. Overview

The thesis overall purpose has been to study factors that affect E-commerce adoption by small and medium enterprises (SMEs) in the outermost regions, understanding gained benefits as well. The study was conducted thru case studies, in four SMEs based and with operations in Madeira Island, where the interviewed CEOs responses, based in their personal views and perspectives of E-commerce adoption in their companies, allowed the collection of evidence, that was the basis of analysed data using TOE Framework (Technology-Organization-Environment), originally created by Tornatzky and Fleischer to describe how the enterprise context influences adoption and implementation of innovations, by analyzing technology, organization, and environment contexts.

Research questions were used to present the conclusions of the study, allowing the readers to have a clear vision of the studied phenomenon.

### **6.1.1.RQ1: How can the factors that influence E-commerce adoption in SMEs from outermost regions be described?**

In a descriptive form, the positiveness of certain factors and the negativeness of others concerning E-commerce adoption decision in outermost regions are suggested by this study. This study did not intend to measure the level of influence, but rather create foundation for further research.

Using TOE Framework, to analyse CEO's answers, it was possible to associate literature existing enablers and barriers to the technology, organization and environment elements of the TOE Framework, in comparison to the CEO's answers, allowing to understand which ones have a positive effect and which ones have a negative effect on E-commerce adoption in SMEs located in the outermost regions.

Within the technology element, understanding that E-commerce could bring greater benefits than the currently used technology, is suggested to have a positive effect on adoption. Seen as an innovation for the company itself, E-commerce adoption technologically was a step up for the company.

Regarding compatibility, it is suggested that has a negative effect on adoption, mainly because of associated cultural issues, or business vision. However, this is not generalizable, as some companies suggested that it has a positive effect on adoption.

In this study, complexity is not suggested to have either positive or negative effects during initial adoption, however, one of the case studies identified that they did not have enough knowledge to deal with the complexity of a more advanced E-commerce technology, thus, having a negative effect.

In the organization element, the importance of top management support and resources availability for adoption are suggested to have a positive effect on E-commerce adoption. Only one of the interviewed CEOs had a background in IT, but still, the majority (three out of four) were perceived to be very proactive concerning adopting innovating technologies that could improve overall business, and this is suggested to play a key role in the adoption decision. On top of this, CEOs with IT knowledge seem to act as their own IT staff, in some IT related issues. Resources availability always takes importance, as SMEs, due to their size, can face difficulties in allocating resources.

ICT Knowledge does not have a clear positive or negative tendency, as it was perceived to positively affect one company and negatively other. It was not considered in the other two companies.

In external element, government support and external support are suggested to have a positive effect, as companies admitted having applied to government funds to support innovation, some to support directly E-commerce adoption. This is perceived to play a key role, as it allows companies to have available resources, which is a factor already identified as positive, within the organization element. External support's importance is perceived to be directly related to solving the lack of internal ICT knowledge within organization element.

Competitive pressure does not have a clear positive or negative tendency, as it was perceived to positively affect one company and negatively other. It was not considered in the other two companies. There is the overall perception that locally, competitors are at the same level, therefore, one company identified E-commerce adoption to differentiate from competition, that, at the time, did not offer E-commerce. On the other hand, one company perceived competitive pressure as having a negative effect, since, competition, came directly from outside the island (e.g., amazon), and they could not compete online with them.

Market characteristics and spatial and locational factors, in a consensus, are suggested to have negative effect on adoption. Madeira is mainly a proximity market, where face-to-face transactions are preferred. These market characteristics, negatively influence E-commerce adoption. The same can be perceived for spatial and locational, as companies consider, that being in the middle of the ocean, away from any supplier, is a huge and costly limitation, and when adopting E-commerce, it acts as a demotivator.

COVID-19 is perceived to provide positive effect on E-commerce adoption, but not only. One of the companies already had E-commerce, before the pandemic, but saw it grow consequently. One of the companies was already starting E-commerce adoption, but the pandemic accelerated it, and it motivated them into adopting more efficient processes. The other two companies felt the need for adopting E-commerce to survive the pandemic. It seems fair to suggest that the pandemic had a positive effect on any innovation adoption.

Even though, there was no intent to measure the level of influence of these factors, it seems that some of them balance with others. For example, not having top management support is a literature known factor that negatively influences adoption, but on the only case in which top management support was not identified, it balanced out with the need to adopt, provided by the pandemic, an environmental pressure. This is in line with literature, where environmental pressures were found to influence CEO's decision of adoption, and it also opens possibilities for further research, to deepen knowledge.

Overall, the findings suggest that in the outermost regions, the factors that affect E-commerce adoption are mostly consistent with the findings from literature, however, there are factors, like Spatial and Locational, that directly affect SMEs in the Outermost Regions, not acting as impediment, but as benefit limiter.

### **6.1.2.RQ2: How can the benefits of E-commerce adoption by SMEs in the outermost regions be described?**

As previously mentioned, and in accordance with the existing literature, companies benefit from E-commerce adoption, or any other innovation adoption, however, benefits vary between industries, business types, or even geographical locations.

This study suggests that in the outermost regions, more specifically in Madeira, companies gain benefits with E-commerce adoption, mostly similar with the ones found in literature.

Increased sales/revenue, more satisfied customers, reduced communication/operational costs, better external communication, processing and delivery speed improvements, improved staff satisfaction, global productivity improvements, improved business processes, improved company image, gaining competitive advantage, better distribution channels and finally, gaining new customers were identified by the CEOs as direct benefits, but still, it was understandable that some, had specific interpretations, associated to their geographical location.

Only three of the listed benefits were transversally identified by all inquired companies, new customers, improved company image and increased market reach. During the interviews, it was suggested that increased market reach, was achieved, but still within the island's boundaries. It was consensual that the company was globally visible and digitally accessible thru internet, but the sales to outside the island were so sporadic or non-existent, that they were not considered as market reach. Global market definition doesn't fully applies to them, as they feel limited in terms of logistics and competitiveness.

Surprisingly, not all CEOs identified sales, revenue and profits growth, as a direct benefit, justified by the fact that, since they operate within the island's boundaries, their customers prefer face-to-face, with direct contact, business relationship. Even when the first contact is made online, the client usually goes to the store to proceed with business. This fact suffered significant changes, during the pandemic, where companies were forced to stop face-to-face business, and E-commerce was the client's only option. But as soon as the lockdown ended, online sales started decreasing.

Not all benefits found in literature were identified by the CEOs and no additional benefits were brought up by them.

As an overall conclusion, SMEs in the outermost regions do gain benefits with EC adoption, similarly to what has been found in literature. In Madeira, it seems that some of the benefits are felt only within the boundaries of the island, which is a perception that differs considerably from what was found in literature.

### **6.1.3.RQ3: How can the outermost region status effect on E-commerce adoption by SMEs be described?**

As part of the TOE Framework, by author's suggestion, in the spatial and locational factor of environment element, the outermost region associated constrains are consensually suggested to have a negative effect on E-commerce adoption, but also on the company's competitiveness capabilities, and, not least, any business operations, due to associated costs.

Still, it does not seem to act as an insurmountable barrier or limitation, as companies did in fact adopt E-commerce, and have adopted other innovations as well. Companies are aware of the constrains and are aware of the limitations, thus, when adopting, they limit their expectations (none of the CEO's identified to have ambitions to sell outside). In theory, having a digital presence and E-commerce should provide access to a global market, but the companies perception differs from that, as they continue to act based on the island's boundaries. It is extremely costly to transport products from suppliers into the island and that must be reflected on the final price of the product, which lowers SMEs competitiveness capabilities in comparison with online stores based in other geographical locations. Only niche products, (e.g., madeira wine) don't suffer from these limitations, as they uniquely produced in the island, and client is willing to pay extra for it.

Still, one positive effect has been detected. Due to the island's small size (in one hour you can cross the whole island), SMEs can implement proximity strategies, like custom deliveries, like what Beta and Delta have done.

It can be concluded that SMEs who sell physical products, face difficulties directly related to the fact that they are in a small island, apart from the mainland, i.e., in an outermost region. This study is not capable of answering how many types of businesses these constrains affect, or how many types of industries, but still, it can identify that the outermost regions suffer from specific constraints that are subject of interest.

## **6.2. Limitations**

This study extended research of factors affecting E-commerce adoption to an under-researched location, and several limitations were identified in the process.

Since case studies are generalizable to theoretical prepositions, not to populations or universes [37], they do not represent a sample of the SMEs in Madeira, and they also do not cover all business types or industries, meaning that this study does not cover all possibilities.

Other identified limitation is that Madeira autonomous region SMEs were the basis of this study, as SMEs that are in an outermost region, but currently there are nine European outermost regions. Two of them are Portuguese autonomous regions, Madeira, and the Azores (respectively distanced 1041km and 1548km from the national capital), one is a Spanish autonomous community, the Canary Islands (distanced 1850km from the national capital), five are French overseas departments, Martinique, Mayotte, Guadeloupe, French Guiana and Réunion (respectively distanced 7641km, 8444km, 7578km, 7841km and 9921km from the national capital), and one is a French overseas community, Saint Martin (distanced 6700km from the national capital). Despite they all share the same constrains associated to outermost regions, the identified factors affecting E-commerce adoption, or the gained benefits, can vary between outermost regions, and this study does not cover that.

The last identified limitation is that COVID-19 pandemic refers to a specific period (2019 onward), but, had direct influence on the conclusions of this study, which, leaves the impression that any study, applied to the same SMEs, but outside the pandemic period, might have different outcomes.

These limitations, offer possibilities for future research.

### **6.3. Future work**

Considering the identified limitations, several future work possibilities can be approached, as there is the need of further investigating outermost regions.

- The need to apply a quantitative research methodology, to understand the level of influence of E-commerce adoption affecting factors in a broader level.
- There is the need for a study involving a large sample of SMEs, to see if the findings hold to other cases.
- There is the need to replicate it in other outermost regions, to see if the findings provide same conclusions.
- Investigate if findings can be generalizable to other business types or industries.
- Investigate on a broader spectrum, how the outermost region status affects competitiveness of companies.

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# Annexes

## **Annex A:** Interview Protocol

- a) Self-introduction to the interviewee.
- b) Explain the purpose of the interview and review the interview protocol with the interviewee.
- c) Ask permission to the interviewee to audio record the interview, and if agreed, proceed with interview.
- d) Inform the interviewee of his/her right to seek clarifications on any questions asked.
- e) Turn on the audio recording device to begin the interview.
- f) Starting at question #1, begin the interview, continue until the last question. If necessary, ask follow-up questions for clarification.
- g) After completing all the questions, discuss with the interviewee some of the interpretations of the interview data, to obtain validation.
- h) Thank the interviewee for taking part in the study.
- i) End of interview

## **Annex B: Interview Guide**

1. Gender
  - a. Male
  - b. Female
2. Age
  - a. < 25
  - b. 25 -35
  - c. 35 – 45
  - d. > 45
3. Position in the company
4. Number of employees
  - a. < 10
  - b. 10 – 50
  - c. 50 - 250
5. How long has the company been in operation?
  - a. 0 - 3 years
  - b. 3 - 5 years
  - c. > 5 years
6. How long does the company have E-commerce?
  - a. 1 -3 years
  - b. 3 -5 years
  - c. > 5 years
7. When adopting, did you consider E-commerce as an innovation?
  - a. Yes
  - b. No
8. At that same time, were you implementing any other innovation(s) in your company?
  - a. Yes
  - b. No
9. If yes, was it a product, service, or process?
  - a. Product
  - b. Service
  - c. Process
10. What E-Commerce applications do you use in your company? Did your employees have previous IT knowledge?
11. And what about you, are you comfortable with technology?
12. How were your internal resources prioritized towards adoption?
13. What do you perceive to be the benefits that your company gained with e-commerce adoption?
14. What do you consider to be the enablers/drivers for e-commerce adoption on your company?
15. What do you perceive to be the most important inhibitors or barriers your company faced while adopting e-commerce?

16. Did e-commerce adoption allow your company to expand outside Madeira and access a global market? Please explain.
17. Do you consider that the fact that Madeira is an OR (Outermost region) affects (or affected) your e-commerce adoption? Why?
18. How are your E-Commerce applications perceived and experienced by your customers and Employees?