Technology Here & There, to Help Budget Hotels Fight COVID-19 Everywhere!

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Dissertation submitted in partial fulfilment of requirements for the International MSc in Management (Marketing), at the Universidade Católica Portuguesa, January 2021.

ABSTRACT:

Dissertation Title: Technology here & there, to help budget hotels fight Covid-19 everywhere!

Author: Morris Beck

The aim of this dissertation is to investigate the attitude of guests towards the implementation of technological solutions to mitigate the spread of the Covid-19 virus in budget hotels. On the 11th of March 2020, the virus was declared a global pandemic and many companies, including those in the hotel sector, implemented new technologies to remain open.

More specifically, this work intends to see how technological solutions can have a positive impact on budget hotel. Although it is not a recent approach in the hotel sector, the implementation of technological solutions can be fundamental for hotels to remain open and increase occupancy rates again during pandemic crises.

The primary data was collected through a pre-tested questionnaire based on the Technology Acceptance Model in order to measure guest attitudes towards the use of technology to reduce the risk of a Covid-19 infection. The results of the analysis indicate that the independent variables (ease of use, effectiveness and usefulness) and the dependent variable (intention to book a room at a budget hotel) are related.

KEYWORDS: Hotel Industry, Technology, Covid-19, Smart Tourism, Budget Hotels

RESUMO:

Título da Dissertação: Um pouco de tecnologia aqui e ali para combater o Covid-19 em hotéis económicos em todo o lado!

Autor: Morris Beck

O objetivo desta dissertação é investigar a atitude dos hóspedes em relação à implementação de soluções tecnológicas para mitigar a propagação do vírus Covid-19 nos Hotéis com tarifas económicas. No dia 11 de março de 2020, foi declarada o estado de pandemia mundial e muitas empresas, incluindo as do sector hoteleiro implementaram novas tecnologias para permanecerem abertas.

Mais especificamente, este trabalho pretende verificar como é que as soluções tecnológicas podem ter um impacto positivo nas reservas em Hotéis com tarifas económicas. Apesar de não ser uma abordagem recente no setor Hoteleiro a implementação de soluções tecnológicas pode ser fundamental para que os Hotéis se mantenham abertos e com elevados níveis de ocupação durante crises pandémicas.

Os dados primários foram recolhidos através de um questionário pré testado tendo por base o Modelo de Aceitação de Tecnologia com a finalidade de medir as atitudes dos hóspedes face ao uso da tecnologia para diminuir o risco de Covid-19. Os resultados da análise indicam que as variáveis independentes (facilidade de utilização, eficácia e utilidade) e a variável dependente (intenção de reservar um quarto num Hotel de tarifas económicas) estão relacionadas.

PALAVRAS-CHAVE: Indústria Hoteleira, Tecnologia, Covid-19, Turismo Inteligente, Hotéis Económicos

ACKNOWLEDGEMENTS:

I would like to express my sincere gratitude to my friends, family and especially my partner for their ongoing support and keeping me motivated throughout the process of this dissertation.

Additionally, I thank Católica Lisbon School of Business and Economics for giving me the opportunity to write my dissertation and helping me grow academically and professionally.

Lastly, I want to highlight and thank Professor Helena Rodrigues for the outstanding support as a mentor to me throughout this thesis. Her insights and thoughts during the process of this dissertation have not only helped me complete my master thesis but also helped me grow substantially academically.

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LIST OF ACRONYMS AND ABBREVIATIONS:

EOU – Ease of Use

EFF - Effectiveness

UF - Usefulness

INT – Intention to Book a Room at a Budget Hotel

TAM – Technology Acceptance Model

SSTs – Self-Service Technologies

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1. INTRODUCTION

Over the last 10 years, the tourism sector has been growing globally at around 5% per annum and accounts for 7% of the world's export business (UNWTO, 2019). The tourism sector in Portugal accounts for 52,3% of all exported services and 19,7% of the total export related activities. In 2019, the sector contributed to the GDP by 8,7% and the touristic employment opportunities accounted for 6,9% (336'800) of the total national job market (turismodeportugal.pt, 2019). Having these numbers mentioned, the importance and the role of the tourism sector in Portugal becomes apparent; it is a key sector for the country's development and its trade balance (imports and exports). Not only is tourism an important sector for Portugal, but also for the whole world.

In 2020, however, the novel coronavirus (SARS-CoV-2), originating from China, Wuhan in December 2019, reached the European continent by March 2020; and was declared a public health emergency of international concern by the World Health Organization (WHO) on January 30, 2020 (Yang & Wang, 2020). The impact of this event had severe consequences for the tourism and hospitality industry on a global scale. The World Travel and Tourism Council announced that, globally, 75 million jobs are at risk (WTTC, 2020). Touristic businesses and the airline industry completely ceased operations (Gretzel, 2020) and started suffering financial losses for months consecutively due to the measures taken by governments across the globe to mitigate the spread of the virus. These measures include, among others, travel bans (international flights were cancelled or offered at enormous price spikes) and social distancing (humans are asked to keep their distance from each other making it complicated to run the operations of many hospitality businesses) which proved to be big barriers for businesses in the tourism sector.

To overcome this crisis, many hoteliers have started applying technology mediated solutions in their daily operations in order to cope with the challenges that come along with the Covid-19 virus, as Technology has become a key factor in building resilience regarding viral safety in the tourism sector (UNWTO 2020). Simultaneously, the global technology sectors are experiencing an economic uplift, as crisis management fuels technological innovation, ultimately offering new solutions adapted to the crisis. The Covid-19 pandemic has accelerated the trend to make use of technological innovation (Kudyba, 2020). Budget hotels is the most ideal hotel category to implement technological innovation, due to their simpler and less complex nature of service (Buhalis & Cheng, 2019). This being said, budget hotels may be the hotel category adapting fastest to the context created by Covid-19.

This paper aims to analyze the role of technology to mitigate the spread of the virus and answers the main research question:

Can perceived ease of use, effectiveness and usefulness of technology increase the guest's intention to book during Covid-19?

For further investigation the following research objectives are established, to help analyze the research question in more depth:

i. **Understand the willingness of the guest to book a hotel when technological solutions help to mitigate the Covid-19 risk.**

ii. **Investigate whether the guest expects technology, used to mitigate the Covid-19 risk, to be implemented in budget hotels during the pandemic.**

In order to answer the research question and the research objectives, a model was created from an adapted Technology Acceptance Model along with three hypotheses derived from the literature review conducted. The dissertation is structured into five components, namely, the "Literature Review" – to understand research that has been conducted until today, the "Methodology" – to collect the necessary data, the "Results" and "Discussion" – forming the evaluation of the data retrieved and lastly, the "Conclusions" – in which the main findings for the study are presented and the research question, research objectives and hypotheses are answered.

2. LITERATURE REVIEW

This section of the paper focuses on the knowledge that has previously been researched by other authors and researchers and is summarized and presented in order to gain deeper knowledge and understanding of the topics that are directly related to the thesis' research questions. The five keywords *Hotel Industry, Technology, Covid-19, Smart Tourism* and *Budget Hotels* form the main subtopics on which a deeper understanding is required to investigate thoroughly the research questions.

2.1 Hotel Industry

The hotel industry consists of various segments which include full-service hotels, select service hotels, limited-service hotels and boutique and themed hotels and is described as a conglomerate of these sectors with a backbone in customer support (soegjobs.com, 2020). It is worth mentioning that the hotel industry is a component of the broader topic *service industry* and is also closely associated with the travel industry and hospitality industry, although having significant differences (revfine.com, 2020). Revfine (2020), a knowledge platform for the hospitality and travel industry, provides a more detailed explanation on their website, stating that the hotel industry is the area of service industry that focuses on accommodating guests and includes not only hotels of various types but also hostels, motels, inns and guest houses. The main difference between the hotel industry and the hospitality industry is that the hotel industry provides guest accommodation and complementary services while the hospitality industry aims to provide leisure in a more general approach. Key players in the hotel industry include Marriot International, Hilton Worldwide, InterContinental Hotels Group and the Wyndham Hotel Group and offer a wide range of hotel brands (statista, 2020). Globally, these big players and many more hotel chains and brands contributed approximately 8,81 trillion USD to the economy on a global scale in 2018 (statista, 2020).

2.1.1 Budget Hotel

Budget hotels have been a hospitality concept that can be traced back to the 1920s in the United States (Brotherton, 2004). Since then, researchers have suggested many definitions, making it difficult to find one definition that is universally accepted and agreed on. Ren et al., (2016) expect a budget hotel to provide limited services with standardized hotel rooms for a rate that is approximately 30% lower than the regular higher rated hotels to provide good value for money. Senior and Morphew (1990) provide a different definition, claiming that a budget hotel is strategically situated and typically offers lower rates, reduced facilities and services and modular construction. Later on, researchers suggested and mixed elements that were included in previous definitions. Brotherton (2004) views a budget

hotel as a property that is at a convenient location, offers good, standardized room units that are built equally and interchangeably, has easy access and a reservation system, limited services and low prices. Ruetz and Marvel (2011) had a different approach and characterized Budget hotels as properties ranging from zero to three stars, offering facilities and services through a systemized process, consisting of at least fifty rooms and carrying the brand of a major chain. Other definitions mention budget hotels being 100 to 200 rooms in size while offering less facilities such as conference rooms, lobby spaces and restaurants (Rogerson, 2011). It is also worth noting that when researching this keyword, many researchers also make use of different terminologies for "Budget Hotels" by referring to these hotels as "economy hotels" (Senior and Morphew, 1990) or "limited services hotels" (Rogerson, 2011).

2.1.2 Smart Tourism

One effective way, that hotel managers have already started to implement, to counter the negative economic impact that the COVID-19 brings to the hotel industry is to make use of technology and become a "smart tourism" destination. The following section examines what "Smart Tourism" entails. The "Smart Tourism" concept can be seen as the progression from the traditional tourism (García, Aciar, Mendoza & Puello, 2018). According to Buhalis and Amaranggana's (2014) "Smart tourism destinations enhancing tourism experience through personalization of services" a destination that is considered to practice "smart tourism" includes providing an experience to the guest that is very technologically based and includes possibilities of personalization, context-awareness, mediation by technology and the collection of real-time data. Gretzel, Reino, Kopera and Koo (2015) define "Smart Tourism" in their paper "Smart Tourism Challenges" as integrated efforts that support tourism at a destination to find innovative ways to collect and use data. The use of advanced technology is intended to interpret the collected data retrieved of and provide the destination with new information/insights to assess new business value-propositions, with the goal of becoming as sustainable and efficient as possible and to maximize the experience of the visitor (Gretzel et al, 2015).

"Smart Tourism" is a concept that has its core characteristics stemming from three different technological and smart infrastructures: 1) Smart technology, 2) smart destination & 3) smart business networks. Smart Tourism occurs when the three technological fields are combined, interconnected, synchronized and aim to reach the same goal (Höjer & Wandel, 2014).

Sensor technology, Internet of Things and Big-Data lie at the heart of smart technology and includes technologies such as Wi-Fi connections, near field communication (NFC), radio-frequency identification (RFID), data warehouses and data mining algorithms to mention just a few (Gretzel,

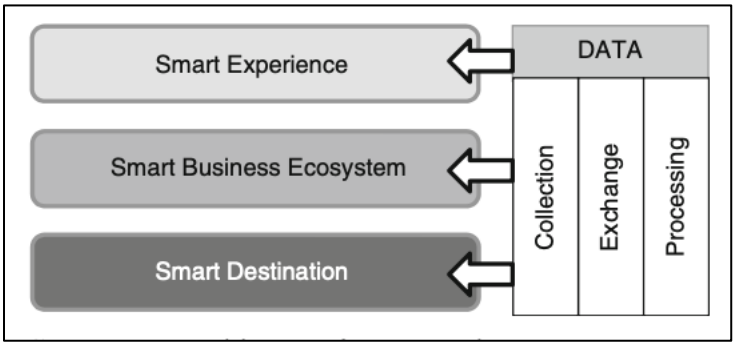
2015). These technologies are key elements in the stages in which technology relies on alerting, gathering data, triggering activities and for example communication with other devices to achieve a common defined goal (IoT).

Smart destinations make use of such smart technology infrastructures in order to provide a better quality of experience for the tourist and the local inhabitants by adding the ICT element to the tourism experience (Hunter, 2015). These smart technologies come in the form of Wi-Fi that is accessible to everyone in the public areas, smart bus stops that contain interactive screens that help the tourist to navigate through the city efficiently and safely or for example the collection of huge amounts of data to analyze and create a more efficient tourism infrastructure. Smart destinations focus mainly on efficiency and sustainability and are included in smart city frameworks planning. It is also worth mentioning that smart cities are considered the destinations to make the most efficient use of smart technologies, therefore, smart destinations observe what smart cities are implementing and working with. Smart destinations, generally speaking, do not have a smart destination framework that is as planned out as smart city frameworks (Gretzel, 2015).

Smart business networks form the third component of smart tourism and include the creation and support of tourism related activities and resources, the ongoing connectivity between the relevant stakeholders, digitalization of business processes and organizational agility (Buhalis & Amaranggana, 2014).

Together, the three ecosystems combined result in becoming a smart tourism ecosystem that is constantly collects, exchanges and processes data derived from the three ecosystems.

Figure 1: The Smart Tourism Ecosystem



Source: retrieved from “Smart tourism: foundations and developments”, Gretzel et al. (2015)

2.2 Technology

The concept of technology is not new to mankind and has been around since the history of humanity. Hoteliers have long made use of technology within their operating properties for the purpose of operational efficiency, cost reduction and added value to the guests (Huh, Kim & Law, 2009). This section of the literature review aims to investigate technology trends in the hotel industry and to provide a basic understanding about the type of technology the hotel industry demands the most.

One approach to start understanding what technology is, as mentioned above, to consider how Oxford Language attempts to define "technology". Oxford Language is the main provider of for English definitions for Google and has over 150 years of experience when it comes to defining and providing a common understanding of terminologies, such as "technology". According to Oxford Language, Technology is defined as "*the application of scientific knowledge for practical purposes, especially in industry*" (Lexico Dictionaries, 2020).

Having this definition in mind, the focus is now shifted to what researchers have discovered regarding the definition of technology. Many researchers have attempted to define "technology" in a contemporary context; however, these researchers conducted their research based on different literature about technology (Reddy and Zhoa, 1990). Therefore, a variety of different terminologies have been elaborated and presented throughout time on what "technology" is (Wahab, 2012).

Kumar et al., (1999) argue that technology is comprised of two main elements. One of them being the physical aspect which includes items such as equipment, blueprints or tools. The second element is the informational aspect. Managerial knowledge, marketing, quality control or for example skilled labor is considered to be the informational aspect of technology. Another author, Maskus (2003), defines technology as "the information necessary to achieve a certain production outcome from a particular means of combining or processing selected inputs (…)". For Buhalis (1998) and Porter & Kramer (2011), technology is seen as a possibility to enhance a firm's competitive advantage. Rogers (1995), just like Kumar et al. (1999), also considers technology to entail a hardware and a software aspect.

2.2.1 Technology in the Hotel Industry

Because technological progression deeply affects business and marketing strategies, self-service technologies (SSTs) have been surfacing as an alternative to human employees (Rust & Espinoza, 2006). The definitions of Kumar et al. (1999) and Maskus (2003) fit the understanding of technology used in the hotel industry quite well. Just like in their definition, technology used in the hotel industry also focuses on the physical aspect and the informational aspect. In the case of SSTs, there also exists a physical component (the SST hardware) and the informational component (the intelligent software

that operates the SST). Technology applied in the hotel industry can further be subcategorized into (a) building technology, (b) environmental management technology, (c) food production and service technology and lastly (d) information technology (Kirk and Pine, 1998). To gain a closer understanding of the different types of technologies that are used by hotels in the hotel industry, articles related to technological innovations in the sector are examined. The overall goal is to give the reader the chance to build practical knowledge. One such article, written by Nicole Carlino (2020) and published on *www.hotelbusiness.com*, titled *"New Normal? New Tech! Amid COVID-19, tech takes on a larger role in hotels"* provides an overview of technologies that are currently used in hotel operations to ensure guest safety while still upholding good business performance. Carlino divides the different technologies into four categories *Advanced cleaning solutions, Health checks, Contactless guest experience and Improved back of the house.* Electrostatic sprays, UV light units, room air hygiene technology or even virus-exterminating irons are technologies that are used to bring the cleaning solutions to a more *advanced* cleaning level. For important health checks no-touch temperature scanner and apps for guests to check all relevant and recommended health safety practices, inside and outside of the hotel, are commonly used during the pandemic. The contactless guest experience is achieved by offering digital menus in form of QR codes, cashless payment or for example hygiene technologies in WCs (e.g., automatic hands dryer or contactless paper dispenser). The other aspect that technology follows, as per Maskus (2003), is the informational aspect. The fourth category of Carlino's overview is *Improved back of the house.* This category of technology focuses on software to increase the efficiency of the hotel operations by analyzing, measuring and recommending the most cost-, time- and resource-efficient solutions for managers. One such solution is for example software that allows the front desk to track temperatures of the guests to then be able to strategically avoid cleaning a room that has a guest inside that is not feeling well. In Carlino's article, various CEOs, that manage firms providing technology for hotels, stated the importance of advertising this technology to the guest. Parminder Batra, founder & CEO of TraknProtect, explains that guests want to be informed about the technological safety measures that are put into place to ensure their well-being during their stay (hotelbusiness.com, 2020). Batra also stresses on the importance of showing and communicating to the guest that these safety measures are followed. Serene Al-Momen, co-founder & CEO of Senseware, mentions that filtering air is not enough, and that technology tracking air quality needs to be co-implemented in order to be able to provide evidence and constantly inform the guest about the air quality of the hotel (hotelbusiness.com, 2020).

2.2.2 Evaluating Technology in the Hotel Industry

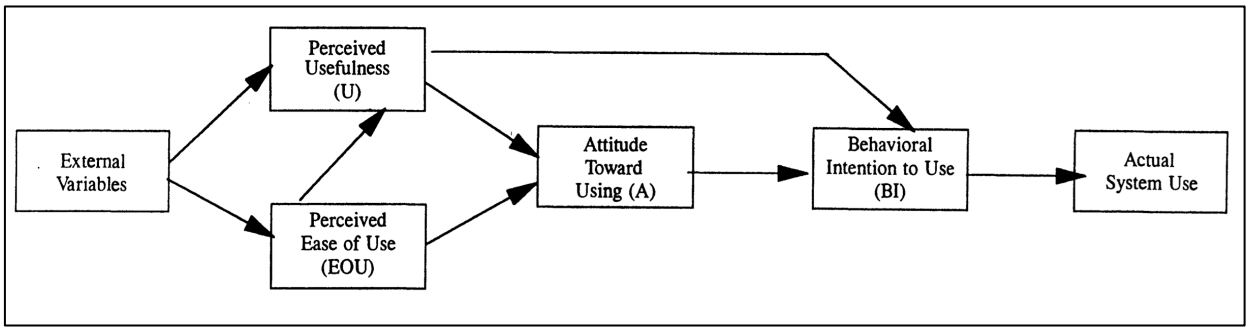
Service organizations (e.g., budget hotels) are worried that the customer-employee relationship may be lost when implementing technology, as the loss would dampen social bonds between consumers and the organization, reduce chances to up-sell products and services, or even cause employee resentment towards technology (Beatson, Coote & Drenna, 2006; Bitner, 2001; Curran, Meuter & Surprenant, 2003). On the other hand, (self-service) technology adoption can reduce labor cost (Chang & Yang, 2008; Erdly & Chatterjee, 2003; Walker, Craig-Lees, Hecker & Francis, 2002) or even improve consumer service and the efficiency of operations (Carline, 2007; Curran, Meuter & Surprenant, 2003; Dabholkar, 1996; Meuter, Ostrom, Bitner & Roundtree, 2003). Therefore, for technological innovations to become successful projects in budget hotels, it is important to be able to evaluate under which conditions guests are willing to use or reject technology. Managers should be aware about how the conditions affect the traveler's needs and choices (Oh, Jeong & Baloglu, 2013).

One method to assess the adoption of technology is to apply the Technology Adoption Model (TAM), in fact, many researchers make use of this model in their studies. TAM was proposed by Davis (1989) and is rooted in the Theory of Reasoned Action (TRA), which was first developed by Martin Fishbein in the late 1960s and revised and extended by Icek Azjen over the many following years. The model explains *user acceptance* of *information technology systems*. Davis, Bagozzi and Warshaw (1989) suggest that the TAM intends to understand user's acceptance of technology-facilitated applications. The TAM is based on two theoretical constructs which are (a) perceived ease of use and (b) perceived usefulness. Together, these two constructs form the fundamental determinants of technology acceptance. The perceived ease of use is the extent to which a person believes that using a specific (technological) system can be "effortless" (Nielsen, 1994). According to Christodoulidou, Brewer and Countryman (2007) a person is more inclined to use technology if it helps them to reduce cognitive effort.

The perceived usefulness can be understood as the degree to which a person perceives that using a specific (technological) system would help or enhance job performance (Davis, 1989). It is also worth mentioning that the more a person is exposed to useful technology, the better the person will understand the function of the technology (Muir & Moray, 1996). According to Lee (2016), perceived usefulness can be seen as a dependent variable and an independent variable. Perceived usefulness has been found useful when trying to predict behavioral intention (therefore, it can be a dependent variable) and at the same time perceived ease of use can predict behavioral intention (therefore, it can also be seen as an independent variable). Lee (2016) further explains that increased levels of perceived

usefulness and perceived ease of use mean that a person is more likely to adopt the given system. Below is the TAM developed by Davis et al. (1989), summing up this sub-chapter:

Figure 2: The Technology Acceptance Model



Source: retrieved from "Empirical Evaluation of the Revised Technology Acceptance Model", Szajna (1996).

2.3 Covid-19

To understand the thesis' topic better, especially in today's context, this section of the literature review provides an overview of the research that has been conducted on Covid-19.

Coronaviruses (CoV) are no new discovery for mankind. In fact, the first coronaviruses to be found were discovered to be in mammals, birds and humans that carried the diseases as early as in the 1960s (CDC, 2020) and its name is derived from its crown-like spikes that can be found on top of the viruses' surfaces (Daga, 2019).

The newly discovered Coronavirus, scientifically named 2019-nCoV, is not the first to affect humans. Currently, there are seven known coronaviruses that cause infection in humans: HCoV-229E, HCoV-NL63, HCoV-OC43, HCoV-HKU1, Middle East Respiratory Syndrome (MERS-CoV), Severe Acute Respiratory Syndrome (SARS-CoV); and the newest infectious disease being 2019-nCoV (Ahmad, 2020). The newly infectious disease is also referred to as SARS-CoV-2 but does not share the same symptoms as SARS-CoV. One research team from China, actually, argues that such a name is not appropriate and is misleading, having the general public believe that SARS-CoV-2 is related (symptoms-wise) to SARS-CoV (Wu et al., 2020). Having placed "SARS" in the new coronaviruses name merely refers to the systematic way of classifying organisms. With this being said, any virus that is placed into the same category as the SARS-CoV virus can make use of the "SARS" abbreviation (Wu et al., 2020).

Additionally, with many new terminologies, the new term SARS-CoV-2 is yet another way to identify the new coronavirus. The World Health Organization refers to the virus as "COVID-19" (WHO, 2020). This term is an acronym for "coronavirus disease 2019" (Cascella et al., 2020). For the purpose of clarity, this paper adopts the most commonly known terminology for the new coronavirus, namely COVID-19.

The novel coronavirus COVID-19 was first discovered in Wuhan City, in the Hubei province of China, in December 2019, when several cases of pneumonia were registered (Ahmad, 2020). The virus spread globally within months and was declared a global pandemic on March 11th of 2020 by the World Health Organization (WHO, 2020). To this date (October of 2020) the World Health Organization reports a total of 34'423'660 confirmed cases of COVID-19 infections and 1'074'817 death cases (WHO, 2020).

For humans, these Coronaviruses primarily affect the upper respiratory tract and the gastrointestinal tract. Furthermore, the virus may lead to harmless diseases, with symptoms similar to the common cold, to more severe outcomes such as bronchitis (Daga, 2020). The most common symptoms include fever, cough, respiratory symptoms, shortness of breath and difficulties in breathing. However, these symptoms can prove to become more complicated and harmful in some patients and even lead to death (WHO, 2020).

Due to the lack of current pharmaceutical intervention, the only method of restraining the virus from spreading is to decrease the exchange of people that find themselves in close proximity (Lewnard & Lo, 2020). Social-distancing, self-isolation as well as travel restrictions lead to a reduced workforce across all economic sectors and caused many job losses. One industry that has suffered of such preventions of the spread of the virus is the hotel industry. These struggles have been analyzed by industry professionals in terms of immediate losses and long-term losses. In terms of immediate losses, interruptions in cash flows, which have led to closures of businesses operating in the hotel industry, and governmental orders to lockdown hospitality establishments, are considered (Hall, 2020). The long-term impacts of COVID-19 are not yet entirely clear; however, experts speculate that the reduced guest demand for hotel services will plunge because of the required safety and hygiene measures (Dube, 2020). Certain experts speculate that the hotel industry is likely to shrink substantially, as the business models of most hotels cannot comply and uphold standards that are tied to the new health measures imposed by the governments to prevent the spread of COVID-19 (Gössling, 2020).

3. METHODOLOGY

The methodology section will discuss its five main components which are “Objectives”, “Hypotheses and Conceptual Framework”, “Questionnaire Conception”, “Target Population” and “Statistical Methods”. More specifically, this section will provide the reader with all the relevant information regarding the research approach for each component mentioned. For the purpose of clarity, the methodology section is divided into the above-mentioned components in the same order as they have been listed.

3.1 Objectives

The fundamental purpose of this study is to provide valuable managerial implications regarding guest’s attitudes towards the mitigation of the spread of Covid-19 in hotels. More specifically, the thesis intends to set its focal area on technology that is used to mitigate the Covid-19 virus in hotels and has as its central research question *What is the guest’s attitude towards technology implemented in budget hotels to mitigate the risk of Covid-19?* To investigate the research question in more depth, two research objectives have been defined. The first research objective with the aim to *understand the willingness of the guest to book a hotel when technological solutions help to mitigate the Covid-19 risk* and the second research objective attempting to *investigate whether the guest expects technology, used to mitigate the Covid-19 risk, to remain in use even after the pandemic.*

3.2 Hypotheses Development and Conceptual Framework

3.2.1 Hypotheses Development

For technological innovations to successfully be implemented and add value to the hotel, it is important to correctly evaluate how the guests respond to new technologies. It is important for a manager to understand how the conditions the guest finds himself in affects their choices and needs (Oh, Jeong & Baloglu, 2011). One way of studying and determining the performance of a new technology is to apply the TAM, proposed by Davis in 1989.

The study from Oh et al. (2011) makes use of the TAM to investigate the “Tourists’ adoption of self-service technologies at resort hotels”. In their research, it is analyzed, based on results from a questionnaire, how guests react to self-service technologies and is also assessed when the guest prefers to interact with a human employee and when with self-service technology. Further on, the results of their research show that perceived ease of use positively impacts the perceived usefulness.

The perceived usefulness, according to Oh et al. (2011) positively impact the intention to use self-service technologies and, therefore, the following hypothesis is developed:

H1: The perceived ease of use of technology used to mitigate the risk of a Covid-19 infection has a positive impact on the intention to book a budget hotel room.

In the study of Oh et al. (2011), not only is ease of use of technology considered, but also the effectiveness of technology. The authors indicate that effectiveness has a negative impact on perceived usefulness. As stated above, perceived usefulness has a positive impact on the intention to use self-service technology. In this thesis, the effectiveness of technology is directly related to the intention to book, as this has not been explored in the TAM of Oh et al. (2011). Therefore, the following hypothesis is developed to explore the relationship between perceived effectiveness of technology and the intention to book a budget hotel room:

H2: The perceived effectiveness of technology used to mitigate the risk of a Covid-19 infection has a positive impact on the intention to book a budget hotel room.

In 1989, Davis suggested that the perceived usefulness can be understood as the degree to which a person perceives that using a specific system would help or enhance job performance. Not only the TAM but also related studies, such as the one from Oh et al. (2011) indicate that perceived usefulness is a prerequisite of intention to use, self-service technology. In this thesis, the perceived usefulness is understood as the independent variable, while the dependent variable being the intention to book a budget hotel room. Consequentially, the following hypothesis is developed:

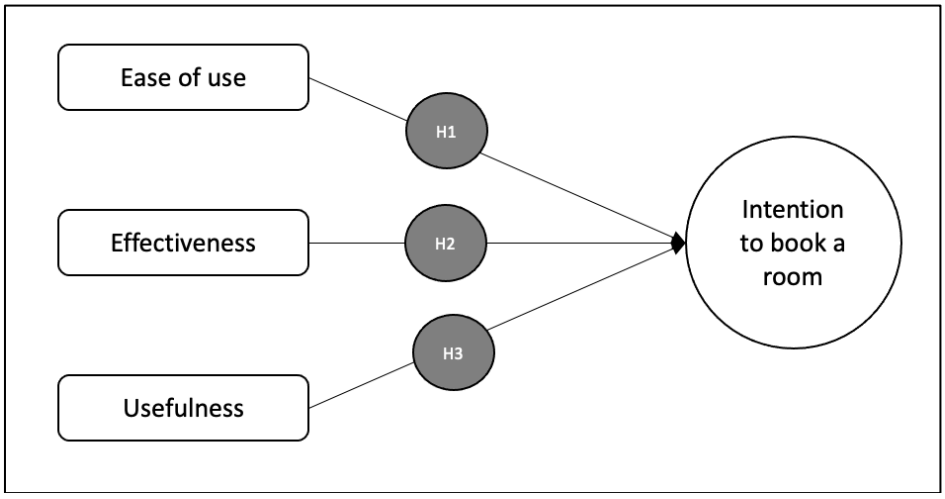
H3: The perceived usefulness of technology used to mitigate the risk of a Covid-19 infection has a positive impact on the intention to book a budget hotel room.

3.2.2 Conceptual Framework

The conceptual framework for this study is derived from a paper titled “Tourists’ adoption of self-service technologies at resort hotels” by Haemoon Oh, Miyuong Jeong and Seyhmus Baloglu, published in October 2011. The study explains why travelers choose self-service technologies over service provided by human staff. The model was adapted to fit the research question of this thesis which is “Can perceived ease of use, effectiveness and usefulness of technology increase the guest’s

intention to book in the post Covid-19 phase?**"** A parallelism between this study's topic and the above-mentioned study's topic exists, namely the willingness to adopt to technology rather than not to adopt technology from the guest's perspective. Just like in the study of Oh et al. from 2011, the conceptual framework of this thesis assesses the impact of "ease of use", "effectiveness" and "perceived usefulness" of technology used to reduce the Covid-19 infection risk on the intention to book a room at a budget hotel. Followed by assessing the relationship between "perceived usefulness" and "Intention to book a room".

Figure 3: Conceptual Framework



Source: Adapted from the study of Oh et al. (2011)

3.3 Questionnaire Conception

The research conducted follows a descriptive and quantitative approach to gather the relevant data required to answer the research question and hypotheses. For the primary research of this study, a survey was developed. According to Malhotra & Birks (2007), the method stated considers the use of a "(…) structured questionnaire given to a sample population.". This method presents itself to be the most effective procedure to collect information from respondents and evaluate their characteristics and attitude towards products & services.

The questionnaire's design is based on a survey that was used in the study of Oh et al. (2011) that successfully measured the "Tourists' adoption of self-service technologies at resort hotels". As mentioned previously in the Conceptual Framework chapter, a parallelism between this study's topic and the research conducted by Oh et al. (2011) topic exists, therefore, the questionnaire that appeared in "Tourists' adoption of self-service technologies at resort hotels" proved to be a good basis for the

conceptualization of this study's questionnaire. To consider the respondents' answers to be credible and of sufficient quality, Malhotra & Birks (2007) advise in using a set of procedures in the survey that include: 1) introductory paragraph to get the respondent familiar and acquainted with the nature of the research, 2) statement confirming the confidentiality and anonymity of the respondent, so that the respondent feels confident enough to answer honestly, 3) information about the duration of the survey, 4) the researchers e-mail address is provided to the respondent should they have any doubt or feedback regarding the survey and the study and 5) information for the respondent to get familiarized with the topic of the research to avoid any sort of misunderstanding. Procedures 1) to 4) have all been included in an introductory paragraph on the first page of the survey. Procedure 5), familiarization of the topic, was presented to the respondent separately on the second page of the survey. This first two pages form the introduction and topic acquaintance section of the entire survey. The third page presents the questions to the respondent. This part of the survey collects the required data for the research.

3.3.1 Macro-Structure

The data collection part of the survey possesses a macro-structure which is comprised of I) Ease of Use of Technology, II) Effectiveness of Technology, III) Usefulness of Technology, IV) Intention to Book a Budget Hotel Room and V) Demographics. The following table provides an overview of the survey's macro-structure and each section's purpose:

Table 1: Macro-Structure of survey

Macro-Structure	**Purpose of section**
Filter question	Filter out respondents that have never stayed at a budget hotel.
I) Ease of Use of Technology	Measure the respondent's attitude towards "ease of use" of technology that is used to mitigate the spread of COVID-19; (5-point Likert Scale)*.
II) Effectiveness of Technology	Measure the respondent's attitude towards "effectiveness" of technology that is used to mitigate the spread of COVID-19; (5-point Likert Scale).

III) Usefulness of Technology	Measure the respondent's attitude towards "usefulness" of technology that is used to mitigate the spread of COVID-19; (5-point Likert Scale).
IV) Intention to Book a Room	Measure the respondent's intention to book a room at a budget hotel when technology is used to mitigate the spread of COVID-19; (5-point Likert Scale).
V) Demographics	Collect data on the respondent's background to understand and interpret the sample.

* (*1 – Strongly Agree, 2 – Agree, 3 – Neutral, 4 – Disagree, 5 – Strongly Disagree*)

3.3.2 Micro-Structure

The macro structure can be further broken down to the micro-structure level of the survey's data collection part. This level consists of questions (or items) for each macro-structure level previously mentioned. The micro-structure consists of 26 questions or statements to which the respondent has to answer or take a position towards to. Below is an overview of the macro-structure along with the purpose of the items chosen for the questionnaire:

Table 2: Micro-Structure of survey

Micro-structure (26 items)	**Purpose of items**
Items 2 – 6 (Ease of Use of Technology)	These items were designed to measure how much respondents trust technology that is easy to use in the context of reducing the spread of the COVID-19 virus.
Items 11 – 14 (Effectiveness of Technology)	These items were designed to measure how much respondents trust technology that work effectively in the context of reducing the spread of the COVID-19 virus.
Items 15 – 17 (Usefulness of Technology)	These items were designed to measure how useful the respondents find technology to be in the context of reducing the spread of the COVID-19 virus.
Items 18 – 20 (Intention to Book a Room)	These items were designed to measure how likely the respondents are to book a room at a budget hotel that makes use of technology to mitigate the COVID-19 infection risk.

Items 21 – 26 (Demographics)	These items were designed to capture the background of the sample.

Items 5 and 6 were adapted from a survey conducted by Porter and Donthu (2006), while items 19 and 20 were adapted from a survey that was conducted by Letchumann and Tarmizi (2011). All the other items were adapted from the study from Oh et al. (2011).

3.4 Target Population

For this research the main target population that was investigated were individuals who have stayed at budget hotels. It was, therefore, critical to include a filter in the survey to ensure that the responses gathered stem from respondents that have experience with budget hotels. The filter mechanism entailed the question "How often do you travel and reside at a budget hotel per year?" with the possibility to answer with "I never travel and reside elsewhere", "1 to 3 times per year", "4 to 7 times per year", "8 to 15 times per year" or "More than 15 times per year". For the convenience of the respondent, the filter question was placed in the very beginning of the survey (item 1), so that respondents who respond with "I never travel and reside elsewhere" were automatically directed to the end of the survey.

To be certain that the developed survey would provide data that is of sufficient quality to analyze in SPSS, a pre-test was conducted. The pre-test of the survey was conducted between the 9th of November and the 11th of November and gathered in total 58 responses. From the 58 responses, 51 responses came from respondents that have been to a budget hotel before. The 58 responses were analyzed with the intended statistical methods in SPSS and it was checked whether the output yielded results that could answer the hypotheses. The results of the pre-testing showed that the survey accurately measures the variables in the appearing in the hypotheses and to answer the research question.

The final version of the survey was launched on the 12th of November and was distributed until the 22nd of December. The survey was distributed through online platforms, as it enables to distribute the survey to a large number of recipients in the least amount of time possible.

On the 22nd of December the questionnaire was closed and gathered 217 valid responses from the total of 260 responses. Valid responses stem from respondents that indicated that they have been to a budget hotel, while the responses from the 43 respondents that indicated they never travel and reside elsewhere were removed. The sample size collected is sufficiently large enough to be considered representative. Authors such as Gorsuch (2003) suggest between 10 and 20 responses per item in the survey and no less than 100 responses per survey. Having said this, the suggested responses required

for this survey can be computed as follows: *Total items in survey* X *10 to 20 responses per item = 19 items* X *10 to 20 = 190 to 380 responses required.* The number of valid responses to be analyzed, lies within the suggested number of responses required, as the survey collected a total of 260 responses of which 217 are valid to analyze.

3.5 Statistical Methods

Responses for the thesis' survey were collected from 09.11.2020 until 22.12.2020. The data was exported from Qualtrics to IBM® SPSS® Statistics (version 26).

To get acquainted with the dataset and its dimensions, descriptive statistics and frequencies were computed to inspect for outliers, missing or invalid responses and to understand the respondents' background.
In order to test the hypotheses of this thesis, a statistical analysis is required that works with dependent and independent variables that are metric. Therefore, a linear regression analysis was conducted on the data set.

4. RESULTS

In this chapter the data retrieved from the survey is discussed in-depth and analyzed with the help of IBM's SPSS Software. The retrieved data is carefully analyzed, and the relevant statistical methods are applied so that important results can be projected on to valuable strategic implications for budget hotels when making use of technology to mitigate the spread of COVID-19. For the analysis of the data, outliers and incomplete responses have been removed, leaving 217 valid responses available to conduct all relevant analyses.

To follow the results section with more ease, this chapter has been subdivided into 1) Statistical Characterization of the Target Population, 2) Univariate Analysis and 3) Data Analysis. Following steps 1), 2) and 3) allows to carefully examinate the results in such a format that allows to answer the research objectives, the research questions and the three hypotheses formulated for this thesis.

4.1 Statistical Characterization of the Target Population

After ceasing the distribution of the survey on the 22.12.2020, a total of 217 valid responses were gathered among respondent who have been to budget hotels. To capture the relevant data for the statistical characterization of the respondents that answered the survey, the demographics section of the survey was analyzed. In detail, questions related to gender, age, current occupation, level of allowance/income, frequency of residing at a budget hotel in one year, main reason for travelling and a question related to technology affinity were presented to the respondents.

The data collected from the demographics section can be divided into a) demographics and b) psychographics. Regarding a) demographics, the mean age of the 217 respondents is 30.6 years old and was mainly concluded by male respondents (53,4%). Of the 217 responses the mean income/allowance group, indicated by the respondents, is 3,70 which lies between the allowance/income groups of "€501 to €1000" (having the value "3") and "€1001 to €1500" (having the value "4").

In regard to b) psychographics, most respondents travel 1 to 3 times per year, as the mean for this item is 2,33, being between "1 to 3 times per year" (having the value "2") and "4 to 7 times per year" (having the value "3") and indicated that their main reason for travelling is to visit and experience a new culture or city (accounting for 43%) and to visit family and visit friends (accounting for 21,1% and 19,3% respectively). The survey also asked whether the respondent believes to have an affinity for technology, whereby the mean value lies at 1,17 (1 = yes, 2 = no) indicating that most respondents (83,4%) consider themselves to have an affinity for technology.

4.2 Univariate Analysis

A univariate analysis allows to describe the data gathered and investigate for patterns. Specifically, this chapter looks at the groups to which the items of the survey belong to.

4.2.1 Ease of Use of Technology

The first five items in the survey belong to the group "Ease of Use of Technology". The item with the lowest mean is item 5 with the statement "*As a hotel guest I can quickly adapt to new technology that is provided in budget hotels.*" (mean: 1,71), while item 4 with the statement "*Technology that is provided in budget hotels would be complicated to use during my stay*." (mean: 2,96) – in both cases the means indicate that respondents seem to accept the use of new technologies at budget hotels, as the mean of item 4 is closest to the answer "Agree" and the mean of item 4 is closest to the answer "Neutral". The means for this group of items equates to 2,1, suggesting that overall, the respondents seem to "Agree" with statements concerning the ease of use of technology.

4.2.2 Effectiveness of Technology

Item 12 and item 13 have the highest mean among the group of items related to the effectiveness of technology (mean: 1,88 and 1,87 respectively). The statements for these two items are "*I expect to be completely satisfied with the use of technology in hotels to prevent the spread of Covid-19.*" for item 12 and "*Technology in hotels is used in the guest's best interest and aims to protect the guest in all relevant aspects*" for item 13, suggesting that the respondents have rather high expectations regarding this specific technology, as they "Agree" with the statements. The lowest means in this group of items belong to item 11 and 14 (mean: 1,72 and 1,73 respectively). Item 11 having the statement "*I expect cleaning technologies in hotels to be effective in reducing the spread of Covid-19.*" and item 14 having the statement "*I expect technology at a self-check-in kiosk to be effective and free of errors.*", suggesting again with a high mean that respondents really expect that technology works effectively. The mean for this group of items is 1,80, meaning that, overall, the respondent seems to "Agree" with this set of items in the survey.

4.2.3 Usefulness of Technology

Concerning the usefulness of technology, the highest mean belongs to item 15 with the statement "*Technology is a solution to reduce the risk of the Covid-19 infection."* and a mean of 1,86. The lowest mean in this group of items can be found for item 17 with the statement "Technology is convenient" (mean: 1,68). Overall, this group scores with a mean of 1,78, indicating that the respondents of the survey mostly "Agree" with these statements.

4.2.4 Intention to Book a Room at a Budget Hotel

Lastly, the group of items related to the intention to book a room at a budget hotel are analyzed. Here, the lowest mean is scored by item 20 with the statement "*I would rather book a hotel that makes use of technology to reduce the spread of Covid-19 than a hotel without technological solutions*." and a mean of 1,82. Item 19 has the highest mean with the statement "*It matters to me if a budget hotel that I book makes use of technology to reduce the Covid-19 infection risk*." and a mean of 1,99. In both cases, the respondents seem to overall "Agree" with these two statements. The average mean for this group of items is 1,91.

4.3 Scale Reliability - Cronbach's Alpha

As preparation for the next chapter - "Data Analysis", the reliability of the scales that were used in the survey is analyzed. To certify the reliability of the scale, the Cronbach's Alpha is computed with SPSS. Cronbach's Alpha measures the internal consistency among items that form a group (*What does Cronbach's Alpha Mean?,* n.d.). Values above 0,70 suggest internal consistency, meaning that the items are closely related to each other. The table below provides an overview of Cronbach's Alpha for each group of items:

Table 3: Cronbach's Alpha

Item	Cronbach's Alpha
EOU1	0,725
EOU2	
EOU3	
EOU4	
EOU5	
EFF10	0,815
EFF11	
EFF12	
EFF13	
UF14	0,740
UF15	
UF16	
INT17	0,858
INT18	
INT19	

4.4 Data Analysis

The Data Analysis subchapter studies the hypotheses by applying the adequate statistical method to the data retrieved from the survey (exported from Qualtrics) in SPSS. Given that the variables used in the survey are metric, linear regressions between the independent variables and the dependent variable were computed to analyze the hypotheses in more depth. Studying the variables with this statistical method allows to investigate for relationships between the intention to book a budget hotel room and the technology applied to mitigate the spread of the Covid-19 virus.

As stated above, linear regressions were computed due to the variables being all metric (having adopted the 5-point Likert Scales). The independent variables are the items that belong to the groups "Ease of Use of Technology", "Effectiveness of Technology" and "Usefulness of Technology", while the dependent variable consists of item 20 "*I would rather book a hotel that makes use of technology to reduce the spread of Covid-19 than a hotel without technological solutions.*", belonging to the group "Intention to Book a Room at a Budget Hotel". The table below shows the relationships computed for each group of items:

Testing for H1: "Intention to book a room at a budget hotel relates positively to the perceived ease of use of technology."

Table 4: Testing for Hypothesis 1

Independent Variables	**Dependent Variable**	**Model Summary** (R Square)	**ANOVA** (Sig.)	**Coefficients** (Unstandardized Beta)	(Sig.)	(VIF)
Item 2	Item 19	0,228	0,000	0,020	0,778	1,598
Item 3				0,178	0,047	1,909
Item 4				0,068	0,124	1,128
Item 5				0,237	0,013	1,730
Item 6				0,168	0,058	1,716

Testing for H2: "Intention to book a room at a budget hotel relates positively to the perceived effectiveness of technology.

Table 5: Testing for Hypothesis 2

Independent Variables	**Dependent Variable**	**Model Summary** (R Square)	**ANOVA** (Sig.)	**Coefficients** (Unstandardized Beta)	(Sig.)	(VIF)
Item 11	Item 19	0,247	0,000	0,155	0,112	1,773
Item 12				0,121	0,175	2,018
Item 13				0,257	0,003	1,542
Item 14				0,181	0,029	1,510

Testing for H3: “Intention to book a room at a budget hotel relates positively to perceived usefulness of technology.”

Table 6: Testing for Hypothesis 3

Independent Variables	**Dependent Variable**	**Model Summary** (R Square)	**ANOVA** (Sig.)	**Coefficients** (Unstandardized Beta)	(Sig.)	(VIF)
Item 15	Item 19	0,300	0,000	0,347	0,000	1,650
Item 16				0,298	0,001	1,506
Item 17				0,071	0,371	1,354

With the above tables computed, the relevant data is available and allows to draw conclusions regarding the hypotheses. The R Square for the three tables are 0,228 (22,8%), 0,247 (24,7%) and 0,300 (30%) respectively. The R Square measures the explanatory power of the model and explains the variance on the dependent variable by the independent variables. The ANOVA analysis yielded a significance level of 0,000 – rejecting the null hypothesis (as $P<0,05$) – indicating that the results are of statistical significance (heterogeneity of variance).

Upon confirming that the independent variables have an influence on the dependent variable, the focus is turned towards the results of the Coefficients analysis to assess the relationship and its strength between the variables in question. Hereby, it is worth noting that only items that have a significance of $P<0,05$ are considered to be statistically relevant. The items with acceptable significance level ($P<0,05$) are marked in dark grey. Albeit rather weak, items 2, 4, 12, 13, 14 and 15 all have a positive relationship with the dependent variable and the existence of a relationship between the independent variables and dependent variables can be confirmed. No item presents a VIF (Variance Inflation Factor) that is above 2,5 – suggesting that there is no multicollinearity.

5. DISCUSSION

5.1 Hypothesis 1

The results of the linear regression (Tables 4, 5 & 6) display that, indeed, the perceived ease of use of technology, that is applied to mitigate the spread of Covid-19, has a positive and significant effect on the guest's intention to book a room at a budget hotel. The item with the strongest impact on intention to book a budget hotel room is item 5 with a coefficient of 0,237, followed by item 3 with a coefficient of 0,178.

In the study of Oh et al. (2011), the perceived ease of use of SSTs also has a positive impact on the perceived usefulness of the technology. In their research Oh et al. (2011) demonstrate that perceived ease of use is a pre-requisite for the technology to be perceived as useful. Further studies from Lanseng & Andreassen (2007) and Lu et al. (2009) support this argument. Özbek et al. (2015) applied the TAM to understand tourists' adoption of online booking tools. The results of their research demonstrated that perceived is of use of online booking websites positively affects the perceived usefulness of booking online. Increasing the perceived usefulness, ultimately, led to increased intention to book a hotel room via the online websites. Thus, the same principles apply to the first developed hypothesis:

H1: The perceived ease of use of technology used to mitigate the risk of a Covid-19 infection has a positive impact on the intention to book a budget hotel room.

5.2 Hypothesis 2

Furthermore, the linear regression allowed to understand that, when it comes to effectiveness of technology, there is evidence of a positive impact on the intention to book a room at a budget hotel with technology used to mitigate the spread of Covid-19. Through this analysis, we can add to the conceptual framework of Oh et al. (2011):

H2: The perceived effectiveness of technology used to mitigate the risk of a Covid-19 infection has a positive impact on the intention to book a budget hotel room.

5.3 Hypothesis 3

Lastly, the linear regression made it possible to explore the relationship between perceived usefulness of technology and the intention to book a budget hotel room, indicating that there is a significant and positive relationship between the variables. As discussed in the Hypotheses Development chapter, the perceived usefulness is an antecedent of intention to use technology and therefore, the following hypotheses further supports this argument:

H3: The perceived usefulness of technology used to mitigate the risk of a Covid-19 infection has a positive impact on the intention to book a budget hotel room.

Management of budget hotels, therefore, should not only consider the implementation of technology to reduce the risk of a Covid-19 infection but also, through strategic marketing initiatives, transmit the ease of use, effectiveness and usefulness of the technology implemented to the guest, as this has a positive impact (although weak) on the intention to book a room at a budget hotel.

6. MAIN CONCLUSIONS:

The purpose of this study was to understand the guests' attitude towards technology that facilitates the mitigation of the spread of Covid-19. Specifically, the thesis intended to provide novel research related to the novel Covid-19 virus. Literature, for this field of study, presented itself to be rather scarce or not fully adapted to the context that the virus created in 2020. Furthermore, the study aims to provide valuable practical knowledge to further support budget hotel management in creating a safe environment for their hotel guests to, ultimately, allow hotel operations to remain open during the pandemic and consequentially increase occupancy rates.

To be able to provide said knowledge to budget hotel management, a quantitative approach was adopted through the implementation of a survey that is based on previous research articles that study the implementation and use of technology in hotels. The survey captures the attitudes guests have towards technology that is implemented to reduce the risk of Covid-19 from spreading. A total of 260 answers was collected, of which 217 were considered to be valid for the research. Through a linear regression, the data collected from the 217 valid responses was carefully analyzed in order to answer the hypotheses.

The findings of the univariate analysis show that technology is accepted, as for statements (items) related to ease of use (mean 2,1), effectiveness (mean 1,8) and usefulness (mean 1,78) of technology, the respondents' overall attitude seems to be to "Agree" with the statements. This goes in line with the findings from the research of Shin and Kang (2020), highlighting that hotels are able to reduce perceived health hazards by making use of technological innovations. To further support this argument, the univariate analysis of the results for items related to the intention to book a budget hotel room, that makes use of technology, show that the respondents seem to "Agree" (mean 1,91) with the statements "*I would rather book a hotel that makes use of technology to reduce the spread of Covid-19 than a hotel without technological solutions*." (mean 1,82) and "*It matters to me if a budget hotel that I book makes use of technology to reduce the Covid-19 infection risk*." (mean 1,99).

Furthermore, the findings from the linear regression indicate that a positive and significant relationship exists between the perceived ease of use of technology and the intention to book a budget hotel room, the perceived effectiveness of technology and the intention to book a budget hotel room and the perceived usefulness of technology and the intention to book a budget hotel room. While relationships exist between the independent variables and the dependent variable, it is worth mentioning that they are rather mild – presenting a range of coefficients between 0,178 and 0,347.

Therefore, the three developed hypotheses can be regarded as acceptable, proven by the study conducted.

Together, the univariate analysis and the linear regression analysis allowed to provide evidence that, indeed, perceived ease of use, effectiveness and usefulness of technology can increase the guest's intention to book in the post Covid-19 phase (research question), that the willingness of the guest to book a budget hotel room, when technological solutions help to mitigate the Covid-19 risk, increases (research objective i.) and that guests expect technology be implemented in budget hotels to mitigate the risk of a Covid-19 infection.

Practical Implications

Technology used to mitigate the risk of a Covid-19 can lead to an increase in the guests' intention to book a budget hotel room and, therefore, hotel management should implement technological innovations that safeguards the guests' health during the pandemic. Specifically, technology that is perceived as easy to use, effective and useful is recommended to be implemented, as these have a positive impact on the guests' intention to book.

Theoretical Implications

Throughout this dissertation, valuable knowledge was created that further contributes to the field of study of technologies applied in hotel operations. Research conducted prior to this dissertation, set the focus mainly on increasing guest satisfaction through technology or efficiency improvements within operations via technological innovations. The focus of this dissertation lied more on the health aspect of the guest by implementing technology. With an ongoing development of the tourism industry and the context that Covid-19 formed, it is important to promote the research on technologies that focus on the health of guests.

Limitations

i) This dissertation attempted to understand the impact of technological solutions to the risk posed by Covid-19 in budget hotels. Unique value propositions of budget hotels are different than those of mid and upper scale hotels, meaning that the type of technology applied must be assessed in accordance with the hotel classification and value proposition offered to its guests.

ii) A further limitation is that the cultural aspect of the guests was neglected in this study. Countries like the United States of America, Germany or South Korea are considered to be among the top five

most technologically advanced countries in the world (worldpopulationreview.com, 2020). Guests originating from the mentioned countries might have a different attitude towards Covid-19 mitigating technologies. Consequentially, it is important for big chains of budget hotels to understand the main origin of their guests and to apply the adequate level and type of technology.

iii) Lastly, and extending limitation ii), the survey was distributed via online platforms. This is a limitation, as it only captures the attitudes towards technology of respondents that are active on social media platforms. Users of social media platforms are required to use a smartphone, table or a computer, suggesting that they are more inclined to use technology than respondents that would be given the survey in a physical format (e.g., paper and pen). Therefore, it is suggested to also conduct this study in an offline format to be sure that his does or does not impact the results.

Future Research

To further contribute to this topic, conducting an experiment could prove to be quite interesting, where different technologies are implemented to test the usage and adoption from the guests (A/B testing). This research approach could provide more empirical evidence to this field of study.

Another research approach, that would create deeper insights and knowledge, would be to conduct interviews and focus groups. Perhaps these research approaches can be applied to both the management of budget hotels and to guests to gain more holistic information.

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APPENDIX

Appendix 1 – Survey

Dear Participant,

Welcome and thank you for choosing to participate in this questionnaire regarding the effect of technology on booking intentions at budget hotels during COVID-19. The questionnaire is conducted in the context of my master thesis at Católica Lisbon School of Business & Economics.
The questionnaire should take you approximately 7 minutes to complete and does not include any right or wrong answers. All data that is collected through this questionnaire will be treated anonymously and confidentially and you can feel free to answer as truthfully as possible.
For questions and/or feedback related to the questionnaire please contact 152119004@alunos.lisboa.ucp.pt

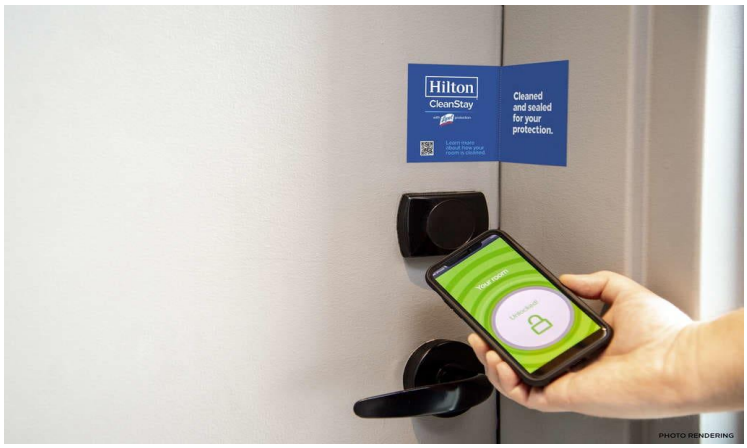
Thank you,
Morris

For my thesis I intend to study the effect that **technology** has on the **booking intentions of guests at budget hotels**. The technology that is being assessed in this relationship is related to all devices and software that help to reduce the risk of a COVID-19 infection. Please refer to the examples below.

Example 1: QR Codes to avoid everyone from touching the same menu

(Source: https://presto.com/2020/05/11/is-your-restaurant-ready-to-operate-in-a-contactless-world/)

Example 2: Contactless key system



(Source: https://blog.wego.com/hotels-resorts-and-airbnbs-are-redoubling-their-hygiene-protocols/)

Example 3: Electrostatic sprayer for rapid sanitation

(Source: https://blog.wego.com/hotels-resorts-and-airbnbs-are-redoubling-their-hygiene-protocols/)

Filter question *(respondents that answered "I never travel and reside elsewhere" were immediately re-directed to the end of the survey)*

1) How often do you travel and reside at a budget hotel per year?

- I never travel and reside elsewhere
- 1 to 3 times per year
- 4 to 7 times per year
- 8 to 15 times per year
- More than 15 times per year

Group I: Ease of Use of Technology *(Likert Scale, 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree)*

In this section of the questionnaire I would like to find out more about your attitude towards the **ease of use of technology** implemented in **budget hotels.** Please indicate to which extent you agree or disagree with the statements listed below.

2) Generally, Technology requires less work to reduce the Covid-19 risk than an employee when cleaning the hotel.
3) Technology that is provided in budget hotels is easy to use.
4) Technology that is provided in budget hotels would be complicated to use during my stay.
5) As a hotel guest I can quickly adapt to new technology that is provided in budget hotels.
6) Normally, technology in budget hotels is intuitive to use.

Group II: Autonomy of Technology *(Likert Scale, 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree)*

In this section of the questionnaire I would like to find out more about your attitude towards the **autonomy of technology** implemented in **budget hotels**. Please indicate to which extent you agree or disagree with the statements listed below.

7) I would rather take care of reducing the risk of a Covid-19 infection by myself.
8) Because I am travelling, the more technology can do to reduce the risk of a Covid-19 infection the better.
9) I trust technology to safely reduce the risk of a Covid-19 infection by itself.
10) I expect that a human employee, of the budget hotel I am staying at, oversees the technological equipment that is used to reduce the Covid-19 risk of infection.

Group III: Effectiveness of Technology *(Likert Scale, 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree)*

In this section of the questionnaire I would like to find out more about your attitude towards the **effectiveness of technology** implemented in **budget hotels.** Please indicate to which extent you agree or disagree with the statements listed below.

11) I expect cleaning technologies in hotels to be effective in reducing the spread of Covid-19.
12) I expect to be completely satisfied with the use of technology in hotels to prevent the spread of Covid-19.
13) Technology in hotels is used in the guest's best interest and aims to protect the guest in all relevant aspects.
14) I expect Technology at a self-check-in kiosk to be effective and free of errors.

Group IV: Usefulness of Technology *(Likert Scale, 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree)*

In this section of the questionnaire I would like to find out more about your attitude towards the **usefulness of technology** implemented in **budget hotels.** Please indicate to which extent you agree or disagree with the statements listed below.

15) Technology is a solution to reduce the risk of the Covid-19 infection.
16) Technology would be useful in meeting my travel needs regarding my health during a pandemic.
17) Technology is convenient.

Group V: Intention to Book a Budget Hotel Room *(Likert Scale, 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree)*

18) I find that a hotel that makes use of technology to reduce the spread of Covid-19 takes ist guests health more seriously.
19) It matters to me if a budget hotel that I book makes use of technology to reduce the Covid-19 infection risk.
20) I would rather book a hotel that makes use of technology to reduce the spread of Covid-19 than a hotel without technological solutions.
Group VI: Demographics and Psychographics *(Likert Scale, 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree)*

21) Please indicate your gender.

- Male
- Female
- I'd rather not say

22) Please indicate your age.

- _____

23) Please indicate your current occupation.

- _____

24) Please indicate your monthly income/allowance group.

- €0 to €250
- €251 to €500
- €501 to €1000
- €1001 to €1500
- €1501 to €2000
- €2001 or more

25) What is the main reason for your travels?

- Visiting family
- Visiting friends
- Medical trips
- Travel for work
- Visiting and experience a new culture or city

26) I consider myself to have an affinity for technology.

- Yes
- No

Thank you for your time spent taking this survey. Your response has been recorded.

Appendix 2 – Tables

Table 7: Micro-Structure of the conducted survey

Dimensions	Q-ID	Items	Authors
Ease of use	2	Generally, Technology requires less work to reduce the Covid-19 risk than an employee when cleaning the hotel.	Oh et al. (2011)
Ease of use	3	Technology that is provided in budget hotels is easy to use.	
Ease of use	4	Technology that is provided in budget hotels would be complicated to use during my stay.	
Ease of use	5	As a hotel guest I can quickly adapt to new technology that is provided in budget hotels.	Porter et al. (2006)
Ease of use	6	Normally, technology in budget hotels is intuitive to use.	
Effectiveness	11	I expect cleaning technologies in hotels to be effective in reducing the spread of Covid-19.	Oh et al. (2011)
Effectveness	12	I expect to be completely satisfied with the use of technology in hotels to prevent the spread of Covid-19.	
Effectiveness	13	Technology in hotels is used in the guest's best interest and aims to protect the guest in all relevant aspects.	
Effectiveness	14	I expect Technology at a self check-in kiosk to be effective and free of errors.	
Usefulness	15	Technology is a solution to reduce the risk of the Covid-19 infection.	Oh et al. (2011)
Usefulness	16	Technology would be useful in meeting my travel needs regarding my health during a pandemic.	
Usefulness	17	Technology is convenient.	
Intention to book	18	I find that a hotel that makes use of technology to reduce the spread of Covid-19 takes ist guests health more seriously.	Oh et al. (2011)
Intention to book	19	It matters to me if a budget hotel that I book makes use of technology to reduce the Covid-19 infection risk.	Letchumann et al. (2011)
Intention to book	20	I would rather book a hotel that makes use of technology to reduce the spread of Covid-19 than a hotel without technological solutions.	
Demographics	21	Please indicate your gender.	Oh et al. (2011)
Demographics	22	Please indicate your age.	
Demographics	23	Please indicate your current occupation.	
Demographics	24	Please indicate your monthly income/allowance group.	
Demographics	25	What is the main reason for your travels?	
Demographics	26	I consider myself to have an affinty for technology.	