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**The impact of service failure provided by AI (vs Human) on
customer satisfaction, brand trust and brand loyalty**

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Master Thesis

presented as partial requirement for obtaining a Master's Degree in Data-Driven Marketing

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação
Universidade Nova de Lisboa

The impact of service failure provided by AI (vs Human) on customer satisfaction, brand trust and brand loyalty

A study about the use of AI in the hospitality sector

by

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Master Thesis presented as partial requirement for obtaining the Master's degree in Data-Driven Marketing, with a specialization in Digital Marketing and Analytics.

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism, any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

Lisbon, 13th July 2024

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ABSTRACT

Artificial Intelligence (AI) is changing the services sector, with an increased number of companies adopting AI systems to produce and deliver their services. AI applications are considered more reliable than humans, as they are not prone to errors arising from fatigue or lack of attention and do not have limited rationality. However, AI systems also fail. Since expectations regarding AI are higher and there is still scepticism in society regarding the use of AI, it is essential to research the impact of a service failure caused by AI on brands' relationships with customers. This study used a scenario-based experimental design through an online questionnaire, with a sample of 220 respondents, to study the impact of the same failure caused by AI and by a human person on customer satisfaction, brand trust and brand loyalty, taking into account service failures of different magnitudes, as this influences customer reactions. This study concluded that, in the case of a minor service failure, the fact that the failure was caused by AI results in lower customer satisfaction, brand trust and brand loyalty. However, in the case of a major service failure, the values of the variables in question are similar for a failure committed by AI and the same failure committed by a human person. These results arise in response to current research questions raised due to the use of AI to provide services, proving that AI can effectively change current theories about service failures. This study proves that people have different perceptions about failures caused by AI or humans, but that these depend on the magnitude of the failure.

KEYWORDS

Service Failure; Artificial Intelligence; Customer Satisfaction; Brand Trust; Brand Loyalty

Sustainable Development Goals (SDG):



TABLE OF CONTENTS

1. Introduction.....	1
2. Literature review	3
2.1. Service Failure and Recovery.....	3
2.2. Brand Loyalty	4
2.2.1. Customer Satisfaction	6
2.2.2. Brand Trust	6
2.3. Artificial Intelligence in Services	7
3. Hypotheses development and Conceptual model	9
4. Methodology	12
4.1. Pretest	12
4.2. Main Study.....	13
5. Results.....	14
5.1. Scales Reliability	14
5.2. Study with a Minor Service Failure.....	14
5.2.1. Customer Satisfaction	15
5.2.2. Brand Trust	15
5.2.3. Behavioural Brand Loyalty.....	15
5.2.4. Attitudinal Brand Loyalty.....	15
5.3. Major Service Failure.....	16
5.3.1. Customer Satisfaction	16
5.3.2. Brand Trust	16
5.3.3. Behavioural Brand Loyalty.....	16
5.3.4. Attitudinal Brand Loyalty.....	17
6. Discussion	19
7. Conclusions, limitations and Future Research	21
7.1. Theoretical Implications	21
7.2. Practical Implications.....	22
8. Limitations and Future Research.....	23
Bibliographical References	24
Appendix.....	28
8.1. Appendix A	28
8.2. Appendix B.....	29

8.3. Appendix C.....30

LIST OF FIGURES

Figure 3.1 - Conceptual Model.....	11
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LIST OF TABLES

Table 5.1 - Scales Reliability Analysis	14
Table 5.2 - Hypotheses results in the case of a minor service failure	17
Table 5.3 - Hypotheses results in the case of a major service failure	17
Table 5.4 - Hypotheses Results	18

LIST OF ABBREVIATIONS AND ACRONYMS

AI Artificial Intelligence

1. INTRODUCTION

Artificial Intelligence (AI) is increasingly becoming a key part of the production processes of many industries (Lu, 2022) and the tendency is for the AI market to increase in the coming years: according to Statista data, the global market size for AI servers is estimated to increase from 31 billion U.S. dollars in 2023 to 430 billion U.S. dollars in 2033 (Statista, 2024).

In the service industry, companies are also adopting AI systems in their processes, both to produce and deliver their services (Gursoy et al., 2019). Service providers are adopting AI to improve service quality (Bock et al., 2020) since, unlike humans, AI technologies are exempt from errors caused by fatigue or limited rationality (Huang & Rust, 2018). People expect AI performance to be automated, consistent and high-quality (Bock et al., 2020), however, what happens when AI fails, and the performance falls below customer expectations?

Besides the belief of error-free service AI, Davenport et al. (2020) also identified several reasons as to why customers negatively perceive AI. AI can be a threat to human work (Huang & Rust, 2018; Lu, 2022; Vrontis et al., 2022), people are still sceptical about this type of technologies (Hengstler et al., 2016) and also experience discomfort when engaging with humanoid machines (Mende et al., 2019).

Service failures are inevitable (Sarkar Sengupta et al., 2015) and the efficacy of the recovery after the service failure depends on how customers perceive the cause of the service failure (Iglesias et al., 2015). Therefore, taking into account the different reactions of customers towards the use of AI in the provision of service, it is essential to understand whether a service failure caused by AI causes a different reaction from customers, compared to a service failure caused by a human being. In fact, (Bock et al., 2020) identified the impact of AI service failures on customers' perceptions as a relevant research opportunity.

Previous studies state that service failures negatively impact customer-brand relationships (Casidy & Shin, 2015), affecting customer satisfaction and brand trust (Bougoure et al., 2016), the two main drivers of customer loyalty (Darmawan, 2019; Setó-Pamies, 2012). The objective of this study is to understand whether the impact of an AI service failure on customer satisfaction, brand trust and brand loyalty differs from a human service failure.

The method used was a scenario-based experimental design through an online questionnaire. Two different studies were conducted, analysing service failures with different levels of severity, since the perceived magnitude of the failure influences customer responses to the failure (Gabbott et al., 2011).

The contribution of this study to the topic of service failures is the analysis of customer perceptions and reactions to service failures caused by humans and AI, providing answers to a future research call from Bock et al. (2020). Moreover, the results of this study provide

relevant practical implications for service providers regarding their AI usage in their service production and delivery processes.

This research is structured in 7 chapters: an introductory chapter, with a contextualization of the research topic and the objectives of this study; a chapter that presents the variables of this study based on previous research from other authors; a chapter that presents the conceptual model and hypotheses of this study; a chapter about the methodology used, followed by a chapter with the results of this study and a chapter with a discussion of the results; finally, there is a chapter with the conclusions of this study, the limitations encountered and the future research opportunities.

2. LITERATURE REVIEW

2.1. SERVICE FAILURE AND RECOVERY

Service failure is the term used to define circumstances where customers have problems with the provision of a service (Spreng et al., 1995) and service performance and customer expectations do not correspond (Hess et al., 2003). Since services are inherently variable in the way they are provided, failures are expected to occur (Colgate & Norris, 2001). Service failure is an important research topic due to its negative effect on customer and brand relationships (Casidy & Shin, 2015).

After service failures occur, companies should take into account people's perceptions about justice (Smith et al., 1999) in order to repair the loss felt by customers from service failures. A brand reaction after a failure is called "service recovery" (Gustafsson, 2009).

Studies report that effective recovery after a service failure has a positive effect on customer satisfaction (Chuang et al., 2012), helping minimize the negative effects on customer satisfaction and thus retain the customer's business (Hess et al., 2003). For an effective service recovery, brands should both consider the magnitude and the type of failure (Smith et al., 1999).

The magnitude of the service failure can be defined as the size of the loss felt by customers (Smith et al., 1999), and this is an individual variable (Mattila, 2004) as it depends on the personal appraisal of each customer regarding the service failure (Gabbott et al., 2011). A failure considered as a relatively minor for one customer may be considered as a major service failure by another customer (Bougoure et al., 2016).

Regarding the type of service failure, the service literature identifies two types: outcome and process service failures (Smith et al., 1999). An outcome service failure corresponds to a core service problem (Spreng et al., 1995) where the company fails to provide the basic service need (Smith et al., 1999), for example, when a service is unavailable (Spreng et al., 1995). On the other side, a process failure corresponds to a deficient service delivery (Chuang et al., 2012), for example, unexpected slow service or small mistakes (Spreng et al., 1995).

Studies report that as the perceived magnitude of a service failure increases, so do customers' expectations for service recovery (Hess et al., 2003). On the other hand, studies also report that a process failure causes greater dissatisfaction when compared to an outcome failure (Smith et al., 1999).

After a service failure, the recovery process is the last experience the customer has with a brand, causing a recency effect (Spreng et al., 1995), highlighting the importance of an effective recovery plan. When a service provider makes a good recovery the customer will experience a better degree of justice, creating a favorable brand image and increasing the

likelihood of future buying intent (Gustafsson, 2009). Conversely, customers who perceive unsatisfactory service recovery experience lower levels of justice.

Moreover, studies also show that satisfaction with recovery has a strong influence on word-of-mouth (Maxham Iii & Netemeyer, 2002), meaning that customers are willing to recommend the failing brand to family and friends if they are satisfied with service recovery efforts (Maxham Iii & Netemeyer, 2002).

The efficacy of the recovery after the service failure depends on how customers perceive the cause of the service failure (Iglesias et al., 2015), which highlights the importance of studying customers' reactions and perceptions of different causes of service failures.

2.2. BRAND LOYALTY

The importance of brand loyalty arises from the intense competition and saturated market situations (Gul, 2014). Loyalty gives companies a sustainable competitive advantage (Setó-Pamies, 2012) as maintaining current customers is less costly than attracting new ones in mature and competitive markets (McMullan & Gilmore, 2008; Oliver, 1999).

Loyal customers may expand the company's income since they are expected to purchase more products and services over time (Bowen, 2001; Setó-Pamies, 2012). Moreover, they can also be considered a "marketing force" by recommending the brand to others and disseminating favourable word-of-mouth (Bowen, 2001; Watson et al., 2015).

Brand loyalty is a concept that has been extensively studied over the last few decades, however, there is no consensus regarding its definition (Watson et al., 2015).

Many researchers started by defining brand loyalty strictly from a behavioural perspective (Bandyopadhyay & Martell, 2007). The major assumption was that repeat purchasing meant customer loyalty toward a specific brand (Bandyopadhyay & Martell, 2007).

However, customer loyalty is not uniquely concerned with behavioural dimensions, such as frequency and depth of purchase (McMullan & Gilmore, 2008), since these explanations are not enough to explain how and why loyalty is created (Dick & Basu, 1994). Behavioural approaches usually don't take into account the psychological processes associated with customer action (Watson et al., 2015). High repeat purchases may reflect situational factors (Bandyopadhyay & Martell, 2007; Dick & Basu, 1994), such as stock-out and non-availability. It can also reflect a preference for convenience or mask multi-brand loyal customers (Oliver, 1999). Nevertheless, low repeat purchases may only indicate different usage situations or variety-seeking (Dick & Basu, 1994) other than no brand loyalty.

Dick & Basu (1994) started by suggesting that it requires both a favourable attitude and repeated purchases to define loyalty. By defining loyalty as an attitude-behaviour

interaction it is possible to investigate brand loyalty from a causal perspective, so it is possible to identify its antecedents (Bandyopadhyay & Martell, 2007).

Later, Oliver (1999) defined loyalty as “a deeply held commitment to rebuy or patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same-brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behaviour”.

Once more, this definition points out that brand loyalty encompasses two different dimensions: behavioural and attitudinal. This view of brand loyalty has been supported by several investigators through the years (Bandyopadhyay & Martell, 2007; Bowen, 2001; Chaudhuri & Holbrook, 2001; Dick & Basu, 1994; Oliver, 1999; Watson et al., 2015), therefore this study will also use this approach.

Behavioural loyalty requires several purchases of the same brand (Chaudhuri & Holbrook, 2001), also known as purchase loyalty. It includes repeated purchases that come from the predisposition to behave for the benefit of a specific brand (Watson et al., 2015).

Attitudinal loyalty can be described as pleasurable fulfilment that favours a particular brand (Watson et al., 2015). It refers to the level of commitment of the customer to the brand (Chaudhuri & Holbrook, 2001).

Brand loyalty must be assessed as an attitude and behaviour separately due to the different items that constitute the two dimensions (Watson et al., 2015), but the key to the framework is the approach of loyalty as the relationship between customer attitude towards the brand and behaviour that leads to favouritism (Dick & Basu, 1994).

With the understanding of the concept and importance of brand loyalty, it's now necessary to understand what impacts loyalty.

Previous studies state customer satisfaction affects customer loyalty (Darmawan, 2019; Setó-Pamies, 2012). Besides studies have used loyalty and satisfaction as a manifestation of the same concept, it was later proved that the two concepts are different (Bowen, 2001; Oliver, 1999). However, if customers are satisfied with a brand, they will persist to use it, they will not move to use other brands and they can even share their experience with others because they have embedded a sense of trust in the brand (Darmawan, 2019) contributing to brand loyalty. Previous researchers concluded that satisfaction is a crucial component for obtaining customer loyalty (Oliver, 1999; Setó-Pamies, 2012), although in many cases it may not be enough (Setó-Pamies, 2012).

Another important element for obtaining brand loyalty is trust (Darmawan, 2019; Setó-Pamies, 2012) which contributes to both behavioural loyalty and attitudinal loyalty (Chaudhuri & Holbrook, 2001).

In fact, (Setó-Pamies, 2012) stated that both satisfaction and trust influence brand loyalty, with satisfaction having a higher influence, which is supported by (Gul, 2014) that reported that satisfaction is the major driver of customer loyalty.

2.2.1. CUSTOMER SATISFACTION

Customer satisfaction is a result of customer expectations regarding service performance and value delivery: performance that is in line with customers' expectations will satisfy them (Darmawan, 2019). Satisfaction is established by the perception that customers have about the service usage, i.e., the positive or negative difference between what customers expect and what they actually receive (Setó-Pamies, 2012).

In what refers to service failure and recovery, customer satisfaction can be separated into two different dimensions: overall service satisfaction and satisfaction with service recovery (Bougoure et al., 2016).

Overall satisfaction contrasts with satisfaction with a specific transaction as it is an active and dynamic process that results from long-term interaction and a cumulative impression of the experience with that brand (Fournier & Mick, 1999).

On the other hand, satisfaction with service recovery is transaction-specific (Homburg & Fürst, 2005). It refers to the customers' impression that justice has been served after a failure and may improve overall company satisfaction and indirectly impact the intent to buy (Maxham Iii & Netemeyer, 2002). Brands should focus on developing an effective recovery plan, as satisfaction with service recovery positively impacts overall brand satisfaction (Bougoure et al., 2016).

Customer satisfaction is a major driver of customer loyalty as satisfied consumers will return to buy, and they will tell others about their good experience with the product (Darmawan, 2019).

2.2.2. BRAND TRUST

Trust is a psychological condition (Darmawan, 2019) that proves to be essential in building lasting relationships between customers and brands (Dam, 2020).

Brand trust refers to the belief that a particular brand can and is willing to fulfil the implicit and explicit commitments (Setó-Pamies, 2012), the customer's confidence in the quality and integrity of the brand (Dam, 2020), the customer's willingness to rely on the brand's capability to successfully complete its function (Chaudhuri & Holbrook, 2001) and the customer's belief that a brand will accomplish its needs according to its desires (Gul, 2014).

Previous studies state that brand trust reduces uncertainty (Chaudhuri & Holbrook, 2001; Setó-Pamies, 2012) since customers feel that they can rely on the brand (Chaudhuri & Holbrook, 2001) as they know that it will fulfil its function as expected (Dam, 2020). Therefore, brand trust simplifies choice and helps manage risks (Setó-Pamies, 2012).

Brand trust begins to develop when customers are satisfied with a brand's results (Darmawan, 2019). If customers trust in the brand, repurchasing is likely to happen (Dam, 2020) and, therefore, their purchase intention will increase (Dam, 2020). When customers trust that the brand will deliver the expected outcome, they remain loyal to that brand and will not use other brands, despite there being alternatives on the market (Darmawan, 2019), which has led previous studies to conclude that brand trust influences brand loyalty (Chaudhuri & Holbrook, 2001; Darmawan, 2019; Rauyruen & Miller, 2007).

2.3. ARTIFICIAL INTELLIGENCE IN SERVICES

Huang & Rust (2018) state that AI refers to machines that have characteristics of human intelligence. Similarly, (Syam & Sharma, 2018) define AI as robots that are able to imitate human behaviours, specifically tasks that require “cognitive” abilities associated with human intelligence, such as problem-solving and learning.

However, since humans can only learn and extract conclusions from limited data and robots can analyse and learn from billions of data points, the definitions of AI on human capabilities are limiting (Bock et al., 2020). In this aspect, Kaplan & Haenlein (2019) definition it's more complete, as it defines AI as “a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation”.

Nowadays, AI is an important part of the production processes of many industries (Lu, 2022), including the services industry, where companies providing different types of services are using AI both to produce and deliver their services. (Gursoy et al., 2019).

In the hospitality industry, hotels are implementing, for example, kiosks that allow customers to check-in and check-out independently and automatically without the assistance of front desk agents (Ivanov & Berezina, 2017). Another example is “Connie”, an AI concierge robot adopted by Hilton that can answer customer questions and learn from previous interactions in order to personalize interactions (Tavakoli & Mura, 2018). In the restaurant industry, AI is enabling the automation of both food service and food preparation stages (Ivanov & Berezina, n.d.), for example, the AI chef named Molley, created by Moley Robotics Company, that is able to replace human chefs in restaurants (Lv et al., 2022). In the airline industry, KLM company, for example, programmed a chatbot that improves customers' travel experience by answering their queries (West et al., 2018).

Bock et al (2020) introduced the concept of “Service AI”, which is defined as “the configuration of technology to provide value in the internal and external service environments through flexible adaptation enabled by sensing, learning, decision-making and actions”. This definition reflects that AI goes beyond applying pre-programmed decisions by manifesting the capability to learn (Bock et al., 2020).

Besides the growing trend of integrating AI applications into the service delivery process (Gursoy et al., 2019), society still shows noticeable scepticism regarding the use of AI (Hengstler et al., 2016) and there are several reasons as to why customers perceive AI negatively (Davenport et al., 2020).

In the first place, AI dramatically affects human work (Lu, 2022). Huang & Rust (2018) theory states that the replacement of people by AI in jobs occurs primarily at the level of replacing tasks, not replacing the job in its entirety, and begins by replacing tasks that require less intelligence, and are therefore easier for AI systems to perform. But as AI systems evolve, they begin to have the capacity to take on all tasks, making it possible to replace jobs that were previously occupied by people (Huang & Rust, 2018). Moreover, with technological progress, computer processing has become faster and cheaper, making it more cost-effective for companies to replace humans with AI in certain tasks (Lu, 2022). In sum, AI may change the world of work and be a threat to human jobs (Vrontis et al., 2022), which can cause the rejection of services provided by AI.

Customers are also less open to the usage of AI because they perceive that AI is unable to perform tasks where humans use intuition and emotions (Castelo et al., 2019). Additionally, customers perceive that AI is unable to identify the unique values of each customer (Davenport et al., 2020), which is especially important for services with higher symbolic value (Granulo et al., 2021). Finally, customers also perceive AI as being less empathetic than human beings (Davenport et al., 2020) which is especially important in the case of service failure and service recovery (Lv et al., 2022).

Additionally, (Bock et al., 2020) also identified expectation management as a problem with the use of AI for service companies. Customers tend to consider AI to be error-free, as it is not susceptible to fatigue like humans, it can methodically process data and respond in a reliable way (Huang & Rust, 2018) thus increasing customer expectations and increasing disconfirmation when AI fails to provide the expected outcomes (Bock et al., 2020).

With all these components involving customer perceptions and expectations regarding the use of AI to provide services, existing studies on services need to be studied from a new perspective that can cause changes to existing theories or even create new theories (Bock et al., 2020).

3. HYPOTHESES DEVELOPMENT AND CONCEPTUAL MODEL

With the objectives of this study and the research questions defined and after systematically reviewing relevant literature on the topics of this study, the model and hypotheses were developed. The model proposed for this study contributes to understanding the impact of an AI service failure on customer satisfaction, brand trust and brand loyalty compared to the same service failure caused by a human being. Therefore, this model has AI (vs human) service failure as an independent variable. The different types of brand loyalty (behavioural and attitudinal) and variables that affect brand loyalty (customer satisfaction and brand trust) are the dependent variables of this model. Finally, the magnitude of the service failure is also incorporated as an independent variable to understand its influence on the relationship between an AI (vs human) service failure and customer satisfaction, brand trust and brand loyalty.

AI technology is becoming an important input for several industries (Gursoy et al., 2019) and service companies have also started using AI technologies to produce and deliver their services (Gursoy et al., 2019), reshaping the service industry and constituting an important driver of innovation (Huang & Rust, 2018).

AI enables more personalized and valuable services (Vrontis et al., 2022), provides more consistent and timely service (Gursoy et al., 2019), and delivers a superior service when compared to human employees (Bock et al., 2020; Gursoy et al., 2019). Moreover, using AI is more cost-effective than using human employees, since with technological progress AI applications have become faster and cheaper (Lu, 2022).

However, besides the benefits of AI-provided services, there is still noticeable scepticism regarding the use of AI (Hengstler et al., 2016), and previous research concluded that humanoid service robots can cause discomfort and eeriness (Mende et al., 2019).

Moreover, people expect AI performance to be more effective and consistent than human employees (Bock et al., 2020) because AI is more reliable than humans, as it is not susceptible to errors arising from fatigue, lack of attention or limited rationality and responds to the environment in a very reliable manner (Huang & Rust, 2018). However, the perception of being error-free also increases customers' expectations for AI-provided service (Bock et al., 2020). Since satisfaction depends on the discrepancy between what customers expect and what they actually receive (Setó-Pamies, 2012) and that service provided by AI affects performance expectations and disconfirmation (Bock et al., 2020), what happens when AI fails and the performance falls below customers' expectations? Do AI service failures generate greater dissatisfaction?

These questions become even more pertinent if we consider that previous studies state that customer satisfaction affects brand loyalty (Darmawan, 2019; Setó-Pamies, 2012). Thus, the first hypothesis of this study:

H1: AI (vs Human) service failure will have a negative effect on customer satisfaction (a), which in turn will have a negative effect on attitudinal brand loyalty and behavioural brand loyalty (b).

Another important element for obtaining brand loyalty is trust (Darmawan, 2019; Setó-Pamies, 2012) which contributes to both behavioural loyalty and attitudinal loyalty (Chaudhuri & Holbrook, 2001). Trust can be defined as the belief that a particular brand can and is willing to fulfil the implicit and explicit promises (Setó-Pamies, 2012). What happens when AI-provided service is unable to fulfil the promises? Since there is still noticeable scepticism in society regarding AI applications (Hengstler et al., 2016) and several reasons why people perceive AI negatively (Davenport et al., 2020), does an AI-provided service failure have a different impact on brand trust, than a failure caused by human error?

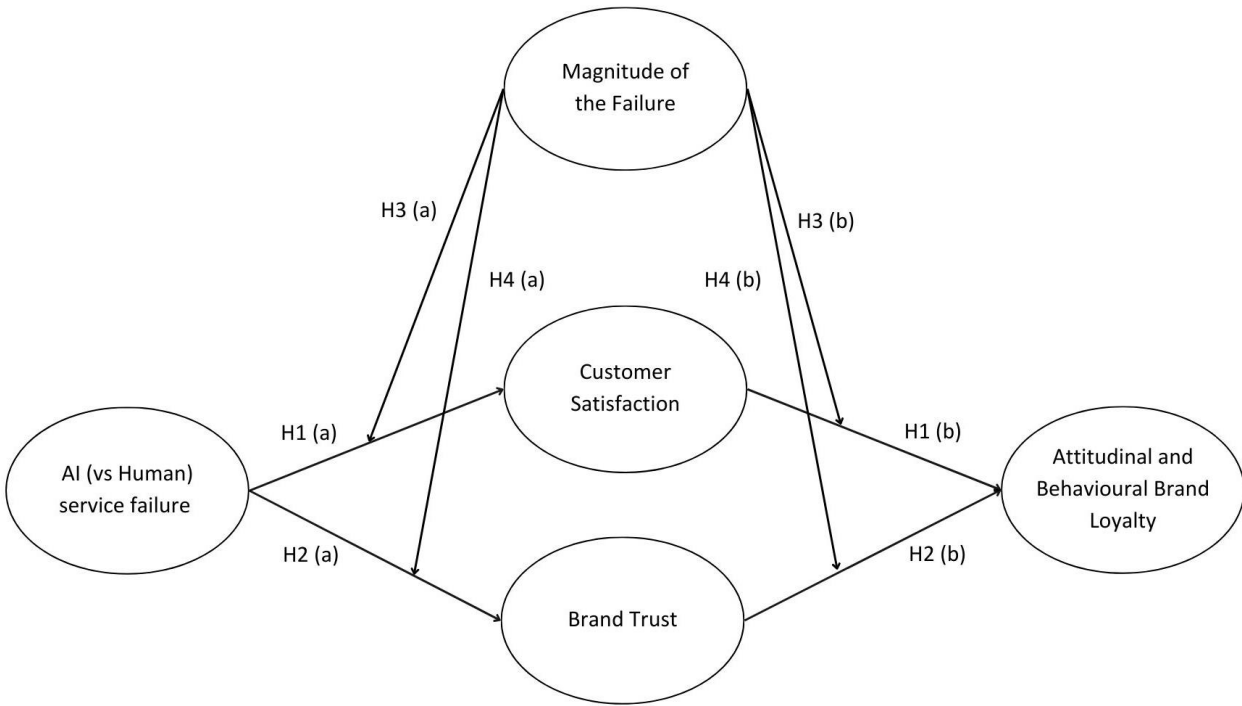
H2: AI (vs Human) service failure will have a negative effect on brand trust (a), which in turn will have a negative effect on attitudinal loyalty and behavioural loyalty (b).

Additionally, it's important to take into account that loss felt by customers during a service failure depends on the perceived magnitude of the failure (Bougoure et al., 2016), which, therefore, influences the customer's behavioural intentions after a failure (Sarkar Sengupta et al., 2015). Studies prove that service recovery expectations increase if customers consider the failure as serious (Hess et al., 2003) and that one of the factors influencing customer satisfaction is the magnitude of the service failure (Chuang et al., 2012). Thus, the magnitude of the failure can influence the relationship between the variables of this study, leading to the third and fourth hypotheses:

H3: The magnitude of the service failure influences the relationship between AI (vs Human) service failure and customer satisfaction (a) and, consequently, influences brand loyalty (b).

H4: The magnitude of the service failure influences the relationship between AI (vs Human) service failure and brand trust (a) and, consequently, influences brand loyalty (b).

Figure 3.1 - Conceptual Model



4. METHODOLOGY

To test the conceptual model, a 2 (service failure: AI-provided service x human-provided service) x 2 (magnitude of the failure: major x minor service failure) scenario-based experimental design was performed in the form of an online questionnaire, taking as an example Bougoure et al. (2016) model that also includes different magnitudes of service failure to study the impact of a service failure.

The experiments were conducted by manipulating the independent variables (AI vs Human Service Failure in the case of a Major vs Minor Service) and measuring its effect on dependent variables (customer satisfaction, brand trust, behavioural brand loyalty and attitudinal brand loyalty).

The hospitality sector was chosen as the study context as it is one of the sectors that is increasingly using AI (Huang & Rust, 2018) and the different scenarios were constructed taking into account real-life usages of AI in the hospitality sector, namely the AI concierge robot adopted by Hilton (Tavakoli & Mura, 2018).

The scales for the experiments were chosen and adapted from previous literature (see Appendix A). All items were measured using a 7-point Likert scale from 1. Strongly disagree to 7. Strongly agree.

4.1. PRETEST

The magnitude of the failure is an individual variable (Bougoure et al., 2016; Mattila, 2004), each customer will differently perceive a service failure as a major or minor (Smith et al., 1999). Therefore, a pretest was carried out to identify the best service failures to use in this study in terms of their magnitude. The pretest was administered through an online questionnaire using Qualtrics, in which respondents were presented with 4 scenarios that included different service failures (see Appendix B) and had to evaluate each scenario in terms of the magnitude of the failure. The magnitude of failure was measured with a 3-item scale adopted from (Bougoure et al., 2016), using a 7-point Likert scale.

The pretest questionnaire had 59 respondents in total, but 28 responses were considered invalid due to non-completion of the questionnaire (n = 15) and invalid answers in the attention check (n = 13).

From the 31 valid responses, the means of the 3 scale items were calculated for each scenario using the software SPSS statistics. The service failure with a higher average (5.14 on a scale of 1 to 7) was chosen as a major service failure and the scenario with the lowest average (2.56 on a scale of 1 to 7) was selected to be used as a minor service failure in the main study.

4.2. MAIN STUDY

After selecting the two service failures to be used in the study through pre-testing, the main study scenarios were constructed adapting each of these failures to be committed by an AI hotel concierge or a human concierge.

A non-probabilistic convenience sampling was used in this study, consisting of respondents from both genders and over 18 years old. The respondents were divided into four subsamples and distributed among the four different scenarios under analysis.

Each respondent was exposed to only one of the scenarios and was then asked to evaluate the magnitude of the service failure, customer satisfaction, brand trust and brand loyalty using the scales selected for this study (see Appendix A) and to provide their demographic data.

The questionnaire (see Appendix C) was created in Qualtrics and the data collected was later extracted into Excel to clean it. This way, incomplete responses or those that failed the attention check were removed. Afterwards, the characterization of the respondents was created, also using Excel. Finally, the data was analysed using SPSS Statistics by performing statistical tests to understand the relationships between the variables.

The questionnaire had 344 respondents in total, but 124 responses were considered invalid due to non-acceptance to participate ($n = 3$), non-completion of the questionnaire ($n = 97$) and invalid answers in the attention check ($n = 24$), resulting in the exclusion of these respondents and leaving a total of 220 valid answers.

The study's samples consisted of 64 men (29,09% of the sample) and 156 women (70,91% of the sample). On average respondents were ≈ 30 years old ($SD = 10,66$), most of them from Portugal (85,45%), followed by the Netherlands (2,27%), Brazil (2,27%), Germany (1,82%), United Kingdom (1,36%), China (0,91%), Luxembourg (0,91%), United States of America (0,91%), Switzerland (0,45%), Sri Lanka (0,45%), France (0,45%), Australia (0,45%), Azerbaijan (0,45%), Estonia (0,45%), India (0,45%), Poland (0,45%) and Canada (0,45%). In terms of education, most of the respondents had a Bachelor's Degree (45,45%) followed by Master's Degree (28,18%), High School Graduate (21,82%), Primary School (4,09%) and Doctorate Degree (0,45%).

5. RESULTS

5.1. SCALES RELIABILITY

Before starting data analysis, Cronbach's Alpha was conducted through SPSS Statistics to assess the internal reliability of Likert Scale variables, namely Magnitude of the Service Failure, Customer Satisfaction, Brand Trust, Behavioural Brand Loyalty, and Attitudinal Brand Loyalty.

The results showed a variation between .892 and .975 (Table 5.1), which indicated a very high level of consistency between the items on the scale. With these results, it was possible to proceed and group the items of each variable to create a single variable.

Table 5.1 - Scales Reliability Analysis

Scales	Initial Number of Items	Cronbach's Alpha	Final Number of Items
Magnitude of the Failure	3	.928	3
Customer Satisfaction	5	.923	5
Brand Trust	4	.892	4
Behavioural Brand Loyalty	2	.972	2
Attitudinal Brand Loyalty	5	.975	5

5.2. STUDY WITH A MINOR SERVICE FAILURE

We first started to analyse the results of the study with a minor service failure. The first step was to check the value, on average, of the magnitude of the failure to verify whether the value effectively corresponds to a minor service failure. With an average of 2 (on a scale of 1 to 7), we considered that the respondents effectively considered the failure presented in the scenario of this study as being a minor failure, and this value is also considerably lower than the average presented in the study of serious service failure (see chapter 5.3). With these results, we were able to proceed with the analysis.

To evaluate and compare the effect of the independent variable (AI vs Human Service Failure) on each dependent variable (Customer Satisfaction, Brand Trust, Behavioural Brand Loyalty, Attitudinal Brand Loyalty) it was conducted a one-way ANOVA using SPSS Statistics software.

5.2.1. CUSTOMER SATISFACTION

The results demonstrated that there is a significant difference between the impact of an AI service failure vs a human service failure [$F(1, 108) = 24,097$ $p < .001$] on customer satisfaction.

Results showed higher values for customer satisfaction mean when the service failure is committed by a human person ($M_{\text{HUMAN}} = 6,25$, $SD = 0,82$). When the service failure is committed by AI, the customer satisfaction mean is lower ($M_{\text{AI}} = 5,23$, $SD = 1,31$).

5.2.2. BRAND TRUST

The results demonstrated that there is a significant difference between the impact of an AI service failure vs a human service failure [$F(1, 108) = 47,519$ $p < .001$] on brand trust.

Results showed higher values for brand trust mean when the service failure is committed by a human person ($M_{\text{HUMAN}} = 6,29$, $SD = 0,67$). When the service failure is committed by AI, the brand trust mean is lower ($M_{\text{AI}} = 4,97$, $SD = 1,25$).

5.2.3. BEHAVIOURAL BRAND LOYALTY

The results demonstrated that there is a significant difference between the impact of an AI service failure vs a human service failure [$F(1, 108) = 22,671$ $p < .001$] on behavioural brand loyalty.

Results showed higher values for behavioural brand loyalty mean when the service failure is committed by a human person ($M_{\text{HUMAN}} = 6,21$; $SD = 1,09$). When the service failure is committed by AI, the behavioural brand loyalty mean is lower ($M_{\text{AI}} = 4,95$; $SD = 1,64$).

5.2.4. ATTITUDINAL BRAND LOYALTY

The results demonstrated that there is a significant difference between the impact of an AI service failure vs a human service failure [$F(1, 108) = 23,793$, $p < .001$] on attitudinal brand loyalty.

Results showed higher values for attitudinal brand loyalty mean when the service failure is committed by a human person ($M_{\text{HUMAN}} = 6,17$; $SD = 1,07$). When the service failure is committed by AI, the attitudinal brand loyalty mean is lower ($M_{\text{AI}} = 4,9$; $SD = 1,62$).

5.3. MAJOR SERVICE FAILURE

Once more, we started by evaluating the average magnitude of the failure to verify if respondents considered it a major failure. With an average of 5,93 (on a scale of 1 to 7), we concluded that the respondents considered it a major failure, so we proceeded with the analysis.

A one-way ANOVA was conducted using SPSS Statistics software to evaluate and compare the effect of the independent variable (AI vs Human Service Failure) on each dependent variable (Customer Satisfaction, Brand Trust, Behavioural Brand Loyalty, Attitudinal Brand Loyalty).

5.3.1. CUSTOMER SATISFACTION

The results demonstrated no significant difference between the impact of an AI service failure vs a human service failure [$F(1, 108) = 2,035$ $p = .157$] on customer satisfaction.

Customer satisfaction mean when the service failure is committed by a human person ($M_{\text{HUMAN}} = 4,7$, $SD = 1,23$) is close to the customer satisfaction mean when AI commits the service failure ($M_{\text{AI}} = 4,38$, $SD = 1,11$).

5.3.2. BRAND TRUST

The results demonstrated no significant difference between the impact of an AI service failure vs a human service failure [$F(1, 108) = 0,704$ $p = .403$] on brand trust.

Brand trust mean when the service failure is committed by a human person ($M_{\text{HUMAN}} = 4,99$, $SD = 1,17$) is close to the brand trust mean when AI commits the service failure ($M_{\text{AI}} = 4,81$, $SD = 1,02$).

5.3.3. BEHAVIOURAL BRAND LOYALTY

The results demonstrated no significant difference between the impact of an AI service failure vs a human service failure [$F(1, 108) = 3,199$ $p = .076$] on behavioural brand loyalty.

Behavioural brand loyalty mean when the service failure is committed by a human person ($M_{\text{HUMAN}} = 4,73$, $SD = 1,52$) is close to the behavioural brand loyalty mean when AI commits the service failure ($M_{\text{AI}} = 4,22$, $SD = 1,47$).

5.3.4. ATTITUDINAL BRAND LOYALTY

The results demonstrated no significant difference between the impact of an AI service failure vs a human service failure [$F(1, 108) = 2,748$ $p = .100$] on attitudinal brand loyalty.

Attitudinal Brand Loyalty mean when the service failure is committed by a human person ($M_{\text{HUMAN}} = 4,66$, $SD = 1,57$) is close to the attitudinal brand loyalty mean when AI commits the service failure ($M_{\text{AI}} = 4,2$, $SD = 1,36$).

Table 5.2 - Hypotheses results in the case of a minor service failure

Hypotheses	Result
H1: AI (vs Human) service failure will have a negative effect on customer satisfaction (a), which in turn will have a negative effect on attitudinal brand loyalty and behavioural brand loyalty (b).	Supported
H2: AI (vs Human) service failure will have a negative effect on brand trust (a), which in turn will have a negative effect on attitudinal loyalty and behavioural loyalty (b).	Supported

Table 5.3 - Hypotheses results in the case of a major service failure

Hypotheses	Result
H1: AI (vs Human) service failure will have a negative effect on customer satisfaction (a), which in turn will have a negative effect on attitudinal brand loyalty and behavioural brand loyalty (b).	Not supported
H2: AI (vs Human) service failure will have a negative effect on brand trust (a), which in turn will have a negative effect on attitudinal loyalty and behavioural loyalty (b).	Not Supported

Considering the results above, we conclude that in the case of a minor service failure, the fact that AI causes the failure has a negative impact on customer satisfaction and brand trust when compared to a failure caused by a human being, consequently it also has a negative impact on brand loyalty. On the other hand, if it is a major service failure, the fact that it was caused by AI or a human does not influence the value of the variables in question. Thus, the results support the hypotheses H3 and H4.

Table 5.4 - Hypotheses Results

Hypotheses	Result
H3: The magnitude of the service failure influences the relationship between AI (vs Human) service failure and customer satisfaction (a) and, consequently, influences brand loyalty (b).	Supported
H4: The magnitude of the service failure influences the relationship between AI (vs Human) service failure and brand trust (a) and, consequently, influences brand loyalty (b).	Supported

6. DISCUSSION

Service failure is a key research topic in service marketing (Bougoure et al., 2016) since customers often experience a service failure (Lopes & da Silva, 2015) and it negatively affects the relationships between customers and brands (Casidy & Shin, 2015). Previous research on service failure becomes incomplete when they prove that customers' attributions about failures influence their attitudes and behavioural intentions toward the brand (Gustafsson, 2009) and nowadays AI is disrupting the service industry (Gursoy et al., 2019) changing customers' perception of the service failure. Therefore, the present study investigated the impact of a service failure caused by AI vs human person on customer satisfaction, brand trust, and brand loyalty. This study also included the effect of the magnitude of the service failure, as previous studies show that customers who experience a major failure are likely to perceive greater loss (Sarkar Sengupta et al., 2015), which may influence their perception of an AI vs human person service failure.

The study of minor service failure showed that customer satisfaction after a service failure caused by AI is lower when compared to the same service failure caused by a human, supporting H1a. These results are supported by current literature that defines customer satisfaction as being the result of customer expectations regarding service performance and value delivery (Darmawan, 2019) since AI is perceived as being more reliable (Huang & Rust, 2018) and consistent (Gursoy et al., 2019), customer expectations are higher (Bock et al., 2020), increasing disconfirmation when AI fails, thus causing a greater impact on customer satisfaction when compared to a human being's failure.

Brand trust after an AI service failure is also lower when compared to the same service failure caused by a human person, supporting H2a. Considering that brand trust is the customer's readiness to rely on the brand's capability to fulfil its function (Chaudhuri & Holbrook, 2001), this result is in line with current literature that reports that people are still sceptical about AI technologies (Hengstler et al., 2016), a factor that can be aggravated after a service failure, as it negatively affects brand trust (Bougoure et al., 2016).

Attitudinal and behavioural brand loyalty are also lower after a service failure caused by AI when compared to the same service failure caused by a human person, which is supported by previous literature that proved that customer satisfaction and brand trust are major drivers of both attitudinal and behavioural brand loyalty (Chaudhuri & Holbrook, 2001; Darmawan, 2019; Gul, 2014; Setó-Pamies, 2012), thus, if customer satisfaction and brand trust are lower when AI commits the failure, then both brand loyalty dimensions are also lower for a failure committed by AI, supporting H1b and H2b.

On the other hand, in the study in which the impact of a major failure was evaluated, it was proven that there is no significant difference in customer satisfaction or brand trust if the service failure is caused by AI or a human person, rejecting H1a and H2a in the case of a major service failure.

These results go against current studies on how customers perceive the use of AI, as they reveal several factors why customers perceive AI negatively (Davenport et al., 2020) and, therefore, it would be expected that the reaction to a service failure caused by an AI system vs a human person would be different. On the other hand, as in the case of a minor service failure the hypotheses H1a and H2a were supported, these results are justified by the variable magnitude of the failure. Studies on service failures reveal that the loss felt by customers during a service failure depends on the perceived magnitude (Bougoure et al., 2016), which then influences customers' reactions to a service failure (Sarkar Sengupta et al., 2015). One of the factors determining satisfaction after a service failure is the magnitude of the failure (Chuang et al., 2012), consequently, influencing brand trust (Darmawan, 2019). In this case, we conclude that in the case of a serious service failure, due to the greater loss experienced by customers, the cause of the failure (AI vs human) does not influence the value of customer satisfaction and brand trust.

Since customer satisfaction and brand trust are the main drivers of attitudinal and behavioural brand loyalty (Chaudhuri & Holbrook, 2001; Darmawan, 2019; Gul, 2014; Setó-Pamies, 2012), the results show that there is no significant difference in attitudinal and behavioural brand loyalty if the service failure is caused by AI or a human person, rejecting H1b and H2b in the case of a major service failure.

Following the results obtained we conclude that in the case of a minor service failure, the fact that it was committed by an AI system (instead of a human person) is detrimental to brands, as it reduces customer satisfaction, brand trust and, consequently, brand loyalty. These results are consistent with previous studies that point out a variety of factors why society negatively perceives AI systems (Davenport et al., 2020), customers are still sceptical about this type of technology (Hengstler et al., 2016), they feel uncomfortable engaging with humanoid machines (Mende et al., 2019) and there is an increased level of demand concerning the use of AI as they consider it to be more reliable and error-free (Bock et al., 2020).

On the other hand, the results of this study show that, in the case of a major service failure, the values of customer satisfaction, brand trust and brand loyalty after a service failure committed by AI are similar to the values presented after a service failure committed by a human being. In sum, when it comes to a major service failure, the fact that it was caused by a human person, or an AI system has no impact on the variables of this study. This result is aligned with previous studies on service failures in which researchers concluded that it will be more difficult to satisfy customers as their perceived magnitude of the failure increases (Bougoure et al., 2016). In this case, if the customers perceive the failure to be serious, the negative factors associated with the use of AI presented in current literature are not relevant to the customer and their relationship with the brand, since the effect of the magnitude of the service failure overrides the use of AI, defining the customer's reactions to the failure.

7. CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

Nowadays, AI is increasingly used to provide services (Gursoy et al., 2019) making it essential to study service failures from a new perspective (Bock et al., 2020). Therefore, the objective of this study was to understand whether the impact of an AI service failure on customer satisfaction, brand trust and brand loyalty differs from the same service failure provided by a human person. This study was conducted from two different perspectives taking into account a more serious failure magnitude and a minor one since the literature revealed that customers' loss during a service failure depends on the perceived magnitude of the failure (Bougoure et al., 2016), which, therefore, influences the customer's behavioural intentions after a failure (Sarkar Sengupta et al., 2015).

Through a scenario-based experimental design, we were able to compare customer reactions to an AI and human service failure, both in the case of a major and minor service failure. The results analysis allowed us to conclude that a minor service failure caused by AI results in lower values of customer satisfaction, brand trust and brand loyalty compared to the same service failure caused by a human person. In the case of a major service failure, we concluded that customer satisfaction, brand trust and brand loyalty values do not change significantly depending on whether the failure is caused by AI or a human person.

In this way, we achieved the objective of this study by concluding that indeed, a service failure caused by AI can have a different impact on customer satisfaction, brand trust and brand loyalty when compared to the same service failure caused by AI and that the magnitude of the failure influences the relationship between AI (vs Human) service failure and customer satisfaction, brand trust and brand loyalty.

These results provide insightful theoretical and practical implications.

7.1. THEORETICAL IMPLICATIONS

The results of this study are a relevant contribution to the topic of service failures by bringing a new perspective that has become necessary after the increased use of AI to provide services (Gursoy et al., 2019). This study is consistent with previous research that claims that service failures negatively impact customer-brand relationships (Casidy & Shin, 2015) and that customers' causal attributions about failures influence their attitudes and behavioural intentions toward the brand (Gustafsson, 2009). Additionally, this study is also in line with current research on the impact of failure magnitude which reports that the more serious the service failure is, the more difficult it is to satisfy customers (Hess et al., 2003) since the loss perceived by customers is higher (Bougoure et al., 2016). However, the results contribute to the current literature on service failures by bringing the perspective of using AI to provide services and the impact of service failures caused by AI.

Bock et al. (2020) identified the impact of an AI service failure on customer perceptions of the failure as a current literature gap that this study addresses by researching customers' reactions to the same service failure caused by AI and a human person.

The findings reveal that minor service failures caused by AI result in lower customer satisfaction, brand trust and brand loyalty compared to those caused by humans. This is consistent with existing research, which suggests customers have higher expectations from AI systems due to their perceived reliability and consistency (Bock et al., 2020; Huang & Rust, 2018). When these systems fail and customers' expectations are not met, it causes greater disconfirmation and dissatisfaction compared to human failures, where variability in performance is more anticipated and tolerated. This contributes to the broader theoretical understanding of expectation-disconfirmation theory in the context of AI-driven service failures.

On the other hand, for major service failures, the source of the failure (AI versus human) does not significantly impact customer satisfaction or brand trust. This highlights the overriding effect of the failure's magnitude on customer reactions, aligning with previous research indicating that the magnitude of the failure determines customer reactions to service failure (Smith et al., 1999). These results contribute to the current literature by showing that while minor failures magnify the negative impact of AI, major failures neutralize this effect, shifting the focus to the severity of the loss experienced by the customer. This provides a more comprehensive understanding of how different levels of service failure impact customer behaviour and brand relationships, extending the current theoretical framework of AI service failure and recovery.

7.2. PRACTICAL IMPLICATIONS

The results of this study result in important practical implications for managers and developers of AI technologies in the hospitality sector.

Managers should be aware that customers have higher expectations of AI systems due to their perceived reliability and consistency, therefore, it is important to take this into account when making decisions regarding the use of AI systems to provide services. In the case of managers who choose to use AI systems to provide hospitality services, it is important to manage customers' expectations about these systems. Additionally, it is also necessary to invest in a robust recovery strategy to be applied in the case of service failures caused by AI systems, which must include what to do and how to reward the customer in case of minor failures in order to mitigate the negative impacts on satisfaction, trust and loyalty.

For developers of AI technologies, this study helps to understand that minor AI failures have a significant impact and, therefore, they should focus on continuous improvement of AI systems used in the hospitality sector, minimizing the error rate and increasing reliability.

8. LIMITATIONS AND FUTURE RESEARCH

Despite the relevant theoretical and practical implications of this study, it is important to note some limitations.

Firstly, this study involves service failures in a specific sector (hospitality) and takes into account a concrete example of the use of AI in this sector (AI concierge), therefore, the results are limited to the sector and AI application under study. However taking into account the insightful results obtained, this study reveals a research gap in studying the impact of using AI in other sectors, following that AI is increasingly becoming an important part of many industries (Lu, 2022) and that the results may vary from sector to sector taking into account that customer perceptions are different, and these influence their reactions in the event of a service failure (Hess et al., 2003).

It is also important to consider that the majority of respondents to this study live in Portugal and are on average 30 years old, depending on the country and age, the results may differ. Additionally, taking into account the academic purpose of this study, a non-probabilistic convenience sampling was used to conduct this research, reaching a sample of 220 respondents, which may generate biased results due to the limitations of the sample in question.

Additionally, the study used a scenario-based experimental design approach in the form of an online questionnaire, which also reveals a limitation of this study since the scenarios used in the studies can bias the reactions of respondents and an online questionnaire can result in low accuracy due to lack of attention when answering or failure to interpret questions.

In this study, three variables were used to evaluate the impact of the same service failure caused by AI vs human person, however, customers' perceptions and reactions to service failures caused by AI are comprehensive, so this study does not completely answer the research gap in the current literature. In future research, it is necessary to evaluate other variables in order to fully understand the impact of service failures caused by AI systems in customer-brand relationships.

Therefore, given that this study proves that the impact of a service failure caused by AI may be different from a service failure caused by a human person, but taking into account its limitations, some research gaps are revealed to study this topic in other sectors, taking into account different AI systems, evaluating new variables, considering different age groups or restricting the population to a specific country.

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APPENDIX

8.1. APPENDIX A

The scales of the study variables

Construct	Number	Adapted Items	Source
Magnitude of the Failure	MF1	In your opinion, this service failure is a minor problem(1), major problem(7).	(Bougoure et al., 2016)
	MF2	In your opinion, this service failure is a little inconvenience (1), a big inconvenience (7).	
	MF3	In your opinion, this service failure is a mild failure (1), serious failure (7).	
Customer Satisfaction	CS1	I am fully satisfied with the service from Hotel 5*.	(Lopes & da Silva, 2015)
	CS2	I really like spending my holidays at Hotel 5*.	
	CS3	Staying at the Hotel 5* was a very pleasant experience.	
	CS4	I'm sure that I made the correct choice when I booked my holidays at Hotel 5*.	
	CS5	Facing the solution received, I was pleased to stay at Hotel 5*.	
Brand Trust	BT1	I trust Hotel 5*.	(Chaudhuri & Holbrook, 2001)
	BT2	I rely on Hotel 5*.	
	BT3	Hotel 5* is an honest brand.	
	BT4	Hotel 5* is safe.	
Behavioral Brand Loyalty	BBL1	I will make a reservation at Hotel 5* the next time I go on beach holidays.	(Chaudhuri & Holbrook, 2001)
	BBL2	I intend to keep booking holidays at Hotel 5*.	
Attitudinal Brand Loyalty	ABL1	I recommend Hotel 5* to my relatives and friends.	(Lopes & da Silva, 2015)
	ABL2	When people ask me about a good beach resort, I indicate Hotel 5*.	
	ABL3	I intend to continue booking holidays at Hotel 5*.	
	ABL4	In my next holidays, I will certainly consider staying at Hotel 5*.	
	ABL5	When I think about staying at a beach resort, my first choice is Hotel 5*.	

8.2. APPENDIX B

Pretest Scenarios

Scenario 1

With a luxurious decor and direct beach access, Hotel 5* offers a calm escape with spacious rooms, attentive service, and a range of facilities including an infinity pool and spa.

Consider that you have made a reservation for a week at the Hotel 5* for a room with direct beach access, however, when you check in you discover that the room where you were supposed to stay is already occupied. This happened because, amidst the bustling holiday season, George, the hotel concierge, encountered a service failure and made more than one reservation for the same room.

George corrects the error, and you are accommodated in a new room, however, due to the hotel's high capacity, the available room does not have the direct beach access that you initially booked. To compensate for the inconvenience, George offers complimentary spa vouchers and dining credits. The rest of the holidays went without any problems and the hotel's facilities and service exceeded expectations.

Scenario 2

Now, consider that you stayed at Hotel 5* and have ordered with George, the hotel concierge, your dinner to be delivered to your room. However, George misunderstood what you said, and the wrong order arrived in your room. When you made the complaint, George apologized for the inconvenience and quickly corrected the order, although, since you had to wait a little bit longer for your dinner, George compensated you with a dining credit. The rest of the holidays went without any problems and the hotel's facilities and service exceeded expectations.

Scenario 3

Now, consider that you stayed at Hotel 5* and you asked George, the hotel concierge, to make a reservation for an anniversary celebration dinner at the hotel's Michelin-starred restaurant. Due to a miscommunication, George misunderstood the day and scheduled dinner for the day before. When you don't show up for dinner, George calls to ask if you want to keep your reservation, to which you inform him that the reservation is for the next day. George corrects the reservation and the next day dinner goes as expected.

Scenario 4

Finally, consider that you stayed at Hotel 5* and requested George, the hotel concierge, assistance to arrange a snorkeling excursion for the last day of your holidays. Due to a glitch in the system, George mistakenly booked the excursion for the wrong date. There were no more places available for that day's snorkeling excursion, so you missed out on the activity you wanted to do. To compensate, George offers an excursion to choose from the ones that are still available for that day and a dining credit.

8.3. APPENDIX C

Main Study Survey

Start of Block: Consent Form

Intro Dear participant,

The following survey is a crucial component for completing the master's degree in Data-Driven Marketing at Universidade Nova de Lisboa.

In this study, we aim to understand the impact of a service failure on consumer behavior. There is no wrong or right answer, and there is no risk involved in answering any of the following questions. Remember that your participation in this survey is voluntary, which means that you are free to participate or not, as well as give up at any time. However, your responses are very important, completely anonymous, and will be used only for academic purposes. This study will take approximately 5 minutes to complete.

Consent Form

Informed Consent Form

I declare that I am 18 or over and agree to participate in this research. I declare that I was informed that my participation in this study is voluntary and that I can leave this survey at any time without penalty, and all data is confidential.

- ☐ Yes, I agree to participate. (1)
- ☐ No, I disagree to participate. (2)

Skip To: End of Survey If Informed Consent Form I declare that I am 18 or over and agree to participate in this research. I... = No, I disagree to participate.

End of Block: Consent Form

Start of Block: Intro

1 In the next section, a hypothetical situation will be presented. Please **read carefully**.

End of Block: Intro

Start of Block: Scenario 1: AI-provided service with a minor service failure

Scenario 1 With luxurious decor and direct beach access, Hotel 5* offers a calm escape with spacious rooms, attentive service, and a range of facilities including an infinity pool and spa.

George, the Artificial Intelligence (AI) concierge at Hotel 5*, is a cutting-edge addition to the hotel's guest services. Equipped with advanced artificial intelligence algorithms, George is designed to assist guests with various requests, including room bookings, restaurant recommendations, travel arrangements, and activity bookings. George leverages natural language processing to understand and respond to guest inquiries promptly, offering personalised recommendations based on individual preferences and past interactions.

Consider that you stayed at Hotel 5* and you asked George to make a reservation for an anniversary celebration dinner at the hotel's Michelin-starred restaurant. Due to a miscommunication, George misunderstood the day and scheduled dinner for the day before. When you don't show up for dinner, George calls to ask if you want to keep your reservation, to which you inform him that the reservation is for the next day. George corrects the reservation and, in the next day, dinner goes as expected.

End of Block: Scenario 1: AI-provided service with a minor service failure

Start of Block: Instructions

1 In the next sections, you will find **questions related to the scenario presented**. Please read each question **carefully** and pay **attention** to the scales used.

End of Block: Instructions

Start of Block: Magnitude of the Failure

Instructions Keeping the scenario in mind, please answer the following questions.

MF1 In your opinion, this service failure is a...

(1)	☐ 1. Minor Problem (1)	☐ 2 (2)	☐ 3 (3)	☐ 4 (4)	☐ 5 (5)	☐ 6 (6)	☐ 7. Major Problem (7)
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MF2 In your opinion, this service failure is a...

(1)	☐ 1.. Little Inconvenienc e (1)	☐ 2 (2)	☐ 3 (3)	☐ 4 (4)	☐ 5 (5)	☐ 6 (6)	☐ 7. Big Inconvenienc e (7)
-----	---	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	---

MF3 In your opinion, this service failure is a...

(1)	☐ 1. Mild Failure (1)	☐ 2 (2)	☐ 3 (3)	☐ 4 (4)	☐ 5 (5)	☐ 6 (6)	☐ 7. Serious Failure (7)
-----	--	--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	---

End of Block: Magnitude of the Failure

Start of Block: Customer Satisfaction

CS Keeping the scenario in mind, to which extent do you agree with the following statements?

	1. Strongly Disagree (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7. Strongly Agree (7)
I am fully satisfied with the service from Hotel 5*. (1)	☐	☐	☐	☐	☐	☐	☐
I really like spending my holidays at the at Hotel 5*. (2)	☐	☐	☐	☐	☐	☐	☐
Staying at the Hotel 5* was a very pleasant experience. (5)	☐	☐	☐	☐	☐	☐	☐
I'm sure that I made the correct choice when I booked my holidays at Hotel 5*. (6)	☐	☐	☐	☐	☐	☐	☐
Facing the solution received, I	☐	☐	☐	☐	☐	☐	☐

was
pleased to
stay at
Hotel 5*.
(7)

End of Block: Customer Satisfaction

Start of Block: Brand Trust

BT Keeping the scenario in mind, to which extent do you agree with the following statements?

	1. Strongly Disagree (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7. Strongly Agree (7)
I trust Hotel 5*. (1)	☐	☐	☐	☐	☐	☐	☐
I rely on Hotel 5*. (2)	☐	☐	☐	☐	☐	☐	☐
To confirm your attention, please select 4 for this question. (5)	☐	☐	☐	☐	☐	☐	☐
Hotel 5* is an honest brand. (6)	☐	☐	☐	☐	☐	☐	☐
Hotel 5* is safe. (7)	☐	☐	☐	☐	☐	☐	☐

End of Block: Brand Trust

Start of Block: Behavioral Brand Loyalty

BBL Keeping the scenario in mind, to which extent do you agree with the following statements?

	1. Strongly Disagree (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7. Strongly Agree (7)
I will make a reservation at Hotel 5* the next time I go on beach holidays. (1)	☐	☐	☐	☐	☐	☐	☐
I intend to keep booking holidays at Hotel 5*. (2)	☐	☐	☐	☐	☐	☐	☐

End of Block: Behavioral Brand Loyalty

Start of Block: Attitudinal Brand Loyalty

ABL Keeping the scenario in mind, to which extent do you agree with the following statements?

	1. Strongly Disagree (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7. Strongly Agree (7)
I would recommend Hotel 5* to my relatives and friends. (1)	☐	☐	☐	☐	☐	☐	☐
When people ask me about a good beach resort, I will indicate Hotel 5*. (2)	☐	☐	☐	☐	☐	☐	☐
I intend to continue booking holidays at Hotel 5*. (7)	☐	☐	☐	☐	☐	☐	☐
In my next holidays, I will certainly consider staying at Hotel 5*. (8)	☐	☐	☐	☐	☐	☐	☐
When I think about staying at a beach	☐	☐	☐	☐	☐	☐	☐

resort, my
first choice
is Hotel 5*.
(9)

End of Block: Attitudinal Brand Loyalty

Start of Block: Demographics

Q21 Finally, please answer the following questions about your demographics:



Age Please indicate your age (numerical values only).

Gender Please indicate your gender.

- ☐ Male (1)
 - ☐ Female (2)
 - ☐ No-Binary (3)
 - ☐ Prefer not to say (4)
-

Education Degree Please indicate the highest degree you have completed.

- ☐ Primary School (1)
- ☐ High School (2)
- ☐ Bachelor Degree (3)
- ☐ Master or postgraduate degree (4)
- ☐ Docturate degree (5)



country In which country do you currently reside?

▼ Afghanistan (1) ... Zimbabwe (1357)

End of Block: Demographics

Start of Block: Scenario 2: AI-provided service with a major service failure

Scenario 2 With luxurious decor and direct beach access, Hotel 5* offers a calm escape with spacious rooms, attentive service, and a range of facilities including an infinity pool and spa.

George, the Artificial Intelligence (AI) concierge at Hotel 5*, is a cutting-edge addition to the hotel's guest services. Equipped with advanced artificial intelligence algorithms, George is designed to assist guests with various requests, including room bookings, restaurant recommendations, travel arrangements, and activity bookings. George leverages natural language processing to understand and respond to guest inquiries promptly, offering personalised recommendations based on individual preferences and past interactions.

Consider that you stayed at Hotel 5* and requested George's assistance to arrange a snorkelling excursion for the last day of your holidays. Due to a glitch in the system, George mistakenly booked the excursion for the wrong date. There were no more places available for that day's snorkelling excursion, so you missed out on the activity you wanted to do. To compensate, George offers an excursion to choose from the ones that are still available for that day and a dining credit.

End of Block: Scenario 2: AI-provided service with a major service failure

Start of Block: Scenario 3: Human-provided service with a minor service failure

Scenario 3 With luxurious decor and direct beach access, Hotel 5* offers a calm escape with spacious rooms, attentive service, and a range of facilities including an infinity pool and spa.

George is the hotel concierge with over two decades of experience, embodying a rare blend of responsibility, efficiency, and meticulous attention to detail. He goes beyond the call of duty to forge genuine connections with guests, taking the time to understand their preferences and desires in order to tailor their experience to perfection and creating unforgettable moments.

Consider that you stayed at Hotel 5* and you asked George to make a reservation for an anniversary celebration dinner at the hotel's Michelin-starred restaurant. Due to a miscommunication, George misunderstood the day and scheduled dinner for the day before. When you don't show up for dinner, George calls to ask if you want to keep your reservation, to which you inform him that the reservation is for the next day. George corrects the reservation and, in the next day, dinner goes as expected.

End of Block: Scenario 3: Human-provided service with a minor service failure

Start of Block: Scenario 4: AI-provided service with a major service failure

Scenario 4 With luxurious decor and direct beach access, Hotel 5* offers a calm escape with spacious rooms, attentive service, and a range of facilities including an infinity pool and spa.

George is the hotel concierge with over two decades of experience, embodying a rare blend of responsibility, efficiency, and meticulous attention to detail. He goes beyond the call of duty to forge genuine connections with guests, taking the time to understand their preferences and desires in order to tailor their experience to perfection and creating unforgettable moments.

Consider that you stayed at Hotel 5* and requested George's assistance to arrange a snorkelling excursion for the last day of your holidays. Due to a glitch in the system, George mistakenly booked the excursion for the wrong date. There were no more places available for that day's snorkelling excursion, so you missed out on the activity you wanted to do. To compensate, George offers an excursion to choose from the ones that are still available for that day and a dining credit.

End of Block: Scenario 4: AI-provided service with a major service failure

