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The Food & Beverage Industry in a Pandemic Context

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Master's in Hospitality Management & Tourism

Supervision:

Profº. Ph. D Leandro Luís Ferreira Pereira, Assistant Professor, Business Management Department, ISCTE Business School

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BUSINESS
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This Master's Degree has represented a challenge for the past two years, my future self will probably laugh when looking back and thinking the difficulty the thesis represented in comparison with what I might be facing in the future.

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Resumo

A pandemia tem vindo a tornar-se uma preocupação séria desde a sua chegada no início do ano de 2020. O principal objetivo desta dissertação é o estudo do declínio da Indústria de Comidas e Bebidas, face à pandemia de Covid-19. Através desta investigação estudámos a classificação da nossa amostra, os medos e a adaptação pela qual os inquiridos estão a passar e por fim a alteração de rotina e por consequente o impacto na indústria. Com a finalidade de responder a estas questões, baseámos a nossa investigação debruçando-nos no desenvolvimento de um questionário que distribuímos e analisámos, um modelo de preditivo e análise de Clusters. As constatações que retirámos deste estudo foram relevantes e levaram-nos à confirmação dos medos e desconfortos mais impactantes quando frequentamos um estabelecimento de restauração num contexto pandémico, mas também às causas que levam os inquiridos a reconsiderar a decisão de frequentar estes estabelecimentos.

Palavras chave: Indústria de comidas e bebidas, pandemia, comportamento do consumidor, restauração

Sistema de classificação JEL:

L66 - Comida; Bebidas; Z32 – Turismo; Desenvolvimento

Abstract

The pandemic has been a serious concern since its arrival in early 2020 around the globe. The aim of this dissertation is to study the decay of the Food & Beverage Industry, facing the pandemic of Covid-19. Throughout this research we have studied the classification of our sample, the fears and discomforts of our respondents regarding the new reality faced and the routine alteration of inquiries and by extension the impacted in the industry. In order to respond to these questions, we have based our investigation in the conception of a survey we have distributed and analyzed, a predictive model and clustering analysis. The findings drawn in this study were meaningful and lead us to the confirmation of the biggest fears and discomfort reasons when attending restaurants in a pandemic context but also the causes that make individuals reconsider their attendance in restauration establishments.

Keywords: Food & Beverage Industry, pandemic, consumer behavior, restauration

JEL classification system:

L66 - Food; Beverages; Z32 – Tourism; Development

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1) Introduction

The food & beverage industry is a wide corporation known to us all. As Woody Allen once quoted – "Why does man kill? He kills for food. And not only food. Frequently there must be a beverage." Throughout this project, the food and beverage industry and its apparent decay was our focus. According to (Cajner et Al, 2020) employment in accommodation and food services decreased in 53% between February and April. Moreover, (Mckinsey and Company, 2020) alongside the World Travel and Tourism Council have predicted the Food and Beverage industry as the most affected in the World by the Pandemic, Covid-19.

In 2019, tourism represented over 12% of the gross domestic product and the touristic revenue increased in 8,1% in 2019, leading us to conclude that Portugal is a country relying on Tourism. Compared to other European countries this percentage is quite high and the negative consequences were according to some, very predictable.

Following the pandemic of Covid-19 the World has been facing this year, the impact over the sector has already shown its colors and the scenario predicts to get worse in the depression yet to come. In fact, we were relying on Tourism and tourist's consumptions for several years to a point that locals felt they were out of place and not the other way around.

Facing this, we are now surpassing what will most likely be the biggest depression over the past few years. In fact, in a very rapid way tourism stopped, restaurants were empty, flights were cancelled, and our hope relapsed on intern tourism. Our focal point was to understand what this Industry stands for, its consequences and people's reaction to this abrupt change once the Pandemic is surpassed in a country were Food and Beverage in alignment with Tourism were so relevant.

2) Literature Review

Key Words: Food and Beverage Management, Consumer/Buyer Behavior, Yield Management, Innovation, Service Quality

2.1) Food and Beverage Industry

In his recent book "Introdução à Gestão de Alimentação e Bebidas", (Gomes. V, 2017) states that Food & Beverage can be described as a function of directing, responsible for the provisioning, reception, stocking, distribution, production, providing services, full or light meals. The Food & Beverage department can belong to a Hotel establishment; it can be an independent unit, a banqueting/catering company, a collective restaurant business with either economic, commercial, or social activities.

When working in the Food & Beverage department, we should be aware; we are not just selling a meal, a course, or a drink. Besides the chosen product we are also selling the production, the service, the gastronomy, the ambience, the comfort, the safety and the consumer expectations. We are selling, products and services with tangible and intangible characteristics that will be judged by the costumer. When the consumer is ready to leave, he will know If his expectations were met and he will decide If he will likely recommend us or not. In 2010, the food supply chain is described by (Parfitt et al., 2010) as process respecting the steps fairly described below:

Figure 1 - Food Supply Chain Process

Source: What is the food supply chain? – Harvard Education - 2010

In the food supply chain, the process begins with the producer of goods or services with the purpose of reaching the consumer. To do so, further steps need to be surpassed – as the

packaging of the product (services can't be packed), to then be distributed, retailed reaching its final step, the consumer.

Furthermore, as shown in the figure below it is relevant to highlight that if the consumer does not buy the product or service we are producing, we won't be able to cover the costs associated with each step described above.

Figure 2 - Food Supply Chain - Costs Process

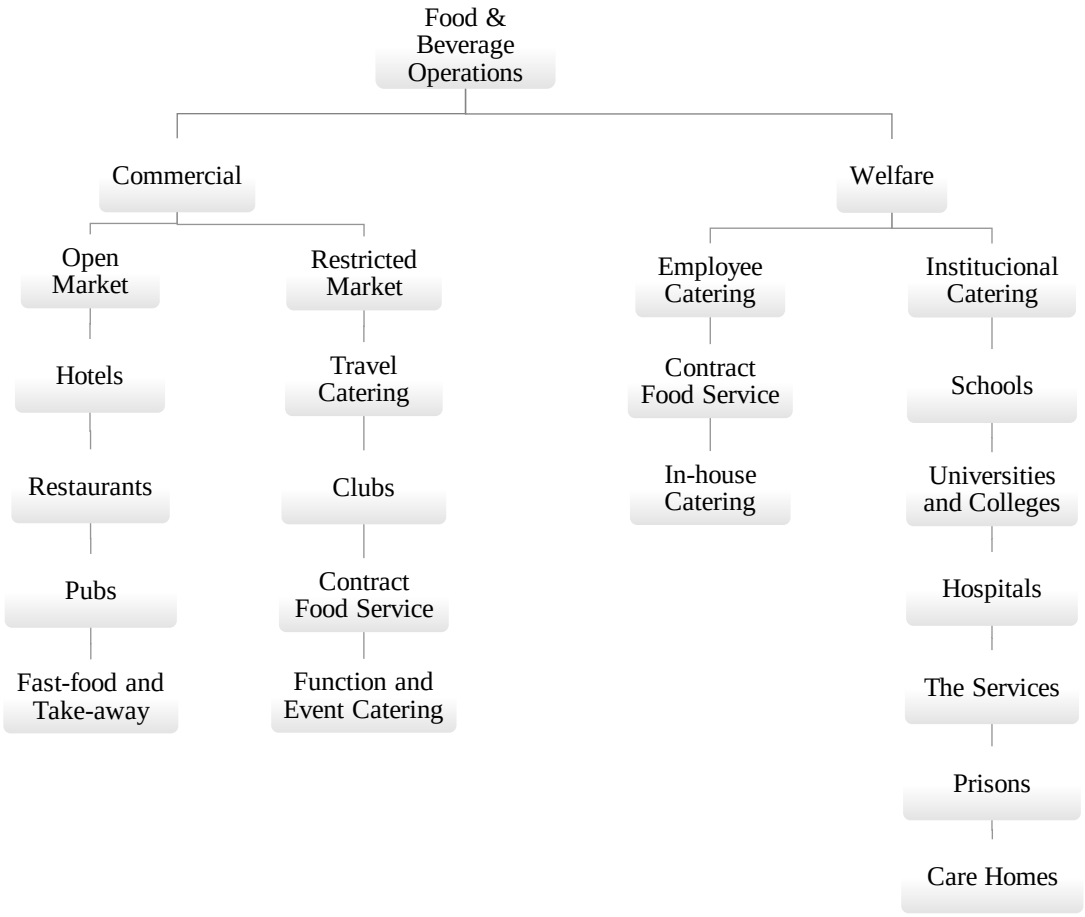
Source: What is the food supply chain? – Harvard Education - 2010

2.1.1) Food and Beverage Management

In 2012, the Government of Canada, described the Food & Beverage Sector as the set of establishments with the primary function of serving meals and beverages inside or out of each establishment premises. Additionally, management stands for the activity of dealing and controlling people and as Steve Jobs stated: "Great things in business are never done by one person. They're done by a team of people."

Food & Beverage Services can be defined as the activities that ensure the preparation of food and the service of beverages. We could easily, define food and beverage as catering, as it reverts on the simple act of cooking and serving people.

The Food & Beverage industry is a wide corporation and throughout the years, the industry has been growing and amplifying the reach of its services, becoming a wide corporation. Below is a figure of the different Food & Beverage Operations:



*F*igure 3 - Food & Beverage Operations

Source: Food and beverage management – Bernard Davis, Andrew Lockwood, Ioannis Pantelidis, Peter Alcott published in 2012

2.1.2) Food & Beverage as a souvenir

In the past few years, food has become an art, an experience not to be missed, specially, when travelling. According to (McKercher et al., 2008) “Dining out is common among tourists and food is believed to rank alongside climate, accommodation, and scenery in importance to tourists’’; meaning that tasting local food is part of the experience while visiting or staying in a country, it enriches our travel experience.

There are certain factors that may turn food unique and by extension create a unique experience. Some of these factors are evoking positive and active emotions and can act as a catalyst for the well-being in agreement with (Cardello et al., 2016) and (Jaeger et al., 2017).

2.1.3) Changes in the Food & Beverage Industry

Throughout the years, the concept of eating or dinning out has changed. We could almost say that the activity is banalized. (Pardey, P.G., et al.,2015) reveal that the energy consumed per person increased from 2250 kcal in 1960s to 2880 kcal. Therefore, the two main concerns for any establishments with a connection to food are: specialization and branding.

It has been discussed by a few authors that food and beverage management is broken alongside its original skills and knowledge. Nowadays, it is more important to focus on marketing tools and productivity knowledge. A restaurant rarely sells itself anymore, especially with the variety the consumer has at his disposal.

The longer the world develops, new concepts appear as for example vegetarian or vegan food and the longer we demand more from the industry: More restaurants, more variety, more different concepts, and good food at an average price. Facing this, the question is to decide if it is more important to meet the consumer's demand for variety or a wider choice in the presented menus. Moreover, we cannot discard that wider choices will imply that each establishment spends more money to be able to provide more selection and not all establishments are willing to take this risk.

The fact is some costumers are willing to choose and experience new trends and types of foods. Throughout a study by (Loss et al, 2017), a conclusion was drawn: There is a higher acceptance over innovative food. This acceptance surpasses the fear of Neophobia which stands for the fear of disliking something new or not familiar. Furthermore, (Loss et al, 2017) concluded that even among neophobic consumers, some foods might be an exception. According to the website article, Hospitality Insights by EHL, more and more people seek for differentiation in food.

In 2018 the most significant trends in F&B were plant-based food, the consumers care more and more about having a healthy lifestyle without having to sacrifice taste. Also, there has been a significant increase on meat made from animal cells to reduce primarily slaughterhouses and carbon food point. New healthy nourishments are appearing in the consumers lives. Nowadays, there is no need to wait for lunch or dinner time to eat something, food is everywhere at any time and the focus of many restaurants is to give the customer a unique experience.

2.1.4) Strategic Alliances between Hotels and Restaurants

Collaboration is often associated with relational governance. It is based on trust, transparency, and shared knowledge between firms as (Cao et al., 2015) stated. In the past few years, Hotel establishments have been integrating F&B services in their business. The main questions asked to ensure success are:

- Customers' needs and expectations
- Alignment between the Hotel and the food and beverage concept
- Turning the Hotel Restaurant to improve the property and by extension would this give the Hotel a competitive edge?

It is known, companies want to maximize their potential profit, therefore these alliances were created. These may bring assets such as: the creation of financial benefits; providing customers with more value; improve the property's image, reinforce the competitive position, and create operational advantages.

One example we could consider highlighting this new successful trend is: Trader Vic's. It started as a restaurant, originally founded in 1937 by Victor Bergen. In 1949, 13 Western Hotels integrated Trader's Vic's turning a Hotel-Restaurant model in 9 countries. 60 years later, Trader Vic's still operates in very known locations in the United States such as The Beverly Hilton or the Palmer House.

Ultimately, this strategy will develop some issues in the relationship between the buyers and the suppliers. (Kim & Choi, 2015) state that one of the main problems will be the conflict of interests between both parties. Recently, (Cao & Lumineau, 2015) have enhanced that contractual and relational governance mechanisms are applied in collaborations to maximize the created value. Even so, it does not necessary mean both parties will take advantage.

Few authors have studied the issues existing between buyers and supplier, usually the focus falls only over one side. Even so, (Wiedmer & Boyer, 2015) are 2 of the few authors that have studied both sides. Finally, we believe the best approach between Buyers and Suppliers is creating value by reducing costs and increasing costumers.

2.2) Consumer Behavior

There are three models that could be considered in Buyer behavior according to (Paine, 2017):

Economic Model: Focuses on the theory that consumer behavior is governed by the idea of getting the most benefits while minimizing costs. The influence of the economic indicators such as the consumer's purchasing power and the price of competitive products for consumer behavior is elaborately discussed in this economic model.

Learning/Psychoanalytical Model: Consumer behavior is influenced by the conscious and the subconscious mind according to (Gomes, 2018). This model was conceptualized based on the idea that consumer behavior is governed by the need to satisfy basic and learned needs. The need for food, clothing and shelter like basic needs and fear and guilt like learned needs was considered as the variables in this model. Thus, a consumer will tend to buy things that will satisfy their needs and provide satisfaction.

Sociological model: Considers that the buying pattern of a consumer is based on his role and influence in the society; and is influenced by the people he associates with.

- How can we describe the buyer behavior?

(Zaefarian et al, 2017), defend that an effective management between the Buyer-Supplier relationship is the foundation of a firm's competitive advantage. According to (Kotler and Keller,2011) we can define buyer behavior as - "the study of the ways of buying and disposing of goods, services, ideas or experiences by the individuals, groups and organizations in order to satisfy their needs and wants.". It is relevant to understand, there are several characteristics that lead and influence a consumer to buy a product or a service.

Below, a brief description of aspects that influence the consumer choice:

- Culture: The most determinant factor in buyer behavior is Culture, it can be expressed thought food, accommodation, outfits, and art. Culture is a dynamic factor, that adopts to each consumer social environment. Examples can be perception, desire and behaviors the consumer learns in society.
- Social Class: Refers to the society divisions in which the belonging members share the same values, interests and behaviors.
- Social Groups: Groups not large enough to be considered as a social class (i.e. Sports team or college class) Even so, with the power to influence the behavior of individuals directly.

- Family: The most relevant characteristic to influence the buyer. The behavior of the buyer will be influenced by the life cycle of the family. In 2018, Gomes emphasizes that a consumer's behavior may also be influenced by the people or culture that the individual most associates with.
- Social Networking: With the current development of the online markets, digital influencers etc. Social Networks are the strongest communities where you socialize, give your opinion, and most importantly acquire information regarding any product or service you may consider try or buy.

We can also consider in the Buyer Behavior Process, the occupation, financial situation, lifestyle, and personality of everyone. These are not clear factors, but they are helpful to better understand each consumer and by extension its needs. Finally, there are four psychological factors that should be taken under consideration:

- Motivation: Describes a need turning into motivation as soon as it reaches a high intensity. The Hierarchy of Needs studied by (Maslow, A. 1954), states that individuals live to fulfill the satisfaction of certain needs and that is how each individual reach motivation. According to the pyramid below, Maslow described the most relevant needs, taking under consideration that physiological needs are the most relevant. Even if the Maslow theory has been developed a few years ago, it is still considered as a relevant and accurate theory.

Figure 4 - Maslow Hierarchy of Needs

Source: McLeod, S.A (2007). Maslow's Hierarchy of Needs.

- Perception: Facing the same situation, two individuals may act differently depending on external factors. Perception defines the process selected by each individual where they select, organizes, and interprets the situation.
- Learning: Most of the human behavior regards what everyone learns in life, through impulses, stimulus and reinforcements. From the moment an individual tries a product or service, they analyze their level of satisfaction.
- Beliefs: Due to our life learnings, we acquire beliefs and attitudes that will influence the buyer's behavior such as the Muslim culture not eating pork meat.

2.2.1) Consumers as a part of Food & Beverage Industry

The consumer purchasing behavior was defined by (Solomon, 2008), as several activities that conducted or perceived leading to the purchase. Even if we have a strong behavioral intention, (Montaño & Kasprzyk, 2017) state there is a need of knowledge and skills.

Usually companies measure the purchase intentions of the consumer throughout the following survey questions: "How likely are you to purchase product x in the next y months?" on a scale with response options such as where 5="definitely will buy," 4="probably will buy," 3="may or may not buy," 2="probably will not buy," and 1= "definitely will not buy." These types of questions can also be used for opinions on product launchings or tests.

Moreover, (Jisana, 2014) defends that the creation of value for consumers, starts with the understanding from marketeers of behavior of the consumers facing products or services. Furthermore, the author defends a five-stage model suggesting the client usually faces five stages**:**

- Need of recognition
- Information search
- Evaluation of alternatives
- Purchase decision
- Post-purchase behavior

Finally, (Kotler, 2012) emphasizes the buying process starts long before any purchase. Moreover, (Kaspars et al, 2016), concludes by stating individuals begin by obtaining information, they evaluate and interpret and only then choose what to buy. Finally, after several studies by numerous authors, we can draw a scheme with the most relevant aspects of the buyer behavior, below, based on (Giampietri, 2017) in Food Quality and Preference:

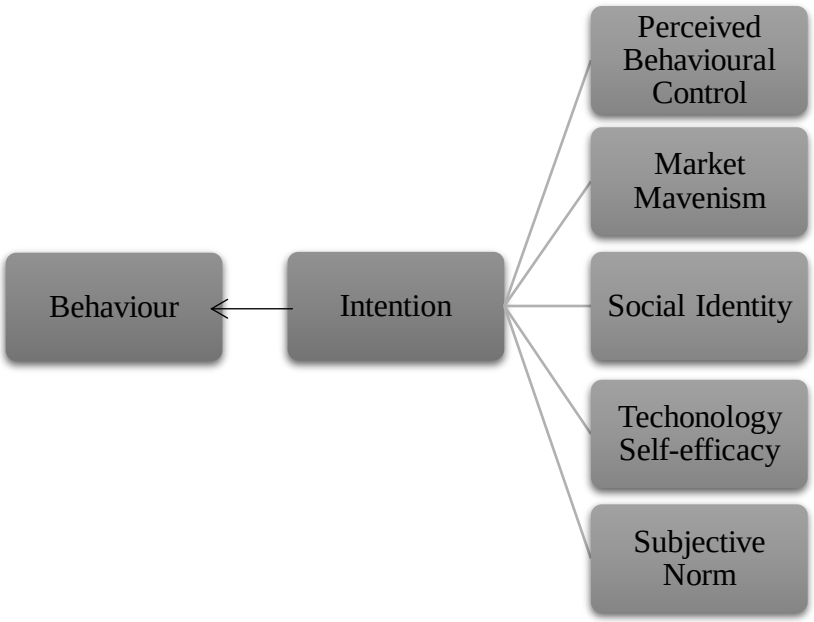


Figure 5 - Model for Consumer Behavior Focusing on Generation Z – 2017

Source: Proceedings of the International Conference on Industrial Engineering and Operations Management Dubai, UAE, March 10-12, 2020

- Subjective Norm: Stands for the approved beliefs of everyone in society. The Subjective norm is determined by the perception of social pressure in society leading to the intentional behavior.
- Perceived Behavioral Control: Refers to the perception regarding the ability to have a certain behavior. The intention and the perceived behavioral control can predict the individual's behavior.
- Market Mavenism: Individual's opinion based on a wide range of information and consumer knowledge about several products, places, and other dimensions of markets
- Social Identity: Portion of an individual's self-concept derived from perceived membership in a relevant social group. Defines how we identify with others in agreement with our similarities.
- Technology & Self-efficacy: Describes the ability of an individual to successfully perform a technological task. In agreement with (Jing & Dothang, 2018) this self-efficacy is directly associated with Generation Z whose personal growth is entangled with technology. The theory states that people with more self-efficacy are more engaged in technological activities and will more likely persist in terminating them.

Finally, (Meiselman., 2007) categorized three variables regarding the discussed theme:

- Consumer: To achieve great success or at least to try, the most important step is to have a target consumer. A product or service made for everyone will most likely fail as every consumer is different, the product or service will end up by not be anyone is favorite and will rapidly be replaced by competition.
- Food: For costumers to be interested in the selling service, the food needs at least to be of good quality, good appearance, worth value and of course, meet the expectations. (Tuorila., 2007) stated that the most important aspect, in food is sensory quality.

Usually, what new services in the market try to put in place to attract their target is a distinctiveness, appealing to the emotions, conveying status and lifestyle, or coming from an origin.

- Environment: According to (Schifferstein & Hekkert, 2007), we live in a world where the environment is constantly changing. As stated, above food is nowadays, not only the act of eating, it is an experience, a souvenir. There are a lot of establishments we could consider as an example, such as: Maxime Restaurant or Beco of José Avillez; which represents the combination of high-class food with a burlesque show.

2.3) Yield Management

Yield or Revenue Management can be characterized by a method for managing profitably and increasing revenue in agreement with the definitions of (Kimes, 2007) and (Bardi, 2003). As both authors state, the concept was born in the aviation industry in the seventies and brought to the Hospitality Industry in the eighties to help with the decision-making process.

Moreover, Bardi reaches the conclusion that this tool worked for each industry is because they have one big similarity: Seasonality. He completes his analysis and states that Yield Management in the Hospitality Industry is based on: Number of available rooms, number of rooms sold, number of guests and its number per rooms and finally revenue per sold room. (Brealey et al., 2015) affirmed the objective of any company is to maximize value. (Watson et Head, 2016) completed the allegation by stating that this is a controversial issue as it is not possible to define the profit maximization clearly.

Furthermore, (Guimaraes, et al., 2012), affirm that tourism has a meaningful part in services referring to the economic and social development ending up by stimulating production and consumption. Yield Management is a method which can help a firm to sell, the right inventory

unit to the right type of costumer, at the right time and for the right price. The method is applied so price sensitive costumers can buy in the peak period and price insensitive costumers willing to buy off peak times can do so. (Powers & Barrows., 2004), state that when applying Yield Management, the first step to is doing a study based on previous years to define right prices for future revenue. In sum, (Kimes, 2007) concludes the application of Yield Management has been more effective when applied to operations that have relatively fixed capacity, predictable demand, perishable inventory, appropriate cost and pricing structure, uncertain and variable demand.

2.4) Innovation

Recently defined by (Martinez, 2013) as new ways of adding value to all our business activities. (Bresciani et al., 2015), defend companies do not face innovation individually anymore, on the contrary they must adopt new alternative innovation approaches. (Lefebvre et al., 2015), completes this analysis by stating that despite the F&B Industry development there are few companies engaged in open innovation.

In agreement with a survey developed by the Grocery Manufacturers Association in 2009, the two main reasons why a product fails are: "consumer found no new or unique value proposition" (71%) and "the product failed to meet consumer needs" (61%). (Huang & O'Brien, 2015) reiterate that innovation strategies fail if they are not executed efficiently.

Recently, companies have established new strategies to launch new products or services, usually following the framework below:

- Corporate Innovation

Should look 3 to 5 years ahead, must be compatible with corporate and marketing plans and not depend in a year plan. – More considered, inventive, protectable, and profitable New Product Development.

- New Product Development Process (NPD) Innovation

As stated above, in the past 20 years, companies have been establishing their own processes for innovation. These processes are in fact project templates. Below, an example usually considered:

Strategy Development → Product and Brand Strategy → Consumer Insight Finding → Idea Generation → Concept Development → Prototyping → Scale Up → Launch → Review → Continuous Improvement

To maintain competitive advantage, each phase of the project should be better, faster, cheaper and open to innovation. Meaning that we are the ones deciding on projects failures or successes.

It is much more important and likely to achieve success if we take under consideration our target's opinion in the NPD development of new products in a higher standard – The success rate can double and give a 70% market participation in opposition to the companies that develop this step poorly.

- Channel Innovation

This point calls for the innovation in the different industries. When owning a business, we currently remind and question ourselves on the following points:

- What are we supplying?
- Where are our costumers going to want It?
- Where are our costumers going to consume It?
- How are we going to manufacture and transport It?
- Why should our consumers want it?
- Who is our target?

Facing the questions above, we can sum that we should redirect our business according to the industry we belong to but more importantly according to our consumers and their needs. We need to focus on our target and market segment and not develop products or services that are reachable to anyone as the success rate will be what we expect.

To finalize this theme, according to Fifty Years of Marketing Wisdom, we can sum up that the most important part in NPD and when owning a business is to know your consumer and understand your costumer's needs.

2.5) Quality

2.5.1) Quality Concept

"Quality means doing it right when no one is looking" as Henry Ford stated. A statement completed by Deming, Edwards – "Quality is everybody's job." Furthermore, in agreement with (Drucker, Peter), quality is not explained by high costs or difficulties in the making process. He states, quality comes from the value and use each product has for everyone.

Moreover, there is no typical definition or 100% correct way to define this concept. Nevertheless, we can try and sum up the concept as follows: Quality is difficult to measure and define as it is a wide concept. It considers aspects as safety, comfort and satisfaction. Quality is the difference between the costumer perception of the service provided and the expectation of the consumer, arising from needs.

Additionally, we can sum up in the presented table below, the quality management evolution process throughout the years as follows:

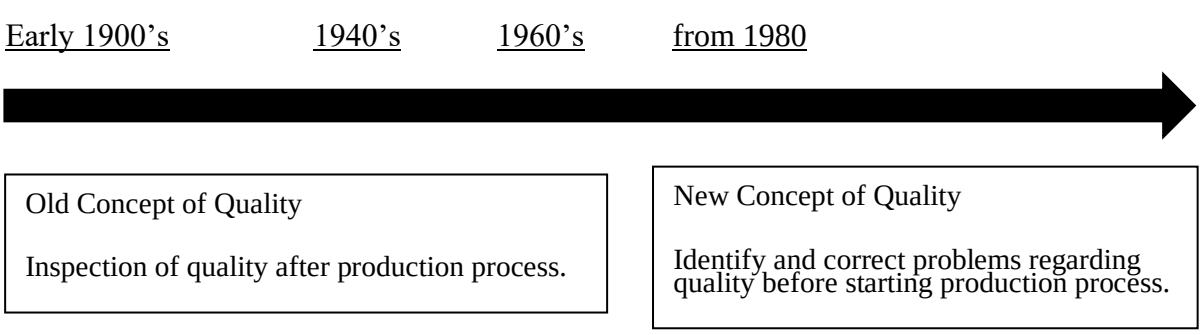


Figure 6 - Evolution of the Quality Concept

Source: Operations Management by R. Dan Reid & Nada R. Sanders – 2007

2.5.2) Improvement and Quality Evaluation

Total quality management (TQM) can be described as the organization effort to improve the quality of products/services to achieve long-term success through customer satisfaction. TQM mainly focuses on the customer – needs and its continuous changes, continuous improvement, employee empowerment – a happy staff will most likely transmit to the costumer a good feeling, use of quality tools, process management, product design and managing supplier quality. It is relevant to say that not all companies decide to pursue Total Quality Management in the company's development and success achieving.

Moreover, there are more ways to study and evaluate quality. We could also consider, the Multi criteria decision analysis, a tool that integrates Dineserv and Topsis – a concept introduced by

(Stevens & Knutson) several years ago. Both represent measurement tools for evaluating quality in the Restaurant service. It is important to state that Dineserv is based in the gap between customer's expectations and perceptions in the Food & Beverage industry and focuses on the following aspects:

Figure 7 - Dineserv Model Focusing on Food & Beverage Industry

Source : Computers & Industrial Engineering Volume 137, November 2019, 106046

- Tangibles: Standing for visually attractive and comfortable areas, impeccable staff, and space.
- Reliability: Standing for the delivery of the promised and expected service.
- Responsiveness: Standing for a quick service for the costumer's request without compromising the quality of the location.
- Assurance: Standing for the confidence the staff should be able to present to the costumer making him feel safe and comfortable.
- Empathy: Stands for the creation of a relationship with the customer making him feel a priority and having his best interests at heart.

According to (Ulkhaq et al, 2016), despite its efficiency very few workers support the tool use.

Finally, (Siew et al, 2018) developed a new tool - Ahp-Topsis. Its main concept is to prioritize the criteria when selecting a fast-food restaurant. The criteria under consideration are customer service, efficiency, price, environment, flexibility, and location.

2.5.3) Service quality

When referring to hospitality management, the first theme to consider is service management, the main example in the hospitality world. Service quality and product quality are the most relevant factors to achieve customer satisfaction in the food and beverage industry. Moreover,

if we achieve the customer satisfaction, we will more likely also achieve the revisiting intentions. (Ismail et al., 2009), defend that the quality of the provided service has an impact on the costumer's behavior and will influence the revisit or re-buying intentions.

Throughout the years, there have been several discussions between several authors, regarding the best tools to measure quality. In the past 25 years, the Serv Qual Model of Parasuraman has been considered the most efficient tool to fulfill this purpose. (Liu R, et al, 2015) emphasize that the Servqual Model is the most common model to measure quality.

According to Parasuraman, the service quality is defined by the difference between the perceptions and expectations of the presented service. Additionally, the factors directly influencing the expectations are the perception of the costumer's needs, the extern communication of the company, the costumer's feedback, and experiences. This model focuses on 5 dimensions as we can see in the diagram below:

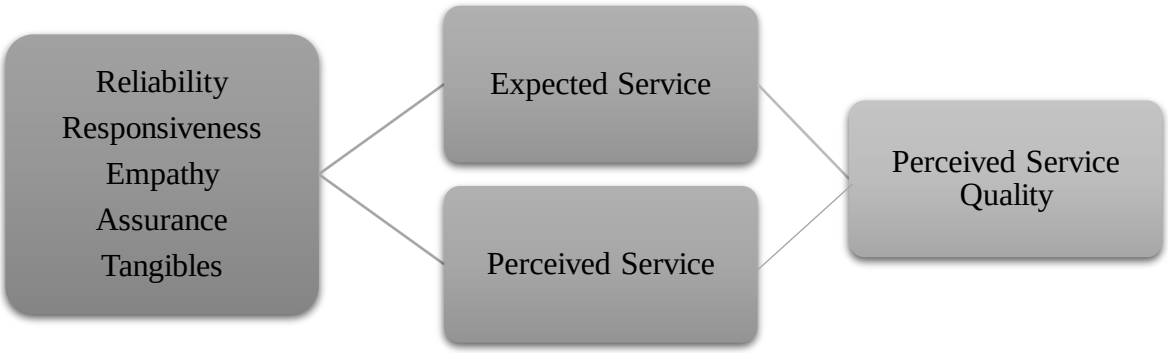


Figure 8 - Servqual Model

Source: Computers & Industrial Engineering Volume 137, November 2019, 106046

- Reliability: Standing for the capacity to deliver the promised service.
- Responsiveness: Willingness to help the costumer's and deliver the service rapidly.
- Empathy: Special attention the organizations delivers to each costumer.
- Assurance: Knowledge and courtesy of each worker and the capacity to inspire confidence.
- Tangibles: Physical installations, equipment, and physical appearance of each worker.

Furthermore, we can see there is no universal definition of quality but however, we can see that service quality is one of the most important factors when opening a Food & Beverage business.

Its most important characteristics are the perfection of the service and the offered products, the consistency of the business, the waste elimination, the speed in delivery, the conformance to requirements (For example: Does my business meet my chosen target?), doing it right the first time because first impressions are crucial and the total customer satisfaction; a happy costumer will more likely come back and/or talk about my business (word of mouth).

Finally, (Gomes, V, 2017) acknowledges that service quality in Food & Beverage is only achieved when a costumer leaves the establishment with exceeded expectations. Meaning that, in the costumer's opinion the expected quality was surpassed through the service provided.

3) Research Methodology

3.1) Critical Analysis

Following the analysis above and considering the scenario we are facing with the pandemic Covid-19, the table below summarizes the most relevant questions to move forward to the Methodology.

Literature Review Issues	Author Reference	Research Question	Research Objectives
-	-	What type of individual is answering the questionnaire? Which individuals should we considering when analyzing our data?	Considerations on the sample and the characterization.
How can we escape the fears of returning to our pre pandemic life?	(Cardello, 2016) (Jaeger et al., 2017) (McKercher et al; 2008) (Parasuraman)	What are the main fears when entering a restaurant? What are people afraid of?	Study the individuals fears and life adaptations in comparisons to the food and beverage industry, facing Covid-19.
Are individuals willing to move forward facing a difficult situation or do they rather await stability.	(Maslow, A. 1954) (Cao & Lumineau, 2015) (Schifferstein & Hekkert, 2007)	Did people totally stop to attend restaurants, or some are still trying to maintain the normal routine?	Study how the consumer behavior has altered facing Covid-19, pandemic.

Firstly, we begin by characterizing our sample as we want to understand what type of people are responding to our survey. We move forward to (Cardello et al., 2016) and (Jaeger et al., 2017) thoughts. These authors state - "there are certain factors that may turn food unique and by extension create a unique experience. Some of these factors are evoking positive and active emotions."

Moreover, focusing on (McKercher et al., 2008) "Dining out is common among tourists and food is believed to rank alongside climate, accommodation, and scenery in importance to tourists''. Additionally, Parasuraman states – "the factors directly influencing the expectations are the perception of the costumer's needs, the external communication of the company, the costumer's feedback and experiences.".

The authors stated above, defend that food is an art, an experience not to be missed. Furthermore, they highlight the importance of the costumer's expectations and perceptions regarding the visited establishment. Even so, facing the current situation and regulations will we be able surpass our fears and focus on the importance this activity once represented to us? It is important to highlight that our focus in this study is to discover how the consumer behavior has altered during this period. Have people decided to eliminate restaurants from their lives?

We live in a World constantly changing (Schifferstein & Hekkert, 2007). According to (Maslow, A. 1954) theory, individuals live to fulfill the satisfaction of certain needs such as eating. Moreover (Cao & Lumineau, 2015) highlight that success is based on the customers' needs and expectations. Finally, (Kaspars et al., 2016) state that this process begins by gathering information and evaluating the product.

Following the statements above, we believe it is relevant to question if individuals are willing to concentrate on the experience they have been missing or they missed during the quarantine or if they will prefer to await the stability of this situation and only then, slowly return to their "normal" life.

3.2) Methodology Analysis

- Research Techniques

In this first chapter we will define the concepts that were used to create our research.

- Survey description

A survey can be defined as a research method or an examination of opinions to gather information on the topic we want to study. There are four ways to develop a survey:

- Face-to-face surveys
- Telephone surveys
- On paper surveys
- Online surveys

We decided to move forward with the online survey as we consider it to be an objective and efficient form to gather the required opinions, as we are looking for a minimum of 100 responses and focusing on acquiring around 400 responses. It is relevant to state that we considered a sample of 328 responses.

Nowadays with the easy access to internet, almost everyone can reply to these questionnaires. Furthermore, when considering the researcher, online surveys are quicker to analyze when considering a lot of responses. Finally, as the survey is anonymous and the respondents do not have any contact with the researcher, the data collected ends up by being more realistic and honest.

- Correlation Analysis

A correlation can be described as a method that highlights the strength of a relationship between two variables – the dependent variable and each of our independent variables. In order to measure the correlation between the variables we resort to the correlation coefficient which assumes values between -1 and 1 where 1 stands for a perfect positive correlation. Moreover, (Koo et al., 2016) state that the Pearson correlation coefficient is only a measure of correlation between -1 and 1.

- Clustering Analysis

When referring to clustering analysis and according to (Henning et al., 2015) in their work Handbook of Clustering analysis, clustering can be defined as setting groups for a sample or data. Clusters can be used in distinctive areas and with several approaches. In this thesis, we will use the clustering analysis to set groups of the data that was collected through our form that we will later explain in our data analysis chapter. It is also important to highlight that in agreement with (Henning et al., 2015), doctors can use clustering to classify tumors, astronomers to group galaxies etc. which leads us to understand that clustering is a broad method. Moreover, we will create from SPSS a cluster tree (dendrogram) which is basically a

clear form of enhancing the hierarchy of clusters. It is relevant to highlight the root of the tree represents a cluster and the leaves correspond to one observation.

- X-Means and Euclidian Distance

K-means is a segmentation process with a main objective of grouping variables by proceeding to the classification of objects in clusters, distance classification of the object in the centroids, minimize the sum of all Euclidian distances between each object and its centroid. Our classification/grouping of inquires was made through a X-Means analysis which resulted in 2 clusters. Moreover, in agreement with (Zendrato et al., 2020), X-Means clustering is a variation of K-Means clustering with the purpose of creating several attempts to achieve the most optimal results.

The goal of the X-mean clustering is creating groups in unlabeled data. This method provides an efficient and accelerated classification of data. Furthermore, it is important to highlight that the Euclidean Distance defines the gaps between each variable.

- Gradient Boosted Trees

The Gradient Boosted Trees is considered one of the most powerful tools to build predictive models which have the main goal of specifying a probabilistic model providing a good fit to test the data. (Cranmer et al., 2016). The gradient boosted trees can therefore be defined as a "decision tree" where we can find different alternatives, results and probabilities in agreement with the collected data.

In 1988, Michael Kearns describes a new concept – Hypothesis boosting problem - which basically means filtering our observations by leaving the controllable observations on the side and focusing on the development of new weak learnings to deal with the remaining difficult observations. The first successful boosting was the Adaptive boosting algorithm. In this algorithm, week learners stand for the decision trees with one split. The algorithm objective is to put more weight on more difficult observations rather than the ones that are already treated properly. Furthermore, we can conclude this model focuses on samples difficult to classify by giving them more weight until the algorithm is able to find a correct model.

The algorithm suffered a change (Friedman, 2001) and was known as Gradient Boosted Machines and is now recognized by Gradient Boosted Trees. Finally, it's important to state that the tree leaves represent the contributions to our forecast, by proceeding to the leaf's sum we can forecast the probability of the individuals to stop attending restaurants.

- Variables description

A variable can be defined as likely to change and may assume a dependent or independent position. When it comes to the dependent variable it stands for the consequences whereas the independent variables stand for causes or motivations. We can define our dependent variable as the one we want to study. In this case, we want to focus on the consumer/ client behavior, when considering the Food and Beverage Industry and its new regulations facing the Pandemic of Covid-19. Moreover, we consider as an independent variable the fears each individual shows.

- Population and sample description

When it comes to the population, the interviewees will be of all ages, we didn't set a specific age range as we feel it's important to have responses from all ages to create a more interesting research. Furthermore, by choosing the online survey we wanted to take under consideration people linked to Hospitality Management, Food and Beverage Industry but also people that work in completely different areas. As we mentioned above, we were looking for a minimum of 100 responses and ideally wanted to reach 400 responses. To get these responses, we mainly focused on social networks as Facebook groups or private messages, LinkedIn, Instagram, and WhatsApp and trusted the mouth to mouth.

Finally, in order to confirm if our study was relevant, we resorted to a Panel of Experts and asked the following question: "Focusing only on Portugal and in percentage, how many people you think are used to go out to eat, at least once a month?" Both questioned parties stated around 65% to 70%.

- Research prototype

Further to the Critical Analysis above and focusing on the method of the Interview as previously explained, we will now display below, the interview questions associated with our research objectives and variables.

Research Objective	Question	Scale	Variables
Considerations on the sample and the characterization.	Do you go out to have lunch or dinner, at least once a month?	Multiple Choice	Sample/Characterization
Considerations on the sample and the characterization.	Please state your age.	Multiple Choice	Sample/ Characterization
Considerations on the sample and the characterization.	Please state your gender.	Multiple Choice	Sample/ Characterization
Considerations on the sample and the characterization.	Please state your literary abilities.	Multiple Choice	Sample/ Characterization
Study the individuals fears and life adaptations in comparison to the food and beverage industry, facing Covid-19.	Please state the main factors that create discomfort or fear when attending a food and beverage establishment.	Checkbox and possibility to add reasons	Independent Variable
Study how the consumer behavior has altered facing Covid-19, pandemic.	Comparing the pre and post pandemic scenario, how much did you reduce your attendance to food and beverage establishments?	Multiple Choice	Dependent Variable

The online survey or questionnaire developed relies on 6 questions, it is quite simple and quick. We have decided to develop 5 questions as multiple choices as we believe it's simpler for the respondents; we have only created one question with checkboxes and an option to add reasons as it is the most important question in the survey and we wanted to make sure we were able to study in dept. The main objective was to understand how the consumer behavior has altered in this atypical time. We want to understand their fears, what creates discomfort and if people did drastically reduce their visits to restaurants or not.

- Pre – test summary

Following the development of our questionnaire and before starting the gathering of opinions, we put in practice a pre-test, a trial; it was based on the opinion of two individuals. While conducting the pre-test the overall impression was good, both individuals stated the survey was straight to the point and concise which is a fringe benefit as we are looking for around 500 responses; with a large survey it would have been much more difficult to achieve this goal.

Moreover, both parties have highlighted the importance of questioning the individual's income. Individuals with low incomes are not very relevant to this study, as they probably do not spend meaningful amounts on Restaurants. Therefore, we decided to begin the survey with a forward question so we could separate the meaningful responses without discomforting the respondents.

4) Data Analysis

4.1) Statistical Analysis

The statistical analysis involved descriptive statistic measures (absolute and relative frequencies) and inferential statistics. The level of significance to reject the null hypothesis is fixated in (α) $\leq$ .05. We decided to use the Qui-Square test of Independence, Pearson Correlation, Gradient Boosted Trees (Predictive Model) and Clustering Analysis. The qui-square assumption states that we should not have more than 20,0% of the frequency cells expected inferior to 5. The analyzed differences have been supported on the standardized adjusted residues. Finally, it is relevant to state that the tool used to support this analysis was SPSS (Statistical Package for the Social Sciences) version 26 for Windows.

4.2) Sampling characterization

As we have referred above, our sample was composed by a total of 328 respondents. It is relevant to state that the largest slice of respondents belongs to the female gender (60.7%), belonging to the age group of 25-34 years old (22.6%) with a college degree (40.5%).

(N = 328)	N	%
Gender		
Female	199	60,7
Male	129	39,3
Age	29.7	10.6
< 25 years old	65	19,8
25-34 years old	74	22,6
35-44 years old	69	21,0
44-54 years old	67	20,4
55-64 years old	47	14,3
> 64 years old	6	1,8
Academic Qualifications		
Preparatory School	7	2,1
High School	106	32,3
College Degree	133	40,5
Master's degree	77	23,5
Doctorate Degree	5	1,5

Table 1 - Sociodemographic characteristics

Source: Extracted from SPSS in 2020

4.3) Results

To better study and understand our sample and as we have stated before, the first query in our survey had the purpose of dividing our respondents in two groups. Our goal was to understand if the inquiries attend at least once a month, restaurants, without creating discomfort by asking them to rank their income.

A proportion of 87.8% of respondents confirmed they attend restaurants at least once a month.

	N	%
No	40	12,2
Yes	288	87,8
Total	328	100,0

Table 2 - Meals per month

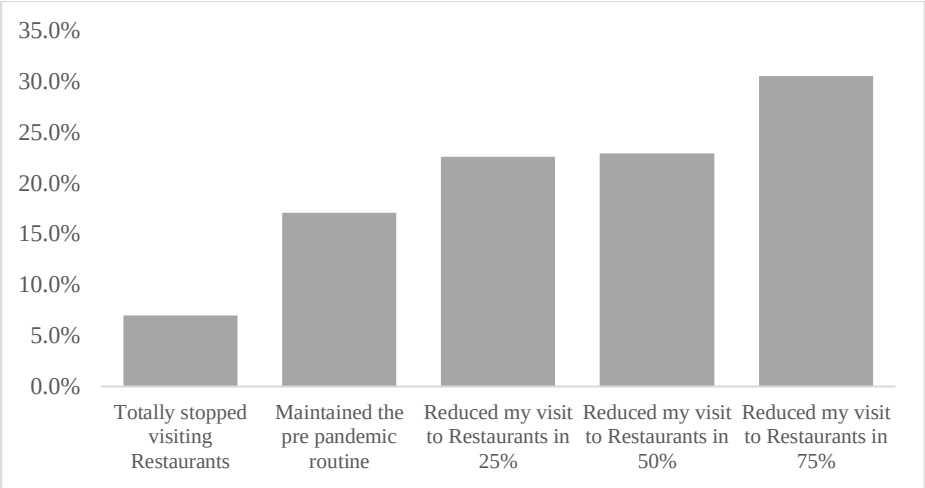
Source: Extracted from SPSS in 2020

When questioned about the comparison of the scenario of pre and post pandemic and how much we have decreased our visits to restaurants, 7% of the inquiries affirm they have completely banished their visits while 17,1% affirm they have maintained their normal routine. The remaining respondents affirm they have decreased their visits facing the pandemic.

	N	%
Totally stopped visiting Restaurants	23	7,0
Maintained the pre pandemic routine	56	17,1
Reduced my visit to Restaurants in 25%	74	22,6
Reduced my visit to Restaurants in 50%	75	22,9
Reduced my visit to Restaurants in 75%	100	30,5
Total	328	100,0

Table 3 - Reduction of Restaurants frequency

Source: Extracted from SPSS in 2020



Graphic 1 - Reduction of Restaurants Frequency

Source: Extracted from SPSS in 2020

When analyzing the motives that caused more discomfort or fear in each of the respondents while going out to a Restaurant, the most evoked causes were**:**

- Careless space cleaning with a representative percentage of 69.5%
- The lack of cleaning tools with a representative percentage of 36.9%
- The poor quality of delivered service represented by a percentage of 26.8%.

Motives	N	%
Careless space cleaning	228	69,5%
Lack of cleaning tools	121	36,9%
Poor quality of delivered service	88	26,8%
Excessive waiting time to be seated	84	25,6%
Insufficient space restrictions	67	20,4%
Elevated meal cost	63	19,2%
Exaggerated proximity of employees	59	18,0%
Unnecessary contact with shared utensils	52	15,9%
No visualization of the kitchen and the food preparation	47	14,3%
Other	8	2,4%

Table 4 - Motives causing discomfort or fear

Source: Extracted from SPSS in 2020

Graphic 2 - Reasons causing discomfort or fears

Source: Extracted from SPSS in 2020

- Routine alteration during the pandemic and gender analysis

When analyzing the routine alteration regarding gender, we concluded that the alterations are quite similar for both genders, as we can conclude through the calculation of the p value: χ^2 (4) = 7.175, p = .127.

		Gender		
		Female	Male	Total
Totally stopped visiting Restaurants	Freq.	18	5	23
	% Gender	9,0%	3,9%	7,0%
Maintained the pre pandemic routine	Freq.	28	28	56
	% Gender	14,1%	21,7%	17,1%
Reduced my visit to Restaurants in 25%	Freq.	43	31	74
	% Gender	21,6%	24,0%	22,6%
Reduced my visit to Restaurants in 50%	Freq.	44	31	75
	% Gender	22,1%	24,0%	22,9%
Reduced my visit to Restaurants in 75%	Freq.	66	34	100
	% Gender	33,2%	26,4%	30,5%
Total	Freq.	199	129	328
	% Gender	100,0%	100,0%	100,0%

Table 5 - Routine Alteration and Gender

Source: Extracted from SPSS in 2020

- Routine alteration during the pandemic and age analysis

When analyzing the routine alteration according to the age groups, we conclude, once again that this routine is quite similar in all age groups through the calculation of the p value**:** χ^2 (20) = 27.926, p = .111.

		Age						
		< 25 Years Old	25-34 Years Old	35-44 Years Old	44-54 Years Old	55-64 Years Old	> 64 Years Old	Total
Totally stopped visiting Restaurants	Freq.	1	5	9	4	2	2	23
	% Age	1,5%	6,8%	13,0%	6,0%	4,3%	33,3%	7,0%
Maintained the pre pandemic routine	Freq.	9	15	8	14	9	1	56
	% Age	13,8%	20,3%	11,6%	20,9%	19,1%	16,7%	17,1%
Reduced my visit to Restaurants in 25%	Freq.	21	17	13	15	8	0	74
	% Age	32,3%	23,0%	18,8%	22,4%	17,0%	0,0%	22,6%
Reduced my visit to Restaurants in 50%	Freq.	13	11	21	18	11	1	75
	% Age	20,0%	14,9%	30,4%	26,9%	23,4%	16,7%	22,9%
Reduced my visit to Restaurants in 75%	Freq.	21	26	18	16	17	2	100
	% Age	32,3%	35,1%	26,1%	23,9%	36,2%	33,3%	30,5%
Total	Freq.	65	74	69	67	47	6	328
	% Age	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Table 6 - Routine Alteration and Age Groups

Source: Extracted from SPSS in 2020

- Routine alteration during the pandemic and Academic qualifications analysis

The routine alterations when it comes to attending Restaurants is quite similar in the academic qualifications as we can confirm through the calculation of the p value**:** χ^2 (16) = 15.730, p = .472.

		PS	HS	CD	MD	DD	Total
Totally stopped visiting Restaurants	Freq.	1	8	9	4	1	23
	% AQ	14,3%	7,5%	6,8%	5,2%	20,0%	7,0%
Maintained the pre pandemic routine	Freq.	2	18	27	9	0	56
	% AQ	28,6%	17,0%	20,3%	11,7%	0,0%	17,1%
Reduced my visit to Restaurants in 25%	Freq.	1	20	34	17	2	74
	% AQ	14,3%	18,9%	25,6%	22,1%	40,0%	22,6%
Reduced my visit to Restaurants in 50%	Freq.	3	26	26	18	2	75
	% AQ	42,9%	24,5%	19,5%	23,4%	40,0%	22,9%
Reduced my visit to Restaurants in 75%	Freq.	0	34	37	29	0	100
	% AQ	0,0%	32,1%	27,8%	37,7%	0,0%	30,5%
Total	Freq.	106	133	77	5	106	328
	% AQ	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Table 7 - Routine Alteration and Academic Qualifications

Source: Extracted from SPSS in 2020

- Routine alteration during the pandemic and frequent attendance in Restaurants

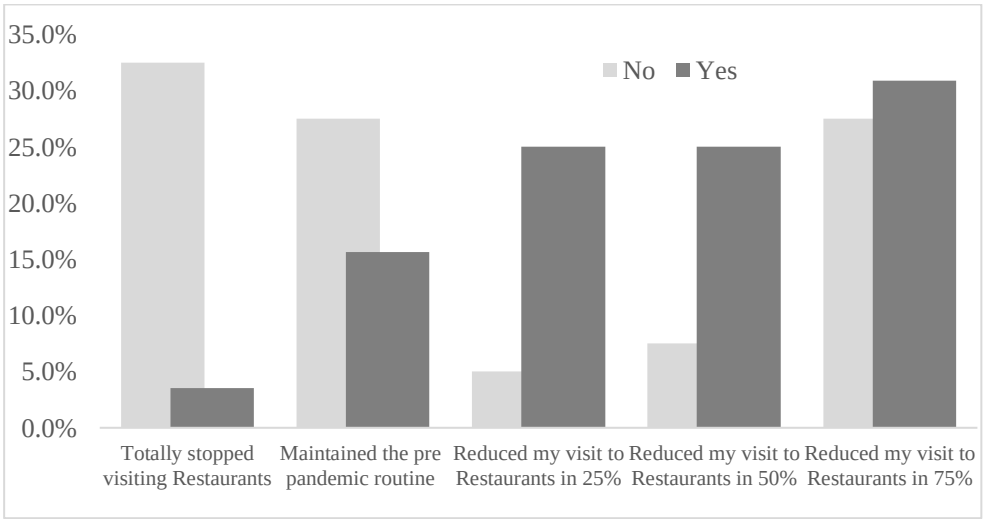
Throughout the analysis, we concluded there is a relationship between the routine alteration of attending Restaurants and the frequency of the attendance (at least once a month) is statistically relevant as proved by the calculation of the p value, χ^2 (4) = 56.169, p = .001.

There is a higher proportion of subjects that stopped completely the attendance in comparison to subjects that did not had the habit to attend Restaurants at least once a month (35% vs 3.5). Furthermore, there is also a high proportion of subjects that were used to attend Restaurants that reduced their visits in 25% (25% vs 5%) or 75% (30,9% vs 7.5%).

		Meal		
		No	Yes	Total
Totally stopped visiting Restaurants	Freq.	13	10	23
	% Gender	32,5%	3,5%	7,0%
Maintained the pre pandemic routine	Freq.	11	45	56
	% Gender	27,5%	15,6%	17,1%
Reduced my visit to Restaurants in 25%	Freq.	2	72	74
	% Gender	5,0%	25,0%	22,6%
Reduced my visit to Restaurants in 50%	Freq.	3	72	75
	% Gender	7,5%	25,0%	22,9%
Reduced my visit to Restaurants in 75%	Freq.	11	89	100
	% Gender	27,5%	30,9%	30,5%
Total	Freq.	40	288	328
	% Gender	100,0%	100,0%	100,0%

Table 8 - Routine Alteration and Restaurant Attendance

Source: Extracted from SPSS in 2020



Graphic 3 - Routine alteration and Restaurant attendance

Source: Extracted from SPSS in 2020

4.4) Predictive Model

As we have highlighted in yellow in the table below, we will describe the most meaningful correlations.

	1 - Do you	2 - Age	3 - Gende	4 - Level	6 - Compa	Carele ss	Elevat ed	Exagg erated	Excess ive	Insuffi cient	Lack of	No visuali	Poor quality	Unnec essary
1 - Do you	1,00	-0,14	0,18	0,10	-0,14	0,06	-0,02	-0,02	0,03	0,01	-0,01	-0,03	0,00	-0,01
2 - Age	-0,14	1,00	0,03	-0,06	0,04	-0,04	0,01	-0,05	0,04	-0,03	-0,06	0,00	0,01	-0,04
3 - Gende	0,18	0,03	1,00	0,09	-0,14	0,13	-0,05	-0,03	0,13	0,00	0,05	-0,03	0,03	-0,06
4 - Level	0,10	-0,06	0,09	1,00	0,03	-0,05	0,00	0,06	0,01	0,01	-0,02	-0,11	0,06	-0,01
6 - Comp	-0,14	0,04	-0,14	0,03	1,00	-0,14	0,04	0,08	0,03	-0,02	-0,10	0,04	-0,09	0,09
Carele ss	0,06	-0,04	0,13	-0,05	-0,14	1,00	-0,25	-0,10	-0,20	-0,01	0,21	-0,03	0,11	-0,07
Elevat ed	-0,02	0,01	-0,05	0,00	0,04	-0,25	1,00	-0,11	0,13	-0,15	-0,32	-0,06	0,09	-0,10
Exagg erated	-0,02	-0,05	-0,03	0,06	0,08	-0,10	-0,11	1,00	-0,13	0,13	-0,01	-0,03	-0,21	0,03
Exces sive	0,03	0,04	0,13	0,01	0,03	-0,20	0,13	-0,13	1,00	-0,19	-0,23	-0,17	0,06	-0,17
Insuffi cient	0,01	-0,03	0,00	0,01	-0,02	-0,01	-0,15	0,13	-0,19	1,00	0,03	-0,15	-0,26	-0,02
Lack of	-0,01	-0,06	0,05	-0,02	-0,10	0,21	-0,32	-0,01	-0,23	0,03	1,00	0,05	-0,13	-0,12
No visuali	-0,03	0,00	-0,03	-0,11	0,04	-0,03	-0,06	-0,03	-0,17	-0,15	0,05	1,00	-0,14	0,01
Poor quality	0,00	0,01	0,03	0,06	-0,09	0,11	0,09	-0,21	0,06	-0,26	-0,13	-0,14	1,00	-0,20
Unnec essary	-0,01	-0,04	-0,06	-0,01	0,09	-0,07	-0,10	0,03	-0,17	-0,02	-0,12	0,01	-0,20	1,00

Table 9 - Correlation Matrix

Source: Extracted from Excel in 2020

When it comes to the correlation matrix and as we have stated before the correlation between two variables states that as one variable changes in value (positive or negative), the other variable changes in direction (positive or negative). While analyzing the presented table, we have decided to highlight the three most meaningful values (above or below 0.3) based on the following patterns:

-1	Strong inverse linear relationship
-0.7	Strong negative linear relationship
-0.5	Moderate negative linear relationship
-0.3	Weak negative linear relationship
0	No linear relationship (Random scatter)
+0.3	Weak positive linear relationship
+0.5	Moderate positive linear relationship
+0.7	Strong positive linear relationship
+1	Perfect linear relationship

Table 10 - Correlation Patterns

Source: Adapted by Hazra. A & Gogtay. N. (2016)

After proceeding to the confirmation of the correlation values we can highlight the weak negative linear relationship between the lack of cleaning supplies and the elevated meal cost with a correspondent value of -0.32 and can conclude that as the lack of cleaning supplies decreases, the value of the elevated meal cost decreases. Moreover, we can observe the weak negative linear relationship between the poor quality of service and the insufficient space restrictions assuming the value of -0.26 and interpret that as the poor quality of service decreases, the value of the insufficient space restrictions decreases. Finally, we can highlight the weak positive linear relationship between the lack of cleaning tools and the careless space cleaning corresponding to a value of 0.21. As the lack of cleaning tools increases, the careless space cleaning increases.

We have created a Gradient Boosted Trees model which is a technique for classifying problems in order to create a prediction model or several weak prediction models, in agreement with (Cranmer, S.J et al. 2016) as we have stated in the methodology chapter.

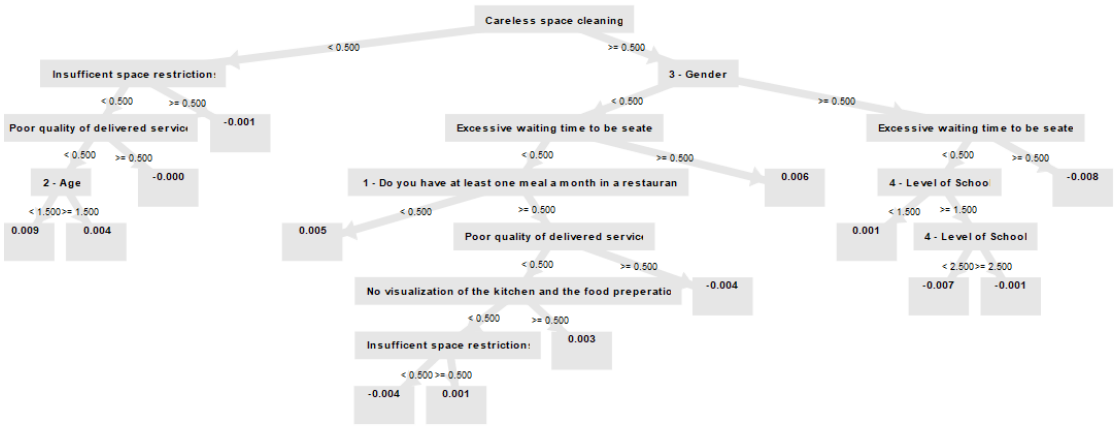


Figure 9 - Gradient Boosted Trees Model 1

Source: Extracted from SPSS

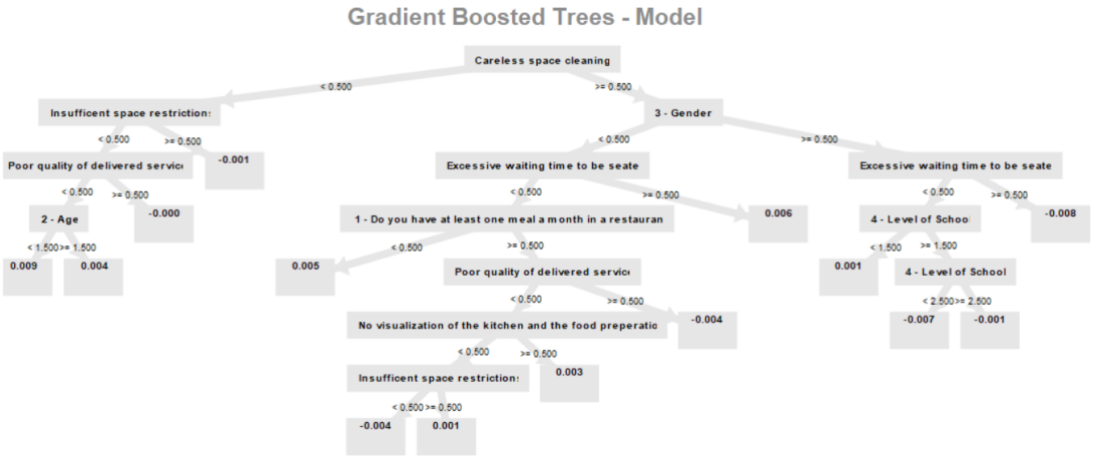


Figure 10 - Gradient Boosted Trees Model 2

Source: Extracted from SPSS in 2020

As we have stated before and in agreement with (Kearns, M. 1988) the construction of the Gradient Boosted Model is made by firstly assigning in the first tree an equal weight to each observation. When analyzing the first tree, we increase the weight of the observations that are more difficult to classify and decrease the weight of those who are easier to classify. When it

comes to the analysis of our trees, we can state that the trees describe the importance given to each variable.

Firstly, the "careless space cleaning" unifies all the branches in the tree. In the first tree, we can see a significant difference in 3 levels. There is a large majority of individuals giving importance to the insufficient space restrictions; for some the node ends at this stage but for others the poor quality of the delivered service is quite relevant. Moreover, it is relevant to state that the importance given to this variable varies within the age groups.

If we focus on the middle tree, we can observe a significant difference in 6 levels. Firstly, a significant difference between the importance given by gender, as men give less importance to the variable "waiting time to be seated" than women; There is a large number of men that rather not attend restaurants in regards to this variable whereas, a small minority still has meals once a month in restaurants. There is a small minority that gives importance to the poor quality of delivered service while most men prefer not to attend, followed by a small group that gives importance to the visualization of the kitchen and food preparation. Finally, there is a very poor representativity of men that give importance to the insufficient space restrictions.

When considering the last tree, there is a significant difference in gender where we can confirm that women give more importance to the variable "Excessive time to be seated" whereas this variable varies withing the level of education.

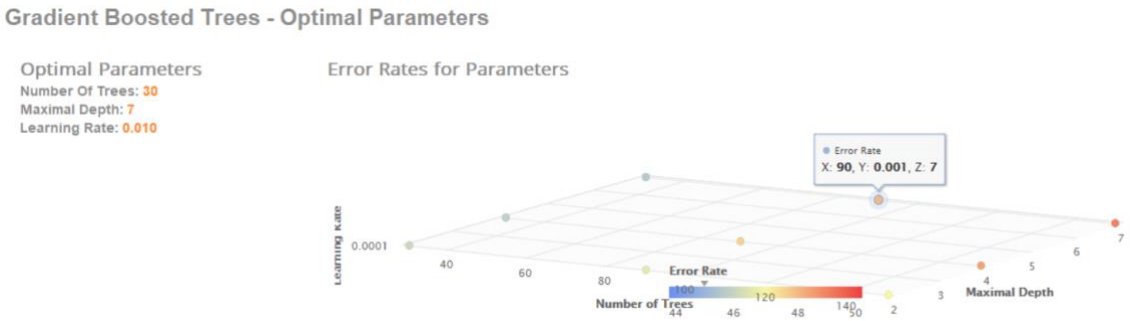


Figure 11 - Optimal Parameters

Source: Extracted from SPSS in 2020

As shown is the figure above, we believe it is relevant to highlight that we have created one model with a total of 30 trees, we should keep adding trees to the model until no further improvements are observed.

Gradient Boosted Trees - Weights

Attribute	Weight ↓
4 - Level of School	0.108
2 - Age	0.056
Exaggerated proximity of employees	0.029
Lack of cleaning tools	0.029
No visualization of the kitchen and the food preperation	0.026
Excessive waiting time to be seated	0.021
Careless space cleaning	0.013
1 - Do you have at least one meal a month in a restaurant?	0.013
Poor quality of delivered service	0.013
Elevated meal cost	0.012
3 - Gender	0.012
Unnecessary contact with shared utensils	0.011
Insufficent space restrictions	0.011

Table 11 – Weights

Source: Extracted from SPSS in 2020

When it comes to weights of the Gradient Boosted Trees, we can define them as the contributions to the dependent variable. The higher the value, higher the contribution. The five interesting weights to be discussed are as follows:

- The level of education (Academic Qualifications) assuming the value 0.108
- Age assuming the value of 0.056
- Exaggerated proximity of employees assuming the value of 0.029
- Lack of cleaning tools assuming the value of 0.029
- No visualization of the kitchen and food preparations assuming the value of 0.026

These five factors are the ones individuals value the most when they step out to a Restaurant. Therefore, if they are not respected there is a high probability of individuals quitting their attendance in restaurants.

- Academic qualifications

We could question if the higher education impacts in any way our dependent variable (alteration of the consumer behavior facing the pandemic). Are people with higher level of qualifications more aware and in search of more information of the danger of being in public spaces such as restaurants, surrounded by other people? As we are not able to confirm if other attendees are affected by Covid-19 and cannot be sure that the disinfection made before sitting at our table was safe enough or even if when we are standing at the restaurant entrance while waiting to be seated, is this safe? In agreement with (Gati, et al. 2008) it's crucial for any individual to gather and process information to be able to come to a decision.

- Age

Focusing on the second most beneficial variable, age, we could argue that as we have had responses from all ages and as we have stated in our first chapter of Data Analysis, the routine is quite similar for ages. In our Literature Review chapter, we quoted "There are certain factors that may turn food unique and by extension create a unique experience. Some of these factors are evoking positive and active emotions and can act as a catalyst for the well-being" in agreement with (Cardello et al, 2016) and (Jaeger, Cardello et al, 2017).

Thus, we can assume that age aligned with high education, leads us to assume that individuals may feel that this is not the time to keep on creating experiences because this is a dangerous and atypical moment, it's a moment to settle down and hope to create better moments, soon regardless of age.

- Exaggerated Proximity of Employees

The third meaningful value that we will analyze is the "Exaggerated Proximity of Employees". In a time where one of the mottos we should follow is respect social distancing, the exaggerated proximity is just not possible to tolerate.

If an individual decides to step in a restaurant, it will be highly uncomfortable to have a service that does not respect social distancing and will most likely force the client to reconsider the idea of stepping out to eat, the next time. (Ferguson et al. 2020) developed a simulation model regarding the spread of Covid-19 stating that social distancing would safe around 1.7 million lives; leading us to conclude the social distancing benefits are obvious.

- Lack of cleaning tools

The last two values we will proceed to analyze are linked to the feeling of security while we visit a restaurant.

As we have mentioned in the chapter of the Literature Review, hospitality involves both tangible and intangible services (Kandampully & Solnet, 2015), the feeling of security (intangible) is extremely valuable at this stage, a costumer should be able to visit a restauration establishment without feeling scared of catching a virus we have all been trying to run away from.

When it comes to the lack of cleaning supplies, it is obliged by regulations to have sanitizer at the restaurant entrance and bathrooms but besides this cleaning supply we can assume the costumer also values the witness of the table cleaning where he is going to be seated etc.

Moreover, as we have stated in the Literature Review when it comes to the Dineserv analysis one of the analysis topics to be considered is reliability – "Standing for the delivery of the promised and expected service.". A costumer that steps into a restaurant will expect a clean and comfortable ambiance. In 2020, with the arrival of Covid-19, we certainly got more demanding and if the Food and Beverage Industry wants to survive, it surely needs to follow and exceed the regulations imposed, otherwise we can assume they will lose even more clients.

- No visualization of the kitchen and food preparation

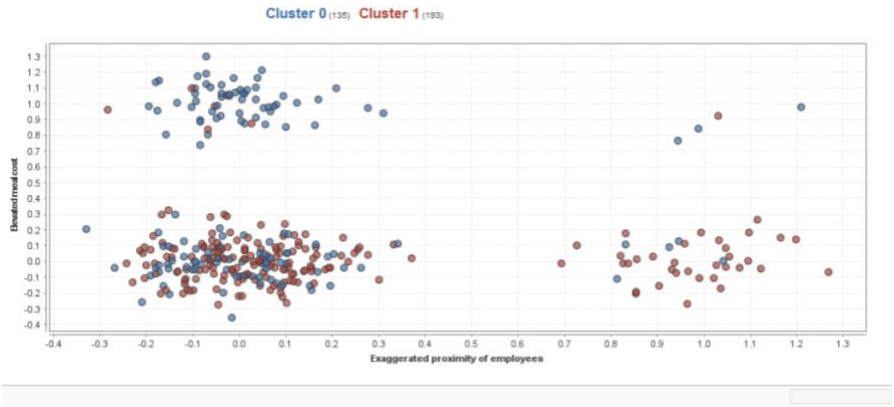
Finally, the last value we will address is the "No visualization of the kitchen and the food preparation". Again, this is a subject that leads us to the client's feeling of security.

In a time like this, individuals will feel much safer if they are able to see the kitchen staff, the kitchen cleaning, the preparation of what they will eat and further on.

In agreement with (Ismail, Abdullah, & Parasuraman, 2009), "if we achieve the customer satisfaction, we will more likely also achieve the revisiting intentions." and with (Gomes, V, 2017) "Service quality in Food & Beverage is only achieved when a costumer leaves the establishment with exceeded expectations.".

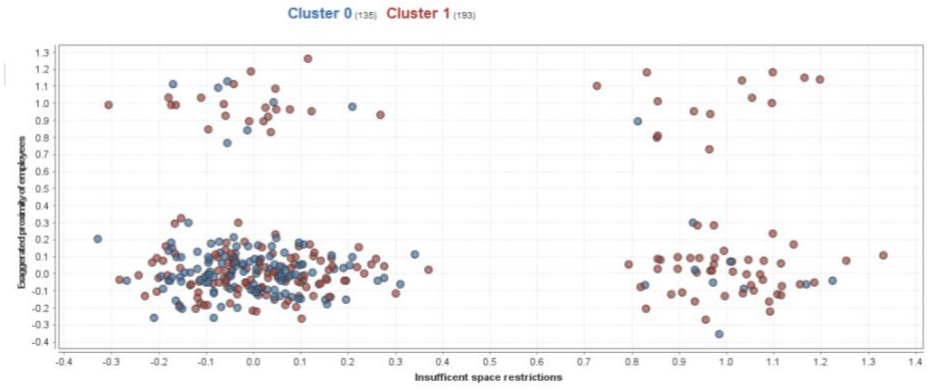
At this stage, the revisiting intentions and exceeded expectations are highly important as the entire Food and Beverage Industry is going through a huge breakdown. Moreover, with Covid-19 arrival, haven't individuals changed their satisfaction patterns?

4.5) Cluster Analysis



Graphic 4 - Cluster 0

Source: Extracted from SPSS in 2020



Graphic 5 - Cluster 1

Source: Extracted from SPSS in 2020

The classification/grouping of the inquires was made through a X-Means analysis and resulted in 2 clusters, as we can observe in graphic 4 and 5 representing Cluster 0 and 1. We have had a total of 328 observations, therefore by analyzing the graphics we can state that our Cluster 0 has a total of 135 observations and our Cluster 1 has a total of 193 observations. By focusing on Cluster 0 and 1, the observations in Cluster 1 are much more scattered than in Cluster 0, where most observations are closer together. Moreover, we could argue that some of the values, mostly the ones concentrated on the right side of the graphics, could be considered outliers.

Figure 12 - Cluster Tree

Source: Extracted from SPSS in 2020

x-Means - Centroid Table

Cluster	1 - Do yo...	2 - Age	3 - Gender	4 - Level ...	Careless...	Lack of c...	Poor qua...	Excessiv...	Insuffice...	Elevated ...	Exagger...	Unneces...	No visual...	6 - Comp...
Cluster 0	0.874	2.067	0.326	1.919	0.775	0.118	0.619	0.169	0.475	0.062	-0.101	0.109	0.232	1.687
Cluster 1	0.881	1.824	0.435	1.881	0.644	0.529	0.116	0.328	0.025	0.304	0.293	0.198	0.086	2.012

Table 12 - Centroid Table

Source: Extracted from SPSS in 2020

A dendrogram can be defined as a diagram that highlights hierarchical relationships between objects. Even so, they are not the most faithful tool as some information may be lost in the making process. It is important to say that a cluster tree is built from a dendrogram (Figure 12). Basically, from the dendrogram we use the centroids method to understand which the closest observations and we are repeat this process until we have a cluster where all the observations fit.

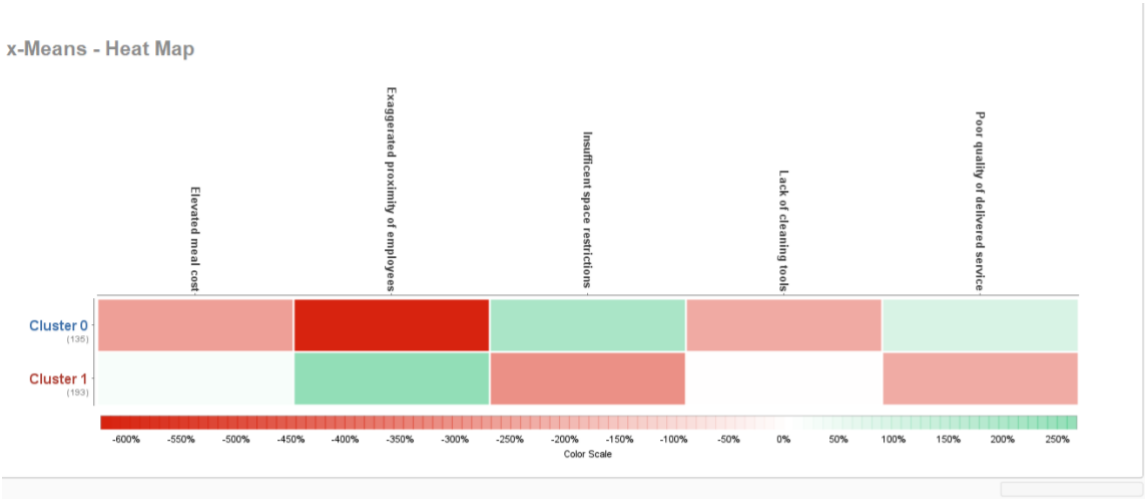


Table 13 - Heat Map

Source: Extracted from SPSS in 2020

A heat map can be characterized by a graphical representation of data where our values are presented in colors instead of numbers. It is also one other form to observe hierarchical clustering. It is relevant to state that the most hot and vivid colors enhance the strongest values whereas the coldest colors enhance the lowest or less meaningful values in each cluster.

According to our graphic, we can state the most meaningful variable in Cluster 0 is "Exaggerated proximity of employees" represented by the color bright red and the less meaningful variable is "Poor quality of the delivered service" represented by a light green. Moreover, in Cluster 1 we can affirm the most meaningful variable is "Insufficient space

restrictions" represented by a dark pink color and the two less meaningful variables are "Elevated meal cost" and "Lack of cleaning tools" represented by the white color.

Figure 13 - X-Means Summary

Source: Extracted from SPSS in 2020

The Figure 13 regarding the X-Means Summary states that in Cluster 0 the "Exaggerated proximity of employees" is worth 623.90% and in Cluster 1 the "Insufficient space restrictions" is worth 315.85% therefore confirming our analysis of the heat map.

5) Discussion and Findings

In this chapter we will focus on interpreting the results to our research questions, supporting on our data analysis chapter. When we defined our research questions, our dependent variable stood for the consumer behavior alteration facing the pandemic and the independent variable stood for the fears and routine alteration facing the pandemic. We will now, focus on answering our research questions focusing on the additional information we were able to extract from our analysis.

Our first research question was "What type of individual is answering the questionnaire?". In order to better understand our sample, we questioned individuals on "Age", "Gender" and "Academic Qualifications". As we have mentioned before we had a total of 328 responses to our questionnaire; we can now affirm that 60.7% of the respondents were of female gender belonging to the age range of 25 – 34 years old accounting for 22.6% and with a college degree accounting for 40.5%. We can also conclude that we had a 39.3% of responses belonging to male gender.

Our next question was "Which individuals should we considering when analyzing our data?". As we have mentioned before, we decided to split our sample in two groups. Our objective was

to understand how many people attend restaurants at least once a month, but we didn't want to question the individual's income in order to not create discomfort within our respondents. We can now conclude that our meaningful sample stands for 288 respondents standing for 87.8% of our sample. This way, we concluded that 40 respondents standing for 12.2% of our sample were not meaningful to our study as they do not attend restaurants at least once a month, therefore their routine alteration will most likely be indifferent to this study.

Our next question was, "What are the main fears when entering a restaurant?" and by extension "What are people afraid of?". We developed a question in our form, where we asked the respondents to choose 3 aspects that created, during this atypical time, fear and discomfort while attending restaurants. The respondents could choose the following hypothesis:

Careless space cleaning; Lack of cleaning tools; Poor quality of delivered service; Excessive waiting time to be seated; Insufficient space restrictions; Elevated meal cost; Exaggerated proximity of employees; Unnecessary contact with shared utensils; No visualization of the kitchen and the food preparation; Other.

We can highlight that the factors that most create fear or discomfort are the careless space cleaning representing 69.5% of answers, the lack of cleaning tools with a representation of 36.9%, followed by the poor quality of delivered service represented by 26.8% of answers and the Excessive waiting time to be seated with a representative value of 25.6%. The remaining characteristics have representative percentages below 20% as we can observe in the Table 4 and Graphic 2.

Our last research question was, "Did people totally stop to attend restaurants, or some are still trying to maintain the normal routine?". We created a question in our form where we questioned the respondents in the differences between their pre- and post-pandemic routine. Th respondents could choose between the following hypothesis:

Maintained the pre pandemic routine; Reduced my visit in 25%/50%/75% or stopped attending restaurants. Throughout our data analysis chapter and focusing on Table 3 and Graphic 1, we concluded that most individuals (30.5%) have reduced their visit to restaurants in 75%, followed by a reduction of visit of 50% (22.9%), reduction of 25% (22.6%). It is also highly relevant to state that 17.1% of individuals have maintained completely their routine, pre pandemic and only 7% of individuals have stopped completely their attendance.

In our Data Analysis chapter, we try to demonstrate how our dependent variable (Consumer behavior alteration) is linked to our independent variable (What are the individuals fears and routine alteration).

In sum, we have reached the conclusion that the most influencing factors or fear creators that could stop the individual's attendance in restaurants were the academic qualifications, the age, the exaggerated proximity of employees, the lack of cleaning tools and the non-visualization of the kitchen and food preparation. As we have stated above, the higher the value of these aspects, higher the contribution to the dependent variable.

In our data analysis chapter, we have interpreted these results, however we have not considered future studies or issues to be raised. Facing the changes individuals have been overcoming in the year 2020, during the pandemic of Covid-19, we could ask ourselves if this routine alteration will remain after the right vaccination/ treatment is released, leading the Food and Beverage Industry to a brutal decrease in comparison to the past few years. Moreover, we could ask ourselves if we are ready for future pandemics? To deal with these atypical moments in a way that we cannot prejudice as much the economy and, in this case, the Food and Beverage Industry. One sure thing we will take from this study is that "future attacks" will destroy this industry even more.

6) Conclusion

Through this study, we have discussed the decline of the Food and Beverage Industry during this unexpected time, the pandemic of Covid-19. We will now proceed to a brief summary of our study and to a description of our findings and conclusions.

When we defined our research questions, we decided to split our answers by asking the inquiries if they visited a restaurant at least once a month and we confirmed that 12.2% of questioned individuals did not, therefore our research focused on the remaining 87.8% respondents. We have confirmed that the majority of acquired responses were belonging to the female gender with a representative percentage of 60.7%, the remaining responses belonging to the male gender represented by 39.3% of responses. We have reached the conclusion that the during this atypical time, the main causes creating discomfort and fear for attending restaurants were the careless space cleaning (69.5%), the lack of cleaning tools (36.9%) and the poor quality of delivered service (26.8%). Furthermore, we have discovered that only 7% of the inquiries have completely stopped visiting restaurants and 17.1% have maintained their normal routine during

the pandemic. It is also relevant to state that 30.5% have reduced their visits to restaurants in 75%.

When considering the post and pre-pandemic routine (dependent variable) aligned with the individuals fears and life adaptations (independent variables), we can highlight that the main contributions to the dependent variable were the academic qualifications, the age, the exaggerated proximity of employees, the lack of cleaning tools and the non-visualization of the kitchen and the food preparation leading us to conclude these are the main characteristics that will make individuals reconsider their attendance in restaurants.

Finally, it is important to question how this industry will move on after the pandemic, will individuals maintain their life adaptions and value more being at home and contradict the authors (McKercher et al., 2008); (Cardello et al., 2016); (Jaeger et al., 2017) that have state that eating out is an experience that contributes the creations of good emotions. Moreover, an important thought to consider is, as we live in a world of constant change (Schifferstein & Hekkert, 2007) will this industry be able to face future unpredictable catastrophes that will surely appear?

7) Limitations

When considering the limitations of our study, the first adversity we can state is the thesis theme regards a very recent topic, a moment we are living at the present time making quite difficult the research of data considering the pandemic and its consequences. Furthermore, as we are living the pandemic at this moment, we see and participate every day in the new measures the Government gives us, and we observe the obvious decline and difficulties the Food and Beverage Industry faces.

Moreover, we can state that the data we collected was quite reliable (N=328), even so we can affirm that not all participants have responded to 3 motives questioned in our survey regarding the causes of fear/discomfort as we had asked.

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