

Evaluation Of The Quality Of Services Perceived By Visitors to the Museum of Tomorrow - Rio de Janeiro

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ABSTRACT

The perception of the service offered in tourist attractions and destinations is considered the beginning of a bond between the consumer in relation to the quality presented, influencing the management and development of the service. This article aims to analyse the quality of services at the Museum of Tomorrow based on the perceptions of visitors. We characterize it as a descriptive research, with a qualitative and quantitative approach, using a non-probabilistic convenience sampling. A total of 1,450 comments were collected online from the TripAdvisor website during the visitation period from January 1, 2018 to May 21, 2021 through Octoparse, tabulated in an Excel spreadsheet and analysed through semantic analysis by TLAB. The results generated in these processes were evaluated by the indicators and categories of the TOURQUAL model (Mondo, 2014), in addition to performing a Sammon Mapping analysis. The results showed that most quality indicators were positively evaluated, especially the quality indicators of the experience as learning category. In the visitors' online comments, a good amount of words related to this indicator

were found, which appeared in a positive way, showing that the Museum of Tomorrow fulfilled its functions and objectives proposed for its audience.

Keywords: Museum, Perception, Quality of Services, TOURQUAL.

INTRODUCTION

Modern tourism has the need of investigating the perception of quality of the tourist for the development of marketing strategies, which fulfill the one's needs (Mondo, 2014). Due to changes and consumer demands, the service sector considers in measuring the quality of the offered service, in a way to recognize the points that should be improved, establishing, therefore, a new approach, fostering the tourist's come back and attracting new clients. Ladhari (2009) defends that the observed and identified quality by the evaluation from the consumers on a product or service should be managed so that the perfection in the delivery of the product or service shall be aimed at.

Due to major changes that the service sector has suffered in the last 30 years, it can be perceived that there is a different behavior in the way of living from consumers. According to Miguel & Salomi (2004), it is important to measure the quality of the service in order to recognize points that can be improved.

Since the SERVQUAL (Parasuraman, Zeithmal & Berry, 1985), going through SERVPERF (Cronin & Taylor, 1992), by Knutson, Stevens & Patton (1996), who structured a scale for restaurants, DINESERV, by Delgado, Díez, Grande Becerra and Turnes (1999), who developed a scale to measure the quality in hosting, HOTELQUAL, by Knutson, Stevens & Patton (1996) with a scale of the quality of service applicable for historical houses, HISTOQUAL and, at last, the MUSA - *Multicriteria Satisfaction Analysis* (aviation), countless measurement scales were developed throughout the time.



However, no tool that could measure the quality of service perceived in tourism attractions in general, was verified, justification which led to the creation of TOURQUAL (Mondo, 2014; Mondo & Fiates, 2017).

Therefore, this research is focused on the application of Tourqual indicators in the reality of the Museum of Tomorrow in Rio de Janeiro. A science museum that, according to Bonela & Cotia (2020) presents “the opportunities and the challenges that humanity will face in the next decades in the perspectives of sustainability and coexistence” (Bonela & Cotia, 2020, p.2)

According to the information of the research on the public of the Museum of Tomorrow, performed by Bonela & Cotia(2020), such attraction “has been among the ten more visited museums in the country in 2016, 2017, 2018 and 2019” (Bonela & Cotia, 2020, p.3). Such information shows us that the museum has awakened the interest of thousands of visitors, who had several motivations to visit it, such as the theme and their exhibitions, being one of the most known tourism attractions in the city of Rio de Janeiro, among others.

According to the Museum of Tomorrow (2020), over 4.2 million people visited the Museum of Tomorrow since its opening, in December 2015, until the interruption of the visits due to the novel coronavirus pandemic in March 2020.

Due to this great number of visitors received annually, constant evaluation of the quality of services are necessary, so that every day quality standard may be more refined, contributing for the museum’s service to become better and more experiential.

Such evaluations may be performed by the analysis of the online comments written by tourists who have already lived the experience in the attraction. Such comments serve for managers to get to know better their offer and for potential tourists to back up their decision to buy or refuse the shopping of that attraction. Those facts happen mainly by the effects of social media and sites related to tourism, which may influence the amount of visitors that the attractions and tourism destinations receive due to the content generated by



the users for its wide scope. According to the definition presented in the document produced by the *Internet Advertising Bureau* :

Content generated by the user (CGU), also known as media generated by the consumer (MGC), refers to any material created and sent through the Internet by professionals who do not work for media, whether a comment left on Amazon.com, a video with professional quality sent to YouTube or a student's profile on Facebook. (Internet Advertising Bureau, 2008, p.1, our translation).

Those materials are produce and become available by their own users, which can be photos, videos, comments, emoticons, likes and others, which represent their opinions, perception, satisfaction, feelings that they had on tourism locations they had visited.

Taking into consideration the importance of museums in the world tourism context, the Museum of Tomorrow in the tourism context of Rio de Janeiro, the importance that the CGU has on the current marketing, this study has as guiding question: *what is the perception of visitors on the quality of services offered by the Museum of Tomorrow?* For such question to have an answer, we posses as main purpose of this article to analyze the perception of visitors regarding the quality of services offered in the Museum of Tomorrow.

REVIEW OF THE LITERATURE

Nowadays, museums are still object of studies, embodying the contribution of social sciences, they aim at understanding the role performed by the museums in the contemporary world (MENESES, 1993; CHUVA, 1995)

For the modern society, to talk about museums is not to talk about the past, but to add the "now", this approach presents the evolution of science and technology. Currently, there are several modern museums, with the same approach of learning, as presented by (1993):

Both museums of natural history and the museums/centers of science and technology share forms of organizing the respective activities, which are based on pedagogical principles, consistent with pedagogical principals that rule the school activities (Chagas, 1993, p.57).



Based on this, Bragança Gil (1993), classifies scientific museum into three categories, such as:

Museums with essentially historical characteristics, from scientific and technological resources of the time and of a certain age; interactive museums, allowing the visitor to learn by observation or experimentation; and at last, museums which gather both unmentioned characteristics (Bragança Gil, 1993, p.79).

Embodying such modern characteristics, inaugurated in December 2015, the Museum of Tomorrow is an initiative of the Rio de Janeiro City Hall, linked to the Culture City Secretary, managed by the Institute of Management and Development (IMD) (IDG). (Bonela & Cotia, 2020).

The grandiose and modern structure draws attention. Located in the Port Region of Rio de Janeiro, several urban interventions in the surroundings were executed, mainly for the Olympic and Paralympic Games in Rio, which were held in the year of 2016 (Bonela & Cotia, 2020).

The Museum has a great impact on the current society, as shown by the research performed by the museum's management, that:

over half million Brazilians have visited a museum for the first time when visiting the Museum of Tomorrow; this public gathering has a heterogeneous social-demographic profile, whether by race, age, schooling, income or place of living, which shows that the awakening of the habit of visiting museums benefits the entire society. (Bonela & Cotia, 2020, p.3).

Searched by tourists, the museum is an attraction of academic production, accessible to everyone, does not work individually and offers its space for “debates and understandings on social demands, which will contribute for the construction of thoughts and political, technical-scientific, cultural, educational and economy projects ” (Museum of Tomorrow, 2015, p.12 and 15 and 38 as quoted in Manso, 2018, p.85). Anyway, this article has the purpose of evaluating the perception of visitors regarding the quality of the



attraction and the providing of service by the Museum of Tomorrow as a way to understand the existing problems and propose management improvements.

Quality of Services

The literature approaches that the concern with the quality of products and services is not current (Martins da Silva, 2005), which can be understood as the process of offering always the best, being already determinant for customers.

Garvin (1992), divided quality management into four eras, which are: (a) **inspection**, due to the mass production, the quality control was limited and aimed at working only with the product's functioning; (b) **statistic quality control**: developed statistic methods to evaluate the produced, a more scientific character; (c) **quality guaranteed**: change in the focus of production, yet in management, directed to the prevention of mistakes; and (d) **strategic quality management**, outcome of the 70's and 80's decades, and present up to the current days; a control for direction and management of companies appeared, in which the quality become implemented in planning of the products and services. In tourism, the quality become the focus of analysis from the 90's decade.

For Zeithaml (1987), the quality perceived by the customer is the judgment on the excellence or general superiority of an entity, which means, resulting from the evolution and modern society, there is always the need to consume the best. Today, to understand the consumers' behavior is a continuous and essential process to of maintaining them close, creating a bond, which is essential in the service sector, essentially, intangible (Kotler & Keller, 2000).

The importance of investing in tools that point out quality, nowadays, is essential, as states Moller (1999), that such process avoids "less defects, better products, better financial situation, higher self-esteem, less personal rotation,



less absenteeism, more satisfied customers and a better image". (Moller, 1999, p.3).

Therefore, to manage the quality of the offer of services in companies of products and services and, more specifically, in tourism companies, destinations and attractions has become essential for the business development and performance.

METHODOLOGY

The methodological procedures developed throughout this article were the review of the literature, descriptive, qualitative, quantitative and also the gathering and analysis of online comments from the online site *Tripadvisor* on the Museum of Tomorrow.

Population and Sample:

According to the information of the research developed by Bonela & Cotia(2020) on the Museum of Tomorrow, from 2018 to March 15th, 2021, the museum was visited by 1.779,105 people, which represents the population of our study. And a sample of 1,450 visitors' comments was selected, considered a non-probabilistic sample by judgment..

Such online comments were posted on the *Tripadvisor* website after the visitation of tourists to the museum. We limited the time range of posts between January 1st., 2018 to May 21st., 2021. We performed such cut by understanding that older comments might not essentially reflect how the museum is currently found. In addition, we highlight that there were 9,211 evaluations performed on the website from 2015 to May 21st., 2021.

Instrument of Data Gathering:

The software Octoparse was used in its free version to gather the comments from the *Tripadvisor* website automatically.



The choice of the website was due to the fact of the site being accessed everyday by thousand of people, searching for different kind of information linked to the attractions, hosting resources, restaurants and others.

In this type of specialized website, several content are available such as names of establishments and attractions, location, prices, user's evaluations, among others. Such evaluations are posted voluntarily by the users after consuming the services in the attractions or in the companies linked to the tourism activities.

Such comments narrate the experiences lived by those people in those places, whether good or bad, bring elements that describe the quality of services, the perception of visitors, satisfaction and other important information for other users and that may also be used by managers that run the evaluated places.

The definition of the company, which manages Tripadvisor is:

The biggest trip platforms in the world*, helps 463 million travelers all months ** to make each trip the best of all. People from all over the world use the website and the *Tripadvisor* app to access over 859 million of evaluations and opinions on 8.6 million hosting locations, restaurants, experiences, flight companies and cruises.(Tripadvisor, 2021).

In the *Tripadvisor* website, we find the necessary materials for the investigation of the present study as the great amount of evaluations and comments on the Museum of Tomorrow that show the visitor's perceptions on the quality of the offered services of this attraction.

Procedure of Gathering and Data Analysis:

The online comments went through some procedures, the first procedure was the selection of the written evaluations in Portuguese in the chosen website. The second adopted procedure was the usage of the *Octoparse* software for the extractions of the comments, which led to the original table with several data.



On the moment when the software was being used, the selection of the important information happened, to perform the measurements with the users' names, periods which the evaluations were posted, dates of the experiences (when the visitations happened), the scores given by the visitors, titles of the posts and descriptions in the comments.

After the processing of the original table, the table file was saved in Excel format by *Octoparse*. However, people's evaluations which were not in the established period for the research were neither selected nor saved in this table.

During the third step, there was separation of the data from the original table according to the dates of the visits to the Museum of Tomorrow, therefore the tables from the years 2018, 2019, 2020 and 2021 were created, having the purpose of easing the future analysis of the gathered data. The original table had all its original data preserved and also, before the creation of the new tables, the verification of the evaluation aiming at identifying incomplete data happened.

In addition, in each table of the time cut, we performed analysis with the intention of identifying the comments in duplicate and those that were not within the defined interval. After such inquiry, the comments which the experiences happened in 2017n were excluded. In the original table, 1,638 comments were found and after the exclusion process, 1,450 comments remained (Table 1).

Number of Comments				
2018	2019	2020	2021	TOTAL
823	487	116	24	1.450

Table 1

Amount of Online Comments from 2018 to 2021

Source: Elaborated by the authors (2021)

Another table was also created, with General data, which are the information withdrawn from the *Tripadvisor* without the use of *Octoparse*, such as the total number of evaluations that the museum received from 2015 until



the day of the extraction of comments, the amount of scores attributed by the visitors (divided in: Excellent, Good, Reasonable, Bad and Horrible), which is equivalent to the symbol, the questions performed by the *Tripadvisor* to the visitors, among others.

The materials found in the tables reflect entirely the visitors' opinions on the Museum of Tomorrow, which were examined through the indicators of TOURQUAL, which was initially idealized to measure the quality of services in tourism attractions (Mondo, 2014) and that currently are applied in hotels, restaurants, vineyards, bars, and others.

In the forth step, the information in the year tables were examined by the *T-LAB* software, in which data underwent through tabulation and data analysis, generating three tables with ranking of words that most appeared on the online comments. Such software brings location and counts the number of words that had more frequency in the text inserted in *T-LAB*. The first table corresponds to the words found from 2018 to 2021, the second, from 2018 - 2019 and the third from 2020 – 2021. We performed such division to identify whether any difference between pre and trans COVID-19 pandemic existed.

At last, the Mapping of *Sammon* or Test of *Sammon* was used to verify in the general comments the proximity of words, which generated three groups of images: the first with the years of all evaluations from visitors, the second from 2018 - 2019 and the third from 2020 - 2021.

The usage of such tools had the main purpose to generate information to be evaluated by the quality indicators of the categories of analysis (Access, Environment, Human Element, Experience, Safety and Technical Quality) from the protocol for evaluation of the quality of services and TOURQUAL experience. The indicators are presented in the charts with the results.

RESULTS AND DISCUSSION

Throughout this section, the obtained results by the methodological procedures will be presented and discussed, such as the average number of comments per years, the evaluation of the quality indicators from the



TOURQUAL categories according to the ranking of comments with higher number of occurrences from 2018 - 2021 and the Test of *Sammon* of group of words from 2018-2021.

Average of Comments:

According to the amount of comments, which was up to 1,450 comments, this section aimed at verifying the general average of comments per year. For the comparison of the result, we aimed at analyzing whether there was any significant statistical different among the comments. It is important to inform that in the *TripAdvisor* evaluation, in addition to writing the comment, you put a score from 1 to 5. As an adopted criteria, the sum of the scores attributed to each comment, after being divided by the amount of comments from the year, was chosen, as resulted according to table 2.

It can be perceived that the averages were kept constant, with few levels of differences and that the year 2021 was not computed as a whole year, but up to the month of May.

Average of Comments				
	2018	2019	2020	2021
Sum of the scores	3171	2189	503	94
N° of comments	823	487	116	24
Average	4,46	4,49	4,33	3,91

Table 2

Average of Online Comments from 2018 to 2021

Source: Elaborated by the authors (2021)

Evaluation of the Indicators:

In this section, the main results of the research will be presented, such as filter for analysis, we chose to classify the words found and distribute them according to the indicators from the TOURQUAL model (Charts 1 - 6), defined by Mondo (2014). A total of 851 meaningful words and more frequent combinations in comments were found, this way, only 380 were considered, since they had adherence to the Tourqual indicators. The other 471 meaningful words were analyzed and we identified that they had no relation with the



researched quality indicators. From the 380 meaningful words found, we highlight the most relevant in each indicator, which will be explained with more details.

Access Category:

According to Mondo & Fiates(2017) it is defined as “the first group of indicators in which the tourist will have contact with the service.”(Mondo & Fiates, 2017, p.457). The information on this category are below in chart 1.

CATEGORY	INDICATORS	WORDS (Words and combinations)
ACCESS	Accessibility/ Location	Access – Airport – Guanabara/Bay - Boulevard/Olympic – To walk/Hike - Downtown/Region - Parking/Car/Uber - Location/Area/Way – Place/Location – Navy/Subway-VLT - Port-Area/Mauá - Rio de Janeiro/ RJ/City – Exit/Easy/To locate
	Accessibility/Disabled	Disabled Accessibility - Condition - Group – To climb
	Bathrooms for the Disabled	Bathrooms
	Wait for the Service	To wait - Take long/Too long – To wait/Wait - Line - Giant - Patient
	Ease of Purchase	To schedule/Scheduled – To anticipate/In advance - Internet/Site/Online - Possibility
	Opening Hours	Age/Period - Open/Close - Holiday -Weekends - Hour/Schedule - Monday/Tuesdays/Tuesday/Saturday/Sunday - Three

Chart 1

Words related to the Access Category and its TOURQUAL indicators

Source: Elaborated by the Authors (2021)

The first indicator analyzed was of accessibility and location, which takes into account the ease of access to the attraction, in this case, the words “Place” (283 times) and “Location” (249) were the most quoted. The users related as an easy space as being close to downtown Rio de Janeiro and being able to be accessed through several means of transportation.

Regarding the accessibility indicator for disabled (10 times), users relate as appropriate, for being a broad space, enabling the circulation of people with reduced mobility. However, this is an indicator that requires a deeper analysis by the management of the service offer of the museum. We suggest



that further analysis should be done by the segment of the demand of tourist with some type of impairment.

In the indicator Accessible Bathrooms, the comments presented positive points, such as clean, big and well distributed. When commented negatively, we identified sanitary supports and broken locks, preventing their use. Despite the small significance of the indicator in the comments, since the word “bathroom” had 10 occurrences, we consider as relevant to present this. The information available in the website of the investigated attraction says that the bathrooms are adapted.

The wait for the service is something very questioned, the comments on this indicator were of negative stamp, aiming at improvements, since the visitors complain about the lines (113 times), for being “giant” and that they “stayed hours” to get inside the location and perform the visit, in addition to the fact that such indicator influenced the quality of easiness of purchase, in which the visitors commented that the museum presents the anticipated purchase service, being able to avoid the box office lines. The words with higher occurrence in the indicator of easiness of purchase were “internet” (53), “site” (27) and “online” (15).

Still regarding the category access, the last indicator is opening hours, in which the comments, in general, were related to the time of permanence of the visit and that in the website of the museum the information that the last hour to visit the museum, at 5 o'clock pm., was not mentioned, words more frequent in such indicator were “hour” (89) and “schedule” (27 times).

At last, we identified that such category had satisfactory comments, due to the fact that the general analysis presented in the chart made that they appeared frequently in the comments as a positive way. Silva (2004) presents that for the visitor to feel satisfied, the museum space (product) needs to present equipment, installations, space and mainly accessibility in addition to a great attendance (service) and such category presented some of those characteristics.



Category Environment:

The category environment takes into account all the "service atmosphere which the tourist finds in the attraction" (Mondo, 2014, p.181) and has two indicators, exhibited in chart 2.

CATEGORY	INDICATORS	WORDS (Words and combinations)
ENVIRONMENT	Temperature /Acoustic	Audio/Sound - Air/Climate
	Comfortable and Inviting Place	Pleasant - Environment - Broad - Scenery/Theme - Fence - Building - Enchanting - Enormous/Huge/Grandiose - Exterior - Bright - Internal/Inside - Light - Better/Great - To go through - Room - Top - Varied - Empty/Spacious

Chart 2

Words related to the Category Environment and their Indicators TOURQUAL

Source Elaborated by the Authors(2021)

Taking into consideration the indicator of temperature, it was verified in comments the citation Air (9 times) and "climate" (6). The indicator was considered good. In the museum website, the suggestion regarding the internal temperature, which is low, is presented, asking people to take a light coat.

Regarding the acoustic of the place, in which the following words were pointed out, audio (5) and sound (8), we verified that the museum has a regular level of silence and that the equipment which transmitted audio were relevant for the interaction in the attraction.

In the indicator of comfortable and inviting place, it was verified the perception of the environment internally, in which the most highlighted words were "enormous" (25), "huge" (16) and "grandiose" (12). Such words may be mistaken and related to the indicator aesthetic or even with the infrastructure, but the context in which the words are related was the atmosphere and the internal environment, which resulted in satisfactory comments, declared as comfortable and pleasure to be in the location.

According to Silva (2004), who talks about installations, space and accessibility, some comments presented issues of negative stamp, such as the



rooms being huge and there was a lot of echo when some moments of speech happened, but nothing that would prevent such category to have a bad result. At last, we analyzed that the environment and the atmosphere of the visitation service is appropriate.

Category Human Element:

Such category is directed to the way that the museum's visitors are attended (chart 3). For Parasuraman et al. (1988), the human element is directly linked to the human aspects, considering empathy, receptiveness and trust as the main issues.

CATEGORY	INDICATOR	WORDS (Words and combinations)
HUMAN ELEMENT	Presentation of the Client's Service	Available – Explanation/To explain – To inform – Instructive/To serve – To monitor - Prepared - Reception
	Attention	To help/Help - Thoughtful - Attentive
	Attendance	Attendant/ Employee /Personnel - Attendance – To put – Disposition – Educated – To improve – Quality – Kind
	Knowledge	-

Chart 3

Words related to the Category Human Element and their indicators TOURQUAL

Source: Elaborated by the Authors (2021)

Within this category, the indicator knowledge did not have a single word to be analyzed, which corresponds to the work of human guidance inside the museum not having great relevance for the visitors.

Thinking about this, the word available was the one that most appears (10 times), when one talks about the presentation of the client's service, which means that the presence of personnel is relevant from the analyzed comments. Regarding the indicator attention, the word that most appears in evidence was thoughtful (11 times), pointed out as good, due to the fact of specific needs of each client have being attended.

With this assumption, the indicator of attendance presented as the most used word personnel (32 times), in which comments of improvement are presented regarding transmitting assertive information and regarding being thoughtful according to what is presented in the indicator attention.



The category is analyzed in a diffuse form. On one hand, many positive comments on attendance and the museum's personnel's attention. On the other hand, some negative comments indicating the fact that the personnel transmitted little information, mainly at the beginning of the consumption of the museum.

Such fact shows the importance of the presentation of the client's tourism service, right at the beginning of its consumption. To present the main characteristics about what the tourist is consuming makes one's expectation to be modeled and also the own perception of the service, helping the search for the global satisfaction of the service.

Category Experience:

The perception of a quality experience is relevant in the context of the perception of the demand and also for the offer. In the case of tourism, the "tourism experience in the destination should be taken into consideration when measuring the quality of services in the attractions of such destination". (Mondo, 2014, p.184).

All quality indicators of the category experience were found in the online comments, which are analyzed and presented in chart 4.

CATEGORY	INDICATORS	WORDS (Words and combinations)
EXPERIENCE	Learning	Environment/Environmental – Animals – Anthropocene – To Learn/Learning – Warming – Updated/Currently – Exhausting – To Cause/Cause – Citizen – Behavior – Concept – Knowledge – Conscience/Conscientiousness – Consequence – Content – To contribute – Cosmos – Culture/Cultural – Curious – To show – To awaken/Awakened – Destruction – Didactic – Diversity – School/Scholar – To stimulate – Existence – Explored – To focus/Focus – Weak – Futuristic – Humanity – Ideas – To imagine – To have an impact – Influence – Information – Instigating – Intention – Interaction/To interact – Interest – Intuitive – Views – Nature – Novelty – Opportunity – Origin – To participate – Vibe – Thought/To think – Questions – Perspective/Perspectives – Pollution – Population – Practical – Preservation/To preserve – Programming – Purpose – Questioning/To question – To reflect/Reflection/Reflective – Responsibility – Rich – To transmit
	Entertainment	Collection – To advise – To like – To love – To attract – to compensate – Comfortable – To contemplate – To enjoy – Disappointment – Fun – To have fun – Exciting – Expectation –



		To experiment – Exposition – Familiar – Fascinating – happy – Movie – Impossible – Incredible – Unforgettable – Wonderful – Option – Pride – Great – To go out – Planetary – To lose – Projection – Reality – To fulfill – Memories – Relevant – To return/Return – Sensation – Sensorial – Alone – Touristic – Is worth/Are worth – To travel – Video – Visit/Visitation/Visits – To live
	Aesthetic	Architectonic/Architecture – Art – Attraction – Beauty – Contemporaneous – Design – Details – Differentiated/Different – Edification – Effect – Elaborated – To enchant – Engineering – Spectacular/Spectacle – Style – Extraordinary – Exuberant – Fantastic – Shape/Format – To photograph/Photography – Futuristic – Impeccable – Impression – Nice – Beautiful – Playful – Magnificent – Modern – Monument – New – Building – Size – Traditional – View
	Evasion	To accompany – Appropriate – To enjoy – Nice – Confuse – To disappoint – To like/Taste – Intense – Interesting – Natural – To surprise

Chart 4

Words related to the Category Experience and their indicators - TOURQUAL

Source: Elaborated by the Authors (2021)

In the indicator of learning, we highlight the following words and their occurrences: to learn (29), learning (14), knowledge (48), information (94). The visitors said that they have learned during their visits to the analyzed museum, mainly during the exhibitions.

Gosling(2016) et al. state that “museums, with their social function linked to the culture, correspond to institutions capable of providing experiences to the population (Gosling, Pereira, Vera, Coelho, & Lima, 2014b), which may result in learning and transformation of the visitors”. (Gosling et al., 2016, p.107).

By the comments, we believe that the visits to the attraction by those people were very meaningful not only due to the entertainment, but also due to the learning.

In the indicator of entertainment, we highlight the word exhibition (323), since people who have visited the Museum of Tomorrow because of the exhibitions remained a long time inside the museum by being entertained. According to reports of some visitors, they had fun in one exhibition.

Still, it is important to point out that some roles and functions which museums play and have as tourism attractions:



The museum accumulates functions such as: point of visitation with social role; a space for collecting pieces; a space for research and exhibition of collections and also to provide education and recreation to its visitors. Such functions need to be managed by the museum's managers, who, sometimes, face challenges to highlight the experiences lived in such space. (Gosling et. al, 2016, p.106).

In the indicator aesthetic, we highlight the word architecture (346). In the visitors' speeches related to the aesthetic aspects, the museum's architecture was complimented and some of its attributes were highlighted, such as: beauty, being beautiful, new, innovative, and others. Many of those people were impressed with the beauty and architectonic shape of the building, mainly in its exterior areas. The exterior architecture really draws the attention of people who circulate near this cultural attraction.

In the last indicator of such category, which is evasion, or in a more simplistic form, escape from the daily routine of the visitor, we emphasize the word interesting (258), once by analyzing the evaluation of the people who visit the museum, many found interesting the way that the museum is capable of allowing that, during the visits, people "forget" their routines. The Museum of Tomorrow has attributes capable of drawing the attention and increasing the time of permanence of the visitors, such as the exhibitions (permanent and sporadic), the Museum of Tomorrow shop and Culinary Farm Coffee Place.

In addition, the exterior areas belonging to the museum that surrounds the attraction such as gardens and water fountains and the pools promote more options of evasion, and also enable the observation of places such as the Art Museum of Rio (AMR), Guanabara Bay and others.

Analyzing the comments of visitors on the quality indicators of the category of Experience, we may evaluate with the concept of Very Good the Museum of Tomorrow. In the article of Pine & Gilmore(1998), in which the four dimensions of the experience are approached: entertainment, learning, escape and aesthetic, there is the logic that the more those dimensions are present and considered at the service, the higher the tendency that they become memorable.



We have realized by the speeches of the people who visited the museum that such dimensions were present and exerted strong influence for those visitors to live intense tourism experiences, which generated several meanings, learning and will not be forgotten due to the moments lived in such place. Such category was well evaluated and it is hoped that it will have relevant impact in the formation of the perception of satisfaction of the tourists.

Category Safety:

This category according to Berkley & Gupta (1994), is the absence of danger, risk or doubt. It includes physical, mental and financial security."(Mondo; Fiates, 2017, p.459).

CATEGORY	INDICATORS	WORDS (Words and combinations)
Safety	Security	Safe

Chart 5

Words related to the Category Safety and their indicators TOURQUAL

Source: Elaborated by the Authors (2021)

In the comments of the visitors of the Museum of Tomorrow (chart 5), related to the indicator safety, the word safe was mentioned directly (20 times). These people mentioned that they felt safe in the areas belonging to the museum (interior and exterior) and also in the public areas.

Mondo & Fiates(2017) stated that in the "tourism attractions", security is considered important since it demonstrates the care and the attention which the tourists receive. Safety makes the tourist to feel free of danger to enjoy the attraction" (Mondo & Fiates, 2017,p.460).

The reasons why people feel protected in the areas belonging to the attraction are due to some factors such as accessibility for all people, presence of employees and security personnel to attend the visitors.

The sense of protection in the public areas surrounding the Museum of Tomorrow is due to the fact that it is a tourism area with the presence of other attractions, within a military perimeter (presence of multiple institutions such as the Brazilian Navy), it is a busy place, presence of military policemen doing



policing in close by places, such factors contribute to the feeling of security of the visitors.

We deduce by the description of the comments of the visitors that safety indicator of quality was evaluated as Good.

Category Technical Quality:

Mondo (2014) indicates that the inspiration of creation for the category Technical Quality came from Grootenboer (1984) and defines that “the technical quality is the quality that the consumer really receives as a result of one’s interaction with the service company and it is important for the consumer and one’s evaluation.” (Mondo, 2014, p.186). Chart 6 present the main words found in the comments.

CATEGORY	INDICATORS	WORDS (Words and combinations)
TECHNICAL QUALITY	Price	Cheap – To charge – To cost/Cost – For free - Gratuity - Free - Whole - Investment – Fair – To pay/Paid - Price - Value
	Climate conditions	Rainy - Sun
	Maintenance (equipment and infrastructure)	Benches - Corner - Floor - Cinema - Construction – Care/To take care- Energy - Engineering - Equipment - Structure/Infrastructure – Installation/To install - Maintenance - Material - Constructions - Wall - Pieces - Signs - Building - Screen - Ceiling
	Sign	-
	Technology	Audiovisual - Science - Scientific- Computer - Digital - Innovation - Interactive/Interactivity - System - Technology/Technological
	Cleanness	Clean
	Load capacity	To fill – To be crowded - Number - Amount
	Variety activities	Food - Activities – Coffee place – To talk - Event - Physical - Garden – Games - Diner - Store - Plate - Meal

Chart 6

Words related to the Category Technical Quality and its indicators TOURQUAL

Source: Elaborated by the Authors (2021)

In the indicator of quality, price, we highlight the “price” (68) due to the number of occurrence and to the speeches of the visitors in the comments. People that have visited the museum have not considered the price of the tickets (whether whole ticket or half entrance) expensive and others have considered the charged money values to be fair. Such opinions should be



corroborated by the value system of those people, and which should be taken into consideration the quality of the exhibitions, the infrastructure, the maintenance, the attendance and other quality indicators.

In some evaluations, price was commented in the non monetary sense, reading the reviews, we realize that such visitors were satisfied with the visit to the museum and had their expectations overcome and the benefits generated for them compensated the value paid, very much in the logic of the perceived value.

The indicator of quality Climate Conditions does not interfere in the visitations to the museum, by being a closed space. Still, we verified the words: rainy (5) and sun(37). Some comments approached that the museum is a great option of tour even on rainy days, we suppose that this is due to the fact of internal attractions and the diminishing of people that go to the museum. In sunny and hot days, the Museum of Tomorrow receives an enormous amount of people.

In the indicator Maintenance (equipment and infrastructure) we verify the occurrence of the words as “structure” (69) and “infrastructure” (7). People made several compliments to the infrastructure offered to the visitors of the museum. We may quote examples of infrastructure and equipment available such as “floors and tactile models, ramps, wheelchairs, elevators, nursery, adapted bathrooms and universal signs” (Museum of Tomorrow, 2021). Their uses allow facilitating the life of people in the internal dependencies of the museum.

The sign did not have any word associated which appeared as significant. But according to the website of the Museum of Tomorrow, there is universal sign, which we understand that are the use of several types of sign, as well as their groups of technical procedures aiming at guaranteeing that all people may be guided and to move through the spaces more easily, with more autonomy and safety.



In the indicator of technology, we highlight the words “technology” (90), “technological” (49) and “interactive” (97), “interactivity” (55). A good amount of the visitors were impressed with the technology employed in the museum and the equipment used, promoting interactivity with the computers' screens that may be touched by the visitors where they can activate some commands, interactive maps and other resources.

The indicator of cleanness by the general comments was well evaluated. The word “clean” appeared 86 times. In the visitors' comments, it was not said that they did not find dirt or trash in the internal environment and neither in the exterior. According to the website, the museum is taking all sanitary measures for the prevention against COVID -19 such as the use of sanitizing rugs, use of gel alcohol in totems, constant cleaning of the interactive equipment and air conditioning system of an effective process of filtering, which renews all air of the Museum every 20 minutes” (Museum of Tomorrow, 2021) and others.

The load capacity may be understood as “the capacity that a certain place or environment has to support the flux of visitors and tourists without losing the characteristics of its originality or having its integrity threatened” (Pires, 2005, p.7). The Museum of Tomorrow was constructed to receive a big amount of visitors per year, we may prove it through the study of Bonela & Cotia (2020).

Many visitors have complained about the big number of people that form lines and it takes long to get inside the attraction. And also relate that due to the big number of people some exhibitions were full preventing some people to enter and to enjoy the spaces. And they made recommendations for the people to buy their tickets through the website so that it would not be necessary to face the box office lines.

The Museum of Tomorrow is very visited mainly on the weekends, holidays and vacation period. Due to the COVID-19 pandemic, this attraction has taken some actions such as to sell tickets only through the company partner of the institution with days and scheduled hours. Visitors arrive with their tickets



previously bought and are validated at the totems at the entrance of the museum.

In the indicator of variety of activities, we verified a meaningful occurrence of the word "activity" (36). The Museum of Tomorrow provides options to the visitors of fun, learning, entertainment which are the exhibition, the educational activities developed, options of food and shopping and without even mentioning the gardens. For example, in the exhibitions, one may watch videos, interact with modern equipment, access several sensations, whether hearing or visual and others. In the gardens, people may sit, talk, take picture, eat food, etc.

The indicators of technical quality may be evaluated as Good, with the exception of sign and load capacity. The indicator quality of sign was not found to be significant, therefore, it is not possible to affirm how the perception of the visitor is.

Regarding the load capacity, it is a concept evaluated as Bad due to several complaints which are found in the reports of visitors, due to the big amount of people that the museum receives daily, creating some problems, such as the formation of huge lines, long time to get inside an attraction and the difficulties that go through the exhibitions and internal environment of the Museum.

SAMMON Analysis

Sammon's test or *Sammon's* projection "is an algorithm that maps a bigger dimensional space, for a smaller dimension, aiming at preserving the distances between the points of bigger dimension, in its smaller projection dimension". (Mondo, 2014, p.156-157). According to figure 1.



The following words located in the fourth quadrant appeared in several descriptions of the comments that are the Reflection (70), Planet(137), Future(153) that are related to the indicators of quality learning and entertainment. The Museum of Tomorrow provides its visitors through exhibitions to develop several actions such as learning, reflection on several subjects approached such as the Planet Earth, how the future of mankind will be and others. In addition, the exhibitions are sources of entertainment.

Por fim, isso explica que a imagem do museu é uma atração que chama muito atenção pela sua estética, além de ser um espaço que provoca vários sentimentos e sensações individuais nos visitantes, que também promovem entretenimento e aprendizado. Nos quais esses indicadores estão presentes no protocolo de avaliação TOURQUAL.

FINAL CONSIDERATIONS

The quality of services is one of the factors that influence in people's decision making process when they acquire services whether from service providers or decide to visit destinations and tourism attractions. From such assumption, this study had as main purpose to evaluate the quality of offered services at the Museum of Tomorrow from the perception of visitors. As instrument of measurement, the protocol of evaluation TOURQUAL, proposed by Mondo (2014), was used.

To identify which the perceptions of people who visited the attraction are, the comments from visitors of the site *Tripadvisor* were analyzed, from the period of January 1st., 2018 to May 21st., 2021, which some procedures such as gathering, extraction and analysis generated results. Such information was evaluated by the 26 indicators of quality from six categories from TOURQUAL which are: Access, Environment, Human Element, Experience, Security and Technical Quality.

After the process of measuring the quality of the services perceived by the visitors, we realized that the museum and the indicators of quality had, in the great majority, good evaluations. Such obtained results are due to some



issues related as the indicator of quality aesthetic, since it was considered an attractive, beautiful and gorgeous museum, but the people who visited. And also for the interactivity of the technological equipment considered of good quality and easy, interesting exhibitions that created the feeling of satisfaction of the visitors, mainly related to the indicator of quality entertainment.

We will highlight some of the indicators evaluated positively and negatively. From the indicators that deserve greater attention, the first is the issue of the wait to get inside the museum, related to the indicator of time of waiting for the service, from the category access, in which some of the comments expressed non-satisfied speeches, for having giant lines and waiting to get inside the space.

Another indicator is the load capacity of the museum, when the museum is crowded some situations are created that generate discomfort to the visitors such as to wait to get less crowded or the diminishing of the number of people in the exhibition spaces. On the other hand, the indicators of quality technical knowledge of the category Human Element and the signs of the category technical quality did not have a single analysis, since on the comments no terms related appeared.

Another important factor that drew much interest in the research is the indicator of quality learning, in the category experience, which presented a higher number of words (terms) on the comments, which makes the museum able to achieve its purpose that is to make visitors learn about the challenges of mankind.

The information generated by the evaluation TOURQUAL reflect the perception from the visitors who know the museum and that have enjoyed the services provided for them. Despite the comments being positive, the need to improve the indicators are not well evaluated.

The Museum of Tomorrow performs researches with its public, but we sign the need for periodical evaluations so that the standards of quality are always



being improved and the indicators of quality negatively evaluated are corrected.

We number some management suggestions considered interesting for the implementation in the museum and improvement of the indicators that are not minimally attended from the online analysis that we performed.

The first issue is to minimize to the fullest the impact of the wait for the service. Strategy of managing lines, variety of activities on the external side available to occupy the lost time of the wait by the tourist, increase in the number of box office or technological improvement in the access of the tourist to the museum are some of the possibilities.

We also suggest that the indicator easy to purchase be improved, increasing the digital presence in the museum and making the process of buying and access to the attraction more technological.

The maintenance of the equipment of support, such as bathrooms, signs and furniture should be preventive, minimizing the impact of possible break and equipment, as it was verified in some situations in the bathrooms.

At last, the issue of load capacity, boosted by the necessary care with the COVID-19 pandemic. The Museum has already established the tickets sold by time and scheduling. In addition, we suggest the implementation of a diverse range of activities within the space of the museum at different hours to “spread” the internal public and to diminish the negative impact of the attraction being overcrowded.

This research presented some limitations, we will quote two: the first is the choice of the period of the analysis of the online comments, not coming from the years 2020 to 2021, since the Museum of Tomorrow was closed for several moments of those years due to the COVID - 19. The second limitation was the not use of the field research as one of the methodological procedures, in which questionnaires based on the protocol TOURQUAL would be applied, as soon as the visitors finished the visits to the museum.



The use of such mean of investigation would have some intentions such as to evaluate what the perceptions on the quality perceived by the offered services in the attraction are and to compare with the obtained results from the analysis of the online comments. However, due to the pandemic, the application of the questionnaires did not happen.

As suggestions for future studies, we indicate the comparison of the obtained results through the online analysis with a quantitative research of perception of the applied quality *in loco* using the same indicators of analysis. It would still be possible a qualitative perspective with the formation of a focal group with tourists or deep interviews analyzing the same indicators here studied.

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