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Chapter · December 2024

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Design of Dashboards for CRM Associated with Health and Wellbeing Tourism

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Abstract. Design of dashboards is strategic for the Customer Relationship Management (CRM) associated with Health and Wellness Tourism, considering all the knowledge acquired about Health and Wellness Tourism, the Machine Learning algorithms identified, and the characteristics to be considered in the development of the reports. It is intended to identify the components to be used in the development of the dashboards, which allow for control of the information associated with this business and to detect deviations in operation, taking into account concepts associated with User Experience/Consumer Experience and the Customer Journey of this type of customers in order to identify opportunities to innovate and grow economically, through the creation of intelligence about this business. In this paper, the presentation of examples of dashboards developed in Power BI, it was possible to show that customer capital indicators can be included, under different dimensions that characterize it. However, the lack of real data to apply in the formulas of the new indicators is one of the limitations of this paper.

Keywords: CRM · Data Storytelling · User Experience (UX) · Data mining · Health and Wellness Tourism · Hospitality

1 Introduction

The implementation of a social consumer relationship management (Social CRM), or CRM 2.0, must integrate the possibility of developing customer-centered co-creation processes [1] to involve the customer. This leads to the co-creation of personalized experiences in the area of health and well-being. With interaction in different communication channels and the proliferation of customer contact points, offering personalized services continuously and throughout the entire customer journey [2].

The CRM system can be enriched with gamification mechanisms [2]; it must allow communication between all interested parties (customers, hotels, event companies, that is, the entire market ecosystem and the company ecosystem). With a view to monitoring and evaluating the hotel's performance, taking into account financial results and contextual factors (such as personality, customer profiles, and needs, privacy, ethical and legal

issues, cultural and social values, and other market factors) that can influence relationships of the tourist's health and well-being satisfaction. This implies the acquisition and enjoyment of services and products linked to health-related and private information of the customer, for their loyalty and loyalty. It is necessary to guarantee the security and privacy of their data while the hotel establishes a trusting and secure relationship with personal data protection mechanisms.

The need to understand relationships between customers and the hotel's financial performance is one of the most critical factors for the success and competitiveness of this industry [3], which takes on a more demanding dimension when it comes to a hotel. That offers services in health and well-being tourism, which deals with different aspects related to the health and well-being of its customers, where it is necessary to include biometrics and health information. The metrics associated with the concepts of Customer Lifetime Value (CLV) [4] are no longer sufficient. It is necessary to include new metrics, as well as the concepts of hotel intellectual capital indicators. Metrics that evaluate the customer in the context of social media, combined not with the most straightforward statistics, but with business intelligence tools, data mining and machine learning techniques, and concepts of customer analytics, customer experience metrics, customer interaction metrics, customer satisfaction metrics, online reach metrics and online financial metrics, customer engagement affective, behavioral, and cognitive metrics [2].

According to Sigala [2], the implementation of a Social CRM must include (1) relational information processes referring to companies' tools and capabilities to monitor, capture, analyze valuable customers and market insights, infrastructure and integration of information systems; (2) internal (with employees) and external (with customers and customer communities) information communication capabilities; and (3) ability to manage various engagement management issues, including managing customer communities, employees, customer engagement, user permission, and ethics/privacy.

Taking into account the dynamics that exist in the relationship between the customer and the company, or between the guest and the hotel, the importance of developing social CRM or even more innovative ones. It is extremely important to create dashboards that allow analyzing all associated metrics to the User experience, where the concepts of Data Storytelling must be combined with metrics that analytically evaluate consumer behavior (customer analytics).

2 Knowledge Management and Competitive Intelligence

2.1 User Experience (UX)

The definition of User Experience (UX) considers simplicity and elegance and goes far beyond a set of items on a checklist or giving customers what they say they want, in the words of Norman and Nielson [5]. The quality of the user experience is defined by a set of several services that come together in a single space: engineering, marketing, graphics, and interface design, which is sometimes confused with User Interface and Usability.

UX is part of the concepts associated with HCI (Human Computer Interaction) combined with interaction design [6], where "it ranges from traditional usability to

beauty, hedonic, affective or experiential aspects of the use of technology” [6, p. 91], as shown in Fig. 1.

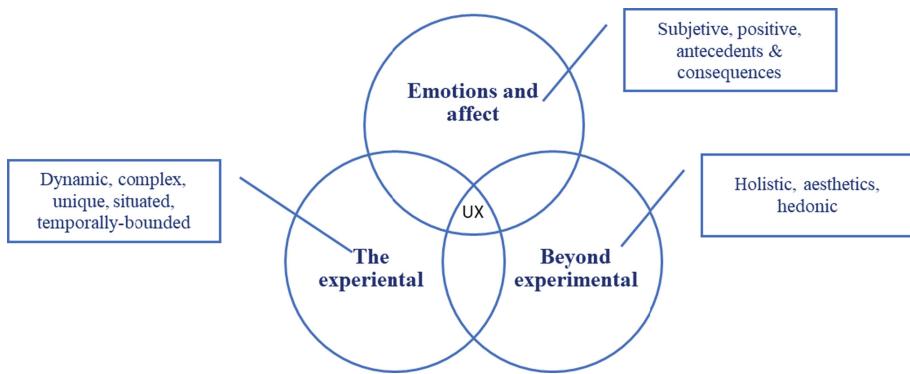


Fig. 1. UX Components. Source: Hassenzahl and Tractinsky [6, p. 95].

Emotions. In human decision-making, the aspects considered are emotions and affection, so in interaction with technology, they are also considered. In this sense, UX must consider positive emotions such as joy, fun, and pride so that the interaction with the user results in an emotionally positive interaction that provides subjective well-being [6, 7].

Experiential Perspective. The experiential component has an impact on the user's well-being, as it assumes that the way the experience and the experience itself can influence the consumer; although they are related, they are not the same.

UX focuses on positive aspects of the relationship between humans and technology, it depends on the user's condition, the context in which they are inserted, and the design characteristics. So, it should privilege exceptional experiences in terms of quality rather than just preventing usability problems, the latter being associated with the efficiency and ease of use of a device or interface, on the part of the user/consumer.

2.2 UX Design

User Experience Design (UED) is defined by the International Organization for Standardization (ISO) [8] as the perceptions and responses that human beings perceive because of the use or anticipation of the use of a product, system, or service. This definition can be divided into two parts: the user's perception and response, which is not controlled by how the design is conceived, and the use of the product, system, or service, which can be managed by designers through the features developed to elicit a behavioral reaction on how it should be used. The designer should consider aspects that can answer questions about how the product or system will be used, such as: why it is used, how it will be used, and what components will be used. In addition, concepts of visual design, psychology, and interaction with the product or system should be considered from a user-centered perspective.

User-centered design involves understanding who the consumers are through interviews, focus groups, and surveys, to identify the “persona” and “customer journey maps” and understand the needs of users to develop appropriate “user stories”. After the development of a prototype, usability tests, A/B tests, heuristic estimates, inclusion tests, and accessibility limitations should be carried out [9].

In user-centered design, the development of the User Interface (UI) should be considered, combining the following components: content, functionality, information architecture (inverted pyramid), interaction, and visual aspects (buttons, colors, icons).

2.3 User Interface (UI)

The User Interface is the point of interaction and communication between the human being and the computing device, while the UX is about the experience that the human being has when interacting with the User Interface, developed with the components mentioned above.

UI has seen its relevance increase in terms of new partnerships, such as in the development of dashboards to support the decision-making process of companies associated with Business Intelligence tools, where data visualization plays an extremely relevant role, such as in the analysis of relationships associated with consumer behaviour or as components of CRM systems. Developing a data-driven dashboard can be challenging due to the complexity of the datasets, poor UI design, and insufficient storytelling [10].

Suprata [10] considered that it must be understood which data will be used, which metrics to include in the appropriate context, and how to transmit numerical information. This contributes to the involvement of the decision-maker, and understanding which decision to make is a challenge. Understand who will use the dashboard and choose which data and metrics to view in the right context. Knowing how to convey information, generate engagement, and persuade the public are essential in today's business practices. Therefore, it is necessary to define appropriate dashboards for the decision-making process, which contribute to promoting knowledge about consumers and the business and include concepts that allow the creation of a narrative associated with data (data storytelling).

2.4 Data Storytelling

Data storytelling is a way of using information to create a narrative. According to Zanan and Aziz [11], “Data storytelling” is becoming a process of the effectiveness of visualization tools, as it has the potential to increase the effectiveness of communication [12].

The development of effective dashboards, which support decision-making and include the essentials of data storytelling to communicate with decision-makers, is an aspect that should also be considered in the analysis of the consumer and their consumer experience since companies have to analyze data that increases 24 h a day, 7 days a week.

Data storytelling is an approach that combines data analysis, visualization, and narrative techniques to communicate complex information and insights in a compelling

way (Segel & Heer, 2010). It recognizes the innate human tendency to understand and remember information through stories, making data more accessible and engaging [13].

Also, data storytelling involves transforming raw data into meaningful narratives that captivate audiences, increase understanding, and drive action [14]. Key concepts in data storytelling include data analysis, visualization, narrative structure, and audience focus. Data analysis involves optimizing insights, patterns, and correlations of datasets using statistical methods and analytical techniques [15]. Visualization techniques, such as charts, graphs, and infographics, are employed to represent data visually and facilitate understanding [16]. The narrative structure provides a framework for organizing the story, incorporating an introduction, a clear, proven supporting objective, and a conclusion [15]. Finally, an audience-centric approach adapts the narrative to the target audience's level of data literacy, domain knowledge, and preferences [17].

Evolution of Data Storytelling. The evolution of data storytelling can be traced back in time to the theory of information visualization, which aimed to make complex data more accessible through visual representations [18]. Over time, the focus shifted from static visualizations to interactive, narrative-driven approaches [13]. Additionally, advances in data analytics and big data processing have contributed to the splendor of data storytelling. The abundance of data generated across multiple domains requires effective communication of insights and knowledge findings [19]. Data storytelling has emerged as a response to this need, offering a structured and engaging approach to conveying data-driven insights to diverse audiences.

Practical Applications. Data storytelling finds practical applications in various domains. In business, it helps organizations present key performance indicators, market trends, and customer insights to support decision-making and strategic planning [18]. In marketing, data storytelling is used to convey brand-associated narratives, consumer behavior insights, and campaign performance indicators [20]. Journalists use data storytelling to communicate investigative reports, election results, and social issues, increasing transparency and public engagement [21].

To effectively utilize data storytelling, several steps are typically followed. This includes identifying the purpose of the story, selecting relevant data sources, conducting exploratory data analysis, gaining insights, and structuring a coherent narrative. Additionally, choosing appropriate graphics and visualizations is crucial for conveying information accurately and engagingly [17]. As analyzed in Fig. 2, graphs should be aligned with the nature of the data and the message to be communicated, considering factors such as data types, relationships, and reliance on specific patterns [22–25].

Nowadays, business intelligence tools such as Power BI and/or Tableau provide easy-to-use interactive interfaces for creating visually appealing data stories. These tools offer a range of customizable visualizations and data storytelling features that make it easy to create engaging narratives and interactive dashboards. The versatility and effectiveness of data storytelling make these tools valuable in various industries, allowing for effective communication of insights, influencing decision-making, and generating positive results.

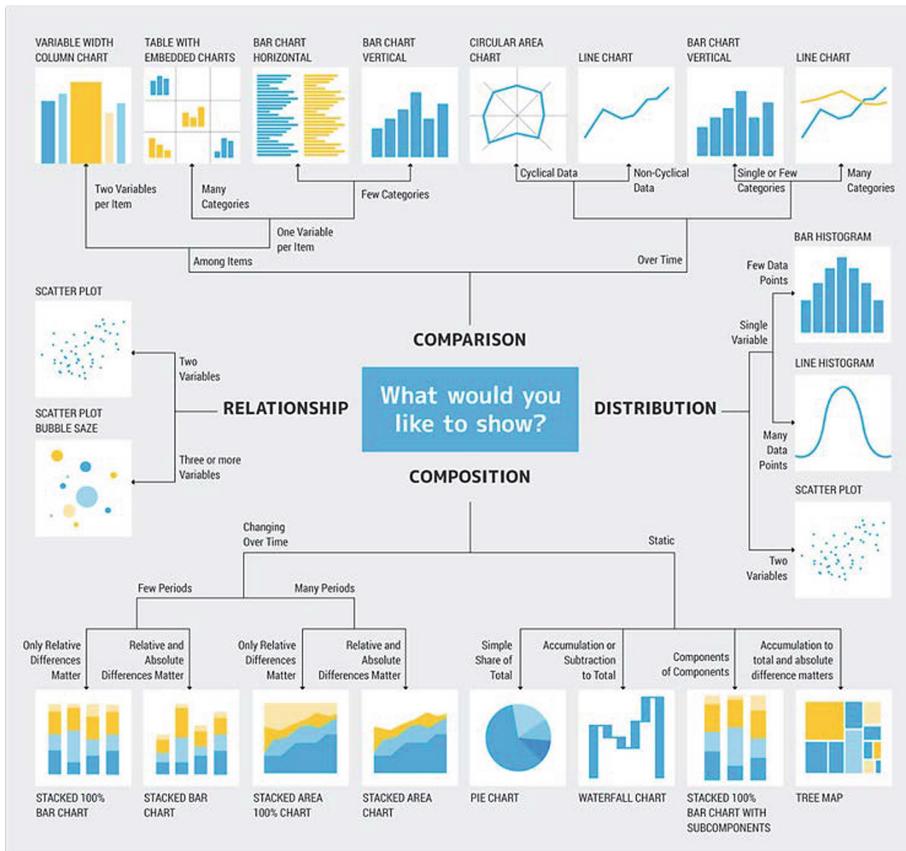


Fig. 2. Which visual element to use? Source: Abela [23].

2.5 Data Storytelling and Dashboards

Data storytelling is an approach that combines data, visual, and narrative aspects [26], which allows for an explanation, involvement, and clarify aspects of the business and consumer behavior, which allows involving the user in terms of credibility, emotional, logical, and rational, as shown in Fig. 3.

In an organization, dashboards can be of three types: operational, tactical, and strategic. The main role of the operational one is the monitoring of operations, the tactical one is the analysis of the measures that represent progress, and the strategic one is the management regarding the execution and definition of strategies [10, 27].

In order to design an effective dashboard that allows the definition of a business measurement model, the following steps should be considered [10, 26]: (1) Planning to define the audience, in terms of knowledge, objectives, and needs; (2) Define the insights, through the collection and relationship of the data; (3) Create context, whether on mobile devices or in person to choose the best view; (4) Adapt to the audience, by

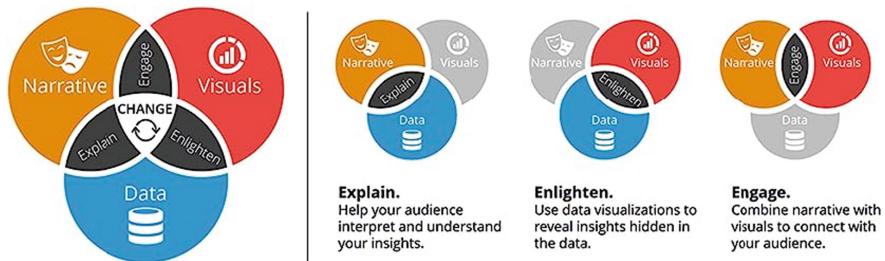


Fig. 3. Effective data storytelling can help your insights drive change in your business. Source: Dykes [17], p. 32].

defining how to present the insights (Freytag's Pyramid) and what elements to include; (5) Consolidate and practice to receive feedback and finish the process (Fig. 4).



Audience + Insights + Context + Storytelling Elements + Practice

Fig. 4. Five steps of effective storytelling. Source: Accenture Technology Labs [28], p. 4].

In Step 1. Audience - In the planning phase (goal step), related to the audience, the objectives of the economic activity are identified and defined, how it will be done, and how it will be measured, as shown in Table 1.

Table 1. Stage of planning a business model and questions that must be answered by the board.

What's the objective?	How will it be done? (customer journey)	How will it be measured? (customer journey)
Increase customers	By email marketing	KPI to be defined according to the objective
Sell a new product	By social media	
Testing a new concept	By social media	
Measure the degree of satisfaction	By email and mobile	
Launch a new product	Across all channels	

Source: Adapted from Zeferino [26], p. 238]

In Step 2. Insights - Data & Tool step: Phase define the data sources and tools to use in data analysis Table 2, to obtain the insights.

Table 2. Insights step to define data sources and technology tools.

What data?	What technology?	What integration?
Internal and external (metrics, KPI, etc.)	Analytics tools, email, social media, mobile, etc.	How will they be integrated? By API?

Source: Adapted from Zeferino [26, p. 240]

Table 3. Phase of auscultation of results.

What evidence?	What actions?
Low level of subscriptions	Consider 2nd wave of emails
Low level of product purchase	Consider promotional action
High level of product purchase	Spread the degree of endorsement
Low search level	Rephrase keywords
Low CTR (Click through rate)	Rephrase content (engagement)

Source: Adapted from Zeferino [26, p. 241]

In Step 3. Context – Listening step: This phase in which the dynamics and results are evaluated to see if adjustments are needed, as shown in Table 3.

In Step 4. Elements of Storytelling – Analysis and knowledge production phase (Intelligence step): This phase in which knowledge is generated and the decision-maker can evaluate the operation of the business and the plan, as shown in Table 4.

Table 4. Analysis and knowledge production phase (Intelligence step).

What information?	What knowledge?	What insights?
Sales exceeded the target (KPI)	The product had an excellent acceptance (feedback)	This product is unique in this market segment with this positioning (perceived attributes)
Subscription volume (form) exceeds objectives (KPI)	Subscriptions were received from geographic regions that were not segmented (source)	The level of interest is far above the initial expectations (sales potential)

Source: Adapted from Zeferino [26, p. 242]

In addition to the one shown in Fig. 2, it is important to identify how the visual elements of each graph should be used. Table 5 presents suggestions, in terms of types and what is proposed for use.

To communicate information through a narrative, it must be elaborated as the structure of a story, for example, according to Freytag's Pyramid, presented in Fig. 5.

Table 5. Charts and chart components as visuals to consider in a dashboard.

Chart Type	Proposed for use?
Plain text	Can be used to display a number
Tables	Used to present and communicate different units of measurement
Pie charts	Represent a distribution or the relative share of each segment (slice) over the total, which represents 100%. Used to contribute to the revenue of each product
Line graphs	To show trends over a period of time. It should be used with models that are intended to emphasize a sequence or trend over time
Column or Bar chart	Ideal for comparing items over a period of time for a given set of values, such as categories
Stacked columns or stacked bars	Allows you to compare several variables at the same time, each category in a color and each portion of each variable
Radar Graphs	Allows the comparison of several values in a radial format
Area charts	Can be thought of as a subset of line charts, where the area below the line is colored. It can be useful when comparing data series
Composite charts, rows, and columns	To compare two variables that are expressed at different scales two Y-axes can be used

Source: Adapted from Suprata [10, p. 5]

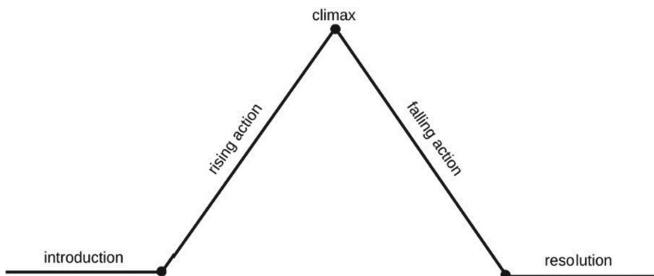


Fig. 5. Freytag's Pyramid. Source: Adapted from Suprata [10, p. 6].

Figure 5 represents Freytag's Pyramid and the moments: (1) Introduction or exposition, to identify the data sources; (2) Rising action on what can be found in the data? (3) Climax to present key insights, (4) Falling action where details, contexts, interpretation, and explanations are presented; (5) Resolution or catastrophe to analyze the key insights and their importance.

In Step 5. Practice - Actionable step (Intelligence step): This phase in which the knowledge generated in the previous steps should be used, and new strategies should be defined, as shown in Table 6.

Table 6. Business optimization phase through the developed dashboards.

What insights?	What decisions?	What actions?
This product is unique in this market segment with this positioning (perceived attributes)	Review sales objectives and consider increasing goals for the year	Design a new short-term campaign introducing a new product feature
This product was not configured correctly for this segment (causes for failure)	Review the communication strategy and understand which digital media can support this decision	New Proof of Concept

Source: Adapted from Zeferino [26, p. 243]

Currently, companies are looking for methods that allow them to obtain information about their business. However, a methodology that combines the presentation of data with visual elements, communicated in visual support such as dashboards, is needed to increase the speed of knowledge acquisition. As well as to enhance the emergence of insights and innovation easily and intuitively in data visualization.

3 Methodology for Elaboration of Dashboard with Indicators Associated with the Hotel Customer Experience

3.1 Research Context

The experience is associated with economic offers and differentiated services provided to the customer, where the focus is no longer centered on the product and shifts to the customer. In addition, management has shifted from physical asset-centric to experience-based assets, which causes a disruptive effect that forces the integration of innovations [29].

In the area of hospitality, innovations must be customer-centric, considering the concepts of “customer centricity, empowerment, and engagement” [30, p. 19]. As the main factors of the new type of customer service, innovation occurs mainly to improve the quality of service and the customer experience [29].

Customer-centric innovations can be considered as functional or experiential innovation [29]. The functional ones are related to the needs associated with the guest’s stay. Moreover, experiential ones are related to the resources, the location of a hotel, and the skills and competencies of the employees providing the services.

Preparing a strong customer experience is a new goal for the hotel manager [38], it must be implemented through CRM with a focus on metrics that allow the evaluation

of the value of the guest, such as CLV [31], together with other metrics (or performance indicators, as shown in Fig. 6).

The innovation associated with hotel services can be accomplished through new ways of delivering a benefit, new service concepts, or business models through continuous operational improvement, technology, investment in employee performance, or the management of the guest customer experience [29]. This challenge can be overcome with the use of CRM if the objective is to increase competitiveness, face competition, create differentiation, and evaluate the value of each customer [2]. Also, the creation of new performance indicators and innovation in the indicators such as intellectual capital of an organization in general, and in particular of a hotel.

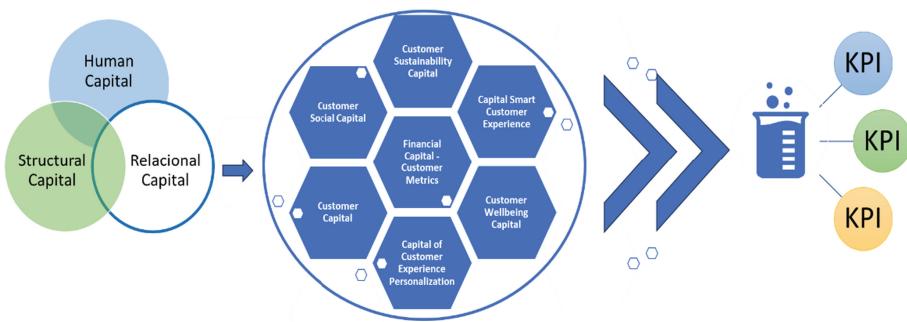


Fig. 6. Conceptual model of the relationship between the Guest's capital and Performance Indicators. Source: Author's elaboration.

Methodology for Defining New KPIs. For the definition of new performance indicators associated with the hotel, health and wellness tourism, and the guest experience, the following methodology was considered:

1. Literature review on intellectual capital indicators and all metrics associated with different areas of society that are related to the client–guest.
2. Identification of indicators associated with each dimension.
3. Conceptual development of the relationship between guest capital and Performance Indicators.
4. Definition of the methodology for data collection.
5. Transforming data so analytics can be performed.
6. Apply Text Mining Algorithm (for Online Comments).
7. Prepare the variables to consider in the model.
8. Define and estimate the regression model.
9. Evaluate results.
10. Create Dashboards with KPIs.

3.2 New Indicators of Capital Associated with the Client

New indicators were presented in the form of formulas, which express the relationship between the variables that measure the client's capital in various dimensions:

First, Health & Wellness Customer Capital (HWCC) is presented in Eq. 1.

$$\begin{aligned} HWCC = & \beta_1 + \beta_2 * CC + \beta_3 * CFC + \beta_4 * SC + \beta_5 * SEC \\ & + \beta_6 * SUC + \beta_7 * WBC + \beta_8 * CEPC \end{aligned} \quad (1)$$

where CC – Customer Capital, CFC – Customer Financial Capital, SC – Social Capital, SEC – Smart Experience Capital, SUC - Sustainability Capital, WBC – Well-Being Capital and CEPC – Customer Experience Personalization Capital.

Second, the Key Performance Indicator (KPI) of the HWCC Client, whose Eq. 2 expresses the calculation to be performed.

$$KPI_i = \frac{\sum_{i=1}^n (\alpha_i * X_i)}{\sum_{i=1}^n \alpha_i} \quad (2)$$

Third, the Health and Well-Being Customer Index (HWBCI) defines the positioning of a client when compared to others in terms of their capital in the different dimensions, which is expressed in Eq. 3.

$$HWBCI_i = \frac{\sum_{i=1}^n (KPI_i)}{n} \quad (3)$$

3.3 Methodology to Develop a Dashboard, a Business Measurement Model for the Health and Wellness Tourism Client

As mentioned above, the methodology to develop an effective dashboard, taking into account the concepts of data storytelling, which allows the definition of a business measurement model for the Health and Wellness Tourism client, is defined by five steps:

1. Planning to define the audience, in terms of knowledge, objectives and needs.
2. Define insights, through the collection and relationship of data.
3. Create the context, whether on mobile devices or in person to choose the best view and what elements.
4. Adapt to the audience, by defining how to present insights (Freytag's Pyramid).
5. Consolidate and practice to receive feedback and finish the process.

4 Results

In this section, the focus is on the elaboration of dashboards that allow the analysis of the consumer experience of health and wellness tourism, and, at the same time, it is possible to calculate metrics that define the relationship capital associated with the customer, in the various dimensions associated with it.

4.1 Planning to Define the Audience and Objectives

One of the main aspects to consider at this stage is to define the objectives, that is, who the dashboard is for, what its functions, its knowledge. And what indicators you need for your decision-making.

In terms of objectives, as presented in Table 1, applied to the hotel industry and relevant to the strategic decision-maker, the following can be considered: increasing the number of customers, measuring the degree of satisfaction, or launching a new product.

4.2 Define Insights by Collecting and Linking Data

After defining the objective(s), the next step is to collect the data. The guest data considered in this study belong to the Hotel Booking Demand Dataset [32] although it does not refer to health and wellness tourism guests, it is one of the most complete datasets found by the authors with characteristics of hotel customers. This dataset is made up of booking information for an urban hotel and a resort hotel. In total, there are 119,390 reservations scheduled to arrive between July 1, 2015, and August 31, 2017.

The identification of the variables, the type of data, and the statistical description are presented in Table 7, which totals twenty-eight variables, not all of which will be used in the present study.

Create the Technology Context for Better Data Visualization. At this stage, it is important to identify where the dashboard will be visualized and which technology should be used for it; in the present study, Microsoft Power BI and its reports visualized on PCs were considered.

Tailor to the Audience or How to Present the Insights. The concepts of data storytelling, from its visual elements, and other characteristics that were not considered in this study, such as colors, and fonts, among other graphics, are highlighted in this stage, in which the dashboards are prepared according to the metrics and indicators considered.

One of the limitations of the present study is the lack of a panoply of dimensions associated with the customer, including the data necessary to calculate the new indicators, as well as other older ones associated with customer analytics such as Recency, Frequency, Monetary value (RFM), and Customer Lifetime.

However, it was possible to use the database, use the concepts of data storytelling, and develop dashboards that allow the analysis of the business model, such as Fig. 7, 8, 9, and 10.

In Fig. 7, the concepts of Data Storytelling were applied to analyze reservations made by countries and channels, which allows the analysis of revenue, number of meals and number of adults per reservation.

In Fig. 8 it is possible to analyze the reservations for the three countries, with the most reservations, with the aim of understanding the behavior of their guests.

Figure 9 shows a dashboard where it is possible to verify that visual elements are combined with visualizations of artificial intelligence algorithms, as is the case of the main influencers.

In Fig. 10, it is possible to visualize the result of unsupervised Machine Learning algorithms that assigned a cluster to each guest; of the four that were obtained, the application of an artificial intelligence visualization (main influencers) also appears. This dashboard aims to show the characteristics of each cluster, the daily average per cluster (*adr*), if they ask for parking or if they have other special requests, the type of meal chosen, as well as the characteristics in terms of the household that positions them in cluster 2, as an example, which can be chosen another from the combo box.

Table 7. Variables contained in the data are to be considered in the present study.

ID	Variable	Data type	Description
1	<i>is_canceled</i> (<i>dependent variable, DV</i>)	Categorical	2 categories: canceled and not canceled
2	<i>hotel</i>	Categorical	2 categories: resort hotel and city hotel
3	<i>lead_time</i>	Numerical	Number of lead days
4	<i>arrival_date_year</i>	Variable related to time	Arrival year: 2015–2017
5	<i>arrival_date_month</i>	Variable related to time	Arrival month: 1–12
6	<i>arrival_date_week_number</i>	Variable related to time	Arrival week: 1–53
7	<i>arrival_date_day_of_month</i>	Variable related to time	Arrival day in month: 1–31
8	<i>stays_in_weekend_nights</i>	Numerical	Number of weekend nights
9	<i>stays_in_week_nights</i>	Numerical	Number of week nights
10	<i>adults</i>	Numerical	Number of adults
11	<i>children</i>	Numerical	Number of children
12	<i>babies</i>	Numerical	Number of babies
13	<i>meal</i>	Categorical	4 categories: type of booked meal
14	<i>country</i>	Categorical	Customer source country
15	<i>market_segment</i>	Categorical	8 categories: market segment designation
16	<i>distribution_channel</i>	Categorical	5 categories: booking distribution channel
17	<i>is_repeated_guest</i>	Categorical	2 categories: whether is a repeat consumer
18	<i>previous_cancellations</i>	Numerical	Number of previous cancellations
19	<i>previous_bookings_not_canceled</i>	Numerical	Number of previous bookings not canceled
20	<i>reserved_room_type</i>	Categorical	9 categories: reserved room type
21	<i>booking_changes</i>	Numerical	Number of booking changes

(continued)

Table 7. (continued)

ID	Variable	Data type	Description
22	<i>deposit_type</i>	Categorical	3 categories: deposit type
23	<i>agent</i>	Categorical	Travel agency ID
24	<i>days_in_waiting_list</i>	Numerical	Number of days in the waiting list
25	<i>customer_type</i>	Categorical	4 categories: type of booking
26	<i>adr</i>	Numerical	Number of average daily rate
27	<i>required_car_parking_spaces</i>	Numerical	Number of parking spaces
28	<i>total_of_special_requests</i>	Numerical	Number of special requests

Source: Adapted from António et al. [32]

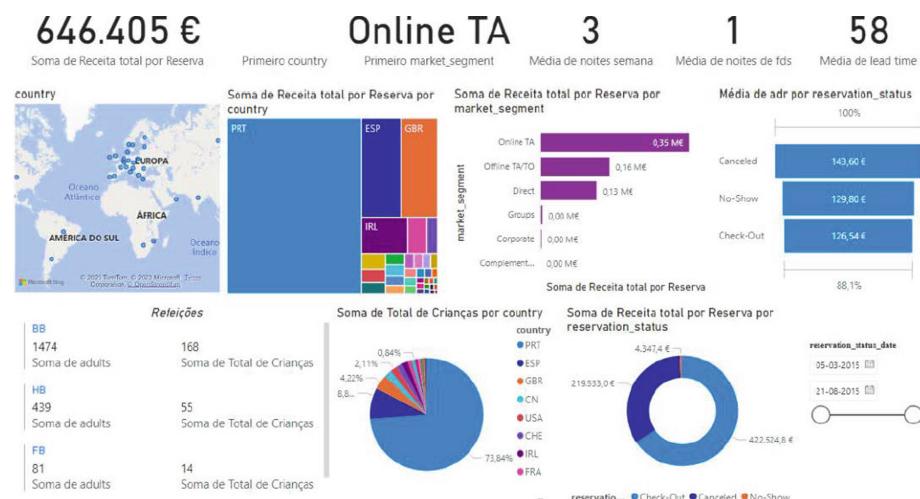


Fig. 7. Dashboard for global business measurement associated with all guests.

4.3 Consolidate and Practice to Receive Feedback and Finish the Process

At this stage, the business objectives and the business strategy should be reviewed, so that it is possible to either continue to have good results or to control deviations so as not to have failure and losses in the business.

The area of Digital Marketing Analytics is increasingly a need for decision-makers and marketers, it should be considered by companies in general, and specifically by those in tourism, to monitor, analyze, and manage their resources, especially those related to

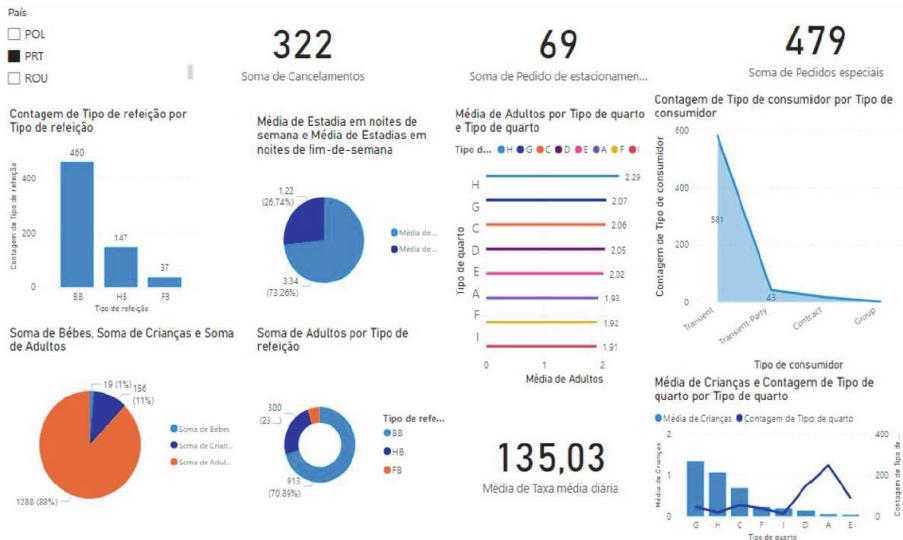


Fig. 8. Dashboard for measuring global business associated with all national guests.



Fig. 9. Dashboard for measuring the global business associated with BB (Bed & Breakfast) meals.

their customers [33–35]. Gamification mechanisms should be considered to enhance their engagement [36], among other strategies, and the various Machine Learning algorithms [37] should be explored to detect and receive insights into the potential and capabilities of the company itself, i.e. the hotel [38, 39].



Fig. 10. Dashboard for global business measurement associated with a cluster or guest segment.

5 Conclusion

User experience is an area of knowledge that relates emotions, with the experience with technology and the consumer experience itself, where the result should be to contribute to a positive consumer experience.

The quality of the visual elements contributes to the experience, and when the intention is to present data about the business, it is important to use visual elements that present them in a simple and easy-to-understand way, where the concepts of data storytelling are increasingly important to tell a narrative that is mostly built by values and numbers mixed with categorical, and with the ultimate goal of supporting the decision-maker in any sector of activity, specifically the hotelier whose customer experience and customer engagement strongly influence their business and the success of the hotel.

Through the presentation of examples of dashboards developed in Power BI, it was possible to show that customer capital indicators can be included, under different dimensions that characterize it. However, the lack of real data to apply in the formulas of the new indicators is one of the limitations of this study.

Acknowledgments. This paper is financed by National Funds provided by FCT- Foundation for Science and Technology through project UIDB/04020/2020 and project Guest-IC I&DT nr. 047399 financed by CRESC ALGARVE2020, PORTUGAL2020 and FEDER.

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