

QUANTATATIVE RESEARCH METHODS

Module code LCDB7011

Abstract

Hotels prioritise revenue management due the perishability of hotel rooms and lost revenue due to empty rooms overnight. The following report focuses on guest booking and cancellation behavior and aims to examine the relationship between market segment, booking lead time and booking cancellation outcomes. This has been achieved through a quantitative research design within the positivist paradigm. Theory of planned behavior and prospect theory have been combined to provide a conceptual model and testable hypothesis which have been tested through SPSS with the outcomes being clear with limitations acknowledged there is statistically a significant difference between the lead time and market segments, a significant relationship between market segments and a weak relationship between lead time and cancellation behavior

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1.Introduction

The application of disciplined tactics predicting customer response to price, optimization of product availability and yielding the greatest business income (Hayes & Miller, 2011), revenue management is applied within industries that require the strategic balance of a fixed capacity, variable demand and high-cost structures (Antonio, Almeida & Nunes, 2019). The fiercely competitive business with profitability influenced by pricing matters (Ahmed et al, 2026). hotel rooms are a perishable product as once a room is not sold for a night, then that night's revenue cannot be recaptured (Phumchusri & Maneesophon, 2014). Therefore, combined with varying demand, high-cost structures and competition levels, the science of managing supply to maximise revenue is adopted worldwide within the hotel industry (Bayoumi, et, al, 2012). According to GlobalData (2025) the largest segment of revenue for global hotels is room revenue accounting for 67.3% of the total industry value in 2024, this reinforcing the maximisation of revenues and profits as a vital component of a hotel business especially during fluctuating demand periods (Binesh, Belarmin & Raab, 2021) with a reliance on continuous analysis and the application of strategic business planning and practices.

Due to the dynamic and unpredictable business conditions that hotels operate within, there needs to be around the clock grasp of actual demand in real time to manage revenue effectively (Kavitha, Singh & Chauhan, 2024). Competitive in nature the hotel industry places effective pricing strategies as it's cornerstone of the business (Guillet et al, 2026). The business practice of dynamic pricing originally attributed to sectors such as aviation is increasingly relevant to hotels with modern day data analytics, machine learning and big data technologies (Ahmed et al, 2026). As an adaptive pricing strategy dynamic pricing adjusts hotel room rates based on circumstances within the marketplace (Gao, 2025) inclusive of when bookings are made, market segments and cancellations.

2. Problem statement

The relevance of understanding behavioural patterns in terms of bookings and cancellations is stated by Mir, et al (2026) as twofold, the first being that the study of cancellations in the current time of increased flexible cancellation options enriches understanding of guest behaviour and secondly that hotels are heavily impacted by cancellations that imply high degrees of uncertainty in occupancy. This study will delve into hotel cancellations and test significant relationships between booking lead time and Market segment in terms of guest cancellation booking.

2.1 Booking cancellations

Irrespective of cancellation policy, hotels assume the risk of guaranteeing rooms for customers who honour their reservation however, simultaneously hotels must take into consideration the cost of vacant rooms through cancellations or non-arrival of guests (Antonio, Almeida & Nunes, 2019). Last minute cancellations result in heavy revenue loss and a zero-salvage value to hotel rooms that remain unoccupied for the night as they do not generate any revenue and cannot be reflected in future inventory (Dong & Ling, 2015). Williams (2026) reported that the cancellations processed in the UK throughout 2025 was 18.24% which remained below the global benchmark of 19.15%, however this still poses a challenge to the maximisation of room revenue and despite the hotel industry growing, increasing cancellations are a downside that must be taken into consideration (Ahmed, Chowdhury & Rahman, 2024). Whilst hotel cancellations can be a combination of factors beyond the guest's control, deliberate customer behaviour such as choosing a better price, superior services or an alternative more desirable location also result in cancellations (Silvestre, Antonio and Carrasco, 2025). According to Kmiecik and Antonio (2026) the response to dynamic pricing strategies and taking advantage of flexible policies are motivations for cancellation by the guest. A behaviour that significantly increases cancellations is guests booking more options with flexible rates and postponing their decisions until the best price is achieved (Chalupa, Petricek and Koklarova, 2026) this proving even more of a challenge for revenue managers. Antonio, Almeida & Nunes, (2019) noted that similarly to hotel demand and selection, cancellations are affected by diverse variables inherent to customer bookings inclusive of the timing of the booking and market segment in terms of customer type.

2.2 Booking lead time

The key metric of interval between the guest making the booking and the actual stay date influences strategic and operational decisions (Katz, Savage and Coles, 2025). With a note of caution that average lead times change country to country Elphick (2024) maintains that a range of 20 -60 days is the average lead time for booking hotels. Jang, Chen and Miao (2019) state that the last-minute booking phenomena is more nuanced than simply looking for a good deal. A structural change in booking behaviour shows that guests are now booking accommodation much earlier than in previous years challenging hotels to rethink about inventory and how early to position rates (Hospitality. Today, 2026). With an increased understanding of lead time and the growth of four days in UK booking lead times since 2019 (Nicholls, 2024) increase market confidence results in better forecasting for hotels.

2.3 Marget segment

The fundamental value proposition of overnight accommodation results in the dominance of the room revenue segment within the industry, demand for overnight stays from leisure, business travellers and long-stay guests drive consistent occupancy rates (GlobalData,2025). Widely employed to facilitate understanding of target segments and customise to the needs of the client's (Ahmed, 2014) market segmentation gives competitive edge among hotels. An increased online presence combined with more hotel choices and access to more details leads to a somewhat more complicated decision-making process (Nie et al, 2020). With an increased efficiency of distribution channels and accessibility through online platforms and smart phones, it is not only increased the flexibility to make a reservation but also the ease of cancelling existing reservations due to the value of time diminishing (Jang, Chen and Miao, 2019) and making different decisions. The marketing practice of market segmentation involves the breaking down of guest types that conceivably are representative of distinct target markets (Ahmed, 2014). The different segments have different motivations for booking a stay and behaviour in accordance with said motivation. This reinforced by Elphick (2024) who states that the implementation of appropriate and relevant promotions can attract the right guest at the right time with an awareness which segments book further in advance. Pimping (2025) reports a pivot in behaviour of guests booking behaviour with 26% of travellers searching for hotel stays with online travel agents such as Booking.com as opposed to google searches and beginning their journey on platforms that combine comparison and booking ability in one place.

The direct booking has also reportedly made a comeback with a twostep booking behaviour evident, as 18% of guests start their search on an OTA and then seek more control by booking directly with the hotel (Pimping, 2025). Fearis (2025) reports an alignment with growth of booking lead times, a more stringent-approval processes is resulting in a reduction of booking of last-minute trips for corporate guests due to focus on ensuring solid business justification to keep costs down.

Based on the three-variables identified, cancellations, booking lead time and market segment a better understanding of the current guests booking behaviours is required to support and inform hotel strategy, aide revenue management practices and manage cancellations to optimise revenue. Therefore, identifying the contribution that achieving the following research aim, objectives and questions of this research with further understanding can make to revenue managers and the hotel industry.

3. Research aim, objectives and research questions

3.1 Aim

To examine the relationship between market segment, booking lead time and booking cancellation outcomes through statistical analysis of hotel booking data.

3.2 Research objectives

1. To determine whether mean booking lead time differs significantly between different market segments.
2. To determine whether there is a significant association between market segment and booking cancellations.
3. To determine whether there is a significant relationship between booking lead time and booking cancellation status.

3.3 Research questions

1. Does booking lead time differ significantly between different market segments?
2. Is there a significant association between market segment and booking cancellations?
3. Is there a significant relation between booking lead time and cancellations?

4.Literature Review

The literature review combines Ajzen (1991) theory of planned behaviour with Tversky and Kahneman's (1992) prospect theory to review current literature of hotel bookings and cancellation behaviour. A consideration of existing literature and findings in relation to hotel booking lead time and cancellation has also been included within the review.

4.1 Theory of planned behaviour (TPB)

Guided by the combination of behavioural beliefs (attitude), normative beliefs (subjective norms) and control beliefs (perceived behavioural control), TPB suggests that a more favourable attitude and subjective norm in addition to greater perceived control results in increased intentions to perform a behaviour in question (Bosnjak, Ajzen and Schmidt, 2020). Developed by Ajzen (1991) and has emerged as the most influential frameworks for explanation of human behaviour shaped by behavioural intentions each constructing a different dimension of behavioural control Mojoodi et al, (2025). In a hotel booking context this combination can facilitate an understanding of why, when and how reservation and cancellation decisions are made (Ulker-Demirel and Ciftci, 2020).

In terms of TPB attitudes shape decisions and intentions therefore, attitude is the outcome of one's interpretation of behavioural outcomes Wong, et al (2024). The first detriment of intention is the extent in which a behaviour in question is favourable or unfavourable (Mohammed et al, 2025) in the case of hotel bookings and cancellation this can be attributed as behavioural perceptions of value, flexibility and risk. Lin, Liu and Chen (2026) found booking lead time emerged as an important dimension of heterogeneity as late bookers showed a lower baseline demand and high price sensitivity, whereas early bookers had a maintain stronger baseline demand and reduced elasticity therefore, a pattern of a discretionary and price sensitivity for last minute demand versus a stable committed demand of early planners.

As stated by Wasaya et al. (2022), TPB assumes the description of subjective norms for a combination of descriptive norms (perception of what others do) and injunctive norms (beliefs of expectations of how one should act). Ma and Li (2022) concluded that group influences and peer recommendations have a significant influence on booking decisions which is reinforced by Wasaya et al. (2022) findings that indicated that an intergenerational model of social norms such as family, friends and reference groups influences behavioural intentions and can be a

strong predictor of booking and cancellation behaviour. This also resonates with the findings of Mojoodi et al, (2025), who investigated the impact of online reviews and their influence on booking behaviour.

As cited by Esfandiar and Hadinejad (2026) The element of perceived behavioural control is in reference to individual's perception of their ability to control specific behaviours (Ajzen,1985), in the case of this context ease of booking, cancelling and planning ability affect lead time and cancellation likelihood. The ever-evolving pricing strategies in the hotel industry have achieved a higher price transparency combined with lower search costs Rita, et al (2026) which supports Bqeen and Saad (2025) who maintained that the dramatic change in preferences for online bookings and digital interaction a deeper understanding of factors influencing consumers intention to book. Whereas, Mir, et al (2026) found that the ease of cancellation and planning ability influences both booking lead times and cancellation likelihood. Mir, et al (2026) reported a nonlinear inverted U shape relation between booking window and likelihood of cancellation and highlighted strategic behaviour of cancellations within the cancellation and rebooking opportunity windows.

4.2 Prospect theory

With the main objective of Prospect theory (PT) to describe behaviour, PT has become a pioneering perspective giving insight into the evaluation of uncertain or risk prospects (Ibrahim, 2026). Rita, et al (2026) states that PT posits an individual's evaluate potential gains and losses in relation to a reference point rather than in absolute terms. Therefore, in the case of this study a reference point of a confirmed booking, the lead time indicates uncertainty and opportunity, the market segment represents what is constitutes as a gain or loss and therefore cancelation a reflection of a reaction to outcomes more relative to their reference point. Mun, et al (2024) identified two potential types of loss associated with booking behaviour in terms of lead time, those being the risk of higher room price and risk of hotel sell out on the date required. It was also suggested by Mun, et al, (2024) that guests balance the benefits of price promotion and the risk of losing booking opportunity over time.

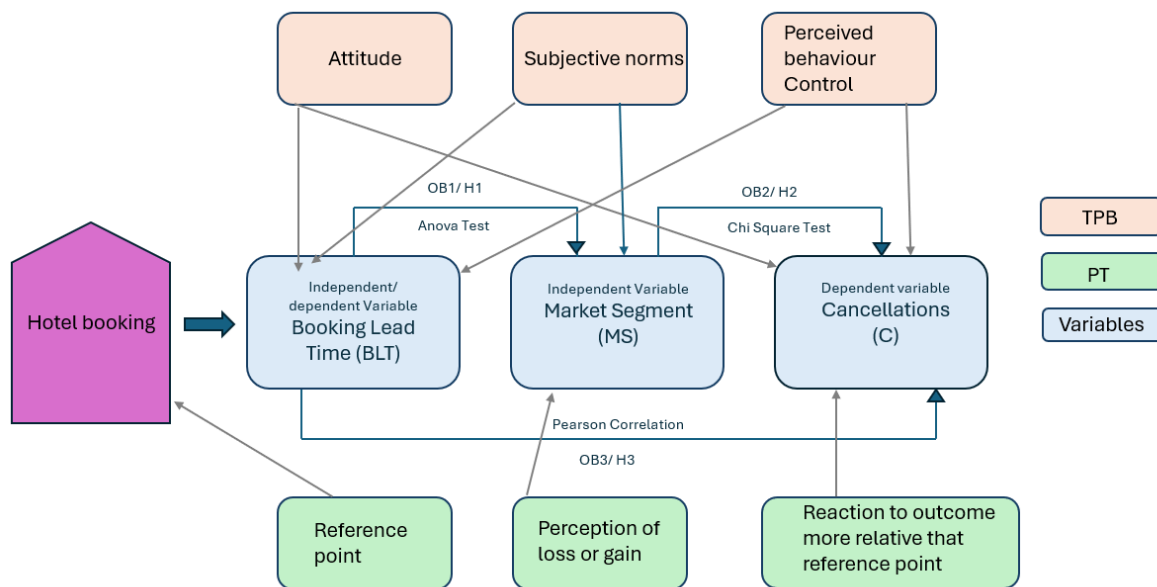
4.3 Booking lead time and cancellations

With the performance of hotels heavily reliant on forecasting future bookings time and booking windows are considered of paramount importance especially due to its non-storable service and perishability (2022) Falk and Vieru, (2018) reported as association between longer booking lead times and higher cancellation rates reflecting the influence of perceived flexibility and risk. Whereas, Mir, et al (2026) found that cancellation behaviour is shaped by refundability, lead time, risk value and control. Choi and Kim (2024) stated that the probability of cancellation increases with early booking and Atabay, Cizel and Atabay, (2026) found that booking window acts as a primary driving force in the cancellation and risk window. That said, Antonio, Almeida and Nunes (2019) state that literature in terms of booking cancellations is sparse and relatively recent, this reaffirmed by Jang, Chien and Miao (2019) who maintains a limited research into lead time and booking behaviour is available as with Mun, et al (2024), who states few studies examine the relationship between booking lead time and cancellation and by Mir, et al (2026), who states that irrespective of the ubiquity of cancellation policies within the industry there is scant research into occurrence. Ahmed, Chowdhury and Rahman (2024) concluded that a longer lead time results in higher cancellation rates and that the implementation of dynamic pricing offering non-refundable rates with discounts based on lead time can reduce cancellations.

Despite the wide and valuable use of the TPB to understand human behaviour Esfandiar and Hadinejad (2026) notes of recent criticism in view of its ability to fully capture complexities of human behaviour, therefore a proposed combined approach of TPB and prospect theory is hoped to give an insight into rational (TPB) and emotional (prospect theory) Factors in relation to cancellation behaviour of hotel guests. This has been used to inform the following conceptual framework for analysis.

4.4 Conceptual Framework

A conceptual framework has been created to draw attention to key concepts and theories and function as a map (Mugizi, 2019) of the identified relationships between the identified variables, theoretical premise and chosen data analysis tests to achieve the aim and objectives of this study. Within the proposed framework the grey arrows represent the relationship between the identified key constructs of TPB and PT in relation to the identified independent and dependent variables. The blue arrows indicate the chosen three test methods and corresponding objectives and proposed hypothesis of the study that follow.



4.5 Statement of Hypotheses

In line with the research objectives one the following hypotheses are proposed:

Objective one

H₀: There is no significant difference in booking lead time between market segments

H₁: There is significant difference in booking lead time between market segments

Objective two

H₀₂: There is no significant association between market segment and booking cancellations

H₁₂: There is a significant association between market segment and booking cancellations

Objective three

H03: There is no significant relationship between booking lead time and booking cancellations

H13: There is a relationship between booking lead time and booking cancellations

4.6 Research gap

A systematic, organised investigation into specific problems within the workplace (Sekaran and Bougie, 2010), business research contributes to management knowledge over a wide spectrum of topics (Easterby-Smith et al, 2021). Pushpanjali, et al (2026) maintains that despite the rise in machine learning as opposed to traditional forecasting methods, that it is essential for hotel managers in real-world decision making to understand the factors influencing predictions. A gap in the literature has been identified with ageing research, a lack of investigation into the lead time impact on cancellations as well as more recent changes in guests booking behaviour which needs to be addressed especially in terms of understanding the risk of cancellations.

4.7 Research approach and philosophy

The quantitative tradition holds a foundational belief that a study involving society is no different and subject to the same rules of engagement as biology and physics, with the requirement to test hypotheses, a deductive logic and need for objectivity (O'Leary, 2021). A quantitative research design is characterised by the examination of relationships between variables, numerically measured and analysed via statistical techniques (Saunders, Lewis and Thornhill, 2012). Deductive in nature and tests objective theories (Creswell and Creswell, 2018) through the presence of laws providing the basis of explanation, allowing phenomena anticipation and predictions of occurrence (Saunders, Lewis and Thornhill, 2012). Whilst based upon the nature of the research problem, a research approach is also informed by the philosophical assumptions of the researcher (Creswell and Creswell, 2018) that influence the research paradigmatic boundaries of the study.

With the premise of a world that can be quantifiably measured by defined rules of inquiry, approached with objectivity and facts (O'Leary, 2021) positivism holds an epistemological

position of asserting knowledge of social phenomenon based on observation and recordings as opposed to a subjective understanding (Matthews and Ross, 2010). This achieved with a clear distinction between the researched and the researcher (Elshafie, 2013). The search for patterns within the social worlds acknowledging a positivist research belief accepts a preference of experiments, quantitative statistical analysis and correlation study (Elshafie, 2013) this, a result of a deterministic philosophy directed by cause determining outcomes and effects (Cresswell, 2018). Throughout the 19th century positivism prevailed as the most trusted method of inquiry (Elshafie, 2013) and forms the paradigmatic basis of this inquiry. The philosophical assumptions of reality held by the researcher is that of one objective reality. This ontological stance is reinforced by Easterby-Smith et al (2021) as a strong positivist position with the discovery of laws and theories to explain the one reality that exists independent of the researcher. Axiologically a commitment to objectivity and findings that are independent of subjective perspectives, positivism advocates value-free research with minimised bias that can yield universal truths (Ali, 2024), allowing formation of general laws and theories.

5. Research Methodology

A coherent picture of a specific situation is achieved through a combination of research methods and techniques (Easterby-Smith et al, 2021) form a methodology, determined by the hypothesis or research question along with the prime interest and focus of the researcher ((Matthews and Ross, 2010). Therefore, the overarching macro level framework offering principles of reasoning associated with the identified paradigmatic assumptions and providing the strategies and grounding for the conducted study (O'Leary, 2021). The paradigmatic assumptions of this study and the researcher are those of positivism which are reflected throughout the methodological choices, techniques and justifications.

The accessibility, cost effectiveness and feasibility of secondary data analysis allow accessible high-level research for novice and experienced researchers alike (Kelly, Peters and Faber, 2024). Existing independently of the study secondary data is situational, that can be gathered and analysed (O'leary,2021). For this study two forms of secondary data were utilised, firstly in the form of the critical examination of existing research and relevant theoretical ideas (Clark, et al, 2016) all from credible sources both online journals and articles published within the last 6 years as well as the library. inform the literature review. Secondly a raw data set was sourced for analysis from a publicly accessible website, the google owned platform Kaggle, who claim to have the world's largest collection of public data (Kaggle.com, 2025) Matthews and Ross (2010) note that although secondary research is an important resource, caution must be taken in terms of where the data comes from and why it's available now. The Hotel bookings data set chosen is a comprehensive data set regarding hotel bookings, cancellations and segments allowing for in depth exploration into cancellation behaviour of guests (Hemani, 2023). The use of the secondary raw data set was also advantageous as it provided an objective buffer by eliminating the requirement for physical access to the participants and answered questions without the requirements for a new-data protocol (O'Leary,2021).

According to Easterby-Smith (2021) the role of the researcher is to explain the reality through experiments eliminating alternative explanations and allowing the precise measurement of key factors to falsify or verify the predetermined hypotheses. In the first instance, to test a hypothesis, measurement of variables is required, the independent variables are identified as the cause and the dependent variables identified as the effect (Field, 2018). For this study the independent variables were identified as booking lead time (BLT), and Market segment (MS) with the dependent variable as cancellations (C).

5.1 Analytical software and data analysis tools

The effective and efficient management of data is critical through a rigorous and systematic approach (O’Leary, 2021) with essential steps to managing your data. A Comprehensive statistical program is required, Statistical package for the social sciences (SPSS) enables to score and analyse large amounts of quantitative data efficiently (Bryman and Cramer, 2011) and has been utilised to conduct statistical analysis in line with the research aim. The essential task of combing through the data to make sure it is all in order and as accurate as possible (O’Leary, 2021) was carried out and any missing data was identified after the raw data set was uploaded into SPSS. The data was also categorised, labelled in SPP and consist of the following:

Cancelled bookings – nominal variable

Cancelled = 0

Not cancelled = 1

Booking lead time – Scale variable

2 = Last minute: bookings made with a lead time of 0-7 days

3 = Short term: bookings made with a lead time of 8-30 days

4 = Mid-term: bookings made within a lead time of 31-90 days

5 = Long term: bookings made within a lead time of 91-180 days

6 = Extended / early: bookings made within a lead time of 181-709 days

The lead time scales were allocated based on a week a month, two months etc as should the amount of time be equal between it would not give an accurate representation of last-minute cancellations compared to those with a longer lead time.

Market segments

The market segments were identified in the data set and coded as the following for analysis:

Aviation

Complementary

Corporate

Direct

Groups

Offline travel agent

Online travel agent

To test hypothesis and achieve the aims and objectives of the research a combination of parametric and non-parametric analysis tests and bivariate analysis was carried out within SPSS. The parametric tests consisted of a Pearson correlation and Anova test and the non-parametric test as Chi square test. A consideration of central tendency and dispersion was carried out to understand the data set fully (O'Leary, 2021) in terms of a normal distribution with the measure of kurtosis and skewness in association with the One-way ANOVA and Pearson correlation.

5.2 One-way ANOVA test

The statistical test adopted to achieve objective one was that of a one-way analysis of variance (ANOVA), this enabling the comparison of the mean of three or above unrelated samples (Bryman and Cramer, 2011), in this case the identified seven market segments and whether the mean lead booking time differs significantly. This as opposed to the undertaking of seven T-tests to assess significant differences as the ANOVA tests for equality of means at the same time through analysis of variance F-test (Argyrous, 2011). Ross and Wilson (2017) advise that ANOVA utilises a *F*-statistic as opposed to a *t*-statistic to determined significance therefore the subsequent critical *F*- values have been used for reporting findings. According to Leard statistics, (2018) carrying out an ANOVA test requires six assumptions to be satisfied for the

test to be appropriate and give a valid result. The assumptions listed in table *** were checked and confirmed prior to the carrying out of the test.

Table *** The 6 assumptions required for ANOVA by Leard Statistics, (2018).

	Assumption	Satisfied
#1	Dependent variable measured in interval or ratio level	√
#2	Independent variable should consist of two or more categorical, independent groups	√
#3	Independence of observations with no relationship between each group	√
#4	No significant outliers	√
#5	The dependent variable approximately distributed for each category	√
#6	Homogeneity of variances	√

Assumptions #1, #2 and #3 were satisfied with the dependent variable of booking lead time being measured in intervals and the categorisation of seven market segments that have no relationship. The tests for significant outliers, distribution of variables and homogeneity were all tested in SPSS prior to the tests being carried out.

5.3 Chai-Square Test

Valarmathi, Hemapriya and Sundar (2024) maintain that Chi-square tests are an essential tool for researchers in various fields due to its reliable investigation methods into relationships and patterns within datasets. The Chi-square test for independence was conducted in association with objective two, investigating if there is a relationship between the market segment and cancellations. This taking into consideration the null hypothesis from the statement of independence and the alternative hypotheses, with the outcome that if the null hypothesis is rejected then the two variables are not independent or if accepted then the variables are independent (Argyrous, 2011). As a model utilising categorical and continuous predictors to predict categorial outcomes (Field, 2018) logistic regression was also considered for objective two but later rejected as the purpose of this test was to investigate if a relationship exists as opposed to building a model predicting the cancellation probability.

5.4 Pearson's correlation

A correlation requires the provision of a yard stick where intensity of a relationship can be gauged, with the use of intervals a Pearson's product moment correlation (Pearson's correlation) is the most common (Bryman and Cramer, 2011). This bivariate correlation has been employed to address objective three and the relationship between booking lead time and cancellations. A Pearson correlation was employed as opposed to linear regression, whilst bearing similarities a linear regression line provides no indication of how strongly related the variables are and instead focuses on the estimation of y values from X values Schober, Patrick et al (2018).

6. Reliability and Validity

6.1 Reliability

Any research activity needs to be carried out with rigour, a level of standardisation and discipline which is often referred to as reliability as the extent to which procedures are replicable (O'Leary, 2021). Reliability refers to consistency or repeatability of testing (Creswell and Creswell, 2018) and should demonstrate the robustness of the research design and implementation.

With the researcher's responsibility outlined by O'Leary (2021) to consciously minimise misleading or false information and be open and accountable the following is disclosed in relation to the Cronbach Alpha carried out. An internal reliability test was conducted using a Cronbach's alpha (Bryman and Cramer, 2011), this requiring the measurement of the consistency of the responses that are combined as a scale (Saunders, Lewis and Thornhill, (2012). Field (2018), states that although that a value of 0.7-0.8 is generally acceptable, that it's argued that value as low as 0.5 will suffice. However, the results of the Cronbach alpha for this research have come in well below the acceptable level, this being attributed to the variables being on different scales and not measuring the same underlying concept.

Reliability Statistics		
	Cronbach's Alpha Based on Standardized	
Cronbach's Alpha	Items	N of Items
.303	.376	3

6.2 Validity

Along with reliability, validity combined are argued to be in the indicators of good research and are seen as scientific proof (O’Leary, 2021) of what you state is correct. Validity on terms of the data is achieved in this instance through a robust methodology section along with the use of a secondary raw data set from a credible source that has not been manipulated for the tests and uploaded into SPSS. In the attempt to gain factorial validity, the data was submitted for factor analysis (Sekaran and Bougie, 2010). A Kaiser-Meyer-Olkin measure of sampling adequacy came out at 0.508 Bartlett’s test of sphericity as <.001 being significant therefore, deeming the data set being appropriate for factor analysis.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.508
Bartlett's Test of Sphericity	Approx. Chi-Square	217.794
	df	3
	Sig.	<.001

6.4 Limitations

The most obvious limitation of secondary data analysis according to Kelly, Paters and Faber (2024), is that characteristics of the data cannot be amended, new questions cannot be added and the inability to analyse what’s not there due to the data collection process having already been completed. The data set used achieved a useability score of 10 which takes into consideration completeness, credibility and compatibility (Kaggle.com, 2023). Other limitations are identified as the age of the data set being three years old, this not representing an up-to-date review of the industry currently. However, in the absence of a more up to date data set this on was deemed as appropriate to facilitate this report. Another limitation is the researchers very limited understanding of the SPSS system which prevented the use of more in depth and challenging testing that the statistical package is capable of.

7. Findings

In line with the aim, objectives, research methodology and hypothesis for testing a one-ANOVA, Chi-Square test and Pearson correlation have been analysed through SPSS with the following results and outcomes in relation to the proposed hypotheses.

Prior to testing a test of normality was carried out to facilitate the one-way ANOVA along with the Pearson correlation. The results are shown in the table below. The results of the Kolmogorov-Smirnov were a P value of $<.001$ out of a sample size of 12129 indicated by the df in the table below, with such a large sample the tests were conducted.

Table 7.1 Test of normality

Tests of Normality			
	Kolmogorov-Smirnov ^a		
	Statistic	df	Sig.
lead-time	.118	12129	$<.001$
a. Lilliefors Significance Correction			

7.1 One-way Anova

A one-way ANOVA was carried out to test if the mean booking lead time differs significantly between booking lead time and market segment. A post Ad-hoc Turkey test to assess the means of two unrelated samples when significant difference is found (Bryman and Cramer, 2011). The outcomes are shown in tables 7.2, 7.3 and 7.4 and are summarised as follows: A normality test of $P<.001$ as the lead time is not evenly distributed (as justified in the research methodology) however, due to the large sample size the ANOVA is considered robust. The overall result was that there is a statistically significant difference in lead time and the market segments with the market segment of groups booking far in advance, aviation bookings made very close to arrival indicating that different customer segments have very different booking behaviours and that the segments differ significantly from each other. Therefore, rejecting the null hypothesis and accepting the alternative hypothesis that there is significant difference in booking lead time between market segments.

Table 7.2 ANOVA results

ANOVA					
lead_time					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	23606476.129	6	3934412.688	407.069	<.001
Within Groups	117161696.260	12122	9665.212		
Total	140768172.389	12128			

Table 7.3 ANOVA Descriptives table

Descriptives								
lead-time								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Aviation	4	3.00	4.243	2.121	-3.75	9.75	0	9
Complementary	20	38.65	63.514	14.202	8.92	68.38	0	252
Corporate	126	48.11	43.721	3.895	40.40	55.82	0	183
Direct	878	83.15	85.677	2.891	77.48	88.83	0	709
Groups	1511	229.75	135.805	3.494	222.90	236.60	0	542
Offline TA/TO	3064	146.19	107.087	1.935	142.40	149.99	0	532
Online TA	6526	102.75	85.262	1.055	100.68	104.82	0	363
Total	12129	127.42	107.735	.978	125.50	129.34	0	709

Table 7.4 ANOVA effect sizes

ANOVA Effect Sizes ^a				
		Point Estimate	95% Confidence Interval	
			Lower	Upper
lead_time	Eta-squared	.168	.156	.179
	Epsilon-squared	.167	.155	.179
	Omega-squared Fixed-effect	.167	.155	.179
	Omega-squared Random-effect	.032	.030	.035

Table 7.5 Ad Hoc Turkey test results

Multiple Comparisons						
Dependent Variable: lead_time						
Tukey HSD						
(I) market_segment_num	(J) market_segment_num	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Aviation	Complementary	-35.650	53.848	.995	-194.44	123.14
	Corporate	-45.111	49.930	.972	-192.35	102.12
	Direct	-80.151	49.268	.665	-225.43	65.13
	Groups	-226.751*	49.221	<.001	-371.89	-81.61
	Offline TA/TO	-143.193	49.188	.056	-288.24	1.85
	Online TA	-99.752	49.171	.396	-244.75	45.24
Complementary	Aviation	35.650	53.848	.995	-123.14	194.44
	Corporate	-9.461	23.664	1.000	-79.24	60.32
	Direct	-44.501	22.232	.414	-110.06	21.06
	Groups	-191.101*	22.128	<.001	-256.35	-125.85
	Offline TA/TO	-107.543*	22.055	<.001	-172.58	-42.51
	Online TA	-64.102	22.017	.056	-129.03	.82
Corporate	Aviation	45.111	49.930	.972	-102.12	192.35

	Complementary	9.461	23.664	1.000	-60.32	79.24
	Direct	-35.040*	9.366	.003	-62.66	-7.42
	Groups	-181.640*	9.116	<.001	-208.52	-154.76
	Offline TA/TO	-98.082*	8.937	<.001	-124.43	-71.73
	Online TA	-54.640*	8.842	<.001	-80.72	-28.57
Direct	Aviation	80.151	49.268	.665	-65.13	225.43
	Complementary	44.501	22.232	.414	-21.06	110.06
	Corporate	35.040*	9.366	.003	7.42	62.66
	Groups	-146.600*	4.172	<.001	-158.90	-134.30
	Offline TA/TO	-63.042*	3.763	<.001	-74.14	-51.94
	Online TA	-19.600*	3.534	<.001	-30.02	-9.18
Groups	Aviation	226.751*	49.221	<.001	81.61	371.89
	Complementary	191.101*	22.128	<.001	125.85	256.35
	Corporate	181.640*	9.116	<.001	154.76	208.52
	Direct	146.600*	4.172	<.001	134.30	158.90
	Offline TA/TO	83.558*	3.090	<.001	74.44	92.67
	Online TA	127.000*	2.807	<.001	118.72	135.28
Offline TA/TO	Aviation	143.193	49.188	.056	-1.85	288.24
	Complementary	107.543*	22.055	<.001	42.51	172.58
	Corporate	98.082*	8.937	<.001	71.73	124.43
	Direct	63.042*	3.763	<.001	51.94	74.14
	Groups	-83.558*	3.090	<.001	-92.67	-74.44
	Online TA	43.442*	2.153	<.001	37.09	49.79
Online TA	Aviation	99.752	49.171	.396	-45.24	244.75
	Complementary	64.102	22.017	.056	-.82	129.03
	Corporate	54.640*	8.842	<.001	28.57	80.72
	Direct	19.600*	3.534	<.001	9.18	30.02
	Groups	-127.000*	2.807	<.001	-135.28	-118.72
	Offline TA/TO	-43.442*	2.153	<.001	-49.79	-37.09
*. The mean difference is significant at the 0.05 level.						

7.6 Chi square test

A chi-square test was conducted to determine whether there is a significant association between market segment and booking cancellations. Tables 7.6, 7.7 indicate the following: There is a significant relationship between market segment and cancellations with a large χ^2 value indicating strong associations between the variables. The highest cancellation rate was those booked through Online travel agents and the complimentary and corporate rooms being cancelled less often. The test shows that cancellation behaviour differs significantly by market segment, a slightly assumption was violated but due to the sample number proves robust. The findings, therefore, again rejecting the null hypothesis and accepting the alternative hypothesis.

Table 7.6 Chi-square out Comes

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1713.683 ^a	6	<.001
Likelihood Ratio	2218.044	6	<.001
Linear-by-Linear Association	870.975	1	<.001
N of Valid Cases	12129		
a. 3 cells (21.4%) have expected count less than 5. The minimum expected count is .81.			

Table 7.7 Chi-square tabulation

market_segment_num * is_canceled_new Crosstabulation					
			is_canceled_new		Total
			Not cancelled	2	
market_segment_num	Aviation	Count	3	1	4
		Expected Count	3.2	.8	4.0
		% within market_segment_num	75.0%	25.0%	100.0%
	Complementary	Count	20	0	20
		Expected Count	16.0	4.0	20.0
		% within market_segment_num	100.0%	0.0%	100.0%
	Corporate	Count	126	0	126
		Expected Count	126.0	0.0	126.0
		% within market_segment_num	100.0%	0.0%	100.0%

		Expected Count	100.5	25.5	126.0
		% within market_segment_num	100.0%	0.0%	100.0%
	Direct	Count	789	89	878
		Expected Count	700.4	177.6	878.0
		% within market_segment_num	89.9%	10.1%	100.0%
	Groups	Count	1368	143	1511
		Expected Count	1205.4	305.6	1511.0
		% within market_segment_num	90.5%	9.5%	100.0%
	Offline TA/TO	Count	3056	8	3064
		Expected Count	2444.3	619.7	3064.0
		% within market_segment_num	99.7%	0.3%	100.0%
	Online TA	Count	4314	2212	6526
		Expected Count	5206.2	1319.8	6526.0
		% within market_segment_num	66.1%	33.9%	100.0%
Total			Count	9676	2453
			Expected Count	9676.0	2453.0
			% within market_segment_num	79.8%	20.2%

7.3 Pearson correlation

A Pearson correlation was carried out to determine if there is a significant relationship between booking lead time and booking cancellation status. Table 7.7 presents the outcome of the test which are summarised as follows: with $r = .019$ there is a very weak positive relationship between lead time and cancellation, but the relationship is statistically significant. The higher lead time is showing association with slightly higher likelihood of cancellation, and the large sample size makes small relationships significant. Therefore, even with a very weak relationship identified, it rejects the null hypothesis and accepts the alternative of there is a relationship between booking lead time and booking cancellations.

Table 7.7 Pearson correlation outcome

Correlations			
		lead_time	is_canceled_new
lead_time	Pearson Correlation	1	.019*
	Sig. (2-tailed)		.041
	N	12129	12129
is_canceled_new	Pearson Correlation	.019*	1
	Sig. (2-tailed)	.041	
	N	12129	12129
*. Correlation is significant at the 0.05 level (2-tailed).			

7.3 conclusions

Following the statistical analysis, it is concluded that there statistically a significant difference between the lead time and the market segments, with very different booking behaviours identified between the segments with aviation bookings made close to arrival and groups booking more in advance. There is a significant relationship between market segment and cancellation behaviour differs significantly between market segments with online travel agents having the highest cancellations. Finally, a very weak positive relationship between lead time and cancellations was found with a slightly higher likelihood of cancellations.

7.2 Word count: **6798**

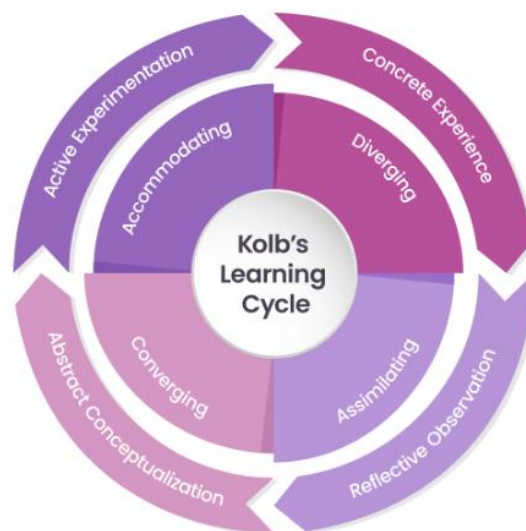
REFLECTIVE ESSAY*

***Not included in report word count**

8. A reflective essay on how this module has enhanced your quantitative skills. Are you convinced that quantitative methodology will be appropriate for your DBA research? Yes, or no? Provide justifications. (Maximum 3 PAGES for item 8 of the task).

Introduction

Reflective practice is a very important aspect of my job and always part of the learning process, in order to reflect on my completing of this research report, I have utilised Kolb's experiential learning cycle (1984) which emphasises learning through experience, reflection, conceptualisation, and testing of new ideas (Mcloed, 2025).



Kolb experiential learning cycle (1984)

Concrete experience

Throughout assuming a positivist perspective throughout this research project, I have struggled with limited understanding of mathematical equations and the premise around there only being one reality as this logically for me has been very challenging. Every concept and theory has

been read and re-read to try and get my head around it whilst attempting to write using the expected language and hopefully to the standard required.

Reflective observation – reviewing

It's been a very stressful, but every experience adds to our knowledge and understanding and a real eye opener throughout of how much work the DBA programme consists of, and the amount of reading required throughout.

Abstract conceptualisation

According to Bryman and Cramer (2011) a large proportion of empirical research of social science draws upon quantitative data and that an acquaintance with methods of analysis is highly desirable. In the early stages of my DBA journey and throughout the process of completing this research report, I have learnt a lot about the language used for Quantitative research design, remaining within the positivist paradigm and its associated tools for analysis. I now have a basic understanding of SPSS that will facilitate an understanding of empirical research papers that are written from a positivistic paradigmatic perspective which will only help me through the DBA programme and especially in part two. I have learned how different quantitative research is too qualitative and what distinguishes and forms each research approach.

Active experimentation

In terms of experimentation, I will continue to read more about quantitative methods and in particular mix methods and to learn more about the SPSS software package and what capabilities it has in preparation for the most appropriate research approach for my thesis.

Whilst I will not rule out the possibility of mixed methods, a fully quantitative approach is not the direction I will be taking

Conclusion

All be it a very stressful time the completion of this module and research report using a quantitative research approach and different paradigmatic viewpoint, I have learnt a lot that I will take with me on my DBA journey as a novice researcher. I will continue to research into different approaches and continue to put myself out of my comfort zone to learn and develop more as the course progresses.

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