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An Empirical Exploration of Online Travel Agencies for Budget Hotel Reservations Among Thrifty Travelers: Insights from Indian Context

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Abstract

This study examines the intricate relationship between technology, guest data, and consumer behavior in the hospitality business, with a specific emphasis on cheap hotels and online intermediaries. The study looks at how technological breakthroughs like artificial intelligence, blockchain, and data analytics affect consumer perceptions and booking decisions. It delves into the challenges faced by guests or budget travelers who majorly rely on computers, and mobile technology, due to which they have data privacy concerns. By investigating the factors that influence consumer decisions when booking budget hotels through OTAs, this study aims to provide significant insights into the scenario. It also finds some appropriate suggestions to make the cyber journey of the guests in choosing hotels a good experience without facing loss of money.

Keywords: -*Online Travel Agencies, Budget hotels, Data Privacy, Consumer Behavior, Technology Adoption*

Introduction

The hospitality industry has transformed, shifting from traditional physical interactions to digital platforms driven by technological advancements. As Ponduri et al. (2024) note, this **digital transformation** leverages technologies like **cloud computing, big data analytics, and artificial intelligence (AI)** to optimize processes and gain insights.

This study explores the role of AI and blockchain in modern hotel booking systems, focusing on their potential for innovation and data security, particularly within the context of budget hotels and online intermediaries. It also examines how these technologies influence consumer trust, perception, and behavior.

AI has permeated the hotel industry, enhancing the guest experience through personalized recommendations and automated check-ins. According to Pola Q. Wang (2024), generative AI improves efficiency by handling routine tasks, enabling staff to focus on more complex, personalized guest interactions. Concurrently, **blockchain**, a decentralized ledger technology, offers unparalleled security for sensitive information like payment details. Rashed Al Karim et al. (2023) emphasize that hoteliers should use blockchain to "digitalize and revitalize transactions in a cost-effective way" to increase customer satisfaction and loyalty.

While these technologies offer immense potential, a critical question remains: how do we leverage them without compromising **consumer data security**? This research delves into the complex relationship between technological innovation and data protection in hotel booking systems. It explores the challenges and opportunities presented by the rapid growth of budget hotels and online platforms, examining how technology can address consumer concerns and improve the guest experience. By understanding this interplay, we can work towards a future where innovation and data privacy coexist.

Literature Review

The hospitality industry is a vast and dynamic sector, encompassing a wide range of businesses from accommodation to entertainment. While the industry is known for creating memorable guest experiences, unbranded budget hotels operate on a different model, offering limited amenities at competitive prices to attract cost-conscious travelers.

Size and Importance

The hospitality industry is a global economic powerhouse, contributing significantly to GDP and employment. Its growth, fueled by tourism, business travel, and global events, is a catalyst for economic development worldwide (Hospitality global market report, 2024). The industry's broad reach and economic impact make it a fertile ground for research and innovation.

Technological Advancements

Technology has become an indispensable tool for the hospitality industry, enhancing guest experiences and optimizing operational efficiency. AI chatbots, for instance, improve guest experience, while mobile ordering and robots reduce staff workload and costs (www.bu.edu, 2023). Sofia Morandini et al. (2023) note that AI's ability to automate tasks allows human workers to focus on more complex, high-level interactions, leading to increased productivity and innovation.

Notable technological strides include:

- **Online booking platforms** and **mobile apps** have transformed guest interaction, offering real-time availability and features like mobile check-in/out (Tonino Pencarelli, 2019; Hyunjeong Spring Han et al., 2011).
- **Property Management Systems (PMS)** streamline operations by managing reservations, guest information, and accounting (Zdenko Cerović, 2013).
- **Customer Relationship Management (CRM) systems** within PMS help hotels personalize services based on guest data (Dušan Borovčanin, 2014).
- **Digital payment systems** have become standard, offering convenience and security (Anil Singh Parihar et al., 2024).
- **AI-powered chatbots** and **smart room technology** are further enhancing guest services (Tarun Kumar Vashishth et al., 2024).
- **Blockchain** is an emerging technology offering enhanced security for guest data, transparent transactions, and potential for loyalty programs and smart contracts (Ma Dolores Flecha-Barrio et al., 2019).

Technological Challenges

Despite the benefits, the adoption of technology in the hospitality industry is not without risks. A notable example is the widespread **"Blue Screen of Death"** outage in July 2024, caused by a software update from cybersecurity firm CrowdStrike. This global incident, which affected systems at hotels like Marriott and Holiday Inn, highlighted the vulnerability of technology-dependent operations (David Weston, 2024; Sayonara De Zoysa, 2024).

Cyber threats and data breaches are a significant concern. A 2023 data breach at Indian Hotels Company Limited (IHCL), for example, compromised personal data of 1.5 million customers, underscoring the need for robust security measures (Dia Rekhi, 2023). As cyber security expert Kanishk Gaur noted, this incident was a "stark reminder" of the escalating threats facing the industry.

Barriers for Budget Hotels

While large-scale, branded hotels can leverage their significant financial resources to adopt advanced technologies, budget hotels face significant barriers. These establishments operate on tighter financial margins, making the high cost of implementation, maintenance, and staff training prohibitive (Maria Nikopoulou et al., 2023; ZF Juqu et al., 2024). This disparity can lead to a competitive disadvantage for budget hotels, as they struggle to meet the expectations of modern guests who value seamless technological experiences. Neglecting these advancements also leaves budget hotels more susceptible to cybersecurity threats, which can have long-term reputational consequences.

Intermediaries between Guests and Hotels

Intermediaries, such as MakeMyTrip and Booking.com, act as a bridge between hotels and consumers, facilitating bookings and offering discounted rates. By enhancing coordination and providing transparent information, they reduce transaction costs for both parties (Aleix Calveras & Francina Orfila, 2007). These platforms are particularly beneficial for small, unbranded hotels, enabling them to increase visibility, revenue, and occupancy rates (Elisabetta Raguseo et al., 2017). However, the collection of sensitive personal and financial data by these platforms raises significant security and privacy concerns for consumers (Hany E. Mohamed & Fatma Abdelaal, 2021).

Consumer Behavior

Consumer behavior in the hospitality industry is complex and is influenced by a combination of demographic, psychographic, and behavioral factors. The decision-making process involves information search, evaluation, and post-purchase assessment, all of which are increasingly shaped by digital platforms and online reviews (Antoni Serra Cantallops & Fabiana Salvi, 2014).

Emerging trends include a demand for personalized offerings, a focus on value for money, and a growing interest in eco-friendly options. The rise of **eWOM** (electronic word-of-mouth) through online reviews and social media significantly impacts booking decisions.

Data Privacy Regulations

The collection and management of guest data are central to providing personalized services, yet they pose significant privacy challenges. As Pola Q. Wang (2024) notes, the reliance of AI on vast amounts of sensitive guest data necessitates ethical use to prevent privacy violations.

Hotels collect data both online (via booking platforms, websites, and loyalty programs) and offline (through manual registration forms and in-person interactions). This information is stored in **Property Management Systems (PMS)** and **Customer Relationship Management (CRM) systems**, which are now standard in the industry.

Indian laws, including the **Digital Personal Data Protection Act, 2023 (DPDP Act)**, the **Information Technology Act 2000**, and the **IT Rules 2011**, provide a legal framework for data protection. The DPDP Act mandates organizations to obtain explicit consent for data collection, state the purpose for which data is being collected, and provide individuals with the right to correct or erase their data. Non-compliance can result in severe penalties of up to INR 250 crore, reinforcing the need for hotels to implement robust security measures and ethical data practices to build and maintain guest trust.

Theoretical Framework

Artificial Intelligence (AI)

AI, the capability of a machine or program to perform tasks requiring human intelligence, is a transformative force in the hospitality industry. It enhances guest experiences and streamlines operations by analyzing data to anticipate guest needs and personalize services (C. Cobanoglu, 2021). Furthermore, AI can optimize hotel management by analyzing reservation data to predict future demand and occupancy rates.

Blockchain

Blockchain is an incorruptible ledger technology that revolutionizes data management and trust in the hospitality sector. It acts as a digital vault, securely storing sensitive guest data—such as payment records and preferences—across a decentralized network of computers. The immutability and transparency of blockchain entries prevent data breaches and ensure data integrity (Rashmi Ashtagi et al., 2024).

Data Privacy

Data privacy is paramount for hospitality organizations, as it involves protecting sensitive guest information from unauthorized access or misuse. It is about respecting guest confidentiality and handling data responsibly, allowing guests to control what information they share. As Rashed Al Karim et al. (2023) note, customers are more comfortable with data collection when they feel their information is used exclusively for the intended transaction. Robust security measures are essential to ensure data remains confidential.

Cyber security Cyber security serves as a digital vigilant, protecting an organization's systems and assets from cyber threats like hacking and malware. As a fast-growing area of crime, cybercrime exploits anonymity and speed (Enrico Panai, 2018). In the hospitality industry, cybersecurity means maintaining strong barriers, such as firewalls and encryption, to shield guests' valuable information. A strong cyber security posture not only protects data but also builds essential trust and relationships with guests.

Summary of the Review of Literature

The hospitality industry has undergone a significant transformation driven by technology and evolving consumer expectations. Advancements such as online booking platforms, AI, and blockchain have revolutionized operations and enhanced guest experiences. However, these innovations introduce critical challenges, particularly concerning data privacy and security.

Guest data is a valuable asset for hotels, enabling personalized services and boosting satisfaction. Yet, its collection, storage, and management carry inherent risks. The 2016 Starwood hack serves as a stark reminder of the vulnerabilities, even within major hotel chains. To protect guest information and maintain trust, adherence to regulations like India's DPDP Act (2023) is crucial.

Online intermediaries and AI-powered chatbots further complicate the landscape. While they offer convenience, they also add layers of complexity and potential risks to data privacy. For budget hotels, the high cost of implementing robust security measures presents a unique challenge, often leaving them more vulnerable. The industry is at a crossroads, balancing technological benefits with the imperative of data protection. By strategically leveraging technology, guest data, and consumer trust, hotels—especially budget ones - can navigate these challenges and create a guest journey that is both secure and comfortable.

Research Gap:

From the review of literature, it is obvious that the travelers go through a difficult and perplexing situation in selecting their OTA for room reservation purpose. Though it is addressed by many researchers previously in the context of branded or standardized hotels, a few studies may have taken place for budget hotels. It is also unclear as to whether such problem prevails all over the world or only in some countries. Therefore a research gap is realized that an investigation on the factors affecting the decision of budget travelers in the context of selection of OTA for budget hotel booking is essential. However keeping in mind the non-feasibility of conducting a research at an international level, the scope of the study was limited to India.

Research Objective:

The review of literature has made it clear that a number of factors affect the travelers when they are supposed to choose their OTA for room booking purpose. The factors affecting it are Performance of the Budget Hotels (POBH), Performance of the OTA proposed for selection (POTA), Knowledge and Experience of the Budget Travelers (KEBT) on the subject already gained and Cyber Threats, Thefts and Crimes (CTTC). Therefore the objective was set to analyze the nature of the problem and to arrive at a suitable conclusion in the Indian context. The non-technical suggestions might enhance the experience of the budget travelers and might be useful to OTAs and budget hotels to gain the confidence of the guests.
The following figure exhibits the model that is studied to achieve the objective.

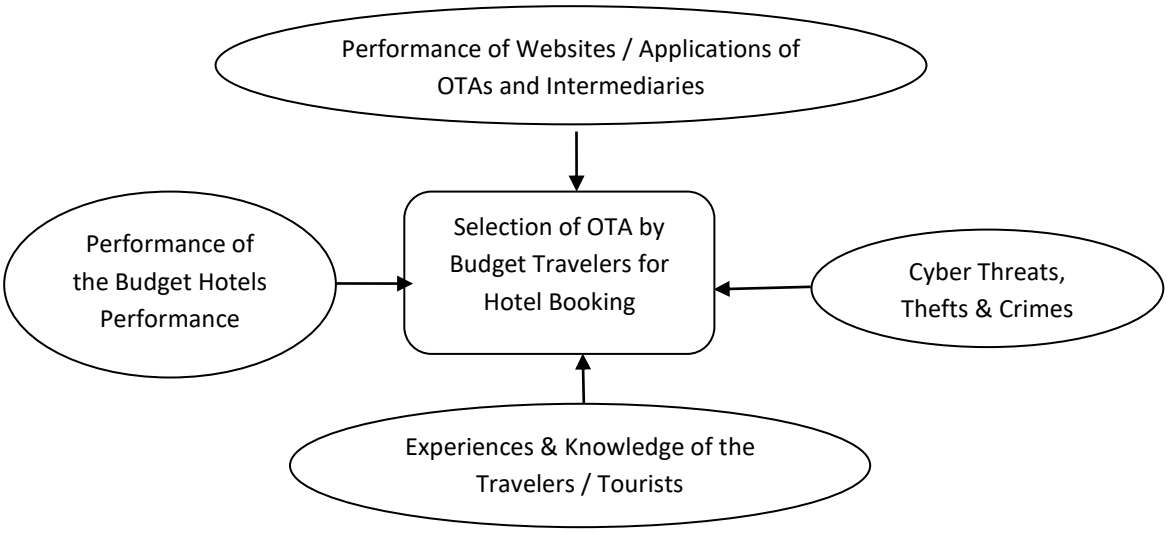

Figure 1 Factors Affecting Budget Travelers / Tourists in Selection of OTA for Budget Hotel Booking

Research Methodology:

In order to investigate the research questions, a questionnaire was developed and data was collected manually and through Google form. The questionnaire consisted of two sections; the preliminary section viz. Section A had 8 questions focusing the demographic and behavior profile of the respondents and the Section B had 38 uni-dimensional 5-point likert scale statements such as Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree with the weightage of 1, 2, 3, 4 and 5 respectively. The respondents were initially asked for their nationality so as to ensure the validity of the responses. Only the responses of Indian nationals considered for data analysis. The variables studied were one dependent variable (Overall Selection of OTA for Budget Hotel Booking (OSOOBHB) and 4 independent variables such as POBH, POTA, KEBT and CTTC The Table Number One given below shows the Cronbach Alpha reliability result calculated using Microsoft Excel. The Croanbach Alpah value found to be more than or closer to 0.7 for all the variables proving the reliability of the items used for the study. It was decided to collect data from 500 respondents from India. The data collection period was June 2024 to July 2024. However, data analysis process could be able to be initiated only with valid responses of 246 respondents. For the purpose of data analysis, percentage,

Mean Score, Goodness of Fit Chi-Square test and Pearson correlation coefficient, One Way Anova, Multi Linear Regression Model were used to predict the result. The mean scores of the items were used as raw data for inferential analysis. The weightage of the likert scale statements was used to measure the mean score and croanbach alpha as well. The website, ***https://www.statskingdom.com,*** was used for statistical analysis.

Name of the Variables	**Type of the Variable**	**Number of Items**	**Croanbach Alpha Value**
POBH	Independent	6	0.880
KEBT	Independent	7	0.863
POTA	Independent	8	0.673
CTTC	Independent	8	0.957
OSOOBHB	Dependent	9	0.987

Table Number One

(Source: Author's own source)

The initial data validation tests marked the mean score of the last two items of the dependent variable as outliers. Therefore those two items were removed from the analysis. Even after removing those two items, the croanbach alpha of the said variable was measured to be at 0.958 for 7 items.

Data Analysis for Section A of the Questionnaire:

The Table Number Two given below is the table showing the demographic responses of the respondents. These variables were further analyzed using Chi-Square Test for Goodness of Fit to conclude as to whether the samples collected represent the entire population or not.

Sl. No.	**Variable**	**Options for Variable**	**Number of Responses**	**In %**	**Chi Square Test for Goodness of Fit Significance at 5%**
1	Gender	Male	119	48.37	$X^2(2, N=246)=117.29, p<.05$
		Female	125	50.81	
		Transgender	2	0.81	Significant
2	Age Group	18 – 29	43	17.48	$X^2(4, N=246)=7.374, p=.117>05$
		30 – 39	55	22.36	
		40 – 49	62	25.20	Insignificant
		50 – 59	48	19.51	
		Above 60	38	15.45	
3	Education	High School	33	13.41	$X^2(4,N=246)=21.317,p=.00027<05$
		Intermediate	39	15.85	
		Graduate	73	29.67	

		Post Graduate	43	17.48	Significant
		Others	58	23.58	
4.	Marital Status	Unmarried	69	28.05	$X^2(3,N=246)=10.228,p=.01673<05$
		Married	78	31.71	
		Divorced	47	19.11	Significant
		Widow / Widower	52	21.14	
5.	Employment	Full time Job	62	25.20	$X^2(4, N=246)=8.959, p=.06212>05$
		Part time Job	43	17.48	
		Seeking Opportunities	39	15.85	Insignificant
		Retired	43	17.48	
		Others / Homemakers	59	23.98	
6.	Popular OTAs used by Budget travelers for booking**	www.agoda.com	186	75.61	$X^2(8, N=2214)=344.801, p<05$
		www.airbnb.co.in	93	37.80	Significant
		www.booking.com	156	63.41	
		www.easemytrip.com	173	70.33	
		www.goibibo.com	147	59.76	
		www.oyorooms.com	221	89.84	
		www.thebudgetstay.com	167	67.89	
		www.treebo.com	142	57.72	
		Others OTAs / Intermediaries	116	47.15	
7.	Sources for OTA Selection**	Ratings of the properties given by others in the website	197	80.08	$X^2(4, N=1230)=88.26, p<05$
		Feedback & comments on the hotel property given by the viewers / users of the website	203	82.52	Significant
		Number of years of service of the property / OTAs in the industry	148	60.16	
		References by Kith & Kin	165	67.07	
		Depending upon the Features / facilities of the property given at the time of booking	210	85.37	
8	No. of times	Traveling occasionally,	116	47.15	$X^2(4, N=246)=183.88, p<05$

	doing room booking in a year	therefore, booking room rarely			Significant
		1 -2 Times a year	83	33.74	
		3 – 5 times a year	9	3.66	
		6 – 10 times a year	18	7.32	
		Above 10 times a year	20	8.13	
9	Usual Purpose of Travel**	Business / Professional	98	39.84	$X^2(5, N=246)=113.95, p<05$
		Family Trip	36	14.63	
		Health, Medical & Fitness	43	17.48	Significant
		Exploration	38	15.45	
		Education	22	8.94	
		Others	09	3.66	

**(As much options as applicable were chosen by the respondents)

Table Number Two (Source: Author's own source)

Profile of the Respondents

Table Number Two above states that female users are increasing and are more than male users by 2.44%. p value *(<.05*) also supports that gender affects the use of websites and application for the purpose of room reservation. It confirms that female gender takes independent decisions in choosing the websites of OTAs. In regards to Age Group, p value *(.117>.05*) confirms that age is not a factor to be considered for use of websites of OTAs for room reservation. However, education of the respondents plays a major and significant role in taking decision on selection of the websites of OTAs for the purpose. P value *(.00027<.05*) underlines the knowledge gained through education, subsequently, backing up the decision. As far as the marital status of the respondents is concerned, p value *(.016<.05*) underscores that marital status marital status significantly plays a role in taking decision on the utilization of websites for room reservation. It may, further, be interpreted that respondents hesitate in choosing their accommodation and faces inconvenience in taking a stand on the subject. Probably other factors such as location, safety & security, accessibility and facilities etc. expected depending upon the marital status and gender may not be matching with the needs and requirements of the respondents. People with different employment status travel and do bookings for their budget accommodation (*p=.06212>.05*). The websites of popular OTAs used by budget travelers is significant (*p<.05*), as the users might be very particular in selection of their OTAs. The discount offers and variety of accommodation might be a factor for this significance. This is further supported by the reasons considered at the time of selection of OTA (*p<.05*). The number of times doing room booking and the travel, both, are significant (*p<.05*), as the tourists keep on traveling, they gain experience, and thus their knowledge on different dimensions of travel enhances as well.

Data Analysis for Section B of the Questionnaire:

The following table provides the number of responses chosen by the respondents for each item studied. The last column of the table gives the mean score of the item.

Variables	Items	Number of Respondents					Mean Score of the Item
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	
POBH	During checkout, I do not face disappointing situation wherein I have to pay amount more than what OTA has promised at the time of booking.	53	147	16	15	15	2.154
	The price list of various services of hotels shown on the website / apps of the Intermediaries and the price list for the services given at the time of checking in vary with each other.	77	79	22	28	40	2.492
	On my check-out, the hotel staff asks me to pay room charges, as my booking is prepaid through OTA / intermediary.	82	61	22	60	21	2.500
	I am not tempted by the hotel staff to cancel my room reservation so that they may allot a room afresh comparatively at a lesser price.	70	115	13	28	20	2.240
	I am insisted by the hotel property to settle the bill for the additional services availed by me at once.	48	75	25	70	28	2.817
	I am not insisted by the hotel property to do some payment in advance at the time of checking in, as I have a confirmed and pre-paid room reservation.	52	147	13	15	19	2.195
KEBT	I am aware of rules and laws made by Government of India to secure personal information of the individuals online	59	148	5	17	17	2.126
	I do not prefer doing payment for the room charges to the OTAs / Intermediary directly rather than paying to hotel.	63	95	15	53	20	2.480
	I usually avoid giving my residential details on hotel booking applications and websites	39	135	22	29	21	2.423
	I trust Hotel / OTA / Intermediary apps and websites when doing a prepaid room booking.	96	70	45	23	12	2.126
	I read privacy policies of the OTAs and hotels before making reservation.	110	105	12	15	4	1.772
	I am not scared to use Credit Card or Debit Card, even though I am forced to	92	83	25	28	18	2.175

	pay the charges for the swipe machine.						
	I do not do research or collect information regarding the hotel in which I finally wish to make room reservation.	63	76	35	36	36	2.618
POTA	I am not getting sufficient payment options in the websites of my OTA	102	111	9	13	11	1.862
	I am not getting discounts and gift vouchers in the websites of my OTA	104	116	10	8	8	1.780
	I am not getting price comparison options at the time of room booking in the website of my OTA	89	118	12	13	14	1.963
	I am not getting contact details and information of hotels in which I wish to book my room in the websites of my OTA	92	114	15	12	13	1.943
	I am not getting the list of hotels with different facilities and features alongwith their charges.	84	114	25	10	13	2.000
	Iam not getting hotels as per my desired location in the websites of my OTA.	109	99	28	8	2	1.760
	My OTA does not ask for any personal details unecessarily.	86	119	14	15	12	1.976
	My intermediary is taking responsibility for the differences in the charges of various services offered by the hotel property and shown on the website.	114	107	15	8	2	1.687
CTTC	I do not hesitate to furnish my family details at the time of doing room reservation	36	65	38	73	34	3.016
	I am not irritated with the promotional emails, messages and calls from online travel agencies and hotels.	108	118	7	9	4	1.711
	I have not faced personal experiences of cyber thefts.	108	111	18	4	5	1.728
	At the time of doing room reservation through the websites of OTAs / intermediaries, unnecessary web pages do not pop up, asking me to enter some personal details.	73	73	29	33	38	2.553
	Just to browse information regarding room enquiry in the websites of OTAs, I am not bound to register myself.	117	121	3	3	2	1.585
	I am confident enough that my personal	53	80	37	43	33	2.687

	information are neither transferred nor leaked out to any third party by the OTAs / hotel properties						
	I hesitate to use the wi-fi services of the hotels, as the chance of getting personal information leaked is higher.	23	33	28	97	65	3.602
	My debit / credit card is not charged twice while settling the bills.	41	87	43	33	42	2.789
OSOOBHB	The hotel options given by my OTA are not upto my satisfaction.	77	73	28	35	33	2.488
	I am not getting sufficient hotel options in the websites of my OTA	70	69	32	40	35	2.598
	I do not depend on my OTA for my hotel related bookings.	78	85	21	35	27	2.382
	I do not prefer OTA for my hotel bookings, instead, I visit the websites of the hotel properties directly	78	86	19	40	23	2.366
	I am not aware of threats and crimes taking place in the cyber space, particularly when I operate the websites of OTA.	89	81	19	30	27	2.289
	I trust my OTA in the context of cyber threats and thefts	68	70	32	40	36	2.618
	The website of my OTA is not safer	57	69	33	45	42	2.780
	I know that I am responsible for the options exercised by me in the websites of my OTA	38	45	35	82	46	3.215
	I prefer only those OTAs who are rated highly online.	34	29	22	81	80	3.585

Table Number Three

Source: Author's Own Source

Data Validation Tests and results:

Levene's normality test, using F distribution df(4,31) (right tailed) rejected the null hypothesis as the p value (0.0001) is less than 0.05. Hence, it is implicit that the data is normally distributed. Linear regression assumes normality for residual errors. Shapiro Wilk p-value equals 0.568. It is assumed that the data is normally distributed. The White test p-value equals 0.378 (F=1.188). Therefore, it is assumed that the variance is homogeneous.

There is no multicollinearity concern as all the VIF values are smaller than 2.5. Although the Priori power to test the entire model for all the 4 predictors is low (0.08413**)**, H_0 of regression analysis was rejected, as the power to prove that each predictor is significant is always lower than the power to test the entire model.

One Way Anova Test:

One Way Anova Test for independent variables using the F distribution df(3, 25) did not reject the null hypothesis, as the p value was 0.0508 (>0.05). It indicates that there has been no variance found among the independent variables. It may be interpreted that all the independent variables studied play equal role and have equal affect on the dependent variable.

Pearson Correlation Coefficient:

The following table shows the correlation prevailing among the variables. The Table Number Four shows that although almost all the variables maintain a negative correlation among themselves, POTAs has a positive correlation with POBH and KEBT. It can be interpreted that the OTA business for hotel bookings tries to keep up a good understanding with their hotel business partners. It also says that travelers also have a good knowledge about their OTAs. The Overall Section of OTA has a positive correlation with CTTC indicating that the travelers presume the risk of online transactions, though they are getting confused with the rest of the factors affecting their decision.

Name of the Variables	**OSOOBHB**	**POBH**	**KEBT**	**POTA**	**CTTC**
OSOOBHB	1	-0.863	-0.678	-0.705	0.506
POBH	-0.863	1	0.461	0.28	-0.742
KEBT	-0.678	0.461	1	0.565	-0.0712
POTA	-0.705	0.28	0.565	1	-0.129
CTTC	0.506	-0.742	-0.0712	-0.129	1

Table Number Four

Correlation Coefficient among the Variables Studied

Multi Linear Regression Analysis:

The backward stepwise method is used to produce an initial screening of the predictors. Y and X relationship R square (R^2) equals **0.998.** It means that the predictors (X_i) explain 99.8% of the variance of Y. Adjusted R square equals **0.996.** The coefficient of multiple correlation (R) equals **0.999**. It means that there is a very strong correlation between the predicted data ($\hat{y}$) and the observed data (y). Goodness of fit of Overall regression, right-tailed, $F_{(3,4)}$ = **599.112**, p-value = **0.00000924**. Since p-value < α (0.05), we reject the H_0. The linear regression model, $\mathbf{Y = b_0 + b_1X_1 + ... + b_pX_p + \varepsilon}$, provides a better fit than the model without the independent variables resulting in, $\mathbf{Y = b_0 + \varepsilon}$.

The following independent variable is not significant as predictor for Y: **KEBT**. Therefore it was excluded from the model. The Y-intercept (b): two-tailed, T = **46.339**, p-value = **0.0000013**. Hence b is significantly different from zero.

The regression analysis took two iterations to arrive at the best possible model from the predictors considered for the study. The Anova table for regression given hereunder suggests that the model derived through regression analysis is significant, rather than just predicting the mean of the predictor variables. Coefficient table for iteration 1 and 2 also explains that those predictors with below 2.5 VIF are only considered to fit the model.

ANOVA table for regression

Source	**DF**	**Sum of Square**	**Mean Square**	**F Statistic**	**P-value**
Regression (between $\hat{y}_i$ and $\bar{y}$)	3	0.621	0.207	599.112	0.00000924

Residual (between y_i and $\hat{y}_i$)	4	0.00138	0.000345		
Total (between y_i and $\bar{y}$)	7	0.622	0.0889		

Table Number Five

Anova Table For Regression

Coefficient Table Iteration 1 (adjusted R-Squared = 0.955)

	Coeff	**SE**	**t-stat**	**lower $t_{0.025}$(3)**	**upper $t_{0.975}$(3)**	**Stand Coeff**	**p-value**	**VIF**
b	5.486	0.155	35.506	4.994	5.978	0	0.0000491	
POBH	-0.229	0.0128	-17.97	-0.27	-0.189	-0.195	0.000376	3.588
KEBT	-0.00853	0.0135	-0.633	-0.0514	0.0343	-0.00812	0.572	2.186
POTA	-1.207	0.0798	-15.127	-1.461	-0.953	-0.474	0.000627	1.502
CTTC	-0.0838	0.0179	-4.685	-0.141	-0.0269	-0.203	0.0184	2.871

Coefficient Table Iteration 2 (adjusted R-Squared = 0.996)

	Coeff	**SE**	**t-stat**	**lower $t_{0.025}$(4)**	**upper $t_{0.975}$(4)**	**Stand Coeff**	**p-value**	**VIF**
b	5.539	0.12	46.339	5.207	5.871	0	0.0000013	
POBH	-0.234	0.00964	-24.244	-0.261	-0.207	-0.199	0.0000172	2.413
POTA	-1.233	0.063	-19.572	-1.408	-1.058	-0.484	0.0000402	1.102
CTTC	-0.089	0.0146	-6.082	-0.13	-0.0484	-0.215	0.00369	2.261

Results of the multi linear regression, based on the above coefficient table iteration 1 and 2, indicated that there was a very strong collective significant effect between the POBH, KEBT, POTAs, CTTC, and OSOOBHB, ($F(3, 4) = 599.11$, $p < .001$, $R^2 = 1$, $R^2_{adj} = 1$). The individual predictors were examined further and indicated that POBH (t = -24.244, $p < .001$) and POTA (t = -19.572, $p < .001$) and CTTC (t = -6.082, $p = .004$) were significant predictors in the model, and was a non significant predictor (KEBT, p >.05) in the model.

The model initially considered and assumed for the study was

Overall Selection of the OTA for Budget Hotel Booking = Performance of Budget Hotels + Knowledge & Experience of the Travelers + Performance of OTA concerned + Cyber Threats, Thefts and Crimes

However, based on the results of data analysis, the model suggested is

Overall Selection of OTA for Budget Hotel Booking = 5.539 - 0.234 Performance of Budget Hotels - 1.233 Performance of OTAs - 0.089 Cyber Threats & Thefts.

The above estimated model suggests that the budget travelers highly depend on the OTAs for their budget hotel booking and this dependability can be maintained or, probably increased, if there would be a decrease of one unit of non-performing hotels, non-realistic guest relationship policies of the OTA and cyber threats, thefts and crimes. It is understood that knowledge and experience gained by the travelers through the experience did not get any significance as it differs from time to time.

Discussion:

Globalization together with technological development has made the people prefer digital transactions because of its various benefits and advantages, regardless of increasing number cyber threats, crimes and bullying taking place around the world. When we look into this scenario in the perspective of room reservation by budget travelers, if pre-payment is preferred, they face the problem of getting their data leaked out. On the other hand if they prefer doing payment during check out, they are scared of getting charged higher or at times facing payment gateway server problems. In such a circumstance, the guests have to repeat the payment process which subsequently raises the puzzlement or dilemma of double payment. Irrespective of the circumstances, digital transaction is preferred as the most convenient method to transfer the money, and thereby, they put themselves into risk deliberately or inadvertently.

The most of the guests do accommodation booking rarely (47.15%). Their cyber journey, starting from selection of OTA, consideration of discounts and offers given by OTA, choice list of budget hotels, additional amenities & facilities and its charges, location of the properties, room reservation either with or without advance payment, check-in uptill check-out with bill settlement, turns to be hectic for them. The whole episode appears to be a quizzical, uncanny and weird for them. Intervention of various sources of information, further, makes the entire process complicated. Therefore, it becomes difficult for them to take independent decisions.

When it is clubbed with the personal experience or knowledge gained on cyber threat & crimes, the guests become absolutely scared and unnerved, ignoring the fact that the server of OTAs penetrates through block-chain technology to maintain the personal data of the guests safer and to offer value added services. Hence, they are left with a feel of insecurity, particularly when the AI powered Chatbots of hotels and OTAs start requesting the guests to register telephone number, email ID etc., just after a piece of enquiry. On contrary, no such detail is required during face-to-face enquiry. Block Chain Technology assists OTAs to maintain customer relationship services. However, these services may have to be extended to the guests only in the comfort and convenience of the guests but not at the discomfort and risk of the guests. For, the services chosen or enquired for are not necessarily to be repeated to the guests, as their choices might vary from time to time depending upon the requirements. Furthermore, even when they are sure that the payment gateways are secured, they assume the risk of getting credit card details or bank details or debit card details leaked out at the time of confirmation of reservation or during check-out. Additionally, Unified Payment Interfaces (UPIs) requires location access having the threat of getting IP address of the device used by the guest exposed, and Internet Banking services requires proper uninterrupted internet services or hotel wifi, use of which may expose or transfer all the personal data stored in the device to the hackers. The use of Electronic Data Capture (EDC) or Point of Sale (POS) attracting machine charges, supposed to be borne by the property, is expected to be paid by the guests.

Like standard hotel properties, the budget hotels do not own or maintain any server / website, due to heavy cost incurred in it. Hence the question of data leakage arises either in the communication channel between OTAs and Budget Hotels, or at the server maintained by the OTAs or at the customer data storage system maintained by the budget hotels or in any combination of these three probabilities

Suggestions:

The suggestions listed below are proposed to make the cyber journey of the potential guests a good experience:

- Travelers are supposed to keep themselves updated with the technology so as to safeguard themselves from crimes and threats.
- OTAs and Budget Hotels must ensure a safe and secured email communication services.
- In protecting the rights of the budget traveler and their interests, particularly the pre-paid travelers, the role and responsibilities of the intermediaries increase day by day. Their serious intervention throughout the stay of the guests is mandatory.

- Intervention of the government is necessary to make the internet users aware of their basic and human rights that would safeguard their personal data. More awareness campaigns and programs may have to be conducted.
- Furnishing telephone number and email id must be made optional to avail services online.
- OTAs having registration office in India must be allowed in India for their cyber operations, so that the guests can easily approach them in case of any query or assistance.
- Guests must consider and give high priority to those OTAs / intermediaries having rewards, awards and reputation from the regional and local bodies / organization of hotels, motels, hospitality and tourism. Such details must be shown on the home page of the websites.
- Accessibility to QR Codes and bar codes of bills, receipts, vouchers etc. should be activated only with the OTPs (One Time Password) sent by the property / OTAs in the cell number of the guests attached).
- Confidence must be built and gained in the minds of the guests by the hotel properties and OTAs on the fact that their data would be kept highly confidential and would not be used for any purpose other than customer relationship management.
- If free wi-fi is given to the guests, this is the moral responsibility of the hotel properties to ensure that the personal data of the guests are not stolen from the smart phones of the guests. To serve the purpose, they can, atleast, paste placards on various places of the property that the guests would enjoy a safe wi-service in their property.
- Integrity, credibility and reliability of IT staff and other staff as well may have to be checked and confirmed at regular period of interval by the hotel properties and OTAs in the interest of safeguarding the guests' personal data.
- OTAs and hotel properties should avoid asking permission for location access of the devices used by the guests.
- Users / guests must know how to utilize Virtual Private Network (VPN), wherever necessary.
- DPDP Act of 2023 of India should be immediately implemented to safeguard the interest of the cyber users.
- Guest relation policy and data security policy may have to be clearly shown on every page of the websites by the OTAs to gain confidence of the guests.
- Once the room reservation process is complete, a confirmation must be sent to the guest immediately not only by the OTA but also by the hotel property. This would put the customer at ease and relax.
- A proper feedback may have to be gathered from the guests either by email or by voice call, so that, OTAs can keep their guests in confidence, particularly
  - After every successful and unsuccessful payment process
  - After every cancellation of the booking
  - After every successful completion of room stay.

Conclusion:

The cyber journey of the guests, commencing from the selection of OTAs and upto the settlement of the bills during check out, should be in such a way that the entire process must leave them a good, comfortable, elate, sweet and memorable experience and that they have to be voluntarily get involved into the Word of Mouth Marketing not only for the OTA but also for the hotel property wherein they had spent quality time. It can further be added that even if the guests do wrong selection of OTAs, their experience in the hotel property in the context of charges, online payment etc. might be good and vice versa. Only when everything goes wrong with them, they lose their toleration level and slowly and gradually stop trusting or feeling better to opt online.

As the payment made by the guests has multiplier effect, the blame cannot simply be stick to individual guests alone. Therefore, it can be concluded that this is the combined effort of all the stakeholders involved in the entire scenario, such as society (to ensure prevention of cyber crime and threats), hotel properties (not to charge unnecessary amount; not to leak personal data of the guests; to ensure the proper discharge of services and facilities for the payment received), OTAs (to take their stand with the guests wherever and whenever necessary so as to protect the consumer rights; not to leak and misuse the personal data of the guests) and the guests themselves (to share their cyber world experience voluntarily with others so as to make others aware; to keep themselves updated with the development taking place in the cyber world), to protect the rights of the guests and to make the cyber experience wonderful.

Limitation of the study:

Even though cyber crimes and threats have become a challenging task for the authorities at international level; the travel, tourism and hospitality industry has been increasing constantly; and the use of internet has become an integral part of everyone's life, the data was collected from India only. Therefore the results may have been found biased towards India. If other countries would be included for the purpose of data collection, analysis and research, reaching a comfortable, convenient, applicable and appropriate decision and conclusion might have been possible.

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