

MODELING FACTORS THAT INFLUENCE ONLINE TRAVEL BOOKING

Michael Conyette

Okanagan School of Business, 7000 College Way, Vernon, BC, V1B 2N5, Canada

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Abstract: Data was collected from an online questionnaire completed by 1,198 respondents in 2008. Analysis of the dataset involved, correlation analysis, exploratory factor analysis, and logistic regression. In the final model building stage, a logistic regression model is generated containing key factors that lead to online travel booking intention. These factors are a unique set of socio and psychographic variables that can be used to more accurately predict website booking of travel products. The contribution to literature that this research makes is that it appears to be one of only a few models available for predicting travel product booking. For instance, this model predicts that consumers who previously booked specific travel products such as hotels or airline tickets will have a greater intention to book other travel products online. This research study also shows the relevance of the Theory of Reasoned Action to online travel but it goes further by enabling the quantification of the strength of variables such as key beliefs, attitudes and subjective norms.

1 INTRODUCTION

The Internet and the tourism industry are the contexts within which this research is based. A virtual company such as a travel website operates by providing access to its travel products and services through the Internet, and both travel websites and travel agents function within the tourism industry. The focus of this research is to assess the determinants of decision processes consumers undertake when booking their leisure travel online. However, it is recognized that consumers can use online or offline aids in the travel planning process (Conyette, 2010).

An online decision aid (ODA) is sometimes nested within a travel website so that a consumer is unaware they are using a sophisticated tool. Consumers also consult a travel agent, that is, an offline aid to assist them in travel planning. The study will provide tourism marketers with some understanding of leisure travelers and their behavior in the travel planning process, thereby helping marketers design suitable travel websites, online tools, travel agency services and marketing strategies. The knowledge deficit with online tools used in travel includes a viable model that explains and quantifies the interplay of beliefs, attitudes, prior

experience with travel agents and websites, social support, and how these factors contribute to online booking.

A proposed model containing these factors is used to test key hypotheses through data collected with a survey instrument. These hypotheses and components point to online travel booking intention, which is the primary interest. Quantitative data analysis helps in understanding the ultimate factors of online leisure travel booking intention. Qualitative research consisting of interviews and focus groups were first conducted in a related study and they guided the development of the model and inclusion of variables (Conyette, 2010).

This research project began with the initial question of whether intelligent agents used in travel planning compare with a travel agent that is highly knowledgeable about both the product alternatives available and the consumer's tastes. Over the past few years, technologies have advanced, and the Internet has spawned numerous new travel business models including travel search engines, online travel agencies, and travel websites with varying levels of sophistication and intelligent infrastructure. What was once an advanced intelligent online tool existing initially in artificial intelligent laboratories such as SmartClient (Pu and Faltings, 2000), Heracles (Ambite et al., 2002), Hamlet (Etzioni et al., 2003),

Theseus (Barish et al., 2000), INTRIGUE (Ardissono, 2003), and other ODAs, is now becoming more commonly used by consumers. Intelligent tools can be found embedded in travel websites such as Farecast's airfare predictive analytics tool, which is now incorporated into Expedia's website infrastructure. Consumers have become more comfortable with Internet technologies, and these technologies have advanced so that they offer travelers more options and assistance in a user-friendly, intuitive and interactive way.

2 HYPOTHESES

A parsimonious model consisting of seven key hypotheses was assessed using logistic regression analysis. The components of the model emerged from theoretical frameworks consisting primarily of the Theory of Reasoned Action (TRA). TRA proposes that a person's beliefs influence their attitudes which in turn affect their behavior as measured by behavioural intention (BI). One key element of TRA is that behavioral intention has been found to predict actual behaviour. Also, BI results from both attitudes toward a behavior and subjective social norms toward that behaviour (Fishbein, 1967). The qualitative research conducted prior to model development suggested that TRA was a suitable and significant theoretical framework for understanding travel product purchases (Conyette, 2010).

The research hypotheses to be tested are as follows:

H1b. Consumers who have more positive beliefs about online travel booking will have a more positive attitude toward online travel booking than consumers who have less positive beliefs about online travel booking.

H1f. Consumers who have more social support for online travel booking will perceive more social acceptance of online travel booking than consumers who have less social support.

H1g. A consumer's perceptions of the extent to which significant referents approve of Internet use for online travel booking will positively affect prediction intention to use the Internet for travel booking.

H1h. Consumers with more prior experience with the Internet and Internet travel will have more positive beliefs about online travel booking than do consumers who have less prior experience with the Internet.

H1i. Consumers who have more positive beliefs about travel agents will have lesser intention to purchase travel online than do consumers who have less positive beliefs about travel agents.

H1j. Consumers who have more prior experience with the Internet and Internet travel will have greater intention to purchase travel online than do consumers who have less prior experience with the Internet.

H1k. Consumers with a more positive attitude toward online travel booking have greater intention to purchase travel products online than consumers who have a less positive attitude.

3 SURVEY INSTRUMENT

An online survey questionnaire was used to determine how the various factors affect travel planning and purchasing decisions. Respondents were invited by various businesses that expressed an interest in the research including The Prestige Hotels & Resorts, Budget Car Rentals, The Kettle Valley Steam Railway, The Fintry Queen boat charters, and DiscoverTheIslands.com.

Thirty five questions were asked to assess prior experience with computers and the Internet, purchasing patterns online and offline, beliefs and attitudes about travel agents and travel websites, knowledge of travel and involvement with it, motivations for using the Internet, and various demographics. A total of 1300 surveys were submitted. One hundred and two surveys were deleted, as responses were not complete, leaving 1198 completed surveys for data analysis.

Some of the tests used on the data collected from the survey instrument include the following:

- Factor analysis, which simplifies the data by reducing the information contained in a large number of variables into a smaller number of subsets or factors. This helps identify the main factors.
- Pearson chi-square test of independence and logistic regression to determine which variables are most strongly associated with the intention to book online.

Pre-testing the questionnaire was important to validate the instrument. After about 250 surveys were collected the data was analyzed to assess the survey instrument and determine whether any changes were needed. Despite the small proportion of unfinished surveys referred to earlier, there were no significant gaps in responses to indicate that questions were unclear to respondents or that

respondents were skipping a particular question. Question items seemed easy to read and understand, meaningful to participants and sufficiently detailed. Directions provided in the questionnaire appeared to be helpful as well.

4 DATA ANALYSIS

Data analysis was performed using both SPSS 17.0, and Stata 10 software. Statistical analysis was conducted using Pearson's chi-square test of independence, logistic regression analysis, Spearman correlation analysis, and factor analysis. A 95% confidence interval was used to determine the level of statistical significance for tests.

The data was assessed for normality, linearity and homoscedasticity. Multivariate normality was not evident with most variables. Transformations of these variables did not improve normality; furthermore, the data needed to be simplified in order to make comparisons easier. Therefore, categories of these variables were merged when needed to more evenly distribute the data and reflect a meaningful distinction between categories in practical terms without limiting interpretations.

5 STATISTIC CALCULATIONS

Hypotheses were tested using logistic regression. For each hypothesis, the Pearson chi-square test of independence with an alpha of 0.05 was firstly used to assess if there was independence between each predictor and corresponding response variable. After each association test was conducted, some variables were kept and others dropped based on statistical criteria. This is followed by univariate logistic regression tests using a level of significance of 0.05 to determine whether the independent variable in the model is significantly related to the outcome variable. The decision to keep predictor variables at this stage was made primarily based on the likelihood test but also the Wald test. Finally, a model was built for each hypothesis by selecting variables for the multivariable analysis using a stepwise method to explain the remaining predictors for the response variable of each hypothesis. The importance of each variable included in the model was verified through an examination of the Wald test statistic. Evidence of interactions in the data was tested and no interaction was found between variables. Therefore, initially there are seven models, one for each H1 hypothesis.

After this hypothesis testing phase, a Final Model (the focus of this paper) predicting online travel booking intention was built using a stepwise logistic regression method by selecting specific variables for multivariable analysis.

Predictor variables retained from testing hypotheses H1g, H1i, H1j and H1k will comprise the elements used in the Final Model to be developed using logistic regression.

5.1 Beliefs Affecting Attitudes

Using the statistical approach outlined above, Hypothesis H1b is supported with predictor variables for the attitude 'desirable' consisting of 'beliefs' 'convenient', 'safe', 'easy', 'enjoyable' and 'convenience importance'. It is also supported with predictor variables for the attitude 'positive' consisting of 'beliefs' 'convenient', 'safe', 'easy', and 'enjoyable'.

5.2 Social Support Impacts Social Acceptance

Odds ratios indicate hypothesis H1f is supported with the predictor variable 'my friends or family encourage me to purchase travel products via the Internet'.

5.3 Social Acceptance Affects Online Booking Intention

Hypothesis H1g is supported with the predictor variable 'some of my friends or family buy travel products' as demonstrated by the odds ratios.

5.4 Prior Experience with Internet Influences Beliefs

Based on odds ratios generated, hypothesis H1h is supported with predictor variables prior experience purchasing specific travel products online such as 'destination tour/attraction tickets' and 'airline tickets', and 'leisure travel purchased online in the past 12 months'. Four models developed to test other belief variables support the hypothesis as well (Conyette, 2010).

5.5 Travel Agent Beliefs Influences Online Booking

Hypothesis H1i is supported with predictor variables

beliefs, 'convenient' and 'expensive' likely to influence online booking intention.

5.6 Prior Experience Influences Online Booking Intention

Hypothesis H1j is supported with various predictor variables measuring prior experience.

5.7 Attitudes Affect Online Booking Intention

Hypothesis H1k is supported with attitude predictor variables 'positive' and 'desirable'.

5.8 Final Model

As stated earlier, the final model building process involves determining which variables best predict online travel booking intention. The Final Model includes retained variables resulting from the tests of hypotheses H1g, H1i, H1j and H1k since they contribute directly to online travel booking intention. In the Final Model odds ratios may be interpreted to gauge the relative importance of predictors and their predictive ability.

Thus in the Model, Table 1, the dependent or response variable is online booking intention as related to the survey question, "How likely is it that you will book or purchase any travel product through the Internet within the next six months?" Categories were merged so that three remain, 1 = highly likely, 2 = likely, and 3 = somewhat likely.

Furthermore, 13 independent or predictor variables are as follows: Some of my friends or family buys travel products on the Internet, Belief that booking with a travel agent is 'convenient/inconvenient', Belief that booking with a travel agent is 'expensive', Having access to the Internet from places other than home or work, Length of time a person has been using the Internet, Number of leisure trips taken in the past year, The attitude that it is positive to book with a travel website, The attitude it is desirable to book with a travel website, Prior experience purchasing five specific travel products online such as, 'destination tour/attraction tickets', 'hotels or accommodation', 'airline tickets', 'car rentals', 'long-distance train tickets'.

At this stage model building was a simple task since all variables have already been merged where necessary, and assessed using a Chi-square test for independence, and univariate analysis using a level

of significance of 0.05. One variable was dropped through an examination of the Wald test statistic. This was the variable related to the question, "About how much time do you use the Internet each week for any reason other than work?"

The Model as a whole yielded a log likelihood of -709.05 and an R² of 16.46%. As Hilbe (2009) indicates the proportional odds model assumes equality of slopes among response levels or categories, so that the odds ratios pertaining to 1 = 'highly likely' to book apply as well to the categories of 2='likely', and 3= 'somewhat likely'. A notable predictor of online booking intention was social acceptance as expressed in the survey statement, "Some of my friends or family buys travel products on the Internet". The social influence element of the Theory of Reasoned Action seems critical in explaining consumers' intention to book travel online.

Another important predictor is a 'positive' attitude toward booking online. A person's attitudes are strongly influenced by groups to which he or she belongs so it is not surprising to see these two variables emerging as key predictors together in this model.

The role of consumers' attitudes that this Model reveals is supported with literature even when some of the literature does not explicitly refer to travel purchases. When consumers have affirmative feelings and attitudes about the online medium and using technology in general (Dabholkar, 1996), (Dabholkar and Bobbitt 2001), (Li and Chen, 2009), (Morrison et al., 2001) and have positive perceptions about the financial benefits of booking online, they are more likely to be online bookers. This is especially the case if they are aware of other people who booked online and if they have been using the Internet for longer periods of time. Online information sources from other consumers are regarded as critical with experience products such as travel products (Bei et al., 2004). Findings from the Web User Survey also reveal that online purchasing increases incrementally with online experience (Georgia Institute of Technology, 1998).

The Model reveals that consumers who previously booked travel products such as 'destination tour/attraction tickets' demonstrate a greater intention to book travel products online. It could be there is a hierarchical structure of vacation planning and purchasing where travelers book certain travel products before others. One conclusion is that early in the planning process travelers reduce uncertainty by taking care of core elements of travel such as transportation and accommodations (Beldona,

2003). In addition, according to one researcher, once accommodation has been booked, the vacation itinerary is relatively predetermined and fixed (Hyde, 2008).

Survey respondents' attitude of desirability toward online travel booking is shaped by their beliefs that online travel booking is safe using their credit card, easy, enjoyable, and they highly regard the importance of its convenience. A desirable attitude coupled with a positive one are the key variables leading to online travel booking intention. Respondents believe it is more expensive and inconvenient booking with an agent than a website. Also, it is more enjoyable and easier booking with a website.

Furthermore, in the Model, the variable "Internet access other ~2" recorded an odds ratio of 1.589 meaning that the expected odds of booking travel online ('highly likely' to book) is almost 1.6 times greater among respondents indicating they had access to the Internet asides from home or work, than respondents who said they do not have such access, controlling for all other factors in the model. With categorical variables Stata creates k indicator variable sets. The procedure is to omit the first group of variables so it acts as a baseline for other categories to help understand their odds ratios. Other key variables from hypotheses tests H1g, H1i, H1j and Hik are significant in this Final Model.

6 CONCLUSIONS

The predictive Final Model contains socio and psychographic variables of the traveler's decision making process when booking travel products, and it quantifies the strength of these variables through the interpretation of odds ratios as indicated above. Such a quantitative model for predicting travel products is unique in travel and e-business literature and thus it is a valued contribution.

In addition to uncovering these predictors, the probability of group membership in each category (online booking intention where, 1 = highly likely, 2 = likely, and 3 = somewhat likely) was determined using logistic regression. When one combines these probabilities with demographic parameters (Conyette, 2011), it gives a website operator valuable information for targeting consumers.

This study holds important strategic implications for the travel industry, and the following are offered to travel website operators and travel agents so they will prosper in the new marketplace.

Some implications deal with consumers' beliefs

and attitudes. Websites should note the perceptions online consumers have that booking with a travel website is positive. Understanding what particular attributes of online shopping make people feel this way is important. It could be that online bookers regard the savings in time and money as a positive benefit. Yet, these savings are not always

Table 1: Final Model.

Ordered logistic regression		Number of obs = 856		
		LR chi2(27) = 279.47		
		Prob > chi2 = 0.0000		
Log likelihood = -709.04845		Pseudo R2 = 0.1646		
Online booking intent	Odds Ratio	Std. Err.	z P> z [95% Conf. Interval]	
Some of my friends_2	1.490089	.3075721	1.93 0.053	.9942923 2.233111
Some of my friends_3	2.635803	.5708602	4.47 0.000	1.724092 4.029633
Some of my friends_4	3.846541	1.003958	5.16 0.000	2.306239 6.415587
Belief convenientA_2	.8059347	.2195409	-0.79 0.428	.4725286 1.374585
Belief convenientA_3	.6573546	.1672914	-1.65 0.099	.3991864 1.082489
Belief convenientA_4	.6292642	.1552033	-1.88 0.060	.3880525 1.020412
Belief convenientA_5	.4359062	.1128951	-3.21 0.001	.262386 .724178
Belief convenientA_6	.5405856	.1592311	-2.09 0.037	.3034873 .9629159
Belief convenientA_7	.5648519	.1587146	-2.03 0.042	.3256568 .9797359
Belief expensiveA_2	1.037616	.2842878	0.13 0.893	.6064888 1.775212
Belief expensiveA_3	1.395234	.3590141	1.29 0.196	.8425983 2.310328
Belief expensiveA_4	1.234324	.3131459	0.83 0.407	.7507253 2.029447
Belief expensiveA_5	1.625916	.3987905	1.98 0.048	1.005363 2.629501
Internet access other~2	1.589834	.2889482	2.55 0.011	1.113392 2.270154
How long using net_2	.7402478	.1117285	-1.99 0.046	.5506833 .9950671
Number of trips~2	.6097605	.1305857	-2.31 0.021	.4007438 .9277945
Destination tour_1	.5910556	.1000929	-3.11 0.002	.4241122 .8237131
Hotels_1	.6086096	.122005	-2.48 0.013	.4108682 .9015193
Airline tickets_1	.5602512	.1240503	-2.62 0.009	.3630033 .8646794
Car rentals_1	.6281079	.1085975	-2.69 0.007	.4475738 .8814626
Long-distance train_1	.367288	.1489853	-2.47 0.014	.165855 .8133637
Attitude positiveW_2	1.654819	.3965239	2.10 0.036	1.034636 2.664754
Attitude positive W_3	1.968378	.5129192	2.60 0.009	1.181143 3.280305
Attitude positiveW_4	1.934779	.4825798	2.65 0.008	1.186647 3.154577
Attitude desirableW_2	1.188753	.25725	0.80 0.424	.7778375 1.816747
Attitude desirableW_3	1.6572	.3936764	2.13 0.033	1.040321 2.639868
Attitude desirableW_4	1.749352	.4169593	2.35 0.019	1.096459 2.791012
/cut1	-.0922823	.352925		-.7840026 .599438
/cut2	1.092407	.3544086		.3977792 1.7877035

realized by using a website, so the online retailer should consider how to convey the belief that savings will result. However, many online bookers are more motivated by the rich information available on the Web and the convenience of accessing it. These bookers find the use of travel agents inconvenient and probably inefficient. Offline consumers often want the assistance and interaction only a human could provide. Travel agencies are best advised to make their services convenient, efficient, useful and very personable.

Travel agents could be trained on the usage of intelligent online tools and combine the assistance these tools provide with the unique aspects of advice that comes from a human touch (human intelligence). Agents could think about inimitable aspects of human knowledge, intelligence and reasoning that cannot be currently provided by online intelligent tools. Combining these methods in novel and powerful ways will exceed the expectations of consumers. Planning long haul or complex trips seems to be the strength of travel

agencies (Law et al., 2004) and so consumers desiring these vacations should be the targets of agencies.

Davis et al., (1989) state that perceived usefulness has a direct influence on behavioral intention. Perceived usefulness and ease-of-use are important (Dabholkar, 1996) and therefore marketers should take these into consideration in the design of user-friendly websites.

Attitudes, which are essentially a person's mental state of readiness (Zimbardo and Ebbesen, 1970) have been used to predict and explain behavior in many research studies (Trafimow and Sheeran, 2004); (Davis et al., 1989); (Fishbein, 1967); (Lord, 2004). Consumer attitudes change when people learn by looking, listening or reading (Conyette, 2010). Marketers can become sensitive to the varied reasons underlying the attitude in question. This study confirms the importance of attitudes and subjective norms in TRA and quantifies the strength of these in the Final Model.

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