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Faculty of Commerce - Papers

University of Wollongong

Year 2007

Management Learning Exercise and
Trainer's Note for Market Segmentation
in Tourism

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This article originally published as: Dolnicar, S, Management Learning Exercise and Trainer's Note for Market Segmentation in Tourism. *International Journal of Culture, Tourism and Hospitality Research*, 1(4), 2007, 289-295. Copyright Emerald 2007. Original journal information available here.

This paper is posted at Research Online.
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**Management Learning Exercise and Trainer's Note for
Market Segmentation in Tourism**

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February 2007

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Management Learning Exercise and Trainer's Note for Market Segmentation in Tourism

Abstract

Tourists are different. Tourists prefer different destinations, engage in different vacation activities and perceive different aspects of their vacation as important. Differences (heterogeneity) among tourists enable the tourism industry to identify interesting groups within the market who have similar and very distinct needs, target them, and gain competitive advantage through offering superior service to a smaller group of tourists instead of trying to satisfy the entire market's diverse needs. The process of identifying and learning about possible market segments that may be managerially useful is referred to as market segmentation. This article shows how researchers can develop learning exercises for training analysts and executives in market segmentation techniques.

Management Learning Exercise and Trainer's Note for Market Segmentation in Tourism

Smith (1956), who introduced the concept of market segmentation to the field of marketing, provides the following definition for market segmentation (p. 6): "Market segmentation [...] consists of viewing a heterogeneous market (one characterized by divergent demand) as a number of smaller homogeneous markets". Market segmentation's aim is to identify or construct one or more consumer groups who are similar with respect to a predefined criterion, to learn as much as possible about them, and – if one or more segments are found to be managerially useful – modify the entire marketing mix to best cater for the segment/s. The result of successful market segmentation is competitive advantage in the marketplace due to strong positioning in a particular part of the market.

A wide range of personal characteristics can be used as predefined criteria (segmentation criteria, segmentation bases) for market segmentation: socio-demographics (e.g., students versus retired people), behavioral variables (e.g., repeat visitors versus first time visitors), or psychographic variables (e.g., tourists interested in the local population versus tourists attending a major sporting event).

Market segments derive in many different ways. Typically, segmentation approaches are referred to as either a priori (commonsense) segmentation approaches (Dolnicar, 2004a; Mazanec, 2000) or a posteriori (post hoc, data-driven) segmentation approaches (Dolnicar, 2004a; Mazanec, 2000; Myers and Tauber, 1977). In a commonsense segmentation study destination management decides in advance which personal characteristics will be used to split tourists into segments. A typical example is to form market segments based on tourists' country of origin. In a data-driven segmentation study multiple variables are used to form market

segments. For instance, a set of 10 travel motives or 6 typical vacation behaviors. These variables represent the segmentation base and are used to form groups of similar respondents. The resulting segments have to be interpreted and understood well before they can be named. They result from an exploratory data-driven process. Often cluster analytic techniques are employed to identify or to construct segments in a data-driven manner in tourism. A typical example is benefit segmentation. Dolnicar (2004) provides a more comprehensive overview of segmentation approaches including various combinations of commonsense and data-driven techniques.

The following exercise demonstrates how data-driven segmentation can be applied by any tourism industry entity to explore the marketplace. The exercise takes the perspective of an Australian tour operator. The tour operator – who specializes in adventure tours in Australia and the Himalayas - is particularly interested whether or not a modest price increase would affect demand, and if some categories of adventure trip tourists may be willing to pay a price premium. The tour operator wants to know whether the market can be segmented on the basis of willingness to pay a price premium. If these segmentation categories can be defined accurately, the tour operator can more effectively manage promotion campaigns. Currently, the tour operator uses two main advertising channels (slide shows and advertisements in newspapers). Which communication channels is most effective in reaching the customer segment that is willing to pay a price premium? Finally, do the segments differ in their interest to travel to different destinations? If yes, can the company develop the most suitable product for them? The results include a data-driven segmentation solution as well as a profile of each segment; both pieces of information form the basis for the evaluating managerial usefulness of the derived data-

driven segmentation solution. Furthermore a number of methodological issues are highlighted which are essential to the correct implementation of a data-driven segmentation study.

The Data

To answer the research question, the tour operator conducted fieldwork using an email list of Australian subscribers to an adventure tourism newsletter. The questionnaire took respondents about twenty minutes to complete. From a list of adventure travel components, respondents were asked which activities they would be willing to pay a price premium. Nine variables were used to cover different aspects of willingness to pay in the context of an adventure trip. Respondents were asked to respond with a “yes” or “no.” A generous prize incentive was offered to ensure a high response rate. The final sample contains 649 respondents.

Respondents also were asked about their intention to undertake adventure travel, the information sources they used, and their preferred destinations. All questions required respondents to answer with “yes” or “no” only. Note that choosing the “yes-no” format (binary format) was very deliberate given that tourism datasets frequently contain respondents from different cultures and that ordinal or rating scales with multiple categories (such as the Likert scale) are known to be susceptible to response biases which can contaminate the data and consequently put in question the validity of results (Dolnicar and Grün, in press).

Training Exercise for Tourism Research Analysts and Executives

The tour operator conducted a segmentation study using a partitioning algorithm called Topology Representing Network (TRN) (see Martinetz and Schulten, 1994). TRN is similar to the frequently used k-means algorithm; however this algorithm has been shown to outperform alternative cluster algorithms (including k-means) in a Monte-Carlo situation with artificial data

(Buchta *et al.*, 1997). The tour operator consequently felt confident that the algorithm choice was suitable. The underlying distance measure was Euclidean distance, which is legitimate given that binary data was used. Fifty replications were conducted for each number of segments. The differences in stability are provided in Table 1.

Table 1 here

The tour operator concluded that the highest increase in stability occurred when a four segment solution was computed. The tour operator consequently chose the four segment solution and computed the final segments—the sizes are reported in Table 2.

Table 2 here

Figure 1 provides the segment profiles for all segments.

Figure 1 here

Finally, the tour operator wanted to validate the resulting segments with additional information of particular managerial interest. For this purpose the tour operator computed Chi-squared tests because all variables are categorical in nature and because the number of variables is small enough to permit Bonferroni correction to be used to account for the overestimation of significance due to independent testing. The test results are provided in Table 3.

Table 3 here

Exercise questions:

1. Is the segmentation base used suitable to help the tour operator answer the research question? Could the use of this segmentation base potentially lead to invalid results?
2. What type of segmentation analysis did the tour operator perform?
3. Would you classify the segmentation solution as “true”, “stable”, or “constructive” clustering? Please justify your decision.
4. Check whether the data-driven market segmentation was conducted in a methodologically sound manner, specifically with respect to the following aspects:
 - a. Is the sample size large enough to segment tourists based on nine variables?
 - b. Does the sample limit the amount of insight that can be gained from this segmentation analysis?
 - c. Was choosing the four segment solution the correct decision? Would you recommend investigating another solution in more detail?
 - d. Given the data format of the segmentation base, was the correct test employed to validate the results?
5. Interpret the resulting market segments.
6. Comment on the managerial usefulness of the resulting market segments.

Instructor’s Notes and Possible Solutions

This exercise aims to (1) provide an opportunity for students, analysts, and executives to interpret the results of a typical data-driven segmentation study and (2) to encourage them to critically question the approach taken in the segmentation study.

Solutions to exercises include the following comments.

1. The segmentation base is an interesting choice and possibly the best one the tour operator could create given that an email survey was conducted. The danger with this segmentation base is that respondents only stated their willingness to pay more for specific services. Respondents did not actually make the decision to do so. Perhaps the answers were affected by social desirability bias or other response biases.
2. Data-driven segmentation. But strictly speaking only adventure travelers were studied, so the kind of segmentation would be an example of Case 5 segmentation: commonsense segmentation using the kind of vacation, then data-driven segmentation using stated willingness to pay a price premium (see Dolnicar, forthcoming 2008).
3. The stability values in Table 1 do not indicate a very high level of data structure, particularly given that the eight cluster solution does not lead to a high increase of stability. A reasonable conclusion is that if the four cluster solution represent true clusters, they would have to be classified as either “stable” or “constructive”.
4. Methodological aspects:
 - a. The sample size is large enough. This concern can be tested using Formann’s (1984) formula for binary data, whereby the sample size should be at least 2^k with k representing the number of variables, in our case 2^9 . While $5 \cdot 2^k$ respondents would be ideal, the data set fulfills the basic requirement ($2^9 = 512$) because the tour operator’s sample contains 649 respondents.
 - b. Yes, this study was essentially a convenience sample of people who subscribe to a newsletter and provide their email address to obtain the newsletter. The sample could be skewed towards more experienced adventure travelers and younger people.

- c. Based on the improvement in stability the four segment solution was a good choice. Given that data-driven segmentation is always exploratory in nature, exploring other solutions would be of interest as to see if they would provide a more differentiated and therefore more managerially useful solution.
 - d. Yes, given that all variables are binary categories (willingness to pay, use of information sources, and interest in different tourist destinations) Chi-square tests may be computed. Bonferroni correction is needed, however, to account for the fact that interrelations between variables were ignored by conducting independent Chi-squared tests.
5. The four segments resulting from the segmentation solution have very distinct profiles. Segment 1 is only willing to pay a price premium for increased comfort. Segment 2 members would not pay a price premium for additional comfort in general (e.g., better accommodation or more private transport), however, they are willing to pay more for traveling to remote areas, areas with capacity restrictions, smaller group sizes, a good local network, and a high level of security and health safety. The largest group (40%) of adventure travelers are in this segment. Segment 3, representing one-third of the sample is similar to Segment 2, except this segment's members are not willing to pay a price premium for increased safety, security and health standards. Finally, members of Segment 4 state that they would be willing to pay a price premium for each one of the listed aspects. This segment must be interpreted with great care because the results could be a reflection of acquiescence (yes saying) response style.

The segments are externally valid. Significant differences emerge from the comparisons of additional pieces of information which were not used to construct the

grouping (Table 3). Based on the Bonferroni corrected p-values, all items in this analysis discriminate between the segments except their intention to undertake adventure travel and their interest in undertaking an adventure trip in Australia. These two values are not statistically significant suggesting that the segments do not differ. The results show that Segment 2 and Segment 3 members (those segments less concerned with comfort) feel attracted to more exotic places like Bhutan, whereas Segment 1 members indicate the strongest level of interest in safe (and comfortable) destinations such as Australia, the USA and France. In terms of advertising channels, slide nights appear to be most suited to communicate with members of Segment 2, only a very small proportion of Segment 1 members can be reached through those channels.

6. Segments 2 and 3 appear to be the managerially most useful choice for the tour operator. These segments are very *distinct* in their willingness to pay a premium price patters, they both *match the strengths* of the tour operator with respect to the destinations they are interested in, a fairly large proportion of both segments can be communicated with (are *reachable*) through the standard advertising channels (slide shows and newspapers), and they represent a significant proportion of the sample (*suitable size*). Note that generalizing the results to the population of adventure tourists is problematic because of the convenience sample approach. The sampling procedure is biased towards readers of electronic newsletters. The only criterion that cannot be assessed based on the above analyses is the *identifiability* of Segment 2 and Segment 3 members. Additional background variables are needed (e.g., age, gender, education, or occupation).

Conclusions

Market segmentation is a valuable technique to explore the characteristics of parts of the tourist market, which forms the basis of evaluating market segments and selecting suitable target markets to cater for and communicate with. The preceding provides an example of how to conduct a data-driven segmentation study. Based on selected variables from an empirical data set, a number of alternative segmentation solutions are computed. The most stable solutions form the basis of interpretation, both with regard to segment distinctiveness along the actual segmentation base, as well as along additional personal characteristics contained in the data set.

The case presented and discussed in this article represents only one of many possible ways of conducting market segmentation. Students, analysts and executives should be aware that market segmentation is an exploratory technique that aims at aiding managerial decision making. Resulting segments are not necessarily naturally occurring distinct groups. Often these segments represent the most suitable grouping for managerial purposes. When data-driven segmentation studies are conducted, careful and informed decisions must be made about the methodology chosen, as the methodology can have major impacts on the segmentation results.

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Tables and Figures

Table 1: Stability of solutions ranging from three to eight segments

Number of clusters	Number of repeated calculations	Percent uncertainty reduction	Improvement in percent uncertainty reduction
3	50	71.96	
4	50	86.14	14.18
5	50	80.00	-6.14
6	50	81.86	1.86
7	50	84.86	3.00
8	50	87.47	2.61

Table 2: Size of segments

Segment	Frequency	Percent
1	108	17
2	252	39
3	190	29
4	99	15
Total	649	100

Figure 1: Segment profiles (Willingness to pay a premium price for ...)

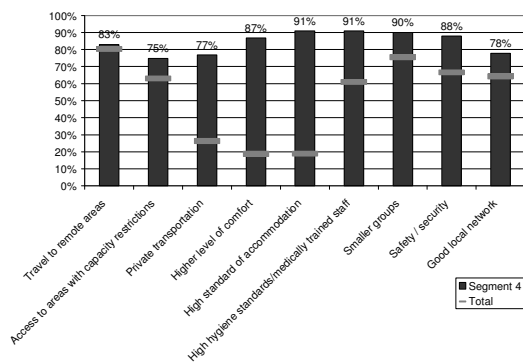
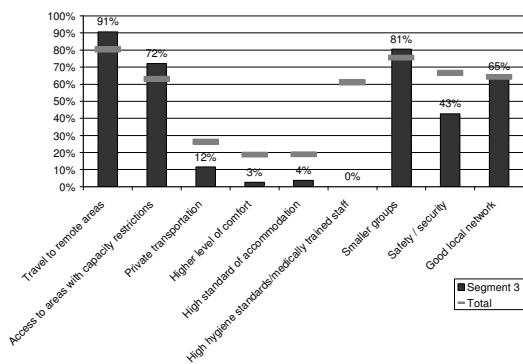
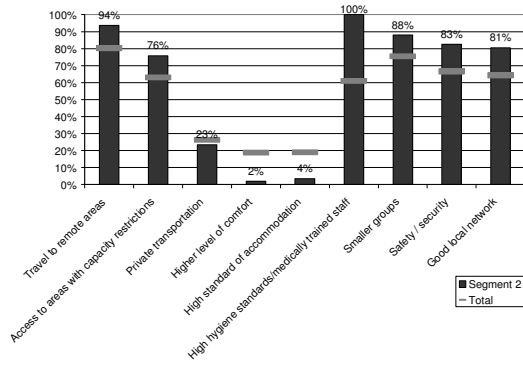
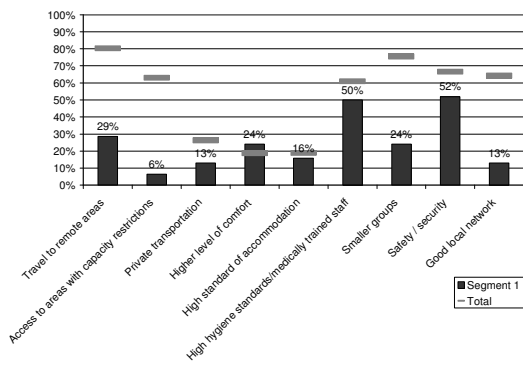


Table 3: Validation using additional variables

	Seg. 1	Seg. 2	Seg. 3	Seg. 4	p-value	Bonferroni- corrected p-value
Intention to undertake adventure travel in future	16	39	30	16	0.03	0.20
Information source: slide nights	10	49	28	13	0.00	0.00
Information source: newspapers	12	42	26	20	0.01	0.05
Destination of interest: Australia	16	40	28	16	0.75	5.23
Destination of interest: USA	17	35	23	25	0.00	0.01
Destination of interest: France	16	40	19	25	0.00	0.00
Destination of interest: Bhutan	10	46	32	12	0.00	0.02