

인터넷에 기초한 웹조사 방법 사례연구 : 호주관광객 (The exploration of the Internet-based web survey as a case study: Australian holiday travellers)

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요 약

호주에 있는 사례연구로 캔버라관광 웹사이트를 채택함으로써 복잡한 의사결정과정에 적용된 인터넷 기능들에 대한 온라인 관광객들의 선호도를 조사하기 위해서 자의적 선택 웹 조사방법이 사용되었다. 모집단으로서 이미 알려진 집주소와 전화번호들을 갖고 있는 우편조사와 전화조사와 같은 다른 전통적인 조사방법에 비해 웹에 기초한 조사방법을 사용하기에는 아직 시기상조이다. 이 연구에서 채택된 웹 조사 방법은 심각한 조사오류들을 발생시킬 수 있는 알려진 모집단이 없는 비확률표본추출에 의존하고 있다. 따라서 이 연구의 결과들은 자의적 선택 웹 조사에 대한 신뢰성을 확인하기 위하여 공식적으로 발행된 통계 자료들과 비교될 필요가 있다. 금번 연구조사는 자의적 선택 웹 조사방법이 어느 정도까지 타당화 될 수 있는 지를 논의한다.

ABSTRACT

A self-selected web survey was utilised to investigate the preference of online holiday travellers to the Internet functions applied to the extensive decision-making process by adopting the Canberra tourism website as a case study in Australia. The use of web-based surveys is not at a mature stage, compared to other traditional surveys such as mail survey and telephone survey that have already-known home addresses and phone numbers as a frame population. The adopted web survey relies on non-probability sampling without a known frame population that can cause serious research errors. Therefore, the results of this study need to be compared to other official published statistics in order to verify reliability or credibility of the self-selected web survey. This study discusses the extent to which the self-selected web survey can be validated by finding the significant difference not only between the demographic results of web survey and those of official statistics released by several articles including the Graphic, Visualizations and Usability Center (GVU) at Georgia Tech research but also between the travel background features and those of 'ACT Tourism Masterplan 2001-2005' published by the Canberra Tourism & Event Corporation (CTEC) located in Australian Capital Territory (ACT).

Keywords : Travel behavioural background; Demographics; Online holiday travellers; the self-selected web survey

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1. Introduction

Australia is recognised as one of leading western countries which have achieved the relatively high penetration of computer ownership and the rate of Internet access. According to figures produced by Australian Bureau of Statistics (ABS), 54% of Australian households (3.8 millions) had personal computers. And also, 33% of households (2.3 million) gained access to the Internet at May 2000. Out of Australian total population (19.2 millions), Internet users accounted for 26% (4.95 millions) in 2000, which was predicted to be increased up to 5.8 millions in 2002 by eMarketer (2001) (Cheung, 2001).

Based on those evidences of the Internet use in Australia, the Internet seems to have become one of major sources used by Australian holiday travellers who seek interstate travel information since the value of domestic travel market cannot be neglected. The BTR (1999) reported that the number of domestic tourists in 1996 totalled over 80 millions, with collective spending of A\$44.4 billion. This last figure shows that the expenditure of domestic tourists in 1996 exceeds A\$16.7 billion spent by overseas visitors to Australia in 1998. Moreover, according to the Netwatch report compiled by ACNielsen (1996), 44% of Australians who had travelled more than three times within the first half of the year 1996 had utilised the Internet in connection with their travel.

However, Destination Marketing Organisations in Australia have not conducted any research for specific travel segment (online travellers), which is considered as potentially lucrative. Amongst the items purchased by

all Internet shoppers, holidays accounted for 12% even though the figure was increased from 8.5% in 1999 (ABS, 2000). Therefore, Australian DMOs are concerned that substantial revenues have not been visualised as much as those from the number of consumers exposed to offline distribution channels and promotional activities. Furthermore, as Tierney (2000) notes, DMOs heavily rely on the click-through rate and hits in order to assess the promotional effect of DMOs' web sites while they do not know who online travellers are and why they travel, which contribute to developing online travel marketing strategies. To achieve the desired web marketing strategies by Australian DMOs, reliable, broadly accepted, and specialised online research outcomes are needed such as those acquired through mail survey or telephone survey having a known frame population. Unfortunately, web-based surveys have not generally been acknowledged as a means of generalisation on the results of the web-based survey to the public. This attitude has arisen not simply because it is a new method but also because it uses an unknown population frame and, as a result, may not reflect the general public opinion in terms of statistical errors: coverage, sampling, and non-response error. Therefore, a known frame population needs to be adopted to justify the use of the web-based surveys as well as to provide reliable research information that helps DMOs to develop applicable online travel strategies.

However, it may be impossible to gain a known population frame like telephone number or home addresses because official e-mail addresses, which can identify indi-

vidual profiles, have never been published excepting official e-mail addresses (e.g. government, private companies). Furthermore, privacy issues are still sensitive to online users, which prevent DMOs from revealing personal information.

If there is no distinctive known population frame, we need to create new ways to justify the use of web surveys by limiting generalisation to a certain population like online travellers visiting a specific travel website (Schonland and Williams, 1996). Alternatively, online traveller demographics can be compared with those published by public institutions (Witte et al, 2000). This comparison will be able to provide future researchers with a basic frame for establishing a unique profile of online travellers distinctive from the demographics of general online users.

Consequently, the main purpose of this paper is to verify reliability or credibility of the use of the self-selected web survey through a comparison of research results with formally released statistics. This will contribute to establishing independent demographics of Australian online holiday travellers from those of general online users.

2. Study background

The Internet web-based survey has advantages for data collection. Couper (2000), Tse (1998), and Schonland and Williams (1996), and Tierney (2000) state that web surveys can be distributed to a mass audience at much lower cost than traditional research

methods mail and telephone survey because research process can be done automatically from data collection to conversion of the raw data into graphs and tables (Tierney, 2000). The web survey can also encourage the respondents to fill out the survey by using multimedia features (Couper, 2000; Domme-yer and Moriarty, 2000). However, several scholars discovered that a low response rate is a main concern in the Internet-based survey (Tse, 1998; Bachmann et al, 1996; Schaefer and Dillman, 1998; Oppermann, 1995, Tierney, 2000). According to the study for measuring promotion effect on CalTour website conducted by Tierney (2000), the response rate of the web-based survey as pre-survey was only 2% while the e-mail survey obtained 37.3%. This fact can affect representativeness on the samples amassed via a web survey. Furthermore, non-response error, which is defined as 'not all people included in the sample are willing or able to complete the survey', can occur (Couper, 2000) because the characteristics of non-respondents cannot be identified. This error may worsen representativeness due to the low response rate (Tierney, 2000).

Couper (2000) notes that several types of web surveys have to be appraised in terms of traditionally agreed major sources of errors including coverage, sampling, and non-response in relation to costs and spent research time in order to differentiate unacceptable web surveys from the acceptable in scientific terms.

As Couper (2000) discussed, coverage error, which is defined as 'a function of the mismatch between the target population (e.g. online holiday travellers) and the frame

population (all personal e-mail addresses), makes it difficult for the web to be accepted as a frame population unless literacy rate prerequisite for use of the Internet and computer ownership does reach over 90% of the population (Couper 2000, Oppermann, 1995). In addition, the big demographic difference between population covered by the web and those who are not covered has too widened depending on age, education level, country, race (Couper, 2000; Dommeyer and Moriarty, 2000; Tse, 1998). Under this circumstance, the only way to generalise the research idea is to limit generalisation to a certain population like only Internet users (Schonland and Williams, 1996). According to Bachmann et al (1996), e-mail surveys would represent a certain population who access the Internet or have e-mail addresses.

Couper (2000) introduces sources of inaccuracy concerns sampling methods: non-probability surveys and probability surveys. The former includes entertainment, self-selected web surveys, and volunteer panels of Internet users. The latter does intercept web survey, list-based samples of high-coverage populations, mixed-mode designs with choice of completion method, pre-recruited panels of Internet users, and probability samples of full population. Among those introduced methods, practically usable methods are from selected web surveys to probability samples of full population excluding entertainment. Intercept web survey and list-based samples of high-coverage populations are ideally recommended surveys to online researchers at the level of academic research. Both types can be statistically

accepted as long as probability sampling is applied to them. Furthermore, other types of web surveys, based on probability sampling, require longer research time and more significant cost than both types. As Couper (2000) and Witte, Amoroso, and Howard (2000) suggest, only probability-based research is significant in terms of statistical inference. However, when taking limited research duration and privacy issues into account, two applicable web methods have to be considered. More than that, even though two ideally recommended methods are used, they cannot avoid the existence of non-response error as the same as self-selected web survey because of low response rate.

The response rate of the Internet-based survey is conventionally lower than that of other traditional mode (Tse, 1998; Bachmann, Elfrink, and Vazzana, 1996; Schaefer and Dillman, 1998; Oppermann, 1995; Tierney, 2000). Thus, contemporary scholars discussed how to increase the response rate of Internet-based survey (e-mail and web survey). Schaefer and Dillman (1998) suggested that the rate of e-mail response obtained by mixed mode (e-mail and mail) was higher than e-mail survey alone; Weible and Wallace (1998) recommended that the incentives are useful method to get high web survey response rate; Couper (2000) and Carroll (1994) emphasised the importance of the design of web surveys to attract the respondents to complete and return the survey; Crawford, Couper, and Lamias (2001) revealed that those who received embedded password and more frequent reminders were high possibility of accepting participation in web survey and Bachmann et al (1996) made

the response rate of e-mail survey closely reached to that of mail survey by follow-up survey.

Among the several suggestions for the increase of the response rate of the Internet-based surveys, only incentives can be used for this study while other resolutions are possible tactics under the survey having a known frame population. Tierney (2000) used incentives to persuade the respondents to proactively participate in his web-based survey. He found that the response rate was very low (2%) despite the use of incentives on his survey. Therefore, this figure may be good example to be compared to that of the self-selected web survey that did not use the incentives in order to answer the question about the usefulness of incentives by Tierney (2000). Some main reasons not to use the incentives in this study is multiple submissions by the same person and unwanted response simply to the context, which can cause the distortion of the respondents themselves and their responses (Schonland and Williams, 1996). As a result, the author decided not to use incentives to approach the targeted respondents (online holiday travellers).

Finally, sampling error arises from the fact that not every member of the frame population is measured. Web surveys do not have entire name lists of Internet users like a telephone book (Tse, 1998). In other words, it is very hard to select a probability samples via a web survey. Therefore, sampling error can be diminished by using a known frame population. As Tierney (2000) mentioned before, it may impossible to get the lists of e-mail addresses. During this

research, this issue was raised by Canberra Tourism Events & Corporation (CTEC) in Australia that was unwilling to divulge e-mail addresses of its clients. In this light, intercept survey and self-selected survey can be alternatives. Intercept survey was not considered as a usable method because the survey design (popping up the invitation message to every nth web visitor) is complex and asks for high research budget and long-term research duration to collect samples enough to be analysed. As a result, the self-selected method was chosen due to simple pop-up screen to every web visitor. Then, retaining as much sample size as possible is the only solution for overcoming generalisation problem. Since this type of survey uses non-probability sampling, the increase of the number of samples is supposed to justify credibility of the result of this survey (Kehoe and Pitdow, 1996; Tierney, 2000). According to the National Geographic Society's Survey 2000 conducted by Witte et al (2000), 50,000 of 80,000 web visitors completed the self-selected web survey. The Internet population used in their study showed similarity to Internet users across the United States while the web respondents could not represent the whole U.S population. On the other hand, Tierney (2000) suspected that the collection of large sample size represent the actual population of visitors to the CalTour web site. Tierney (2000) concluded that relatively large sample size did not represent the average visitor to the CalTour web site.

Therefore, the sample validity may be identified by comparing the distribution on standard demographic variables to official

government statistics or previous statistics (Witteet al, 2000). However, the demographic information of online holiday travellers in particular has hardly been accumulated through the official survey. Therefore, this research has no choice but to adopt demographic information of the general Internet users collected through GVU research reviewed by Kolettis (2001), that published by Kern (1999) and previous travel background statistics of actual visitors to Canberra provided by CTEC even though there are basic different characteristics between online holiday travellers and general Internet users and offline holiday travellers. Now, as Internet travel market is stepping into mainstreaming of travel segments, we need some standardised criteria to determine if the survey results can be valid and reliable by providing comparable statistics to current researchers who especially focus on the study for online travellers and tourism-related organisations that want such credible materials for developing their web travel marketing strategies.

3. Methodology

This study used the CTEC website (www.canberratourism.com.au) to collect online survey data by popping up the full screen invitation message to every visitor to the CTEC website. Basically, this survey was administered to the CT web visitors so as to observe their buying decision behaviours on the Internet, based on previous visit experience to Canberra in Australia. Therefore,

this article results from a part of the main research. Demographic characteristics and previous travel background were garnered from the main study to test the sample validity through a comparison with previously published official GVU statistics and 'ACT Tourism Masterplan 2001-2005' compiled by the CTEC

This research cooperated with the CTEC and the Division of Management and Technology in University of Canberra in order to undertake the self-selected web survey. The web questionnaire was designed by using MicroSoft FrontPage program. The CTEC projected full online instant message screen to every online visitor to the CT web site. On the other hand, the Division of Management and Technology in University of Canberra provided the author with web server for the web survey and database server for collecting raw data as Microsoft Access format rather than using SQL database server that is used to store magnificent data. When an online visitor clicked 'Yes' icon on the invitation message for voluntary participation in the web survey, the respondent was linked to the web survey(www.dmt.canberra.edu.au/tourism) installed in the Division of Management and Technology in university of Canberra. Then, the collected data was automatically stored in the database server in University of Canberra. The raw data was converted into Microsoft Excel program for descriptive analysis. Statistical Package for the Social Sciences (SPSS) was operated for other analysis by changing the data stored in Microsoft Excel program into statistical entries.

4. Results and Discussions

A pilot survey was conducted from 17 to 22 October, 2001. The response rate of pilot survey was 2.02%. 46 samples out of 2282 exposure times of popped invitation messages were collected through the preliminary survey before the launch of the formal survey in order to examine whether the web page of the Internet survey worked and to find the ambiguous questions the respondents do not understand. The formal web survey was launched on 23 October, 2001 and was ended on 14 December, 2001. 23,656 online invitation messages were exposed to every Canberra tourism web site visitor during online survey. 446 respondents took part in the online web survey. The response rate was 1.9 % which was lower than that of pilot survey (2.02%). However, 22 of total responses were screened out because of duplicate responses (mistakenly double clicking 'submit' icon), local residences, and improper answers (especially, from some respondents who used inappropriate languages). Therefore, 424 responses were analysed with SPSS. It took one and a half months to collect the valid sample size.

4.1 Demographics of the CTEC web visitors

Four demographic factors were used to compare the current profile with those produced by other previous studies, these were: age, gender, total household income, and highest education. The analysed data of the demographic factors were compared with the characteristics of online users collected

from a daily tracking survey on Americans' use of the Internet, by Rainie and Packel (2001) and those collected from the study of the Graphic, Visualizations and Usability Center (GVU) at Georgia Tech (Kolettis, 2001).

After examining the data on demographics of CTEC web users, visitors to the CTEC web site were found to be in a younger group aged between less than 20-30 (58.2%) whereas people aged between 40-60 account for 42%. According to the figures produced by Rainie and Packel (2001) relating to the American experience, 75% of people aged 18 to 29 and 51% people aged 50-64 accessed the Internet. This figure is consistent with the demographics in this study where the Internet access is still dominated by the younger generation. However, more people in the older age group are beginning to access the Internet (Rainie and Packel, 2001). This means that the Internet access is capable of reaching all age groups. On the other hand, considering the mean score of the age variable, the average age score of the CTEC web visitor was 38.3 years. That is, the average age score of visitors to the CTEC website (38.3 years) is higher than the average age (36 years) of all web users, according to research conducted by GVU (Kolettis, 2001). Consequently, as Kolettis (2001) states that there is no age difference in the Internet use based on the average age score (36 years old) compiled by GVU, it can be said that the CTEC website was accessed by all age groups (38.3 years old).

Secondly, the gender ratio of users of the CTEC website reflects the International Data Corp (IDC)'s 1999 forecast that the Internet

is being feminised (Kern, 1999). The number of female online users exceeded that of males for the first time in early 2000 in the United States (Media Metrix and Jupiter Communications, 2000). Furthermore, according to Rainie and Packel (2001), among American adults, 50.6% of online users are female compared with 49.4% males. This present study also shows a similar fact that the female rate (60.7%) of usage was much higher than for males (37.9%). Although it can be said that the female-dominant CTEC website reflects the online worldwide gender trend towards more use of the Internet by females, this trends also suggests that women play a major decision maker role in the purchase of most household goods (Kern, 1999). According to the study conducted by Rainie (2002), in December 2001, 52% of people who had ever purchased goods online were females.

GVU discovered that the average household income for online users has decreased from US\$60,000 to US\$53,000 (Kolettis, 2001). This suggests that an increasing number of people in lower incomes are participating in Internet activity (Kolettis, 2001). The study conducted by Rainie and Packel (2001) also found that those with lower earnings are rapidly gaining Internet access with an increase from 28% to 38% in less than one year. The findings of this study are consistent with the change of household income class for CTEC web users, showing that there is a little difference between people with a household income under A\$60,000 (44%) and those with an income of A\$60,000 and over (55%). This suggests that the use of destination website

is capable of being adopted by a lower income class, even though people at the higher income level still dominate the use of travel destination website.

This study also found that 69% of visitors to the CTEC website had an education College/TAFE/Advanced Diploma and over. This reflects that the typical demographic characteristic of online users is at a higher level of education. As Rainie and Packel (2001) discovered in their research, 82% of people with a college degree or more accessed the Internet.

This study examined whether the Internet market is still targeted to very specific demographic users, that is, those with a high income, with a high education level, and in the young age group (ABS, 2000, Bellman, 2001; Goodrich, 2000; Couper, 2000) rather embracing all members of the general public as is typical with the mainstream media. According to the results of a survey conducted by GVU (Kolettis, 2001) and Rainie and Packel (2001), the demographic profile of the Internet market has changed from single, young, college-educated males with a high income to highly educated young females with modest incomes. The present study also identifies the fact that the demographics of online travel users is changing to that of a young, married female with a modest income (average A\$ 64,000). Visitors to the CTEC website tended to be female (59%), in the 20-39 years old group; 61.9% is married or living with partner; 73.7% have education level (above College degree); 63.3% have a professional occupation (above advanced clerical and service workers); however,

52.9% was under \$60,000 whereas 47.1% was \$60,000 and over. In addition, this study supports the fact suggested by Kolettis (2001) and Rainie and Packel (2001) that older people and people on low incomes are also accessing the Internet. In other words, it can be seen that the Internet is capable of reaching the general public, including those on low incomes, older people, and women, rather than being skewed to specific online groups even though 100% penetration of the Internet has still not been achieved, which will reach 75% in the United States by 2005 unlike TV (98% of all American households) (Rainie and Packel, 2001).

4.2 Previous travel behaviour of the CTEC web visitors

This section discusses the previous travel background to the CTEC web visitors in comparison with the report of 'ACT Tourism Masterplan 2001-2005', published by the CTEC (2000). This comparison examines whether the previous travel behaviours of the CTEC web visitors during their last trip to Canberra are different from those of offline previous visitors to Canberra who were surveyed by BTR (1999; 2001).

The present study found that most respondents can be considered as repeat visitors who had visited Canberra within the last two years. According to the Bureau of Tourism Research (BTR)(2001), the purpose for visiting Canberra could be divided into the following categories: Visiting Friends and Relatives (VFR) 34.2%; holiday/leisure 31.7%; Business 29.9%; and other 4.2%. However,

this study categorised the trip purposes into 11 categories. Among these, VFR was ranked as first place, representing 15.0% of the CTEC web visitors. Those in the holiday categories accounted for 13.5%, which ranked it as the second category; followed by business and work purposes (54.3%) of 'Other' category (11.8%). The CTEC web visitors show a similar pattern for the purpose of their visit to Canberra compared to those surveyed by BTR (2001) with regard to the order of ranking.

Online visitors are compared with that of BTR (1999) for past travel behaviour. BTR (1999) analysed the length of stay by purpose of visit. 75% of holiday visitors stayed between one to three nights whereas 18% of this group stayed between four and seven nights (CTEC, 2000). On the other hand, this study found that 42.5% of the CTEC holiday visitors stayed between one to three nights whereas 34.0% of those stayed between four and seven nights. This comparison suggests that CTEC holiday travellers stay in Canberra longer than those surveyed by BTR (1999).

Furthermore, BTR (1999) found that 71% of people in the VFR category stayed between one and three nights whereas 21% of VFR stayed between four and seven nights. On the other hand, the present study found that, while 49.0% of people in the online VFR category stayed between one and three nights, 34.0% of online VFR stayed between four and seven nights. This comparison suggests that people in the online VFR category stayed a shorter period than those surveyed by BTR (1999).

5. Conclusions

This article investigated how different the results of demographics and behavioural background collected through self-selected web survey are those from several published articles and official report of CTEC.

Demographics in this study are showing very similar characteristics to those suggested by Kolettis (2001) and Rainie and Packel (2001). On the other hand, although ranked categories of trip purpose of CTEC web visitors are a similar pattern to those surveyed by BTR (2001), CTEC web visitors has a dissimilar travel stay-length pattern to those in BTR (1999). In other words, it could be said that the CTEC web visitors have different segments from offline domestic holiday visitors to Canberra.

This research identified several advantages of the use of the web-based survey. Firstly, the web survey can be administered to the mass at much lower costs (Couper, 2000, Tse, 1998; Schonland and Williams; 1996). Secondly, the web survey makes the respondents interested in participation of the web survey due to the use of multimedia features (Dommeyer and Moriarty, 2000; Carroll, 1994) and easy completion of web survey by just clicking buttons. Thirdly, pilot web survey can be conducted with real samples. In other words, pilot responses from real online samples were really helpful to discover and correct survey mistakes. Fourthly, as soon as minor problems were uncovered in the web survey such as spelling missing and inconsistent word size, the researcher could correct them by immediately updating the web survey.

Nonetheless, this paper recommends that future researchers review web survey methodology. This study used self-selected web survey rather than list-based samples of high-coverage populations or the web-based intercept surveys. This study wants to suggest two issues; the difference between probability and non-probability sampling, and representativeness caused by low response rate of web surveys.

Future web-related studies need to compare self-selected web survey that is based on non-probability sampling with list-based web survey and intercept web survey that is based on probability. The results from the comparison of different sampling methods will reveal which sampling method is reliable. In addition, future researchers need to develop many new ways to increase the response rate of self-selected (1.9%) in this study and intercept surveys (2.0%) in Tierney's study (2000), which seriously affect representativeness because two web surveys do not have known frame populations. However, probability-intercept web survey is accepted as reasonable web survey because only probability-based survey can draw reliable inferences. Therefore, if future researchers test two methods with same research questionnaires, the difference of reliability between two methods will be able to be found.

Finally, this paper wants to suggest the possible way to use list-based web survey. Basically, the official demographics of online holiday travellers need to be established in tourism, this specific online travel demographic makes it possible for web researchers to measure reliability of conducted web

surveys. List-based web survey can use a known frame population like mail or phone survey generally considered as high reliable. Therefore, demographics established through list-based web survey can be highly valid. However, most travel destination organizations are reluctant to reveal the e-mail addresses of their clients.

Cooperation of DMOs is absolute to build credible demographics of online holiday travellers. As a result, destination Internet marketers should provide future researchers with a known frame population by getting permission from the registered members or the potential surveyed before formal survey. Such cooperation is no doubt that successful research will be accomplished.

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