WPI

Project Code: LJM-03A2

Interactive Technology and Zoos Victoria:
The Effect of Interactive Multimedia Technology on the Visitor Experience

VICTORIA'S OPEN RANGE ZOO AT WERRIBEE

MELBOURNE ZOO

HEALESVILLE SANCTUARY

An Interactive Qualifying Project Report
submitted to
the Department of Discovery and Learning,
Zoological Parks and Gardens Board of Victoria
and to the Faculty of
WORCESTER POLYTECHNIC INSTITUTE
In partial fulfillment of the requirements for the
Degree of Bachelor of Science

By

Sara M. Maska

Ravi Srinivasan

Anna Y. Tatashina

John A. Tranquilli, Jr.

Date: April 29, 2003

Approved:

Professor Laura J. Menides, Major Advisor
Professor Jonathan R. Barnett, Co-Advisor

Abstract

This project, conducted in Australia at the three properties of Zoos Victoria, studied how interactive multimedia technology affects the visitor experience. The project team researched cultural institutions and survey design; created survey questions; surveyed over 400 people both on and off the zoo properties; conducted focus groups; analyzed the collected data; and made recommendations about how technology could complement visitors' experiences. The results of this study provided a benchmark against which the impact of multimedia technologies may be tracked longitudinally.

Executive Summary

This project studied the effect of interactive multimedia technology on the visitor experience at the three Zoos Victoria properties: Melbourne Zoo, Healesville Sanctuary, and Victoria's Open Range Zoo at Werribee (VORZ). Upon our arrival in Australia, Zoos Victoria was in the process of developing an exhibit at Melbourne Zoo that utilized multimedia technologies in the form of interactive games and information stations. These technologies receive and react to user input by means of a computerized interface. To assist with directions for the future development of interactive multimedia technology at each of the Zoos Victoria properties, we conducted research to discover how patrons who used the multimedia stations reacted to them. It was also appropriate to learn how visitors and non-visitors assessed the prospect of integrating interactive multimedia technology into the zoo experience.

Our goals were (1) to determine whether the zoos' natural environments and the information provided by interactive multimedia stations combine to create a better experience, and (2) to gather and analyze information that would provide a benchmark against which future studies could be measured. To facilitate this study for Zoos Victoria we conducted research in several areas including:

- the zoo properties themselves
- survey design
- interactive multimedia stations
- marketing methods used by other zoos and museums

By conducting surveys on-site at Melbourne Zoo, Healesville Sanctuary, and Victoria's Open Range Zoo at Werribee, and off-site at the Bourke Street Mall in downtown Melbourne, we were able to collect visitor and non-visitor opinions about interactive multimedia technology and its effect on the zoo experience. Over the

course of a two-week period we surveyed a total of 403 people. We also conducted two focus groups with volunteer guides from the Friends of the Zoos (FOTZ) organization.

Based on the analysis of responses to our surveys and focus groups, we found that most visitors would either like to see more interactive multimedia technology in the zoos or had no opinion on the matter. Visitors were interested in seeing interactive maps that would help them find their way around the zoo. This result, coupled with the fact that many participants indicated that they were not satisfied with the information provided by the zoos' maps and directional signage, led us to recommend that interactive maps be among the first new technologies installed.

A relatively small percentage of visitors and non-visitors surveyed had used either the Zoos Victoria website or the interactive multimedia stations at Melbourne Zoo. According to our survey results, the stations usually had a positive effect on the visitor experience, sometimes had no effect, and never had a negative effect. Furthermore, those who had used either the website or multimedia stations showed higher levels of interest in interactive multimedia technologies and interactive multimedia stations at the zoos. Due to the connections between interests in these different technologies, we stressed the importance of promoting both the website and the unique content of the interactive multimedia stations.

From the focus groups we conducted, we learned that participants believed interactive multimedia technology will grow to play an important and helpful role in the future zoo experience, as long as the technology does not become the main focal point of the zoos. The participants expressed particular interest in the placement of interactive stations near habitat exhibits that would engage visitors with interesting facts about the plants and animals surrounding them. They also believed that stations

that provide details about individual animals, such as their ages and names, would add a personal touch to the zoo experience.

After analyzing the results of our surveys and focus groups, we provided the Zoos Victoria staff with several recommendations concerning the future integration of interactive multimedia technologies into the zoo experience:

- The implementation of interactive maps would be highly beneficial to zoo visitors.
- Interactive multimedia stations should be placed by exhibits in order to provide visitors with frequently updated details on the plants and animals in the zoos.
- The website must be promoted more actively in order to increase visitation and utilization of everything the Zoos Victoria experience has to offer.
- Zoos Victoria should continue to assess how technology affects the zoo experience which can be accomplished in the future by conducting the follow-up survey that we left for the Zoos Victoria staff.

The data from future studies can be analyzed using our results as a benchmark to track the effects of technology on the visitor experience.

Acknowledgements

We would like to thank the following people for their support and guidance throughout this project:

- Jennifer Aughterson
- Jonathan Barnett
- Michael Ciaraldi
- Patricia Crawford
- Erwin Danneels
- Discovery & Learning Centre
- Amanda Embury
- Friends of the Zoos
- Chickery Kasouf
- Byron Menides
- Laura Menides
- Sara Murphy
- Matthew Ward
- Christina Watson
- Our friends and families

Authorship

This project was written and actively edited by Sara M. Maska, Ravi Srinivasan, Anna Y. Tatashina, and John A. Tranquilli, Jr. All group members contributed an equal amount of work to all parts.

Table of Contents

Table of Figures

1. Introduction

Melbourne, Australia is celebrated as a center for culture, arts, and entertainment. Three of the city's attractions are the properties of Zoos Victoria. As set forth in its 2001-2002 Annual Report, the purpose of Zoos Victoria is "to lead, inspire and empower everyone to connect with wildlife, build knowledge, develop skills and take informed action to conserve the natural world" (Zoos Victoria 5). Zoos Victoria manages the Royal Melbourne Zoo, Victoria's Open Range Zoo at Werribee, and Healesville Sanctuary, which together are known as Victoria's Three Great Zoos. More details about Zoos Victoria may be found in Appendix A.

Worcester Polytechnic Institute sent our group to Melbourne, Victoria in order to complete our Interactive Qualifying Project by working with Zoos. Upon our arrival in Melbourne, Zoos Victoria was in the process of developing an exhibit that involves the use of multimedia technology in the form of interactive games and informational stations. The purpose of these booths is to enhance and enrich the visitor experience by providing in depth information about animals, plant life, and conservation efforts that could not have been provided merely through signage. The interactive multimedia stations are currently in use only in the *Trail of the Elephants* exhibit at Melbourne Zoo, but there is interest in the implementation of multimedia technology for use in other exhibits at all three of Zoos Victoria's properties. There is also interest in using multimedia technology for other purposes, such as interactive navigational maps that explain how to get around the properties and what types of exhibits one might find in a particular area of a property.

To assist with directions for the future development of interactive multimedia technology at each of the Zoos Victoria properties, it was appropriate to conduct market research to find out how patrons who had used the stations responded to them.

and learn how visitors and non-visitors assessed the prospect of integrating interactive multimedia technology into the zoo experience. In addition to the information concerning visitor and non-visitor opinions on interactive multimedia technology, Zoos Victoria was also interested in learning how patrons use the Zoos Victoria website and how useful they find it for their purposes. By conducting surveys on-site at the three Zoos Victoria properties and off-site at the Bourke Street Mall in central Melbourne, our team was able to collect visitor and non-visitor opinions on these matters. Two focus groups with volunteer guides from the Friends of the Zoos (FOTZ) organization were also conducted. Members of FOTZ are highly involved in Zoos Victoria, with many members volunteering at the properties on a regular basis. Because of FOTZ members' high level of involvement with the zoos, their opinions on the integration of multimedia into the zoo experience were both enlightening and pertinent to our research.

The knowledge we gained by studying how other organizations, such as museums, and zoos, obtained demographics and visitors' opinions became the background for what we accomplished through this project. We conducted interviews with marketing personnel of cultural institutions and by reviewed relevant literature while in the United States. Once in Melbourne, we utilized the information gained through our background research to help us conduct on and off-site surveys and focus groups.

Our background research as well as our surveys and focus groups enabled us to provide Zoos Victoria with a detailed report on visitor and non-visitor opinions regarding the integration of interactive multimedia technology into the zoo. It was possible to determine differences in opinions of patrons at each site as well as off-site. The results of this study also allowed us to make recommendations to Zoos Victoria

regarding future use of interactive multimedia stations. Furthermore, we created a benchmarking tool through which the impact of interactive multimedia technologies may be tracked longitudinally. The results of future studies can be compared to our data to determine how opinions and perceptions have changed with time. (See Appendix B5 for a copy of the future survey.)

The Worcester Polytechnic Institute Interactive Qualifying Project is meant to connect technology with social concerns. Such projects demonstrate how engineers and scientists affect people and their environment. We studied visitor and non-visitor opinions on how interactive multimedia technologies affect the zoo experience. Our goal was to determine whether the zoos' natural environments and the electronic information provided by interactive multimedia stations could be combined to create a better experience, and also to provide a benchmark against which the views of future visitors can be measured. Based on the gathered data we also made recommendation to Zoos Victoria concerning the idea of multimedia integration in the zoo environment.

2. Background and Literature Review

To facilitate a successful marketing study for Zoos Victoria that focuses on the effects of interactive multimedia technologies on the zoo experience, it was necessary to form a solid background in several areas. These areas included information about the zoo sites themselves, the design and employment of surveys and survey sampling methods, interactive multimedia stations in general, and marketing theories and techniques used by other zoos, and museums. This information was obtained from various sources including books, journals, and interviews with several marketing professors and marketing representatives from organizations in Worcester, Massachusetts.

2.1 Cultural Institution Marketing

There are very few marketing studies that specifically pertain to zoos, but a wealth of information can be found when museums are taken into consideration. According to the International Council of Museums zoos are in fact museums, so practical techniques and information learned through studies of museums include techniques relevant to our project.

Museums and zoos (hereby referred to as cultural institutions) are valued as many things to many different people. They are seen to have several purposes:

> [As] academic institutions whose primary roles are the preservation, articulation and exhibition of artifacts evolved from both the natural and cultural heritages, as symbols of local importance and pride, and as places of education and entertainment (Prince 149).

Each of these interpretations is valid and influences visitors' decisions to come to these places. Furthermore, each description can hold a different value for different visitors. While it is possible that all visitors view cultural institutions as educational, this virtue may only be valued positively by some, and may even discourage others

from visiting. Therefore it is important to understand how people come to develop a positive or negative attitude regarding cultural institutions (Prince 151).

Another important consideration when trying to determine opinions about cultural institutions is that surveys taken on-site cannot be passed off as a representative sample of the general populace. On-site surveys can help determine what visitors like or dislike about a cultural institution and to get an idea of visitors' characteristics, but they do not provide information about finding ways to attract a wider audience (Prince 152). In most cases, visitors are not in a position to answer questions regarding why some people do not visit the zoo. Even first-time visitors are not representative of those who may never think to visit the zoo (Kirchberg 241). Conducting surveys on-site and off-site at the same time can give a better understanding of a cultural institution's potential and target audiences, unlike the specific information received when only visitors are sampled.

2.1.1 *Visitors and Non-Visitors*

Kirchberg conducted one such study of both cultural institution visitors and non-visitors in Germany in 1995. The sample population was determined using random-quota sampling and involved 16,862 responses. This study tried to determine how a number of factors influence museum visitation. The factors included age, income, education, occupation, gender, and the region of Germany in which the respondent lived. Since these factors themselves can be closely related (i.e. education and occupation), Kirchberg used multiple classification analysis (MCA) to identify these inter-dependencies and to make certain they did not affect the results of the study.

The results of this study both corroborated some long held views on cultural institution visitors and shed new light on others. The idea that the more educated

people are the more likely they are to visit a museum was upheld. However, the idea that the typical museum visitor is a working professional was not backed up since students were found to be the predominant category of visitors at the museum studied in this report. While a number of factors were found to influence the visitation of different types of cultural institutions, no single difference could be found that separates visitors from non-visitors. Instead, Kirchberg says that there exists a "continuum" of factors that influence visitation which suggests that there is no single thing a cultural institution may do to attract many new audiences. Kirchberg concludes that catering only to current visitors or attempting to change marketing methods drastically in order to attract new audiences are not the best options. He does not state what he believes may be better options since his study was a review of past marketing methods (Kirchberg 256-257). We continued to review further studies in order to determine what the best methods would be.

Prince's 1988 Lincolnshire study is another example of a survey that aimed to gather information about both visitors and non-visitors. The goal of the study was to understand the views of visitors and non-visitors to help the County's museum service determine better marketing strategies for its properties. One of this study's major points was that there is an attitude held by visitors of cultural institutions that needs to be affected if attendance is to be increased. The main idea is that visitors do things consistently. If they have a good experience at a cultural institution it will positively reinforce their attitude towards the cultural institution and they will be more likely to visit again or recommend it as a place to go with their family and friends.

According to Prince, cultural institutions must be seen "as 'educational', 'entertaining' and 'interesting', 'doing a valuable job in protecting our heritage' and in not being a 'waste of tax-payers' money'. Similarly, a pro-museum stance would

be that they are not 'boring', 'only for children' or only for 'intellectuals', and that they are not perceived as being 'static' or 'out of touch with today'" (Prince 14).

Another important finding is that attitudes are more easily swayed by information from sources that an individual values. This means that a recommendation from a family member or friend is more influential to a potential visitor than media-based marketing strategies. Prince suggests that since attitudes towards a given place seem to greatly affect visitation, museums can attract visitors not only by strengthening their images but also by weakening the images people hold about competing attractions.

Part of the study involved surveying to determine what activities compete for visitors with museums. Zoos in particular did not fare well in comparison with other cultural institutions. Only 25% of individuals who described themselves as regular cultural institution visitors also said they visited a zoo in the previous year. Fifteen percent of those who were self-described non-visitors went to zoos in the previous year. This is in comparison to the 61% of visitors and 39% of non-visitors who have gone to a natural history museum in the previous year (Prince 156).

Another section of Prince's study looked at a number of possible changes cultural institutions could make to see if they would help attract new visitors. Discouragingly, none of the options were favored by more than half the sample population. The most popular improvement would be the addition of workshops where visitors could see things being made (favored by 46%). This idea could be translated to having more opportunities for visitors to see humans interacting with the animals in a zoo. Also of note is how all the options were favored more by regular visitors than by non-visitors. This suggests that it is very difficult to attract new visitors simply by improving internal operations at cultural institutions (Prince 165).

2.1.2 *Competition*

Competition is something that needs to be discussed when trying to market cultural institutions. A fair number of researchers have expressed ideas on what will not help them overcome competition. van Linge argues that zoos need more than exotic animals to attract visitors, but then goes on to say zoos do not need a great deal of money or new technology to offer something that sets them apart from other attractions in a good way (van Linge). However, he does not offer any concrete suggestions on what can create a positive distinguished image. In his 1993 paper, McLean argues that most cultural institutions tend to take an approach towards marketing that is simply the transferal of existing marketing techniques into the museum environment. This practice "lacks relevance" and "has been mocked for its impracticality" (McLean 12).

McLean's advice is contained in a model for museum marketing that has five parts: The collection, the building, the staff, organization mechanisms, and the public. Each of these items can be marketed in different ways, yet they come together to form the framework around which the marketing of cultural institutions should be constructed. Looking at marketing in this way helps avoid the problems of directly translating existing marketing theories to not-for-profit institutions.

2.2 Visitors Expectations and Perceptions

Before Zoos Victoria could meet the expectations of its visitors, it first needed to know what those expectations were. In terms of the visitor experience, one of the most important factors is to ensure that visitors can easily access sources of information. Zoos Victoria has released two new sources of information: a multimedia learning resources CD and two different types of interactive multimedia stations. Determining if these sources effectively communicate with visitors required a visitor

study regarding how people react to new technologies. However, old methods such as providing printed maps of the zoo territory will still be required.

In Ben Booth's 1999 study, "Understanding of the Information Needs of Visitors to Museums," the author aimed to discover what would ease the visitors' experience of locating information within cultural institutions. Booth's study consisted of in-depth interviews, questionnaires, and discussion groups. The main questions that were asked include how hard it was for visitors to locate a museum, how much information they needed at the very entrance, and the ways visitors prefer to receive this information. One of the concerns brought to Booth's attention by participants was the need for websites so that visitors could plan their trip in advance. The research on the existing museum's websites showed that there are large numbers of "virtual visitors," those who are planning to visit the museum or will be using it for research purposes.

Another result of Booth's study indicated that most questions (64%) asked by visitors were general inquiries into the museum's facilities, ticketing, general navigation, and basic questions about current displays and exhibits. These results suggest that general questions should be answered through some form of system with which visitors can directly interact.

To understand what visitors expect from their zoo experience, we needed to understand their reasons for coming to the zoo in the first place. In the study "Modern Zoo: How People Perceive Zoo Animals" (Reade, Louse and Natalie Waran, 1996) researchers surveyed visitors to determine the main factors that brought them to the Edinburgh Zoo in Edinburgh, Scotland. The three main motivations noted were all entertainment-based, as can be seen in the table below. Additionally, 4% stated education to be their main motivation, and no one mentioned conservation, which is

generally the most important goal for modern zoos. The figure below shows the results of the survey.

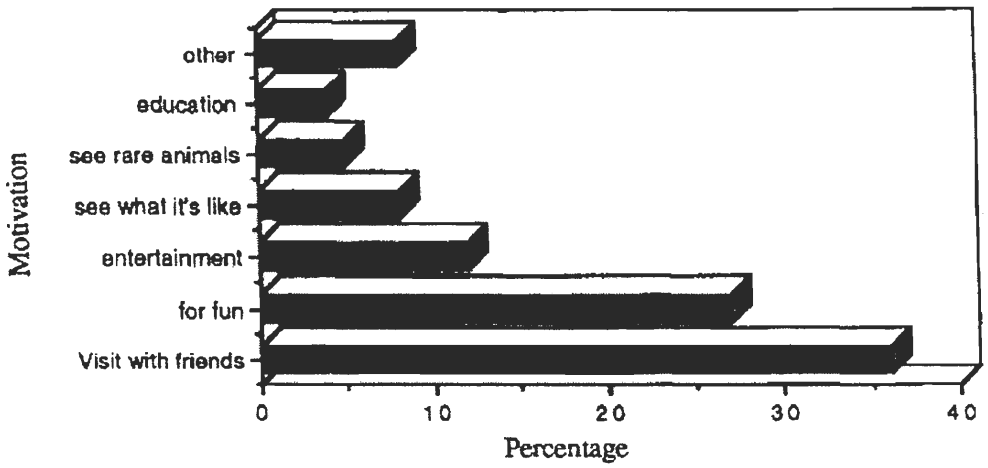


Figure 1. Main reasons for the zoo visit (survey done in Edinburgh Zoo) n=230 (Reade, 1996).

Research was also conducted outside of the zoo on the streets of downtown Edinburgh. The same sampling method that was used on-site was used off-site; sampling took place on the same days of the week and at the same times as the surveys conducted at the zoo. The same numbers of people were surveyed on-site and off-site. The results of this study showed that, in the opinions of off-site survey participants, animal conservation was the most important purpose of a zoo (74%), followed by research (49%), education (42%) and entertainment (7%). Of the reasons for visiting, entertainment was ranked least important almost twice as often as the other purposes combined (14%). The data from the off-site survey is shown below.

	Very important	Important	Average importance	Less than average importance	Not important
Entertainment	7.4	17.6	42.6	18.5	13.9
Research	49.1	26.9	13.9	5.5	4.6
Conservation	74.1	13.9	7.4	2.8	1.8
Education	41.7	37.0	13.0	3.7	4.6

Figure 2. Perceived importance of the four roles of today's zoo. The results are expressed as the percentage of 230 participants allocating a rating of 1 (very important) to 5 (not important) to each of the four roles.

The previous study yielded controversial results. If the two data sets (off-site surveys and on-site surveys) are shown alone, they will show biased information in the conclusion. Using only on-site survey results may drive the zoo marketing team to concentrate on the entertainment aspect of the zoo, while the off-site population expects the zoo to focus on providing a habitat to endangered species. The perceptions of people outside the zoo seem to imply that the zoo is expected to be a place for animal conservation, rare animal exhibits, and educational facilities. The actual visitors present at the zoo expect a day of fun and relaxation with their families and friends. This places the zoo in a difficult situation when addressing the issue of marketing. The zoo is expected to carry the image of a place for animal conservation while at the same time it is seen a place for the family to relax and spend quality time.

Another interesting divergence of opinion uncovered by this study was that of peoples' perceptions of animal treatment and conservation. Most of the off-site participants believed that the conditions in the zoo were very poor and that the animals in the zoo were unhappy and bored. In contrast, almost 80% of zoo visitors stated that animals seemed to be well kept and appeared to look very happy. This presented an interesting marketing issue that our IQP team discussed with the personnel at Zoos Victoria. It was concluded that this issue may be researched further in future marketing studies.

In her study "Knowing the Public: A Review of Museum Marketing Literature and Research." 1999, Nobuko Kawashima discovered that much attention has to be given to the negative responses of non-visitors to cultural institutions. She suggested running a qualitative study employing focus groups. There are particular questions Kawashima suggested asking visitors, including: Do people come to a museum spontaneously or in a more planned way? How far in advance do people plan a visit to

a museum? How often do people who have interests in temporary exhibitions miss an opportunity to see them because they forget? "Answers to these questions, when obtained, would help museums with marketing and programming, and for example, in deciding the optimal length of temporary exhibitions; they will also be useful in deciding the timing for the distribution of posters for temporary exhibitions" (9). This set of questions suggests that it is important to determine the time it takes for a visitor to physically come to the cultural institutions after he or she first heard about a new exhibit. This will provide the organization with a better understanding of its visitors' needs in terms of timing, and how to improve the exhibition schedules, making them available to a larger number of visitors.

In 1998, Stacey Bielick and David Karns ("Exploring Amazonia: Survey of Entering and Exiting Visitors", 1998) concluded that patrons who visited only the zoo portion of the Amazonia park found it to be an enjoyable day out with their family. However, these responses changed when questioning visitors who passed through the zoo as well as the science area of the park. Participants mentioned that the scientific portion of the visit made their experience richer. This was helpful information for the Zoos Victoria marketing team since one of the zoos' goals is to become 21st century zoos by including more in the visitor experience than animal exhibits alone.

Three out of four studies that were discussed in this section had a common factor: they all surveyed and interviewed approximately the same number of people - 230. The study conducted by Nobuko Kawashima did not provide data on the number of people that were interviewed. The methods used in the studies were interviews, surveying, and focus groups. All these studies show that it is very important to know what visitors expect to gain from the zoo and that most people have a specific idea of what the experience will be like before they enter the zoo. One of the zoo's goals

should be to determine these expectations in order to provide the most positive experience possible, so visitors will return again and again.

2.3 Past Marketing: Case Studies

In order to determine the best means of conducting a marketing survey for Zoos Victoria, it was necessary to research how other similar organizations had gone about conducting their market research in the past, and also to learn what market research methods they plan to implement in the future. This information was gathered from interviews with marketing personnel of cultural institutions in the United States and through reading several journal articles. We found that the market research yielded results that were of great use to the organizations that conducted them, which suggested that our marketing study for Zoos Victoria would provide beneficial information as well.

2.3.1 *Amazonia Exhibition and Science Gallery, Washington D.C.*

The Amazonia Exhibition and the Amazonia Science Gallery are part of the Smithsonian National Zoological Park, also known as the NZP. The Exhibition is located in the upper two levels of the Amazonia building and contains a recreation of the Amazon River, complete with aquarium tanks holding various forms of Amazonian wild life. The Science Gallery is also located in the Amazonia building, and is a "zoo-based science education facility" in which visitors have the opportunity to not only observe, but participate in many exhibits (Smithsonian, Karns 2, 6). In 1998, a study was conducted by the Smithsonian's Institutional Studies Office which was "to provide National Zoological Park (NZP) staff with reliable information about the experience of visitors in the Amazonia building, especially in the Amazonia Science Gallery." The main research questions addressed in the study were:

A. How do visitors use the Gallery?
B. Who uses it?
C. Is the Amazonia Science Gallery successful?
D. If so, how does it work for visitors? (Karns 3).

The answers to the above questions were found in a variety of ways. To determine how visitors used the Amazonia Gallery, an observational study was conducted. To learn who used the Amazonia Science Gallery and why, visitors were surveyed through entrance and exit interviews in the form of questionnaires (Karns 3). To learn what purposes the Amazonia Exhibition and Science Gallery served for visitors, "in-depth interviews" were held with several families who were "seriously engaged in the Amazonia Science Gallery," (Pekarik 85).

In the observational study, visitors who were chosen through a continuous sampling technique were "unobtrusively tracked" from when they entered the building until when they exited the building. Detailed notes were made regarding the path visitors chose through the building and the exhibits at which they stopped (Karns 83-84). Analysis of this data allowed the Institutional Studies Office to determine how visitors used the building, including which exhibits were visited and for how long each exhibit was viewed (10).

For the surveying portion of the study, visitors were also chosen using the continuous sampling technique. Three categories of visitors were surveyed: "those who entered the Amazonia building, those who left the building after viewing the Amazonia exhibition but who did not enter the Science Gallery, and those who left the building after visiting both the Amazonia exhibition and the Science Gallery." The questionnaire developed for the study asked for five types of information. These were "characteristics of the individual, information about the visit, attitudes towards science, experience in the exhibition, and the satisfaction experienced during the

visit." Information was also noted about the time at which the interview was given, where in the building the interview took place, and reasons why some questionnaires were not completed (Bielick 84-85). The information that was gathered from these surveys allowed the Institutional Studies Office to understand what people felt they got out of their visit to the Amazonia building and worked as a gauge of the effectiveness of the Amazonia Science Gallery in fulfilling the needs of visitors (Karns, 21).

Finally, interviews with several families were conducted in order to determine how the Science Gallery had been useful for them. Families were chosen after having shown great interest in at least one of the exhibits at the Science Gallery. Interest was determined by viewing the family unobtrusively while they participated in various exhibits. Only those who seemed highly engaged were chosen to be interviewed. The interviews ranged from 10 minutes to a half hour and the responses were recorded by the interviewer (Pekarik 85-86). These in-depth interviews were used to "demonstrate the richness and complexity of the interactions between visitors and the Science Gallery." (Karns 40).

2.3.2 *Galveston Museums, Galveston, Texas*

Galveston, Texas is a city with a rich history. Towards the late nineteenth century, it was known as "the largest city and port in Texas and the financial and cultural center of the Southwest." (Tian 34). The city thrived until 1900, at which time the island port was devastated by a hurricane. Although enough was destroyed in the storm to bring the city out of its heightened status, many buildings were salvaged, and in the past two decades, have been restored by the Galveston Historical Foundation, also known as the GHF. Some of these buildings are now part of the six museums owned and operated by the GHF (Tian 34).

Between 1993 and 1994, the GHF noticed significant drops in attendance at all six of their locations. In order to understand and combat these plummeting attendance rates, a study was conducted by Tian et al. in which visitors were asked to rate the perceived benefits and constraints of attending the museums. The goal of this study was to determine what types of people perceived visiting the museums as beneficial and what types felt that there were constraints which were keeping them from visiting. The results of this study aided the GHF in understanding what group of people made up their ideal target audience and how they should market to this group (34-35).

Surveys were handed out to visitors at five out of the six museums. A form of systematic sampling was used in which every *n*th visitor was approached and asked to participate in the survey. Those who agreed were provided with a questionnaire and a prepaid envelope so that they could complete the survey and send it in at their convenience. Participants were asked to rate several types of benefits and constraints on a scale from one to seven. Benefits included "socialization/bonding," "relaxation," "social recognition," "self-esteem," and "educational entertainment," and constraints included "cost," "time," "difficulty of access," "repetition," "product failings," and "lack of interest." The responses to these questions, combined with the demographic information provided, were used to determine the target market for each museum. The results showed that the average visitors were adults who came to the museum with the purpose of bringing their children (Tian 37-44).

2.3.3 *Worcester Art Museum, Worcester, Massachusetts*

The Worcester Art Museum, also known as the WAM, was founded in 1898 and remains one of central Massachusetts' leading cultural institutions. The museum hosts a wide variety of paintings, sculptures, mosaics, and other works of art from all reaches of the globe (Worcester Art Museum). In order to determine who their visitors

were and how they learned about the WAM, on-site surveying was conducted by the museum semiannually for several years (Murphy).

The surveying was performed by volunteers stationed in immediate proximity to exhibits, such as "Modernism and Abstraction". The volunteers were instructed to initiate contact with as many visitors as possible and request each visitor to fill out a 3-minute questionnaire. Each questionnaire consisted of multiple choice and rating questions and ended with several demographics questions and a space for comments or suggestions. After the questionnaire was filled out, coupons for individual memberships to the WAM or one free future admission were given to the participant as a token of appreciation for their time and effort. By conducting surveys in this manner, the WAM receives between 300 and 500 questionnaires per study, which are then sent to a marketing company for data compilation and analysis. The results of these studies were confidential, so they will not be discussed in this report (Murphy).

The WAM concentrates most of its advertising in local newspapers and magazines, particularly the Worcester Telegram & Gazette and Worcester Magazine. The museum also performs mass mailings two or three times per year, and has begun to send information to an online mailing list that includes e-mail addresses of those who completed surveys in the past (Murphy).

2.3.4 *EcoTarium, Worcester, Massachusetts*

The EcoTarium, formerly the New England Science Center, was founded in 1825 as the Worcester Lyceum of Natural History. As an institution of natural study, the EcoTarium aims to "promote appreciation, increase knowledge and foster stewardship of New England environments by stimulating learning about the world in which we live" (EcoTarium).

In the recent past, visitation to the organization has remained in the range of 130,000-135,000 people per year. As this audience has predominantly consisted of families with children under the age of 12 and lacks a base of young adult and teenage visitors, additional information regarding visitor demographics was desired. With the purpose of obtaining more information about their visitors, the EcoTarium performed on-site surveying and conducted several focus groups (Crawford).

Zip codes of visitors were collected when tickets were purchased. By doing so, general trends in visitation could be observed. For example, by inspecting a 40-minute drive time radius around the EcoTarium, it was recognized that the organization was far from saturating its immediate market. Additionally, volunteers administered exit surveys which yielded about 600 responses. The volunteers were stationed at predetermined locations and would request visitors to complete the 15-20 minute survey. Volunteers wrote down the answers given by participants. After having completed the study, the EcoTarium concluded that the surveys were too lengthy and attempted to address an excessive number of issues, but had still provided some useful information (Crawford).

In order to receive in-depth feedback through dialogue, the EcoTarium hired a consulting firm to run several focus groups. Each focus group consisted of about 12 non-members who had visited the EcoTarium in the past year, and whose names had been obtained from previous surveys. Several sessions were performed, each representing a different segment of the population—namely, parents with children under 6, parents with children over 6, adults without children, seniors, and educators. As an incentive to attend the 1.5-hour sessions, participants were paid and provided meals (Crawford).

The EcoTarium has primarily used community papers and local newspapers, such as the Worcester Telegram & Gazette, as well as radio stations including WSRS and WXLO, to promote itself to the general public. Recently, the organization has given greater priority to radio advertisements. By utilizing these marketing channels, the EcoTarium believes it can attract a wider audience and increase visitor turnout (Crawford).

2.4 Past Marketing Studies: Zoos Victoria

Zoos Victoria has conducted several marketing studies during the past few years, most of which attempted to find out visitors' expectations, perceptions, and satisfaction levels regarding the zoo experience. Some of the studies had very specific goals, such as to obtain patrons' opinions about specific upcoming exhibits, while others were more general. One such general study was conducted by Stanley & Milford. Their report was helpful to our project in numerous ways. First, they conducted studies at all three properties, as was done by our group. However, the Stanley & Milford study did not compare results from the three properties, while one of the goals of our study was to provide an analysis of differences between the results collected at each property. Surveys were conducted at both entrance and exit locations. The results were compared to the benchmark study performed by the same organization in 1999. In 2000, as many questions from the 1999 study as possible were incorporated. Exit surveys were shorter than entrance surveys because only questions about the impressions people had after their visits were included in the exit surveys. Different surveys were conducted at each of the Zoos Victoria properties, having been designed according to the specific features of each property. The anticipated sample size of this study was 200 people, although Stanley & Milford only managed to get 187 participants at the exit locations. Surveys were collected during

two weekends, and additionally on one Friday and one Thursday. At all three properties, the number of surveys completed during the weekends were approximately twice the number achieved during the weekdays (Stanley & Milford).

The most recent marketing study was conducted in 2002 by students of the Bourke Group, with the Department of Hospitality & Tourism, and was aimed at gathering visitors' perceptions of Melbourne Zoo. People were surveyed at Melbourne Zoo and at an off-site location in downtown Melbourne in order to examine the different perspectives of on-site and off-site participants. Most off-site participants who had not visited the zoo stated their reasons for not visiting were time constraints. Most visitors surveyed stated that they came to the zoo for "a day out with friends." The questions were asked during two time slots on Fridays for 2 hour periods, which led to 156 completed surveys.

2.5 Multimedia Stations

Interactive multimedia stations can be used to offer people information and entertainment through a variety of functions. These functions include videos, games, text, graphics, and sound. Interaction gives the user an opportunity to select the areas of the information available that he or she would like to access so that the station will enrich the user's experience by seeming to be tailored to the individual. Interactive stations can allow organizations such as zoos, art galleries, and other cultural institutions to share the details of specific exhibits without hiring extra staff members. They provide visitors with an opportunity to observe aspects of an exhibit that may not be available at all times. These can include footage of vibrant mating rituals that may only occur once or twice a year, descriptions of the natural habitats of the animals at the zoo, or the process of creating a sculpture.

Some interactive stations include touch-screen monitors, meaning that users can choose the next episode of a presentation by pressing directly on the screen. For this reason, a great deal of attention must be paid to graphical design so that navigation will be easy for users of all education levels. The text on interactive stations is usually written at a fourth-grade reading level, and a narrator gives audio direction. These characteristics make the stations suitable for a wide range of users and people of all ages can use them. Children, adults, and the elderly are encouraged to use the displays, ask questions, and retrieve information from the station. Interactive displays in public places allow visitors who prefer to learn on their own to do so without the need of asking a guide or employee.

An example of such a display is the interactive kiosk developed for the Galleria dell'Accademia which allows visitors to virtually explore Michelangelo's David in detail and from all angles. The idea to develop the kiosk arose when technicians saw the reactions of visitors who were allowed to play with a 3D model of the statues in the Medici Chapel while they were being scanned into computers for preservation (Levoy).

The project was successfully completed and opened to the public in October 2002. This is one of the examples of how technology can improve visitors' experiences at cultural institutions. The following is a quotation from a marketing professional in a speech entitled "The New Media Belongs to the Users":

> The Internet itself is not all that new. It's actually been around since the sixties. What is new, and more importantly, what is particularly powerful, about the Internet and its two-way cousins -- namely the CD-ROM and interactive kiosk -- is the up-close-and-personal, lean-in, two-way nature of this new communications medium. (Johnson).

CDs, interactive kiosks, and a website are three methods of information distribution Zoos Victoria is implementing now. Using them will enrich the visitors' experiences at the zoos and will bring Zoos Victoria to a higher technologically advanced level.

2.6 Survey Design and Implementation

According to Arlene Fink, "a survey is a system for collecting information to describe, compare, or explain knowledge, attitudes, and behavior" ("Handbook" 1). The three main purposes of a survey as stated by Fowler are to determine customer desires and inclinations for marketing purposes, to quantify public opinions on various matters for an assortment of reasons such as for use in newspapers or magazines, or to learn the political ideas and views of the public for use in political elections (10). It is unclear exactly when or how the idea of the survey first originated, but it is known that surveys have been conducted since 1790 when the Decennial Census was first implemented (Fowler 10, Davidson). Since the time of the first Decennial Census, the mediums through which surveys may be employed have become vast, and include such methods as telephone, conventional mail, electronic mail, the World Wide Web, and face-to-face interviewing. Surveys have become a highly valued tool in many areas, because when written, structured, and sampled properly, they can provide a highly effective means of procuring almost any type of information from a given population.

2.6.1 *Survey Types*

There are four main survey types as noted by Fink; these include self-administered questionnaires, interviews or face-to-face/guided surveys, structured record reviews, and structured observations. A self-administered questionnaire is written with the objective of the participant filling it out on his or her own, and may

be received in a number of ways, including through conventional mail, electronic mail, or the World Wide Web. This type of survey may also be handed directly to a potential participant, in which case he or she may be asked either to complete the survey on-site or to bring it home and mail it in on his or her own time ("Handbook" 42).

Focus groups, as mentioned by Fink, are very useful in determining the general opinions of a particular portion of a population. They are similar in nature to interviews, except that they are conducted with a group rather than with an individual. A group of approximately ten people is immersed in a guided conversation on a particular topic, often resulting in a "relatively in-depth [portrait] of the needs and expectations of a specific population," ("Sample" 19-21). In the case of Zoos Victoria, focus groups with members of the Friends of the Zoos organization were useful in obtaining in-depth visitor opinions and information of great interest (Kasouf).

2.6.2 *Question Types*

Much like the surveys they are part of, survey questions also may occur in several different forms. These include closed questions, partially closed questions, and open, or open-ended, questions. A closed question is one in which the survey participant is asked to choose one (or more) of several responses provided on the survey. It is assumed that the respondent's answer will fall into one of the options or categories provided. Partially closed questions are exactly the same as closed questions except that "other" is given as an answer option, often followed by a blank line where the participant is asked to specify what "other" means in his or her circumstance. This helps to prevent the participant from feeling that he or she is being forced into lying or stretching the truth by fitting his or her answer into one of the

answers provided. Open questions simply have a blank space after them in which the respondent can write or type anything they wish in response to the question (Dillman and Salant). We used only one open ended question in our surveys to keep the data structured and allow for relatively straightforward statistical analysis.

The ordering of questions can also impact survey results. In order to obtain data on the primary technological interests of Zoos Victoria, questions intended to obtain demographics information were placed at the end of all surveys. Furthermore, the total number of questions was minimized in order to diminish the risk of incomplete surveys (Kasouf).

2.6.3 *Response Formatting*

Equally as important as asking questions that are meaningful and to the point is providing response options that are exhaustive and applicable; this obviously does not apply when asking open ended questions, but is imperative in the design of closed and partially closed survey or interview questions. According to Dillman and Salant, there are two styles of responses that may be used, depending on the content of the question. These two response formats are ordered responses and unordered responses. An ordered response is one in which the response choices are set in an order, such as from high to low or one to five. This type of response usually occurs after questions that ask a respondent to rate or rank something or someone. Unordered responses occur after questions that do not ask the respondent to rate or rank something. An example of an unordered response is one in which the respondent must pick from a list of colors the color of their house (Dillman and Salant). Fink adds a third type of response format which she refers to as numerical. A numerical response is appropriate when the respondent is asked for a number, such as their age or height in inches ("Handbook" 16-17).

2.6.4 *Sampling*

Sampling is a technique used in surveying and research when the size of a population is too large to make it feasible to survey or study every member, due to monetary, time, or other constraints. The two main categories of sampling are probability and nonprobability sampling. Probability sampling assumes that "each person in the population has an equal chance of being selected," (Fink and Kosecoff 53). Examples of probability sampling include simple random sampling, stratified random sampling, systematic sampling, and cluster sampling. Systematic sampling, the method chosen for the on-site surveys in our study, is a method of sampling in which every *n*th person to enter a room is surveyed, or every *n*th minute the next person seen by the surveyor is surveyed. The value of "*n*" is determined by the total population size and the size of the desired sample. Convenience quota sampling, the method chosen for the off-site surveys in our study, is a method in which participants are chosen based on convenience under a certain ratio, which in this case was the male and female ratio of the state of Victoria.

2.6 Summary

The research and interviews conducted in the United States provided the background we required to understand how we should go about answering our research questions. These resources relayed information on how other institutions performed similar studies and what was gained from each of those experiences. This knowledge allowed us to make informed choices regarding how we planned to achieve our project goals in Australia.

3. Methodology

The goals of this project were (1) to determine whether the zoos' natural environments and the information provided by interactive multimedia stations combine to create a better experience, and (2) to gather and analyze information that would provide a benchmark against which future studies could be measured. Market research requires carefully selected data collection techniques to ensure that the information received is unbiased and without error. We decided to use surveys, focus groups, and informal interviews as our primary means of data gathering. Refer to Appendix D for the schedule that was followed while conducting this study.

We employed two types of surveys in our research. On-site surveys were used to provide first-hand visitor information both on demographics and personal opinions while off-site surveys presented the views of the general public in Melbourne. Focus groups were conducted with Friends of the Zoos volunteer guides to determine their opinions on the interactive multimedia stations currently in use at the Melbourne Zoo. Additionally, many informal interviews were conducted with our liaisons, Jen Aughterson and Amanda Embury, to ensure that the goals of Zoos Victoria were being fulfilled.

While in the United States, we conducted interviews with a number of individuals who provided valuable information regarding our project. Worcester Polytechnic Institute Professors Chickery Kasouf, Michael Ciaraldi, and Erwin Danneels were contacted for information in their areas of expertise, which are surveying, human-computer interaction, and marketing, respectively. Marketing representatives from several local cultural institutions were interviewed to learn how their organizations obtained visitor information in the past and what their advice would be for future marketing studies. The knowledge relayed to us by these

individuals provided us with a solid idea of what we had to do in order to successfully conduct market research.

3.1 Sample Size Selection

Before conducting on-site surveys at the three properties of Zoos Victoria, we first decided upon and calculated the appropriate sample size in order to ensure that our survey results were representative of the total visitor population at each site. This calculation gave us the optimal number of samples we needed to be confident that our results could be generalized to the visitor population. For Melbourne Zoo the desired sample size was 200, for Healesville Sanctuary the sample size was 75, and for Victoria's Open Range Zoo the sample size was 40. These sample sizes were not the exact number of people we sampled; they were the minimum numbers of usable samples we proposed to collect in order to have confidence in our results (Wade 1). A sample size of 200 for the Melbourne Zoo was decided upon because it was the sample size used in several of the past marketing studies conducted (Savard, Stanley & Milford). Approximately 900,000 visitors, 300,000 visitors, and 150,000 visitors pass through the gates of the Melbourne Zoo, Healesville Sanctuary, and Victoria's Open Range Zoo at Werribee each year, respectively. The sample size of 75 for Healesville Sanctuary and 40 for Victoria's Open Range Zoo were chosen proportionally to the Melbourne Zoo sample size of 200.

3.2 Pilot Survey

All surveys we conducted in Australia first had to be approved by the Senior Executive Team for Zoos Victoria. Since the Executive Team meets only once a week, it was imperative that we prepare our surveys during our first week in Melbourne. This allowed us to have the surveys approved early in our stay. After our

on-site survey was approved, we conducted a pilot study at Melbourne Zoo to ensure that the data collected would help answer our research questions, and to verify that there were no logistical problems with the survey itself (see Appendix B for Pilot Study).

3.3 On-site Surveys

Once revisions were made to the survey in response to the results of the pilot study, we began our main data collection stage. The three locations at which we conducted on-site surveys were Melbourne Zoo, Healesville Sanctuary, and Victoria's Open Range Zoo at Werribee. We had a team of two surveyors at each location. Surveys were conducted for six consecutive days at Melbourne Zoo, and for three consecutive days at Healesville Sanctuary and Victoria's Open Range Zoo at Werribee. This schedule allowed us to meet the desired sample size for each location and allowed us to complete our on-site surveying in two weeks.

Since our intention was to collect data that would accurately represent the total population of visitors, we used systematic sampling for all our on-site surveys (see section 2.6.4 for details on this method). This particular method was also employed in the survey completed by the 2002 Zoos Victoria IQP group. The survey results they compiled were found to provide an accurate representation of the population they sampled, so we chose to utilize the same sampling method (Savard). We selected an adult visitor every 4 minutes in the time blocks discussed below. Participants were surveyed at the zoo exits. To ensure that our sample contained visitors who arrive at different times, we used Randomized Complete Blocking Design, or RCBD. Samples were taken during three time periods: 11:00 a.m. to 12:00 p.m., 1:00 p.m. to 3:00 p.m., and 3:30 p.m. to 4:30 p.m. The surveys were conducted by handing the participant the survey and collecting it once completed. This was found to be the most

effective method of survey distribution with our given time restrictions in which we aimed to keep the survey time under 5 minutes. We found that verbal surveys took more time for participants to complete, and required more time than most participants were willing to invest; the same questions were answered more quickly and completely by participants who filled out the survey themselves.

3.4 Off-site Survey

Off-site surveying was conducted for two days at the Bourke Street Mall in downtown Melbourne in order to receive data from the segments of the population that may not have visited the zoo. We intended to gain an understanding of the general population's views of Zoos Victoria. The data collected from the off-site survey provided us with information regarding how people off-site felt about the integration of interactive multimedia technology at the zoos. For this survey we used the convenience quota sampling method (see section 2.6.4 for information on this sampling method). This survey was conducted during the second half of the main data collection stage. The target sample size for each day was the average number of participants surveyed per day during the previous week's surveys, which was approximately 40 surveys per day. The two sub-groups we sampled were males and females over the age of twelve.

3.5 Future Zoos Victoria Survey

After writing and conducting our on-site and off-site surveys, we were able to write a survey that Zoos Victoria can use to track the impact of interactive multimedia technologies longitudinally, using the results of this study as a benchmark.

3.6 Focus Groups

It was important to our research goals that we document the opinions held not only by zoo visitors, but also by Friends of the Zoos (FOTZ) members. In order to make effective recommendations we had to be familiar with how the people working in the zoo and those who visit the zoo on a regular basis perceive the zoo's information distribution methods. Focus groups with FOTZ volunteer guides were conducted to acquire opinions about the integration of interactive multimedia technology at the zoos. The guides were asked about their knowledge and experience with the interactive multimedia stations at Melbourne Zoo, and how they felt the stations impacted visitors' experiences at the Zoo. They were also asked to supply ideas about where they felt more stations like this would or would not be useful (see Figure 30 for the script followed during the Friends of the Zoos focus groups).

3.7 Analyzing the Data

After we collected the data from the aforementioned surveys, interviews, and focus groups, we analyzed them using a number of techniques. For closed and partially closed questions, we used Microsoft Excel to compile data into a format that allowed us to analyze the data and to make recommendations based upon the findings. Responses from focus groups and interviews were summarized, and points of interests that would help us answer our research questions were noted.

The use of these techniques provided us with the relevant data we required to make recommendations to the Discovery and Learning Department of Zoos Victoria, allowing its members to better understand their clientele's reactions to interactive multimedia technology. With this knowledge, we were able to assist Zoos Victoria in determining the best ways to promote its image as a technologically advanced organization. Also, we provided Zoos Victoria with surveys that may be used for

future research to determine visitor opinions on technology in the zoos, a report of our findings, which was written throughout our stay in Melbourne, and an oral presentation during which zoo personnel were encouraged to comment and ask any questions.

3.8 Summary

During our stay in Melbourne, we conducted surveys both on and off-site of the Zoos Victoria properties and conducted interviews and focus groups of zoo employees and volunteer guides from the Friends of the Zoos organization. The data obtained from on and off-site surveys provided Zoos Victoria with information regarding visitor and non-visitor opinions about the integration of multimedia technology into the zoo experience. The interviews and focus groups provided Zoos Victoria with the opinions and ideas of the people who are most involved with the zoo. The combined results of these studies allowed us to make recommendations that will help Zoos Victoria to determine their course of action in regards to further implementation of interactive multimedia technology in the zoo.

4. Results and Analysis

Through our data collection methods, we gathered the information that is presented and analyzed in this section. First, we discuss the results from our on-site and off-site surveys, next the trends and correlations found through analysis of the data, and finally, the information that was obtained through the focus groups conducted with Friends of the Zoos (FOTZ) volunteer guides.

4.1 Surveys

On-site surveys were conducted at each of the three Zoos Victoria properties. Surveys were conducted at Melbourne Zoo between March 23 and March 28, 2003, at Victoria's Open Range at Werribee between March 24 and March 26, 2003, and at Healesville Sanctuary between March 31 and April 2, 2003. All surveys were conducted in time blocks between 11:00am and 12:00pm, between 1:00pm and 3:00pm, and between 3:30pm and 4:30pm. Off-site surveys were conducted outside the Bourke Street Mall in downtown Melbourne on April 8 and April 9, in time blocks between 12:30pm and 2:00pm and between 2:30pm and 4:30pm. The questions asked on the off-site survey were similar to those asked on-site. See Figure 3 for an example of the Melbourne Zoo Survey. Copies of all other surveys are available in Appendix B. Additional survey data can be found in Appendix C and on the attached CD.

Figure 3. Melbourne Zoo survey

1. What is your gender?
   ❑ Male ❑ Female

2. Please check the appropriate boxes in the table below:

	Melbourne Zoo	Healesville Sanctuary	Victoria's Open Range Zoo at Werribee	The Zoos Victoria Website
Have you visited this location?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
If you answered yes above, when was your last visit? (not including today's visit)	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago
Please rate your overall experience at each location.	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A

3. What was the purpose of your trip to Melbourne Zoo today? (Check all that apply)
   ❑ Family outing
   ❑ To see the animals
   ❑ Attending a function
   ❑ To see a specific exhibit (please specify) _____
   ❑ Other (please specify) _____
   ❑ Bringing visiting friends
   ❑ To see *Trail of the Elephants*
   ❑ As part of a school group

4. How did you expect to receive information during your Melbourne Zoo visit? (Check all that apply)
   ❑ Signage
   ❑ Printed maps
   ❑ Interactive way-finding maps
   ❑ Guided tours
   ❑ Other (please specify) _____
   ❑ Interactive computer games
   ❑ Keeper presentations
   ❑ Computer stations
   ❑ Brochures

5. How satisfied were you with the information provided about each of the following:

	Fully Satisfied	Somewhat Satisfied	Not Satisfied	Unsure
Conservation	❑	❑	❑	❑
Animal exhibits	❑	❑	❑	❑
Habitats and environments	❑	❑	❑	❑
Directional maps	❑	❑	❑	❑
Function of zoos	❑	❑	❑	❑

6. On a scale of 1 to 5, state your level of interest in each of the following, 1 being of no interest and 5 being a great deal of interest:

Interactive CD with educational games	1	2	3	4	5
Multimedia CD with information about plants and animals, and their natural habitats	1	2	3	4	5
Frequently updated website that offers an online extension of the zoo experience	1	2	3	4	5
Interactive multimedia stations with games related to nearby exhibits	1	2	3	4	5
Interactive maps located at various locations throughout the zoo	1	2	3	4	5

7. If you have visited the Zoos Victoria website, for which of the following purposes did you use it? (Check all that apply) ***If you have not visited the Zoos Victoria website, please skip to question 11.***
   - ❑ To plan today's trip
   - ❑ Research for a school project
   - ❑ Personal enjoyment/education
   - ❑ To learn about the role of Zoos Victoria
   - ❑ To learn more about a specific animal
   - ❑ To purchase retail products or tickets online
   - ❑ For information about events at the zoo (please specify) _____
   - ❑ Other (please specify) _____

8. How well did the website serve your purposes?
   ❑ Completely ❑ Moderately ❑ Not at all

9. Do you anticipate using the Zoos Victoria website in the future?
   ❑ Yes ❑ No

10. How did you first learn of the Zoos Victoria website? (Check all that apply)
    - ❑ Zoos Victoria staff member
    - ❑ Family or friends
    - ❑ Advertisement
    - ❑ Search engine
    - ❑ Signage at the zoo
    - ❑ Other (please specify) _____

11. Have you used any of the interactive multimedia stations located in the zoo? ***If no, please skip to question 13.***
    ❑ Yes ❑ No

12. How did the interactive multimedia stations affect your experience?
    ❑ Positively ❑ Negatively ❑ No effect

13. Would you like to see more interactive multimedia stations here at Melbourne Zoo?
    ❑ Yes ❑ No ❑ No preference

14. How important do you think it is for interactive multimedia technologies to be part of the experience here at Melbourne Zoo?
    ❑ Very important ❑ Somewhat important ❑ Not important at all ❑ No preference

15. Have you visited zoos outside of Zoos Victoria? ***If no, please skip to question 18.***
    ❑ Yes ❑ No

16. Compared to other zoos you have visited, how technologically advanced do you think Melbourne Zoo is?
    ❑ Above average ❑ Average ❑ Below average ❑ N/A

17. Of all the zoos you have visited, which have impressed you the most?

    _____ _____ _____

18. To which of the following age groups do you belong?
❑ 12-24 ❑ 25-39 ❑ 40-54 ❑ 55 and older

19. What is your country of residence? _____

20. If the answer to previous question is Australia, in which city and state do you live and what is the post code?

City _____ State _____ Post Code _____

21. Are you a member of Friends of the Zoos (FOTZ)?
❑ Yes ❑ No

Thank you very much! Please feel free to add any comments you may have.

_____

_____

_____

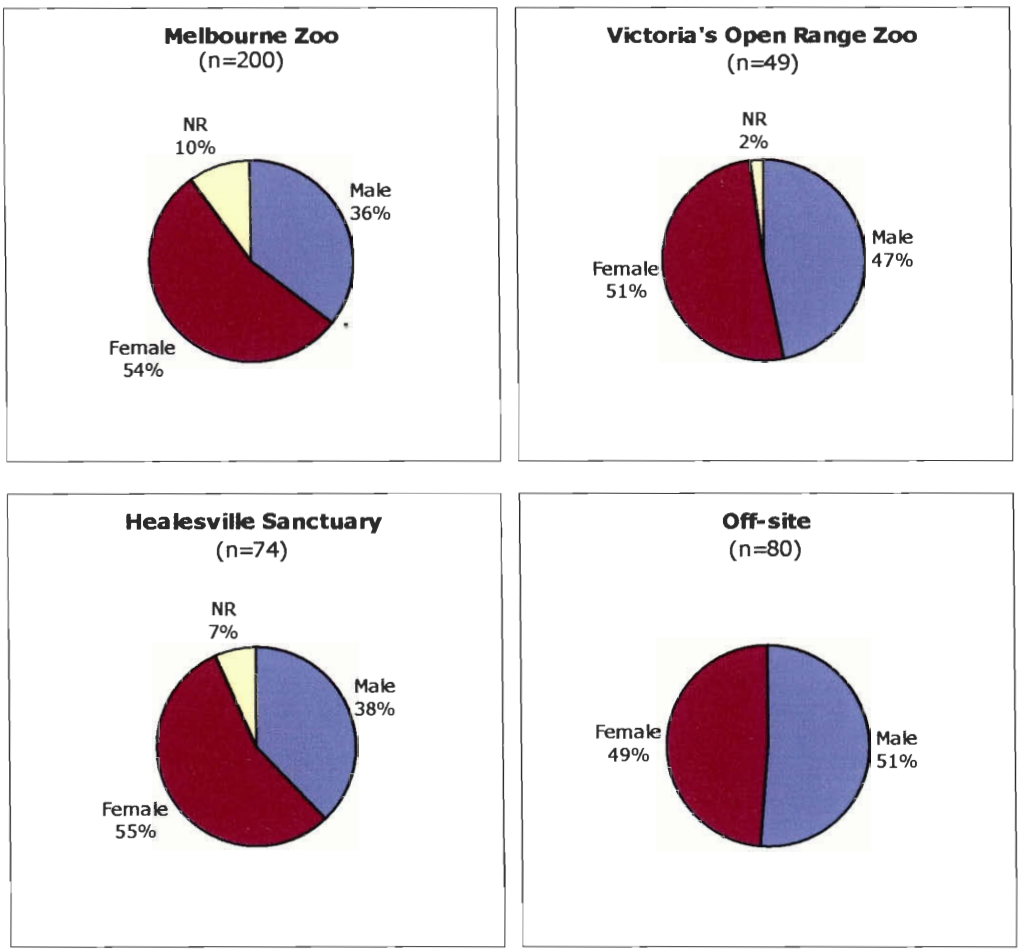
4.1.1 *Demographic Data*

Questions relating to demographics were used primarily to categorize the responses to questions from the remaining categories (see Appendix B for survey questions).

Gender

As shown in Figure 4, over 50% of the 200 people surveyed at Melbourne Zoo and the 74 people surveyed at Healesville Sanctuary were female, while less than 40% of those surveyed at each property were male. Of the 49 participants at Victoria's Open Range Zoo at Werribee (VORZ), a slightly larger percentage were female. The nearly equal number of males and females among the 80 respondents off-site coincides with the larger gender distribution of Melbourne.

Figure 4. Respondent gender



Age

The visitors surveyed at the three Zoos Victoria properties were largely between the ages of 25 and 39, ranging from 36% of participants at Healesville Sanctuary to 45% at VORZ. Off-site, the largest group of participants was between the ages of 12 and 24 (37%) (Figure 5). Over 20% of visitors surveyed at each of the Zoos Victoria properties were composed of females between the ages of 25 and 39 (Figure 6).

Figure 5. Respondent age

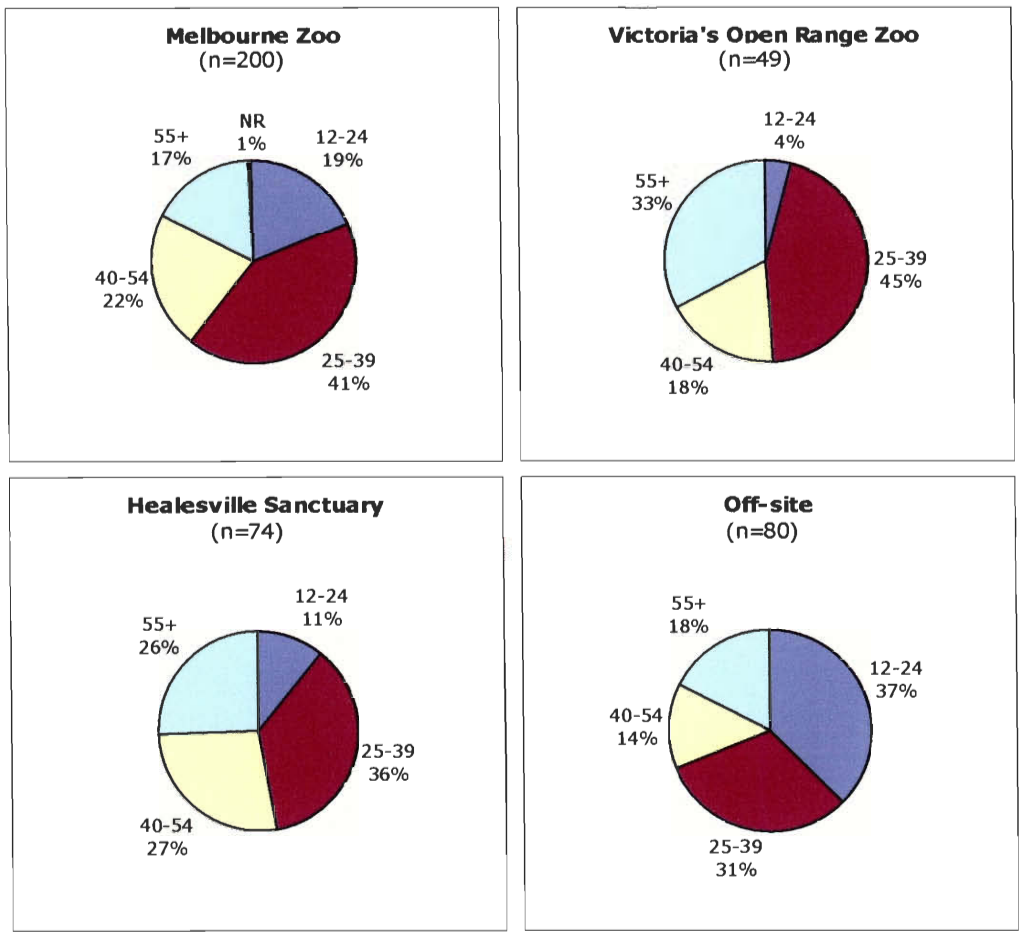
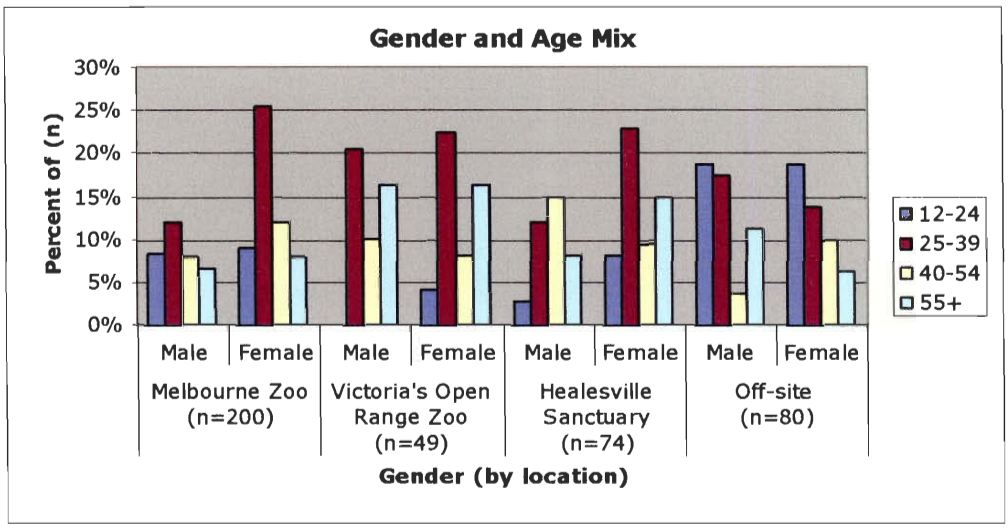


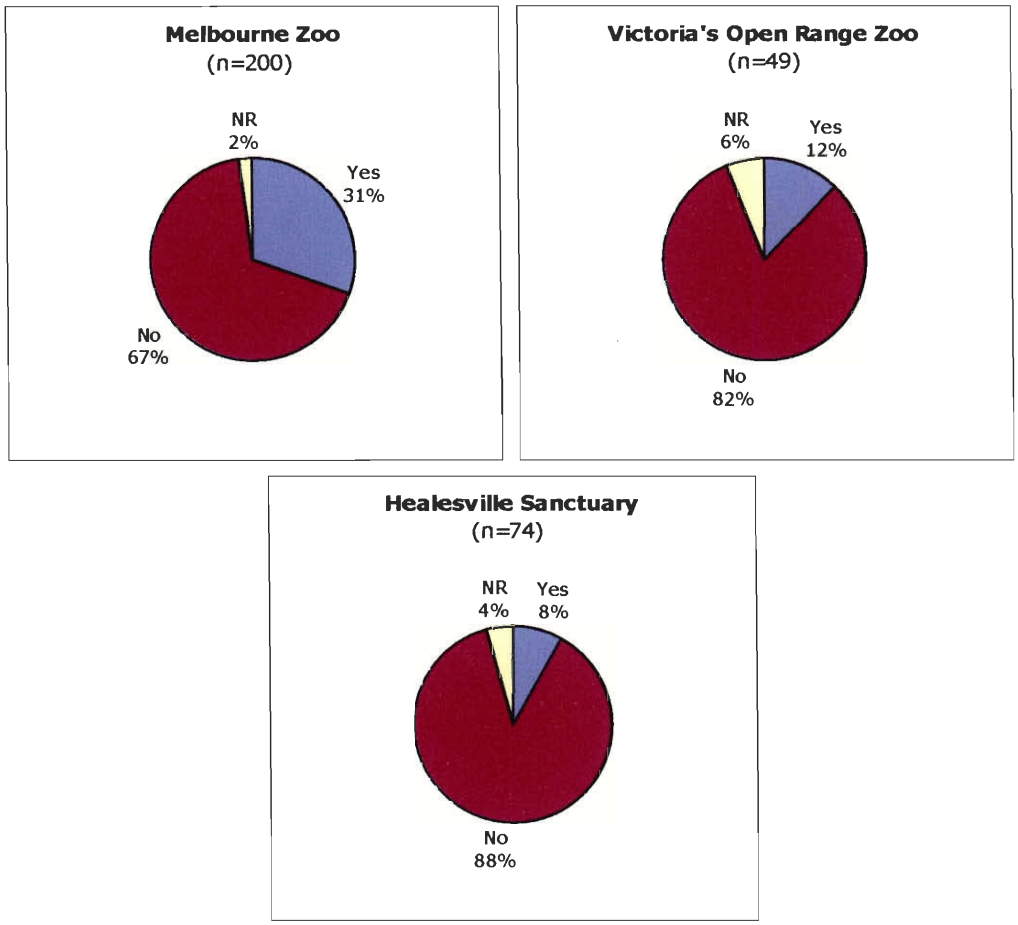
Figure 6. Respondent gender and age mix



FOTZ membership

The largest percentage of Friends of the Zoos members surveyed was at Melbourne Zoo, where they accounted for nearly one-third of the respondents surveyed there (Figure 7).

Figure 7. FOTZ membership



Country of residence

The majority of participants at all surveying locations resided in Australia. Other common countries of residence included New Zealand, the United Kingdom, Germany, and the United States of America (Figure 8).

Figure 8. Respondent country of residence

Melbourne Zoo (n=200)		**VORZ (n=49)**		**Healesville Sanctuary (n=74)**		**Off-site (n=80)**	
Country	*Percent*	*Country*	*Percent*	*Country*	*Percent*	*Country*	*Percent*
Australia	84%	Australia	80%	Australia	58%	Australia	64%
USA	5%	UK	10%	UK	26%	Germany	10%
UK	4%	NZ	6%	USA	7%	UK	8%
Other	8%	Other	4%	Other	9%	Other	19%
NR	1%	NR	0%	NR	0%	NR	0%

4.1.2 *Information Distribution Data*

Finding out how visitors expected to receive information and determining visitors' level of satisfaction with the information that was provided at the zoo allowed us to make recommendations on how Zoos Victoria could improve their information distribution methods.

Expectation of information during a zoo visit

As can be seen in Figure 9, most participants expected to receive information during their visit to each Zoos Victoria property by conventional means, including printed maps, signage, and brochures. Less than 15% of on-site participants expected to receive information by means of interactive multimedia technology including interactive way-finding maps, computer stations, and interactive computer games. However, almost 25% of off-site participants indicated that they would expect to find interactive way-finding maps during a visit to a zoo.

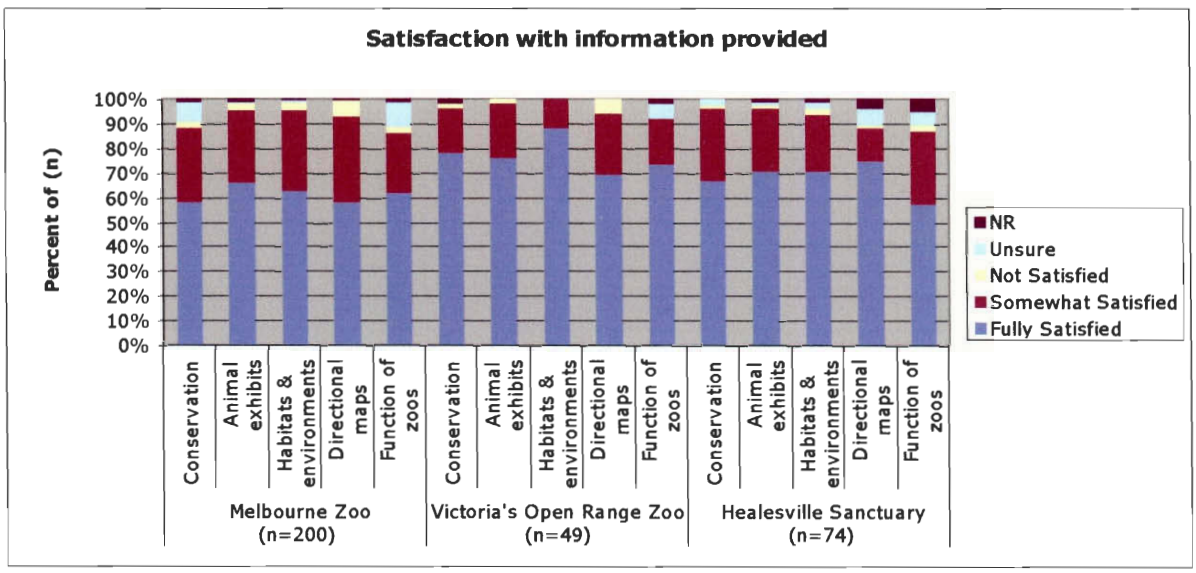
Figure 9. Expected ways to receive information during the zoo visit

Type of information	MZ (n=200)	VORZ (n=49)	HS (n=74)	Off-site (n=80)
Signage	80%	67%	68%	64%
Interactive computer games	2%	4%	1%	6%
Printed maps	77%	69%	74%	84%
Keeper presentations	26%	35%	43%	51%
Interactive way-finding maps	9%	14%	12%	24%
Computer stations	3%	2%	7%	10%
Guided tours	7%	71%	19%	53%
Brochures	24%	43%	41%	56%
Other	3%	0%	4%	3%

Satisfaction with information provided

More than 50% of all on-site participants indicated that they were "fully satisfied" with the information provided about conservation, animal exhibits, habitats and environments, directional maps, and function of the zoos. However, over 40% of participants at Melbourne Zoo and nearly 30% at Healesville Sanctuary and VORZ were either "not satisfied" or only "somewhat satisfied" with directional maps, which received the most negative responses among all categories of provided information (Figure 10).

Figure 10. Satisfaction with information provided



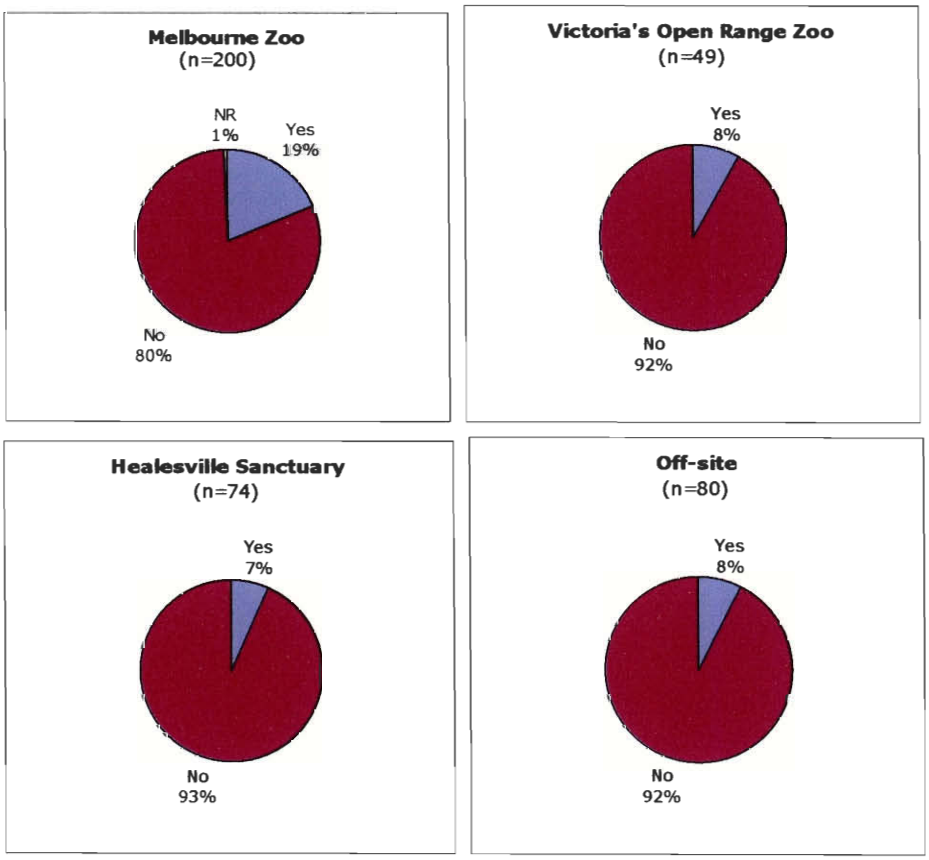
4.1.3 *Zoos Victoria Website Data*

By asking questions regarding access to and future use of the Zoos Victoria website, we sought to evaluate the usefulness and appeal of extending the zoo experience online, and also to learn if visitors had used the website or intended to use it in the future.

Web-site visitation

Nearly 20% of Melbourne Zoo participants had visited the Zoos Victoria website. However, at all the sites other than Melbourne Zoo, less than 10% of visitors had visited. This may indicate that advertising for the website must be increased at Healesville Sanctuary, VORZ, and to the general public in order to increase visitation (Figure 11).

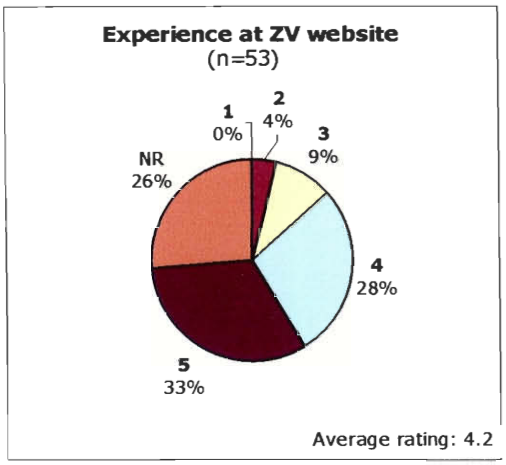
Figure 11. Website visitation by zoo visitors



Rating of last visit to the Zoos Victoria website

The average rating of the website ranged from 3.2 to 4.5 on a scale from 1 to 5, with 1 being "bad" and 5 being "good." The average rating across all four sites surveyed was 4.2 (Figure 12).

Figure 12. Rating of last visit



Purpose for visiting the Zoos Victoria website

Most participants indicated that they had visited the website to either plan a trip to one of the zoos or to receive information about one of the zoos (Figure 13).

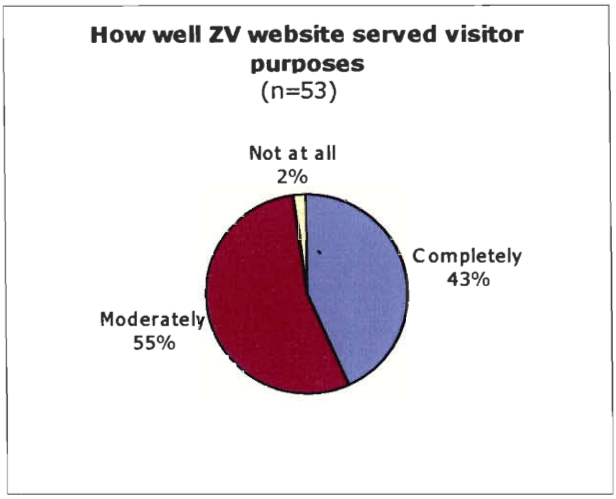
Figure 13. Purpose for visiting Zoos Victoria website

Purpose	**Website visitors (n=53)**
To plan a (today's) trip	40%
For information about events at the zoo	30%
Personal enjoyment/education	30%
To learn more about a specific animal	11%
Research for a school project	11%
To learn about the role of Zoos Victoria	9%
Other	9%
To purchase retail products or tickets	4%
NR	2%

Effectiveness of the Zoos Victoria website

The majority of survey respondents at VORZ, Healesville Sanctuary, and off-site indicated that the website had served their purposes "moderately," and the majority of participants at Melbourne Zoo found the website had served their purposes "completely" (Figure 14).

Figure 14. Effectiveness of Zoos Victoria website for respondents at all locations



First learned of the Zoos Victoria website

The majority of all on-site participants first learned of the website by means of a search engine (Figure 15).

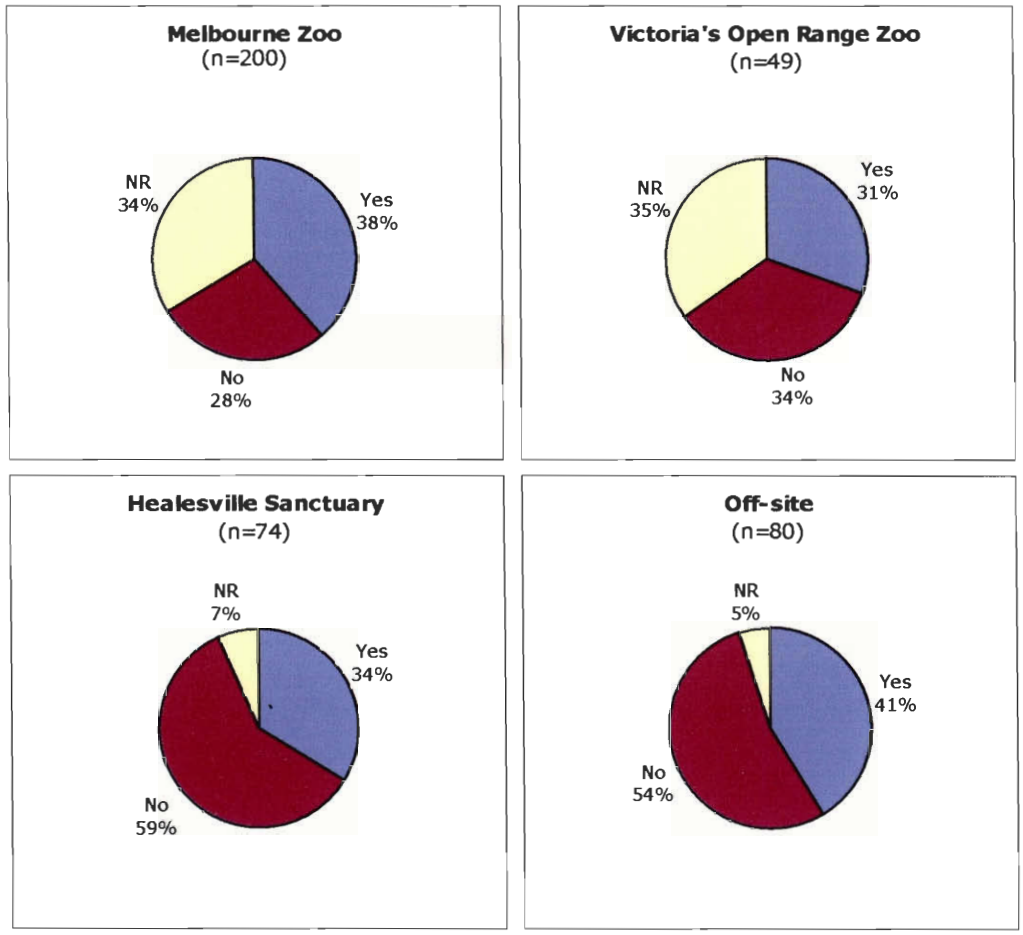
Figure 15. Ways in which respondents learned of the website

Source	**Website visitors (on-site) (n=47)**
Search engine	64%
Advertisement	13%
Other	13%
Family or friends	9%
Signage at zoo	9%
Zoos Victoria staff member	2%

Future use of Zoos Victoria website

Between 30% and 40% of participants at all locations indicated that they planned on using the Zoos Victoria website in the future (Figure 16).

Figure 16. Anticipation of website usage



4.1.4 *Interest Levels in Interactive Multimedia Technologies*

Knowledge of participants' interest in different interactive multimedia technologies was needed to determine the best formats for the future implementation of interactive learning stations.

Interest in multimedia technology

Participants were provided with a list of five types of interactive multimedia technologies and were asked to rate their interest in each on a scale from 1 to 5, with 1 being of no interest and 5 being of a great deal of interest. Interactive maps were on average rated higher at all sites, their average rating ranging from 3.5 to 3.9 with over 60% of participants rating their interest in interactive maps as either a 4 or 5 (Figure 18). The technology with the second highest rating of interest was "a frequently updated website that offers an online extension of the zoo experience"; the average rating of interest for the website ranged from 2.6 to 3.0 (Figure 17) with around 40% of participants rating their interest as either a four or a five (Figure 18). The two technologies that were rated lowest overall were "a multimedia CD with educational games" and "interactive multimedia stations with games related to nearby exhibits."

Figure 17. Interest in multimedia technologies as a part of zoo experience

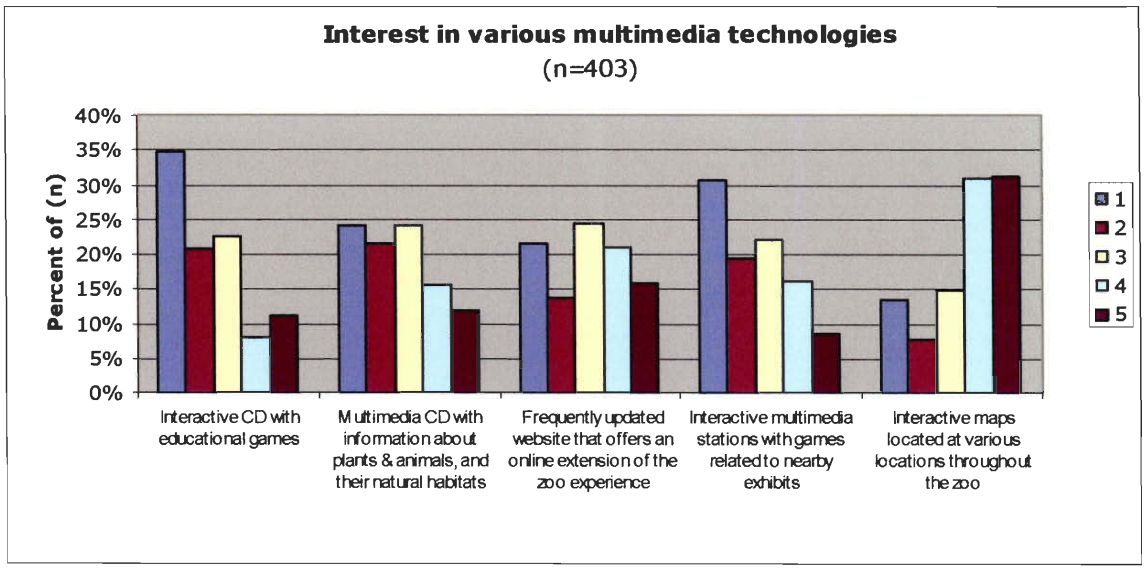
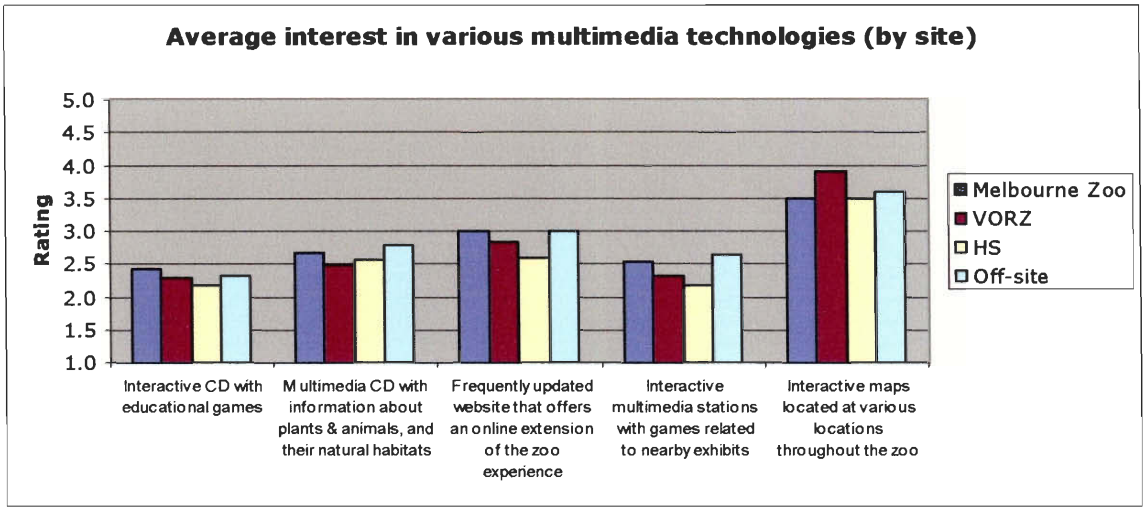


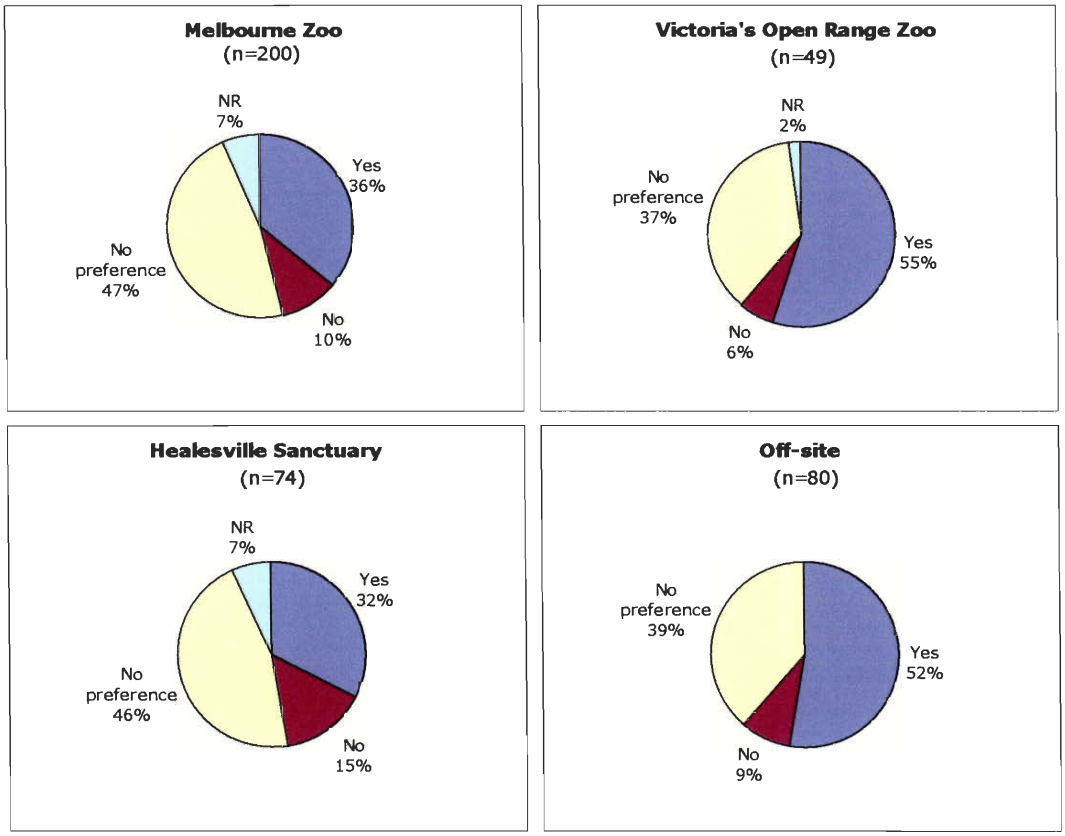
Figure 18. Interest in multimedia technologies as part of zoo experience (by site)



Interest in further implementation of similar interactive multimedia stations

Participants were asked if they would like to see more interactive multimedia stations in the Zoos Victoria properties. About 35% of participants at Melbourne Zoo and Healesville Sanctuary stated that they would like to see more interactive multimedia stations at these locations. 55% of those surveyed at VORZ stated that they would like to see more stations. Slightly over half of the off-site participants indicated that they would like to see more interactive multimedia stations located in the zoos. At Melbourne Zoo and Healesville Sanctuary, there were fewer "yes" and "no" responses combined than there were "no preference" responses. Only a small percentage of participants across all surveying locations stated that they did not want more stations to be located at the zoos. The site with the greatest resistance to the stations was Healesville Sanctuary, where 15% of those surveyed stated that they did not want interactive multimedia stations at the sanctuary (Figure 19).

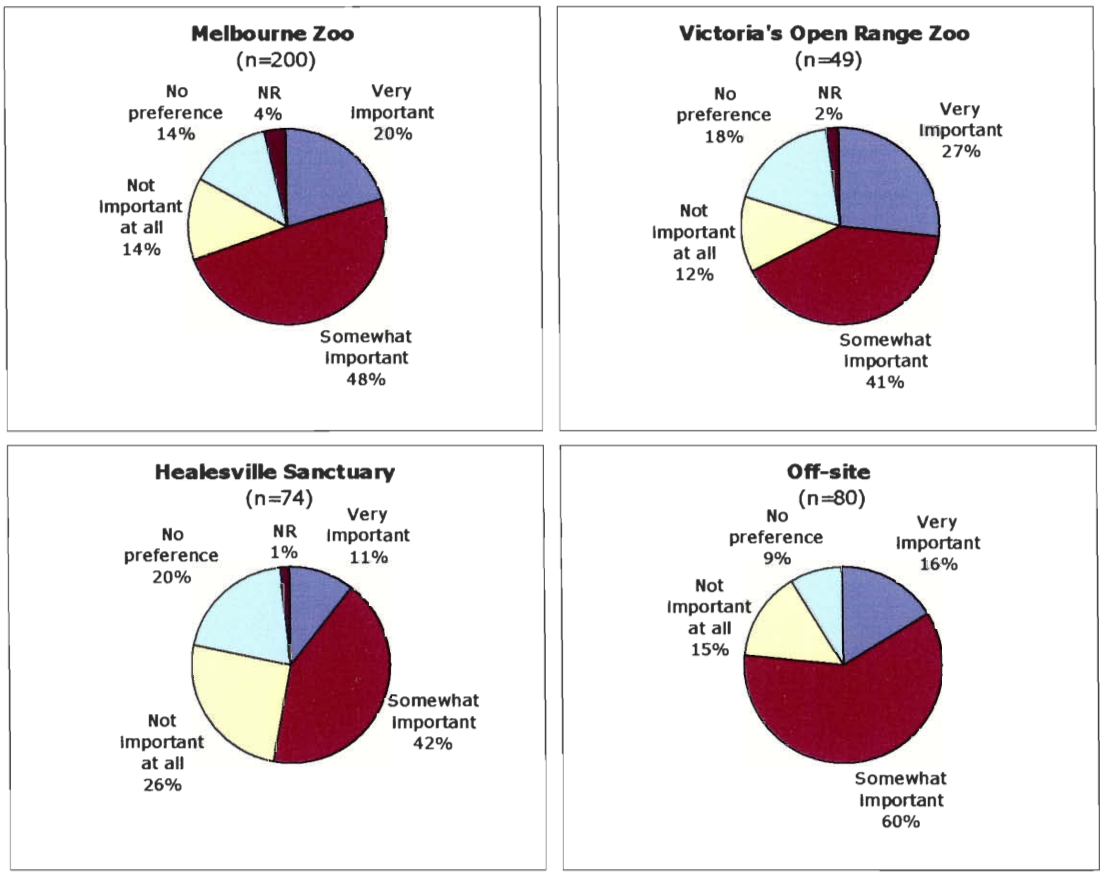
Figure 19. Interest in further implementation of multimedia technologies



Importance of interactive multimedia technology in the zoo experience

When asked how important it was that interactive multimedia technology be integrated into the zoo experience, the majority of participants at all locations indicated that they felt it was "somewhat important" (Figure 20). 27% of visitors to VORZ responded that such technology was "very important." This figure was more than any other site. Healesville Sanctuary had the highest percentage of "not important at all" responses (26%).

Figure 20. Importance of interactive multimedia technology in zoo experience



4.1.5 *Experience with Interactive Multimedia Technologies at Melbourne Zoo*

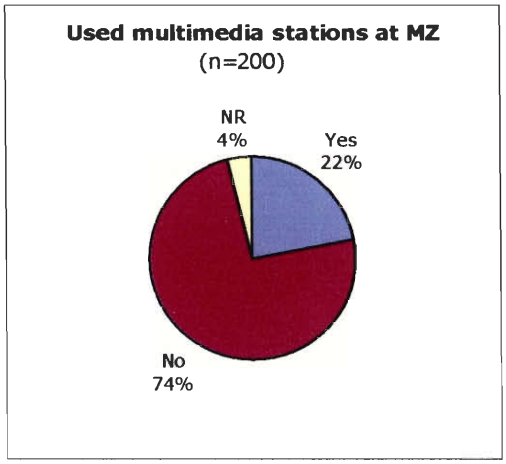
In addition to asking participants their opinions on interactive multimedia technologies, we also asked whether they had used the interactive multimedia stations located in the *Trail of the Elephants* exhibit in Melbourne Zoo.

Usage of multimedia stations

Fewer than 22% of off-site and on-site participants who had visited Melbourne Zoo indicated that they had used the interactive multimedia stations there (Figure 21). Such a low percentage could be due to the fact that at the time when the survey took place, the *Trail of the Elephants* exhibit had been open for only two weeks.

Melbourne Zoo visitors may have been somewhat discouraged from visiting the stations due to crowding around them, which was mentioned in focus group discussion (Section 4.2.1).

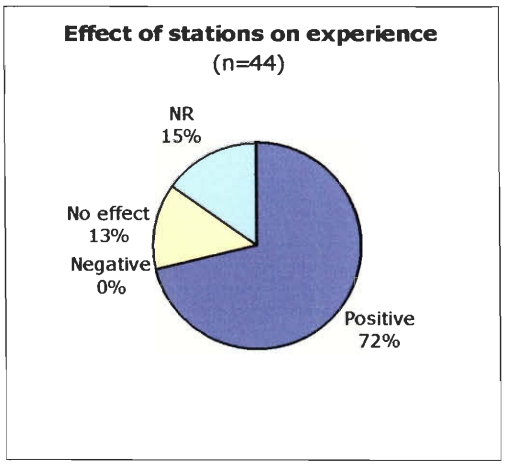
Figure 21. Usage of multimedia stations at Melbourne Zoo



Effect of interactive multimedia stations on the zoo experience

More than 70% of survey respondents who had used the interactive multimedia stations at Melbourne Zoo stated that they had a positive effect on their visit (Figure 22). It is also noteworthy that none of the participants who had used the stations stated that they had "negatively" affected their experience at Melbourne Zoo.

Figure 22. Effect of interactive multimedia stations on zoo experience



4.1.6 *Visitors Opinions of the Technological Standing of Zoos Victoria*

Because Zoos Victoria strives to be a premier 21st-century zoo, it was important for us to determine visitor opinions regarding the technological standing of the Zoos Victoria properties.

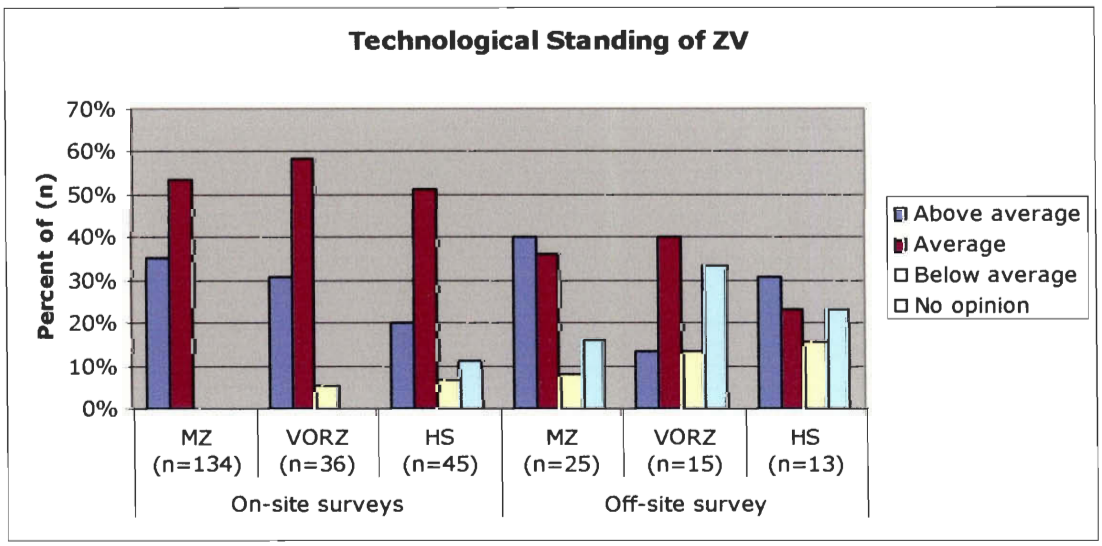
Visitation to zoos outside of Zoos Victoria

More than 50% of participants at all locations indicated that they had visited zoos outside of the properties of Zoos Victoria.

Technological standing of Zoos Victoria

Nearly all on-site respondents believe that the three Zoos Victoria properties were either "average" or "above average" in technological standing compared to other zoos they had visited. Respondents both on-site and of-site found Healesville Sanctuary to be below average in technological standing, more often than any other Zoos Victoria location (Figure 23).

Figure 23. Technological standing of Zoos Victoria



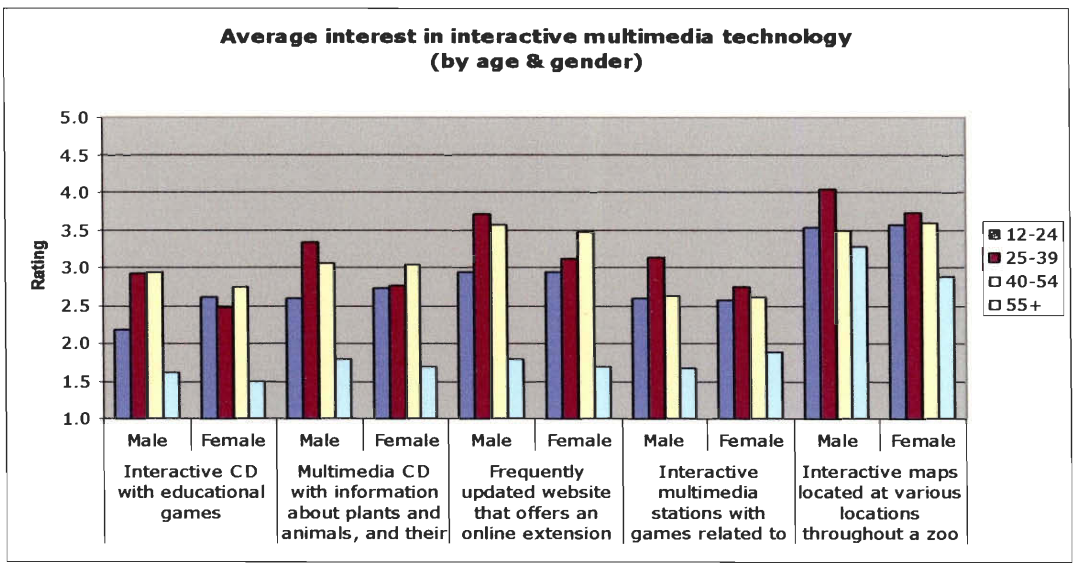
4.1.7 *Cross-Category Analysis of Survey Results*

By analyzing the above data, it was possible to discover trends and correlations in the results.

Interest in interactive multimedia technology: age and gender correlations

Male and female survey respondents of all groups were more interested in interactive maps than in any of the other types of interactive multimedia technologies presented on the survey. Surprisingly, male and female adults between the ages of 25 and 54 rated most of the forms of interactive multimedia technology higher than males and females between the ages of 12 and 24, a result that contrasted with the notion that younger individuals are more interested in technology. In agreement with this belief, male and female participants over the age of 55 rated their interest in the different forms of technology lower than respondents of every other age group. While there was little difference between male and female responses of the 12-24 age group, males in all other age groups were consistently more interested in the different forms of technology than females of the same age groups (Figure 24).

Figure 24. Interest in interactive multimedia technology: age and gender correlations



Information distribution expectation: age and gender correlations

No apparent correlations were found between a participant's age and gender and how he or she expected to receive information through technology at the zoo. It was noted however that participants of almost all ages and both genders expected to receive information by means of interactive maps more than any other form of technology, such as interactive computer games and computer stations.

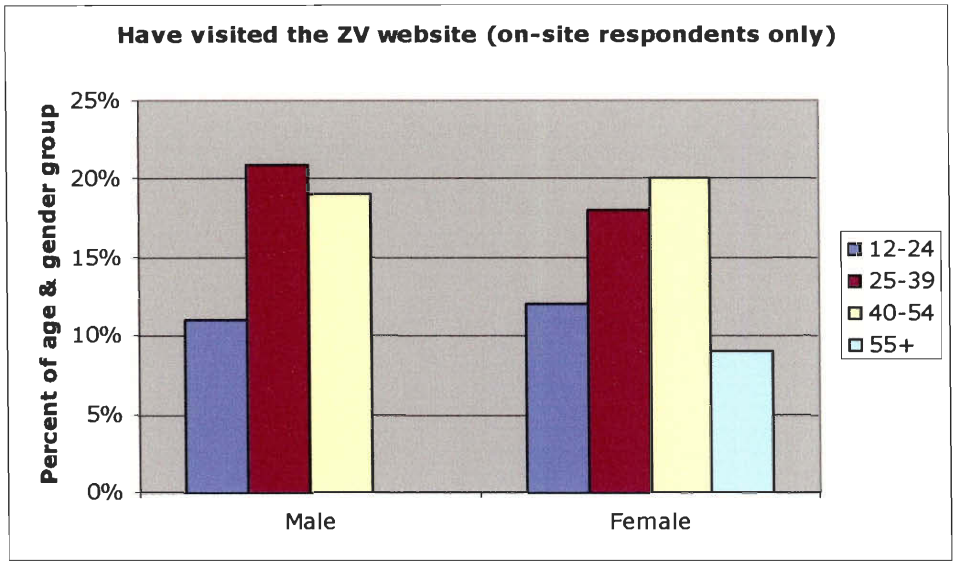
Experience with interactive multimedia stations: age and gender correlations

Melbourne Zoo female participants of all ages except for those between 40 and 54 years had used the interactive multimedia stations more than males in the same age groups. Around 25% of females between the ages of 12 and 24 and between the ages of 25 and 39 had used the stations. No male participants over the age of 55 had used the interactive multimedia stations at Melbourne Zoo.

Experience with the website: age and gender correlations

The largest percentage of male and female participants at all surveying sites who had used the Zoos Victoria website were between the ages of 25 and 39 and between the ages of 40 and 54. No male participants over the age of 55 had used the website (Figure 25).

Figure 25. Experience with the website: age and gender correlation



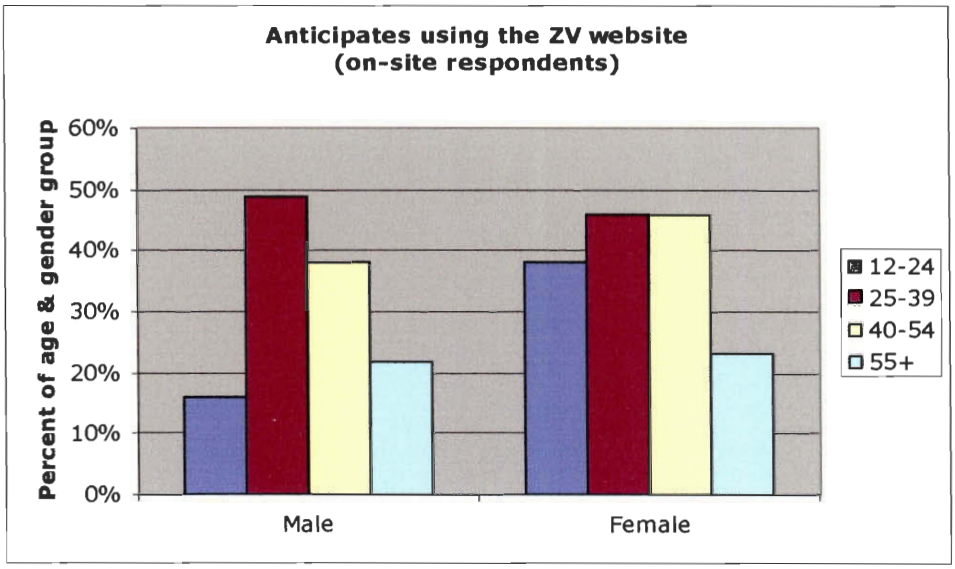
Experience with the website: FOTZ and non-FOTZ members

About 25% of FOTZ members surveyed indicated that they had visited the Zoos Victoria website in the past compared to only 11% of non-FOTZ members.

Future use of the website: age and gender correlation (on-site)

Around 45% of males and females between the ages of 25 and 39, and 40-54 indicated that they expected to visit the Zoos Victoria website in the future. Less than 25% of females and males 55 and over and males between the ages of 12 and 24 expected to use the website (Figure 26).

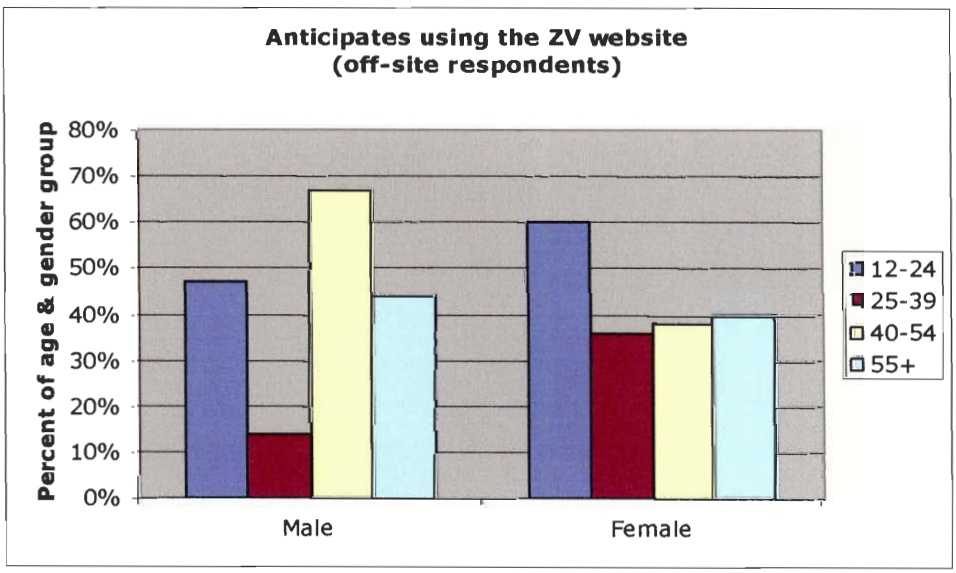
Figure 26. Future use of the website: age and gender correlation (on-site)



Future use of the website: age and gender correlations (off-site)

Around 40% of off-site females over 25 years of age expected to use the Zoos Victoria website in the future. Over 60% of males aged 40-54 expected to use the website in the future (Figure 27).

Figure 27. Future use of the website: age and gender correlation (off-site)



Future use of the website: FOTZ and non-FOTZ members

More than half the FOTZ members surveyed indicated that they expected to use the Zoos Victoria website in the future, while less than 35% of non-FOTZ members surveyed expected to use the website

Experience with the website and expectations of interactive multimedia technology

There was no direct correlation between people who had experience with the website and their expectations for receiving information through the use of interactive multimedia technology.

Experience with the website and interest in interactive multimedia technology

Compared to Melbourne Zoo visitors who had not used the website, visitors who had used it expressed a greater amount of interest in all the types of interactive multimedia technology mentioned on the survey, particularly in a frequently updated website (average rating of 3.9 compared to the rating of 2.8 given to this choice by participants who have not used the website).

Visitors who had not visited the website were also more interested in interactive maps (average rating of 3.6) than in any of the other forms of technology provided as options on the survey. This figure could indicate either that use of the website increases people's interest in other forms of interactive multimedia technology, or that those who have used the website are more likely to be interested in interactive multimedia technology than people who have not used the website.

Experience with the website and desire to see additional interactive multimedia stations at Melbourne Zoo

Nearly half of the survey participants at Melbourne Zoo who had used the Zoos Victoria website indicated that they would like to see more interactive multimedia stations there, while less than one-third of participants who had not visited the website indicated they would like to see more of these stations. This result reinforces the premise that people who have used the website are more interested in interactive multimedia technology.

Experience with the website and experience with the interactive multimedia stations at Melbourne Zoo

Nearly 35% of Melbourne Zoo participants who had used the website indicated they had used the interactive multimedia stations located in the *Trail of the Elephants* exhibit, while less than 20% of participants who had not visited the website indicated they had used the stations. This seems to indicate that people who have visited the website are more likely to use interactive multimedia stations, perhaps due to an overall interest in technology.

Experience with the website and the effect of interactive multimedia stations on the zoo experience

While no respondents stated that the interactive multimedia stations negatively affected their experience there was a moderate difference between the responses of visitors who had been to the website and those who have not. 92% of those who had visited the website stated that the stations positively affected their experience. A slightly lower percentage (81%) of the people who had not visited the website found

the stations to have a positive effect on the zoo experience. The remaining participants all stated that the stations had no effect on their experience at the zoo.

Experience with the website and technological standing of Melbourne Zoo

There appeared to be no relation between participants' experiences with the website and whether they felt the zoo was "above average," "average," or "below average" in its technological standing.

Experience with interactive multimedia stations and interest in interactive multimedia technology

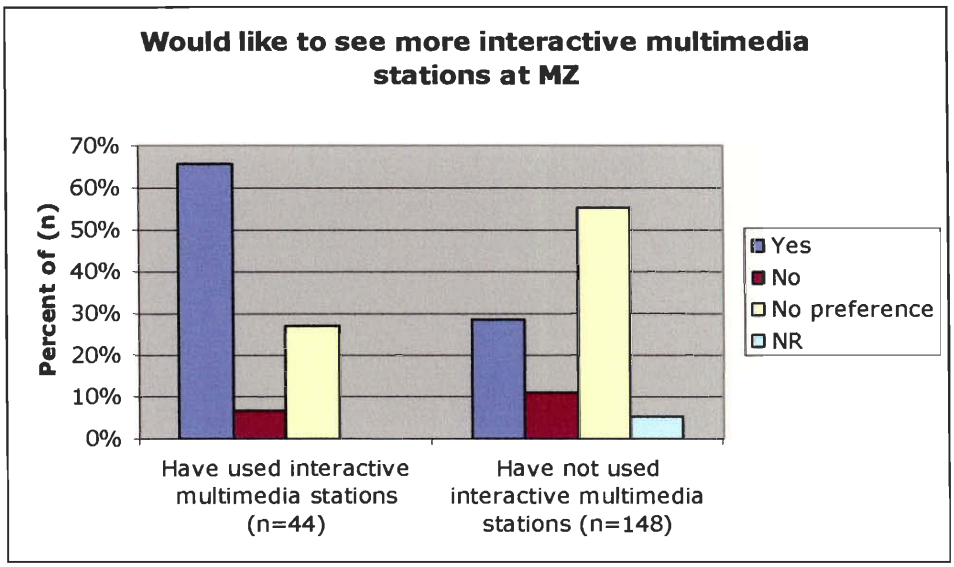
Participants who indicated they had used the interactive multimedia stations at Melbourne Zoo were, on average, more interested in other forms of interactive multimedia technology than participants who had not used the stations. This could indicate either that the use of the stations increased participants' interest in interactive multimedia technology, or that participants had interest in these types of technologies beforehand and it was such an interest that compelled them to use the interactive multimedia stations.

Experience with interactive multimedia stations and the desire to see more interactive multimedia stations

Over 65% of participants who used the interactive multimedia stations at Melbourne Zoo stated that they would like to see more similar stations at the zoo, whereas only a quarter of participants who had not used them stated that they would like to see more (Figure 28). This seems to indicate either that the use of interactive multimedia stations increases a person's desire to see more such stations, or that a

person who approaches the stations is interested in these types of stations in the first place, and would thus like to see more of them.

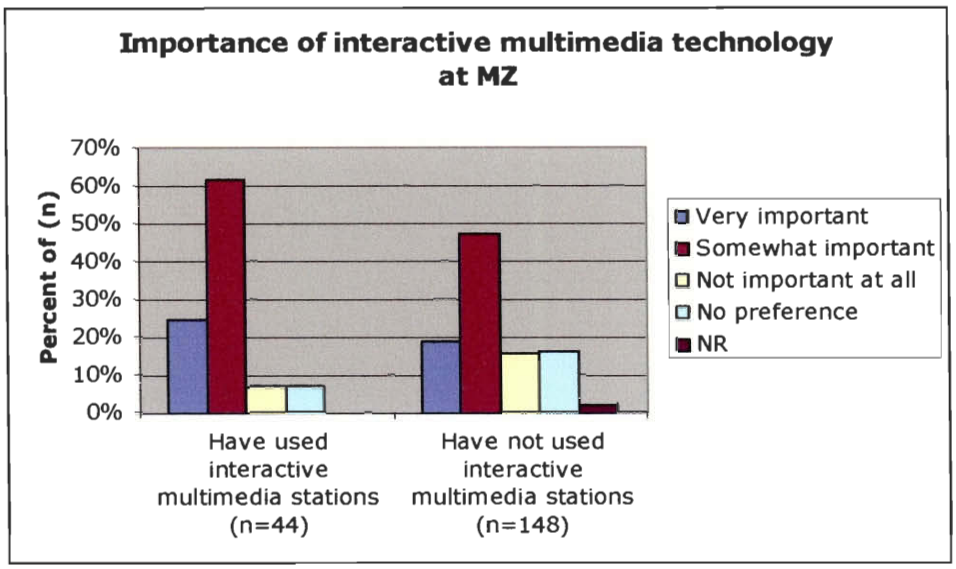
Figure 28. Would like to see more interactive multimedia stations at MZ



Experience with interactive multimedia stations and the importance of interactive multimedia technology in the zoo experience

Almost 90% of participants who had used the interactive multimedia stations at Melbourne Zoo felt that it was either "somewhat important" or "very important" for interactive multimedia technology to be a part of the zoo experience. This figure was greater than the 70% of participants who had not used the interactive multimedia stations but felt that it was "somewhat important" or "very important" for interactive multimedia technology to be part of the experience (Figure 29).

Figure 29. Importance of interactive multimedia stations at MZ



4.2 Friends of the Zoos (FOTZ) Focus Groups

In order to learn more about how interactive multimedia technologies affect the Zoos Victoria experience, we conducted two focus group sessions with Friends of the Zoos volunteer guides. The knowledge of the zoos brought to the discussion by the guides was instrumental in coming up with ideas and recommendations for current and future implementations of these technologies at all three zoos. It is important to note that because the FOTZ members who participated in our focus groups were all volunteer tour guides for the zoo, there existed somewhat of a bias in their ideas that may not necessarily reflect the opinions of visitors and all zoo staff members. The focus group protocol can be found in Figure 30.

Figure 30. FOTZ focus group protocol

Moderator: Good morning. We are here today to obtain your opinions on how technology influences visitors' experiences at the zoo. We feel that you, as the most experienced visitors, will know better than anyone what visitors might expect to see when coming to any of the Zoos Victoria properties. Before we begin, we would like to notify you that the focus group discussion will be videotaped for future reference and will be used for research purposes only. Also, at any time we encourage any questions or opinions in regards to the topic. Please raise you hand in the event that you have a question.

Questions:

- Have you all seen the multimedia stations spread out along the new "Trail of the elephants" exhibit?
- How many of you have used those stations?
    - How did you feel while using them?
- Have any of you seen visitors using the stations?
    - What impressions did people seem to have while using them?
- How do you think these particular stations might impact visitors' experiences?
- How do you think interactive technology impacts visitors' experiences at the zoo?
- What do you think about the addition of interactive technology for visitors at Healesville Sanctuary and Victoria's Open Range Zoo at Werribee?
- What kind of information do you think the stations should be providing to visitors?

Moderator: Thank you for your time. And if you have any additional comments. please let us know as we will be here until April 28.

4.2.1 *Focus Group with FOTZ Volunteer Guides: April 7, 2003*

The first focus group was conducted on April 7 with 5 FOTZ volunteer tour guides. The focus group protocol is attached in Appendix D. All participants were females over the age of 55. Participants' duration of FOTZ membership ranged from one to twenty-two years.

All focus group participants had used the interactive multimedia stations located in the *Trail of the Elephants* exhibit and had seen Zoo visitors using the stations. They noted that mainly children were using the stations, though some adult visitors had also been seen using the stations. One participant mentioned that she had seen a parent directing a child away from one of the stations, making the comment that the child could find the same information by visiting the website from home. With this in mind, it should be stated somewhere near the stations that the experience afforded by the station is only available at that given station and is not available at the website.

In general, participants said that they were afraid to see Melbourne Zoo change into a theme park with fewer animals and environmental exhibits and less emphasis on conservation. The FOTZ guides made it clear that they felt if technology is to become a part of the zoo experience, it must not become the emphasis of the zoo, nor should it be considered a substitute for visiting the zoo itself. However, participants came to the general consensus that technology could be a useful supplement to the zoo experience. There are a variety of questions that are frequently asked by visitors which were mentioned by the FOTZ volunteers; participants agreed that these questions could be answered by facts such as animals' age, gender, diet, lifespan, and gestation periods. Zoo guests want to know personal details about the animals they are observing. Although each of the animal exhibits has a sign next to it,

the focus group participants noted that these signs are difficult to update and often display a very limited amount of information. Data provided on an interactive multimedia station could be easily changed and updated according to recent events. Participants stated that the information on these stations should not be overwhelming, but should consist of simple fact sheets relevant to particular aspects of the particular animal and its conservation. Data could also be presented in the form of short videos showing the animals at different angles. Some of the exhibits that the FOTZ guides mentioned as examples of possible places for the stations included hunting dogs, large cats, platypuses, and the red panda. Focus group participants noticed that many people tend to pass the exhibits with animals that spend most of their time high in the trees or hiding. To rectify this situation, they suggested putting information at eye level, pointing out the animals' favorite hiding places.

All of the participants agreed that Victoria's Open Range Zoo at Werribee has no need for interactive stations on its property. In their reasoning, the bus driver serves as a guide while visitors tour the site, thus eliminating the need for stations. On the other hand, the interactive stations could be very useful at Healesville Sanctuary next to exhibits such as the platypus or bird enclosures where keepers are often not there to provide information to the visitors. In general, interactive multimedia stations were deemed valuable by the focus group participants, who believed the stations would help enrich the visitor experience so long as they do not become the primary focus of the zoos.

4.2.2 *Focus Group with FOTZ Volunteer Guides: April 10, 2003*

The second focus group was conducted on April 10. There were 5 participants, all of whom were over the age of 55. The group was comprised of 2 males and 3 females who had all been FOTZ members for over 5 years. Not all of the participants

had used the interactive multimedia stations at the *Trail of the Elephants* exhibit, but they all have seen the stations. Participants in this focus group noticed that the stations were being used mainly by young children. It was mentioned that adults often tried to pull their children away, noting that they had only a limited amount of time to spend in the zoo, and thus they wanted their children to spend time seeing as many animals as possible and not on playing with computer technology. The guides also thought that visitors who use computers at home feel more comfortable using the interactive multimedia stations at the zoo; because people are becoming accustomed to technology in their everyday lives, technology should also be present in the zoo.

Participants agreed that some of the rainforest or habitat exhibits are often overlooked by visitors because these exhibits focus more on plants and common animals and do not contain any large or flashy animals. These exhibits do not have zoo personnel stationed at them to explain their special characteristics, so the placement of interactive multimedia stations has the potential to be extremely helpful. Examples of such habitat exhibits include the *Grasslands and Wetlands* exhibit at Healesville Sanctuary and the *Volcanic Plains Walk* at Victoria's Open Range Zoo at Werribee.

Focus group participants noticed a specific problem with the computer stations located at the Research Hut in the *Trail of the Elephants* exhibit. These stations have touch pads rather than a conventional mouse to allow users to move the cursor, and the guides mentioned that they have noticed the confusion people had figuring out how to move the cursor. It was suggested that a small sign be placed nearby to instruct users on how to navigate using this type of input device.

Participants provided some comments from their own experiences with the interactive multimedia stations, such as finding the video "Poo Paper" very

educational, while the videos using the "Channel 9" format for presenting information were not very useful. It was also mentioned that the television screen for the video station is in a poor location; it is in a corner, almost completely hidden from people entering the hut. However, in general all the current interactive multimedia stations were described as being user friendly and educational. Participants believed that the stations belong in the Zoos Victoria experience since children learn from these stations and have fun at the same time.

4.3 Summary

The surveys and focus groups that we conducted supplied us with opinions and ideas regarding the role of interactive multimedia technology in the visitor experience at the properties of Zoos Victoria. We analyzed this data to come up with an understanding of how visitors as a whole and in specific groups, perceive technology's role in the zoo.

Our survey revealed that, for the most part, enjoyed interacting with the current interactive multimedia stations, and more often than not would like to see more of them. A significant number of visitors chose the "no preference" option when it was available for questions involving technology. This lack of preference can be useful in showing that, currently, technology is not on visitors' minds when thinking about zoos.

Friends of the Zoos volunteer guides gave us useful information about how visitors are interacting with the multimedia stations and about specific problems or concerns with the current stations. Also, they provided us with a number of good ideas for ways that interactive multimedia technology could be used to benefit visitors without detracting from the zoo experience or distracting visitors from the primary reason for the zoos existence, the animals.

The results discussed in this chapter have led us to a number of conclusions, as well as our sets of recommendations. However, there is a wealth of data gathered from our surveys that is not pertinent to our project goal. Since this data may be of use to Zoos Victoria, our team has included a CD that contains all the collected data for future analysis.

5. Conclusions

The goals of this project were to determine visitor and non-visitor opinions regarding the integration of interactive multimedia technology into the Zoos Victoria experience, and to provide Zoos Victoria with a benchmark against which they will be able to compare future studies regarding visitors' opinions on interactive multimedia technology. To meet these goals, we conducted background research on the zoo sites themselves, as well as on survey design and employment, survey sampling methods, interactive multimedia stations, and marketing theories and techniques used by other zoos and museums. This research allowed us to determine the best methods to utilize in order to provide Zoos Victoria with the information it required.

The first half of this project took place in Worcester, Massachusetts, USA from January to February of 2003. During this period we conducted background research and determined how we would achieve our project goals once in Melbourne, Australia. In March and April of 2003 we conducted surveys at Zoos Victoria's three properties and at a location in downtown Melbourne in order to collect visitor and non-visitor opinions; we also held two focus groups with Friends of the Zoos (FOTZ) volunteer guides to find out what they thought about the integration of interactive multimedia technology into the zoo experience.

The results and analysis of our surveys and focus groups allowed us to draw conclusions about the effect of interactive multimedia technologies on the zoo experience. Overall, visitors were interested in having these technologies present in the zoo. Different types of technologies had different levels of interest associated with them. For example, interactive maps and a frequently updated website were ranked highly by visitors, while technology that involved computer games was not found to be as interesting.

In our survey, we asked a number of questions regarding the importance of technology in the zoo experience and whether visitors wanted to see more of the types of interactive stations already present at Melbourne Zoo. Most survey participants responded either positively or said they had no preference. At all locations except Healesville Sanctuary, the positive responses towards technology outweighed the negative responses by a ratio of at least 5:1. This shows that, while a fair number of visitors have not formed opinions regarding technology in the zoos, the individuals who have formed opinions believe that technology can have a positive impact.

Another technological aspect of the zoo experience is the Zoos Victoria website. Less than 10% of participants at all surveying sites except Melbourne Zoo indicated that they had visited the website. Participants who had visited the website responded more positively to all the questions involving interactive multimedia technology than those who had not visited the website. A similar pro-technology trend was also observed in the small percentage of respondents who had used the interactive multimedia stations located at Melbourne Zoo. The tendency for interest in technology to increase with the use of technology may be useful for Zoos Victoria when deciding how to promote its website and the interactive multimedia stations.

Gender and age also impacted the types of responses given to technology-related questions. Participants between the ages of 25 and 39 expressed the highest level of interest in interactive multimedia technology. Males of all age groups except for those between the ages of 12 and 24 were more interested in all forms of technology than females of the same age groups. This information may be useful in determining the target market for advertising relating to interactive multimedia technology.

From the two focus groups with FOTZ guides, we gained valuable insight into possible uses for interactive multimedia technologies in the zoos. Although the participants believed technology can be beneficial to the zoo experience, they stressed that technology should in no way become the primary focus of Zoos Victoria. Also, they felt that interactive technologies would be better suited and received at Melbourne Zoo and Healesville Sanctuary than at Victoria's Open Range Zoo at Werribee.

These results provide a benchmark against which Zoos Victoria may compare the results of future studies regarding the role of interactive multimedia technology in the visitor experience. This may be accomplished by conducting the survey we have left for the staff of Zoos Victoria. In addition, analysis of our survey and focus group results have allowed us to present Zoos Victoria with a set of recommendations regarding the current and future implementation of interactive multimedia technology in the zoos.

6. Recommendations

Zoos Victoria is just beginning to integrate interactive multimedia technology into the experience at their properties. Our study was useful not only in determining current views regarding these technologies but also in setting a benchmark against which future studies can be compared. This benchmark will allow Zoos Victoria to track how visitors react to interactive multimedia technology components of the zoo experience through the years.

Through our research and data analysis we have arrived at two sets of recommendations. The first group is for Zoos Victoria; it includes a summary of the important findings from our surveys and focus groups. The second set of recommendations includes findings that will help either Zoos Victoria or WPI in future projects related to the topics in our project.

6.1 Recommendations for Zoos Victoria

We have divided this section into three parts: recommendations on improving the existing interactive multimedia stations, recommendations for the stations that Zoos Victoria might implement in the future, and recommendations for the Zoos Victoria website.

Most of the ideas for recommendations on improving the existing interactive multimedia stations found in the *Trail of the Elephants* exhibit came from the focus groups that were conducted with Friends of the Zoos volunteer guides. The information on these stations is unique to the stations themselves and cannot be found on the Zoos Victoria website. However, the guides noted that many visitors did not use the stations because they believed the information would be available on the website. To remedy this, a sign acknowledging the uniqueness of the information on

the stations would prevent visitors from assuming that the information may be found elsewhere.

Another recommendation involves the fact that some of the current interactive stations require knowledge of how to use a touch-pad mouse. Touch-pad controls are a common feature on laptop computers, but are rarely encountered by individuals who have never used a laptop. Our focus group participants mentioned that many visitors had made inquiries about how to operate the mouse. We therefore advise that instructions explaining how to use the touch-pad be posted near the stations so that all visitors, regardless of their technological background, may benefit from the information provided by them.

When our group investigated the existing interactive multimedia stations, we found it difficult to clearly see the station that focused on conservation. Although placed in clear view in the middle of a walking track in the *Trail of the* Elephants exhibit, and thus easy to locate, the station's screen was difficult to read when the sun was out because of shadows and reflections. We recommend that this particular station either be moved to a location where it will not reflect the sun, or be surrounded by a tent or enclosure that will protect it from the sunlight. Another interactive station that allows visitors to choose a short video display is placed in the corner of one of the buildings in the *Trail of the Elephants* exhibit and it is difficult for visitors to see unless they already know it is there. We therefore recommend that the station be moved to a location where it may be clearly seen by visitors or that a sign be placed near the station directing visitors to it.

If Zoos Victoria decides to implement new interactive multimedia stations in the future, we first suggest it consider interactive maps as a possibility. We learned through our surveys that visitors are not entirely satisfied with the information that is

provided by the maps and directional signage that are currently in place. Also, a large percentage of survey participants rated their interest level in interactive maps as high. If implemented, these stations will benefit visitors by answering any directional questions they may have, helping to make their experience at the zoo more enjoyable.

Another type of interactive multimedia station that Zoos Victoria should consider a kind that explains details about exhibits. These stations would be located next to exhibits, and could be given a name such as "e-keepers." These so-called "e-keepers" could provide information about the exhibits they are nearby. Questions that these e-keepers should be able to answer about animal exhibits include age, gender, natural habitat, diet, lifespan, and gestation period. Videos of natural habitats and different species of these animals will allow visitors to broaden their knowledge about the animal beyond what they can learn by merely observing. These stations should also tie the information they provide to the conservation efforts of the zoos. As mentioned by a FOTZ member (see 4.2.1), these "e-keepers" could also help to increase interest in the habitat exhibits present at Victoria's Open Range Zoo at Werribee and Healesville Sanctuary. These exhibits focus primarily on ecosystems and habitats rather than specifically on animals and are often passed over by visitors who wish to see more "exciting" exhibits. Perhaps the incorporation of interactive multimedia stations into these types of exhibits would make them more exciting to visitors, particularly children, increasing visitors' knowledge and understanding about ecosystems and the environment.

Some important facts must be taken into consideration when the implementation of further interactive multimedia stations is discussed. First, these types of stations require a certain amount of upkeep and maintenance. In order to minimize the amount of repair required to keep them in working order, the physical

structure of the stations must be sturdy enough for them to be able to withstand frequent use. Regular maintenance sessions should be scheduled. Second, it is suggested that such stations be located in a place where they may be easily seen and accessed by handicapped individuals, children, and adults.

We learned through our surveys that a large percentage of visitors and non-visitors have never used the Zoos Victoria website. Therefore, Zoos Victoria must increase public awareness in order to increase visitation to its website. We also learned that visitors who had visited the website were more likely to have used the interactive multimedia stations on-site and vice-versa, implying that marketing of the website will function as marketing for the interactive stations as well. Since a large number of visitors and non-visitors surveyed expressed a desire to visit the Zoos Victoria website in the future, and because a large number of visitors were not aware that the website existed, we suggest the running of a marketing campaign which would help raise the public's awareness about the website. This campaign could include printing the website address on gift store bags, maps, and brochures and also on advertisements, posters, business cards, and all other material printed by the zoo. We recommend that the website be mentioned on outgoing recorded phone messages, along with the website address and a description of what may be found there. Also, because children are typically more acclimated to technology, they may be more interested in visiting the zoo if they are aware of the interactive portions of the zoo experience. Marketing the technological aspects of the zoo to children may lead them to prompt their parents to bring them there, thus increasing interest in and visitation to the zoo.

6.2 Recommendations for Future Marketing Studies and IQPs

As we worked to complete this project, we found that the following information would have been very helpful to us had we known it before embarking upon our research. In this section we list recommendations that may be used for future marketing studies and Interactive Qualifying Projects. We believe this information will save future researchers a great deal of time.

In terms of survey design and the surveying process itself, we suggest having coding sheets ready before surveying. Having coding sheets saves time because the data collected daily can be coded daily. Also, an outline that delineates the pertinent information required from the survey should be written before commencing the surveying process. This outline helps shorten the surveys by eliminating questions that are not pertinent to the project topic. Having an outline also helps to organize the data gathering process, plus it allows researchers to concentrate on the major points of the survey.

If conducting surveys that participants complete on the spot, researchers should make sure the participant answers all questions. This will decrease the number of non-responses and will make compilation and analysis of the data easier. We also recommend that visitors who came as a group not be surveyed unless doing so is essential for the project. These respondents tend to fill out surveys in a rush and not to pay adequate attention to the questions.

In this project we collected over 30,000 pieces of data. Due to this large number, we focused only on data that directly related to our project. The remaining data that was not analyzed can be found in the attached CD. We believe that future IQP groups and marketing professionals will find this additional information about

visitors' perceptions, expectations, and overall visitation to all three properties of Zoos Victoria useful for further studies.

Bibliography

Ahern Communications, Ink. Marketing Research - Ahern Communications, Ink. 18 Feb. 2003 <http://www.aherncomm.com/marketing_sales/ marketing_research.htm>.

Andreasen, Ala R. "'Backward' Market Research." Harvard Business Review May – June, 1985

Berg, Bruce L. Qualitative Research Methods. Boston: Allyn and Bacon, 2001.

Bielick, Stacey and David Karns. "Exploring Amazonia; Three Studies of Visitors at the National Zoological Park: Survey of Entering and Exiting Visitors." Institutional Studies Office, Smithsonian Institution, 1998.

Booth, Ben. "Understanding the Information Needs of Visitors to Museums." Museum Management and Curatorship 17.2 (1998): 139-57.

Borchers, Jan, Oliver Deussen, and Clemens Knorzer. "Getting It Across: Layout Issues for Kiosk Systems." SIGCHI bulletin 27.4 (1995): 68-74.

Bradburne, James M. "A New Strategic Approach to the Museum and its Relationship to Society." Museum Management and Curatorship 19.1 (2001): 75-84.

Brennan, Mike, Peter Seymour and Philip Gendall. "The Effectiveness of Monetary Incentives in Mail Surveys: Further Data" Marketing Bulletin 4 (1993): 48-52.

Ciaraldi, Michael. Personal Interview. 23 Jan. 2003.

Crawford, Patricia. Personal Interview. 13 Feb. 2003.

Danneels, Erwin. Electronic Mail Interview. 21 Feb. 2003.

Davidson College Library. "Decennial Census." 6 Feb. 2003 <http://www.davidson.edu/administrative/library/GovDoc/gov-decennial_census.htm>.

Dillman, Don A. and Priscilla Salant. How to Conduct Your Own Survey. New York: John Wiley & Sons, Inc., 1994.

"Duane Reader Launches Interactive Kiosk." Chain Drug Review. 5 Aug. 2002.

EcoTarium: Our Mission, History, and Future. 15 Feb. 2003 <http://www.ecotarium.org/info/about/history.html>.

Harrison, Julia. "Museums and Touristic Expectations." Annals of Tourism Research 24.1 (1997): 23-40.

Hodgson, Robert A., David N. Silk. "Of Kiosks and Campuses. (college campus information kiosks)." Technological Horizons In Education Journal 23.1 (1995).

Fink, Arlene. How to Analyze Surveys. Thousand Oaks, CA: Sage, 1995.

---. How to Design Surveys. Thousand Oaks, CA: Sage, 1995.

---. How to Sample in Surveys. Thousand Oaks, CA: Sage, 1995.

---. The Survey Handbook. Thousand Oaks, CA: Sage, 1995.

--- and Jacqueline Kosecoff. How to Conduct Surveys. Beverly Hills: Sage, 1985.

Fowler, Floyd J., Jr. Survey Research Methods. Newbury Park, CA: Sage, 1988.

Fritz, Mark. "Keys to the Kiosk." EMedia 13.4 (2000). 12 Jan. 2003.

Griffin, Des and Morris Abraham. "The Effective Management of Museums: Cohesive Leadership and Visitor-Focused Public Programming." Museum Management and Curatorship 18.4 (2000): 335-68.

Goulding, Christina. "The Museum Environment and the Visitor Experience." European Journal of Marketing 34.3/4 (2000): 261-78.

Jansen-Verbeke, Myriam and Johan van Recom. "Scanning Museum Visitors: Urban Tourism Marketing." Annals of Tourism Research 23.2 (1996): 364-75.

Johnson, Steve. The New Media belongs to the Users. Riger. 27 March 2003 <http://www.riger.com>.

Karns, David and Steven J. Smith. "Exploring Amazonia; Three Studies of Visitors at the National Zoological Park: Observations of Visitors." Institutional Studies Office, Smithsonian Institution, 1998.

Kasouf, Chickery. Personal interviews. 29 Jan. 2003 and 7 Feb. 2003.

Kawashima, Nobuko. "Knowing the Public. A Review of Museum Marketing Literature and Research." Museum Management and Curatorship 17.1 (1998): 21-39.

Kiosk Magazine Online. Online Magazine. 23 Jan. 2003 <http://www.kiomag.com /newsandf>.

Kirchberg, Volker. "Museum Visitors and Non-Visitors in Germany: A Representative Survey." Poetics 24 (1996): 239-58.

Kish, L. Survey Sampling. New York: Wiley, 1967.

Kotler, Neil and Philip Kotler. "Can Museums be All Things to All People?: Missions, Goals, and Marketing's Role." Museum Management and Curatorship 18.3 (2000): 271-87.

Kovach, Carol. "Strategic Management for Museums." The International Journal of Museum Management and Curatorship 8 (1989): 137-48.

Levoy, Marc. "An interactive kiosk for the Tribune del David". Stanford Computer Graphics Laboratory. 27 March 2003. <http://graphics.stanford.edu/projects /mich/kiosk/>.

Litman, Mark S. How to Measure Survey Reliability and Validity. Thousand Oaks: Sage, 1995.

Maguire, M. C. "A Review of User-Interface Design Guidelines for a Public Information Kiosk Systems." International Journal of Human-Computer Studies 50.3 (1999): 263-86.

McLean, Fiona Combe. "Marketing in Museums: A Contextual Analysis." Museum Management and Curatorship 12 (1993): 11-27.

Murphy, Sara. Personal interview. 11 Feb. 2003.

Pekarik, Andrew J. and Gary Shank. "Exploring Amazonia; Three Studies of Visitors at the National Zoological Park: Interviews with Selected Families." Institutional Studies Office, Smithsonian Institution, 1998.

Prince, David R. "Factors Influencing Museum Visits: An Empirical Evaluation of Audience Selection." Museum Management and Curatorship 9 (1990): 149-68.

Reade, Louise S. and Natalie K. Warren. "The Modern Zoo: How Do People Perceive Zoo Animals?" Applied Animal Behaviour Science 47 (1996): 109-18.

San Antonio Business Journal. Daily Business News Online. 25 January, 2003 <http://albany.bizjournals.com/sanantonio/>.

Savard, Jeffrey, Jennifer Scheipers, and Christina Watson. "A Zoo Without Boundaries: Transforming the Zoos Victoria Website." Worcester Polytechnic Institute, Interactive Qualifying Project, 2002.

Shneiderman, Ben. Designing the User Interface: Strategies for Effective Human-Computer Interaction. 3rd ed. Reading: Addison, March 1998.

Smithsonian Institution. "Welcome to the Amazonia Science Gallery." 16 Feb 2003 <http://www.hrw.com/science/si-science/biology/animals/amazonia/backgrnd.html>.

Status of Technology and Digitization In the Nation's Museums and Libraries 2002 Report. 10 May 2002. Institute of Museum and Library Services. 18 Jan. 2003 <http://www.imls.gov/reports/techreports/intro02.htm>.

Tian, Shu, John L. Crompton, and Peter A. Witt. "Integrating Constraints and Benefits to Identify Responsive Target Markets for Museum Attractions." Journal of Travel Research 35.2 (1996): 34-45.

Tobelem, Jean-Michel. "The Marketing Approach in Museums." Museum Management and Curatorship 16.4 (1997): 337-54.

Tung, L.L., and J.H. Tan. "A Model for the Classification of Information Kiosks in Singapore." International Journal of Management. 18.4 (1998): 255-64.

van Linge, Joost H. "How to Out-Zoo the Zoo." Tourism Management 13.1 (1992): 115-7.

Verdaasdonk, H., C.J van Rees, M. Stokmans, K van Eijck, and M. Verboord. "The Impact of Experimental Variables on Patterns of Museum Attendance: The Case of Noord-Brabant Museum." Poetics 24 (1996): 181-202.

Wade, Angie. A Guide to Calculating Sample Size. Great Ormond Street Hospital for Children NHS Trust, 1995.

Wadsworth, Frank, Eldon Little, Edward Galanif, and David Eplion. The Use of Promised Non-Monetary Incentives to Increase Survey Response Rates in a Non-Traditional, Not-for-Profit Environment. Marketing Management Association. 24 Jan. 2003 <http://www.sbaer.uca.edu/Research/1997/MMA/97mma098.txt>.

Worcester Art Museum – Brief Museum History. 11 Feb. 2003 <http://www.worcesterart.org/Information/history.html>.

Zoo Atlanta. Official Site of Zoo in Atlanta, Interactive Media Technological Center. 24 Jan. 2003 <http://www.imtc.gatech.edu/html/zoo_atlanta.html>.

Zootopia in Pursuit of the Perfect Zoo. Official Site of Sydney Zoo. 23 Jan. 2003 <http://www.zoo.nsw.gov.au/content/view.asp?id=129>.

Zoos Victoria Annual Report 01/02. Zoos Victoria. 27 Jan. 2003 <http://www.zoo.org.au/ZPGB/Imagedir/AnnualReport01-02.pdf>.

Zoo Visitor Survey 2003. ZooWatch. 18 Jan. 2003 <http://www.zoowatch.freeserve.co.uk/Zoo%20Visitor%20Survey.rtf>.

ZooWatch: Zoo Visitor Survey 2003. ZooWatch. 18 Jan. 2003 <http://www.zoowatch.freeserve.co.uk/survey.htm>.

Appendix A: Zoos Victoria History and Mission

Please note: This appendix was taken from "A Zoo Without Boundaries," the 2002 Zoos Victoria IQP.

The Melbourne Zoo was founded in 1862, under the direction of the Zoological Society of Victoria. Originally designed as a domestic animal acclimatization area, the zoo began collecting unique species from around the world beginning in the 1880's. These animals included species such as the elephant, zebra, and giraffe. Over the next century, the Melbourne Zoo acquired many unique animals, constructed permanent enclosures, and developed programs for captive breeding of endangered species. In the 1980's, the Zoo developed and implemented a master plan to divide the grounds into three bioclimatic zones, and furthered the Zoo's regional conservation and education efforts through additional activity programming.

Several agencies have overseen the Zoo since its inception. Zoo leadership was transferred to the Zoological Board of Victoria in 1937, created in 1936. The Zoological Board was responsible for the creation of Victoria's Open Range Zoo at Werribee in 1975, and the Healesville Sanctuary, formed in 1978. Together, these three conservation areas are known as Victoria's Three Great Zoos and their purpose is "to lead, inspire and empower everyone to connect with wildlife, build knowledge, develop skills and take informed action to conserve the natural world" (Zoos Victoria 5). Currently, the Zoos are led by the Zoological Parks and Gardens Board, established in 1996.

Appendix B: Surveys

All the surveys conducted in this study were very similar in content; the main differences were the changes made to accommodate the names of the three different sites.

B.1 On-Site Pilot Survey (Conducted at Melbourne Zoo)

1. Are you 12 or older?
   ❑ Yes ❑ No
2. What is your gender?
   ❑ Male ❑ Female
3. Please check the appropriate boxes in the table below:

	Melbourne Zoo	Healesville Sanctuary	Victoria's Open Range Zoo at Werribee	The Zoos Victoria Website
Have you visited this location?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
If you answered yes above, when was your last visit?	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago
Please rate your overall experience at each location.	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A

4. What was the purpose of your trip to Melbourne Zoo today?
   ❑ Family outing
   ❑ To see the animals
   ❑ Attending a function
   ❑ To see a specific exhibit (please specify) _____
   ❑ Other
   ❑ Bringing visiting friends
   ❑ *To see "Trail of the Elephants"*
   ❑ As part of a school group

5. How did you expect to receive information during your visit to Melbourne Zoo? (Check all that apply)
   ❑ Signage
   ❑ Printed maps
   ❑ Interactive way-finding maps
   ❑ Guided tours
   ❑ Other
   ❑ Interactive computer games
   ❑ Keeper presentations
   ❑ Computer stations
   ❑ Brochures

6. How satisfied were you with the information provided about each of the following:

	Fully Satisfied	Somewhat Satisfied	Not Satisfied	Unsure
Conservation	❑	❑	❑	❑
Animal exhibits	❑	❑	❑	❑
Habitats and environments	❑	❑	❑	❑
Directional maps	❑	❑	❑	❑
Function of zoos	❑	❑	❑	❑

7. On a scale of 1 to 5, state your level of interest in each of the following, 1 being of no interest and 5 being a great deal of interest:

Interactive CD with educational games	1 2 3 4 5
Multimedia CD with information about plants and animals, and their natural habitats	1 2 3 4 5
Frequently updated website that offers an online extension of the zoo experience	1 2 3 4 5
Interactive multimedia stations with games related to nearby exhibits	1 2 3 4 5
Interactive maps located at various locations throughout the zoo	1 2 3 4 5

8. If you have visited the Zoos Victoria website, for which of the following purposes did you use it? (Check all that apply)
   - ❑ To plan today's trip
   - ❑ Personal enjoyment/education
   - ❑ To learn more about a specific animal
   - ❑ For information at about events at the zoo (please specify) _____
   - ❑ Have not visited the website
   - ❑ Research for a school project
   - ❑ To learn about the role of Zoos Victoria
   - ❑ To purchase retail products or tickets online
   - ❑ Other

9. How well did the website serve your purposes?
   ❑ Completely ❑ Moderately ❑ Not at all

10. Do you anticipate using the Zoos Victoria website in the future?
    ❑ Yes ❑ No

11. How did you first learn of the Zoos Victoria website? (Check all that apply)
    - ❑ Zoos Victoria staff member
    - ❑ Advertisement
    - ❑ Signage at the zoo
    - ❑ Family or friends
    - ❑ Search engine
    - ❑ Other

12. Have you used any of the interactive multimedia stations located in the zoo?
    ❑ Yes ❑ No

13. If you have used the interactive multimedia stations at Melbourne Zoo, how did they affect your experience?
    ❑ Positively ❑ Negatively ❑ No affect

14. Would you like to see more interactive multimedia stations here at Melbourne Zoo?
    ❑ Yes ❑ No ❑ No preference

15. How important do you think it is for interactive multimedia technologies to be part of the experience here at X?
    ❑ Very important ❑ Somewhat important ❑ Not important at all ❑ No preference

16. Have you visited zoos outside of Zoos Victoria?
    ❑ Yes ❑ No

17. Compared to other zoos you have visited, how technologically advanced do you think Melbourne Zoo is?
    ❑ Above average ❑ Average ❑ Below average ❑ N/A

18. Of all the zoos you have visited, which have impressed you the most?

    _____ _____ _____

19. To which of the following age groups do you belong?
    ❑ 16-24 ❑ 25-39 ❑ 40-54 ❑ 55 and older

20. What is your country of residence? _____

21. If the answer to previous question is Australia, in which city and state do you live and what is the post code?

City _____ State _____ Post Code _____

22. Are you a member of Friends of the Zoos (FOTZ)?
❑ Yes ❑ No

Thank you very much! Please feel free to add any comments you may have.

_____

_____

_____

B.2 Healesville Sanctuary Survey

1. What is your gender?
❑ Male ❑ Female

2. Please check the appropriate boxes in the table below:

	Melbourne Zoo	Healesville Sanctuary	Victoria's Open Range Zoo at Werribee	The Zoos Victoria Website
Have you visited this location?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
If you answered yes above, when was your last visit?	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago
Please rate your overall experience at each location.	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A

3. What was the purpose of your trip to Healesville Sanctuary today?
❑ Family outing
❑ To see the animals
❑ As part of a school group
❑ To see a specific exhibit (please specify) _____
❑ Other (please specify) _____
❑ Bringing visiting friends
❑ Attending a function

4. How did you expect to receive information during your visit to Healesville Sanctuary? (Check all that apply)
❑ Signage
❑ Printed maps
❑ Interactive way-finding maps
❑ Guided tours
❑ Other (please specify) _____
❑ Interactive computer games
❑ Keeper presentations
❑ Computer stations
❑ Brochures

5. How satisfied were you with the information provided about each of the following:

	Fully Satisfied	Somewhat Satisfied	Not Satisfied	Unsure
Conservation	❑	❑	❑	❑
Animal exhibits	❑	❑	❑	❑
Habitats and environments	❑	❑	❑	❑
Directional maps	❑	❑	❑	❑
Function of zoos	❑	❑	❑	❑

6. On a scale of 1 to 5, state your level of interest in each of the following, 1 being of no interest and 5 being a great deal of interest:

Interactive CD with educational games	1 2 3 4 5
Multimedia CD with information about plants and animals, and their natural habitats	1 2 3 4 5
Frequently updated website that offers an online extension of the zoo experience	1 2 3 4 5
Interactive multimedia stations with games related to nearby exhibits	1 2 3 4 5
Interactive maps located at various locations throughout the zoo	1 2 3 4 5

7. If you have visited the Zoos Victoria website, for which of the following purposes did you use it? (Check all that apply)

❑ To plan today's trip
❑ Personal enjoyment/education
❑ To learn more about a specific animal
❑ Have not visited the website
❑ Research for a school project
❑ To learn about the role of Zoos Victoria
❑ To purchase retail products or tickets online
❑ For information about events at the zoo (please specify) _____
❑ Other (please specify) _____

8. How well did the website serve your purposes?
❑ Completely ❑ Moderately ❑ Not at all

9. Do you anticipate using the Zoos Victoria website in the future?
❑ Yes ❑ No

10. How did you first learn of the Zoos Victoria website? (Check all that apply)
❑ Zoos Victoria staff member
❑ Advertisement
❑ Signage at the zoo
❑ Family or friends
❑ Search engine
❑ Other (please specify) _____

11. If you have visited the Melbourne Zoo, have you used any of the interactive multimedia stations located there?
❑ Yes ❑ No ❑ Have not visited Melbourne Zoo

12. If you have used the interactive multimedia stations at Melbourne Zoo, how did they affect your experience?
❑ Positively ❑ Negatively ❑ No affect

13. Would you like to see interactive multimedia stations here at Healesville Sanctuary?
❑ Yes ❑ No ❑ No preference

14. How important do you think it is for interactive multimedia technologies to be part of the experience here at Healesville Sanctuary?
❑ Very important ❑ Somewhat important ❑ Not important at all ❑ No preference

15. Have you visited zoos outside of Zoos Victoria?
❑ Yes ❑ No

16. Compared to other zoos you have visited, how technologically advanced do you think Healesville Sanctuary is?
❑ Above average ❑ Average ❑ Below average ❑ N/A

17. Of all the zoos you have visited, which have impressed you the most?

_____ _____ _____

18. To which of the following age groups do you belong?
❑ 16-24 ❑ 25-39 ❑ 40-54 ❑ 55 and older

19. What is your country of residence? _____

20. If the answer to previous question is Australia, in which city and state do you live and what is the post code?

City _____ State _____ Post Code _____

21. Are you a member of Friends of the Zoos (FOTZ)?
❑ Yes ❑ No

Thank you very much! Please feel free to add any comments you may have.

_____

_____

_____

B.3 Victoria's Open Range Zoo at Werribee Survey

1. What is your gender?
   ❑ Male ❑ Female

2. Please check the appropriate boxes in the table below:

	Melbourne Zoo	Healesville Sanctuary	Victoria's Open Range Zoo at Werribee	The Zoos Victoria Website
Have you visited this location?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
If you answered yes above, when was your last visit? (not including today's visit)	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago
Please rate your overall experience at each location.	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good) ❑ N/A

3. What was the purpose of your trip to Victoria's Open Range Zoo today?
   ❑ Family outing
   ❑ To see the animals
   ❑ As part of a school group
   ❑ To see a specific exhibit (please specify) _____
   ❑ Other (please specify) _____
   ❑ Bringing visiting friends
   ❑ Attending a function

4. How did you expect to receive information during your visit to Victoria's Open Range Zoo? (Check all that apply)
   ❑ Signage
   ❑ Printed maps
   ❑ Interactive way-finding maps
   ❑ Guided tours
   ❑ Other (please specify) _____
   ❑ Interactive computer games
   ❑ Keeper presentations
   ❑ Computer stations
   ❑ Brochures

5. How satisfied were you with the information provided about each of the following:

	Fully Satisfied	Somewhat Satisfied	Not Satisfied	Unsure
Conservation	❑	❑	❑	❑
Animal exhibits	❑	❑	❑	❑
Habitats and environments	❑	❑	❑	❑
Directional maps	❑	❑	❑	❑
Function of zoos	❑	❑	❑	❑

6. On a scale of 1 to 5, state your level of interest in each of the following, 1 being of no interest and 5 being a great deal of interest:

Interactive CD with educational games	1 2 3 4 5
Multimedia CD with information about plants and animals, and their natural habitats	1 2 3 4 5
Frequently updated website that offers an online extension of the zoo experience	1 2 3 4 5
Interactive multimedia stations with games related to nearby exhibits	1 2 3 4 5
Interactive maps located at various locations throughout the zoo	1 2 3 4 5

7. If you have visited the Zoos Victoria website, for which of the following purposes did you use it? (Check all that apply) ***If you have not visited the website please skip to question 11.***

❑ To plan today's trip
❑ Research for a school project
❑ Personal enjoyment/education
❑ To learn about the role of Zoos Victoria
❑ To learn more about a specific animal
❑ To purchase retail products or tickets online
❑ Have not visited the website
❑ For information about events at the zoo (please specify) _____
❑ Other (please specify) _____

8. How well did the website serve your purposes?

❑ Completely ❑ Moderately ❑ Not at all

9. Do you anticipate using the Zoos Victoria website in the future?

❑ Yes ❑ No

10. How did you first learn of the Zoos Victoria website? (Check all that apply)

❑ Zoos Victoria staff member
❑ Family or friends
❑ Advertisement
❑ Search engine
❑ Signage at the zoo
❑ Other (please specify) _____

11. If you have visited the Melbourne Zoo, have you used any of the interactive multimedia stations located there? ***If you haven't visited the Melbourne Zoo, please skip to question 13.***

❑ Yes ❑ No

12. If you have used the interactive multimedia stations at Melbourne Zoo, how did they affect your experience?

❑ Positively ❑ Negatively ❑ No affect

13. Would you like to see interactive multimedia stations here at Victoria's Open Range Zoo?

❑ Yes ❑ No ❑ No preference

14. How important do you think it is for interactive multimedia technologies to be part of the experience here at Victoria's Open Range Zoo?

❑ Very important ❑ Somewhat important ❑ Not important at all ❑ No preference

15. Have you visited zoos outside of Zoos Victoria? ***If no, please skip to question 18.***

❑ Yes ❑ No

16. Compared to other zoos you have visited, how technologically advanced do you think Victoria's Open Range Zoo is?

❑ Above average ❑ Average ❑ Below average ❑ N/A

17. Of all the zoos you have visited, which have impressed you the most?

_____ _____ _____

18. To which of the following age groups do you belong?

❑ 12-24 ❑ 25-39 ❑ 40-54 ❑ 55 and older

19. What is your country of residence? _____

20. If the answer to previous question is Australia, in which city and state do you live and what is the post code?

City _____ State _____ Post Code _____

21. Are you a member of Friends of the Zoos (FOTZ)?

❑ Yes ❑ No

Thank you very much! Please feel free to add any comments you may have.

_____

_____

_____

B.4 Off-site Survey

1. Please check the appropriate boxes in the table below:

	Melbourne Zoo	Healesville Sanctuary	Victoria's Open Range Zoo at Werribee	The Zoos Victoria Website
Have you visited the following location?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
If you answered yes above, when was your last visit?	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago	❑ more than 5 years ago ❑ 1-5 years ago ❑ less than 1 year ago
Please rate your overall experience at each location.	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good)	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good)	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good)	❑ 1 (bad) ❑ 2 ❑ 3 (neutral) ❑ 4 ❑ 5 (good)

2. How would you expect to receive information during a visit to a zoo? (Check all that apply)

❑ Signage
❑ Printed maps
❑ Interactive way-finding maps
❑ Guided tours
❑ Other (please specify) _____
❑ Interactive computer games
❑ Keeper presentations
❑ Computer stations
❑ Brochures

3. On a scale of 1 to 5, state your level of interest in each of the following, 1 being no interest and 5 being a great deal of interest:

Interactive CD with educational games	1 2 3 4 5
Multimedia CD with information about plants and animals, and their natural habitats	1 2 3 4 5
Frequently updated website that offers an online extension of the zoo experience	1 2 3 4 5
Interactive multimedia stations with games related to nearby zoo exhibits	1 2 3 4 5
Interactive maps located at various locations throughout a zoo	1 2 3 4 5

4. If you have visited the Zoos Victoria website, for which of the following purposes did you use it? (Check all that apply) ***If you have not visited the Zoos Victoria Website please skip to question 6.***

❑ To plan a trip
❑ Personal enjoyment/education
❑ To learn more about a specific animal
❑ Research for a school project
❑ To learn about the role of Zoos Victoria
❑ Other (please specify) _____

5. If you have used the website, how well did it serve your purposes?

❑ Completely ❑ Moderately ❑ Not at all

6. Do you anticipate using the Zoos Victoria website in the future?

❑ Yes ❑ No

7. If you have visited the Melbourne Zoo, have you used any of the interactive multimedia stations located there?

❑ Yes ❑ No *(please skip to question 9)*

8. How did the interactive multimedia stations affect your experience at Melbourne Zoo?

❑ Positively ❑ Negatively ❑ No affect

9. Would you like to see interactive multimedia stations at a zoo?
❑ Yes ❑ No ❑ No preference

10. How important do you think it is for interactive multimedia technologies to be part of a zoo experience?
❑ Very important ❑ Somewhat important ❑ Not important at all ❑ No preference

11. Have you visited any zoos other than the three Zoos Victoria properties?
❑ Yes ❑ No *(please skip to question 14)*

12. Compared to other zoos you have visited, how technologically advanced would you expect the Zoos Victoria properties to be?
❑ Above average ❑ Average ❑ Below average ❑ No opinion

13. Please specify which zoos have impressed you the most (these may include the three Zoos Victoria properties).

_____ _____ _____ _____

14. What is your gender?
❑ Male ❑ Female

15. To which of the following age groups do you belong?
❑ 12-24 ❑ 25-39 ❑ 40-54 ❑ 55 and older

16. What is your country of residence? _____

17. If answer to previous question is Australia, in which city and state do you live and what is the post code?

City _____ State _____ Post Code _____

Thank you very much! Please feel free to add any comments you may have.

_____

_____

_____

B.5 Zoos Victoria Technology Survey

1. How did you expect to receive information during your *(current location)* visit? (Tick all that apply)
   - ❑ Signage
   - ❑ Printed maps
   - ❑ Interactive way-finding maps
   - ❑ Guided tours
   - ❑ Other (please specify) _____
   - ❑ Interactive computer games
   - ❑ Keeper presentations
   - ❑ Computer stations
   - ❑ Brochures

2. How satisfied were you with the information provided about each of the following:

	Fully Satisfied	Somewhat Satisfied	Not Satisfied	Unsure
Conservation	❑	❑	❑	❑
Animal exhibits	❑	❑	❑	❑
Habitats and environments	❑	❑	❑	❑
Directional maps	❑	❑	❑	❑
Purpose of the zoo	❑	❑	❑	❑

3. On a scale of 1 to 5, state your level of interest in each of the following, 1 being of no interest and 5 being a great deal of interest:

Interactive CD with educational games	1	2	3	4	5
Multimedia CD with information about plants and animals, and their natural habitats	1	2	3	4	5
Frequently updated website that offers an online extension of the zoo experience	1	2	3	4	5
Interactive multimedia stations with games related to nearby exhibits	1	2	3	4	5
Interactive maps located at various locations throughout the zoo	1	2	3	4	5

4. Have you visited the Zoos Victoria website?
   - ❑ Yes
   - ❑ No *(please skip to question 9)*

5. Please rate your overall experience with the Zoos Victoria website:
   - ❑ 1(poor)
   - ❑ 2
   - ❑ 3 (neutral)
   - ❑ 4
   - ❑ 5 (excellent)

6. If you have visited the Zoos Victoria website, for which of the following purposes did you use it? (Tick all that apply)
   - ❑ To plan today's trip
   - ❑ Personal enjoyment/education
   - ❑ To learn more about a specific animal
   - ❑ For information about events at the zoo (please specify) _____
   - ❑ Other (please specify) _____
   - ❑ Research for a school project
   - ❑ To learn about the role of Zoos Victoria
   - ❑ To purchase retail products or tickets online

7. How well did the website serve your purposes?
   - ❑ Completely
   - ❑ Moderately
   - ❑ Not at all

8. How did you first learn of the Zoos Victoria website? (Tick all that apply)
   - ❑ Zoos Victoria staff member
   - ❑ Advertisement
   - ❑ Signage at the zoo
   - ❑ Family or friends
   - ❑ Search engine
   - ❑ Other (please specify) _____

9. Do you anticipate using the Zoos Victoria website in the future?
   - ❑ Yes
   - ❑ No

10. Have you used any of the interactive multimedia stations located in the zoo?
❑ Yes ❑ No *(please skip to question 12)*

11. How did the interactive multimedia stations affect your experience?
❑ Positively ❑ Negatively ❑ No effect

12. Would you like to see more interactive multimedia stations here at the zoo?
❑ Yes ❑ No ❑ No preference

13. How important do you think it is for interactive multimedia technologies to be part of the experience here at *(current location)*?
❑ Very important ❑ Somewhat important ❑ Not important at all ❑ No preference

14. Have you visited zoos outside of Zoos Victoria?
❑ Yes ❑ No *(please skip to question 18)*

15. Compared to other zoos you have visited, how technologically advanced do you think *(current location)* Zoo is?
❑ Above average ❑ Average ❑ Below average ❑ No opinion

16. Of all the zoos you have visited, which have impressed you the most?

_____ _____ _____

17. What is your gender?
❑ Male ❑ Female

18. To which of the following age groups do you belong?
❑ 12-24 ❑ 25-39 ❑ 40-54 ❑ 55 and older

19. What is your country of residence? _____

20. If the answer to previous question is Australia, in which city and state do you live and what is the post code?

City _____ State _____ Post Code _____

21. Are you a member of Friends of the Zoos (FOTZ)?
❑ Yes ❑ No

Thank you very much! Please feel free to add any comments you may have.

_____

_____

_____

Appendix C: Additional Survey Data

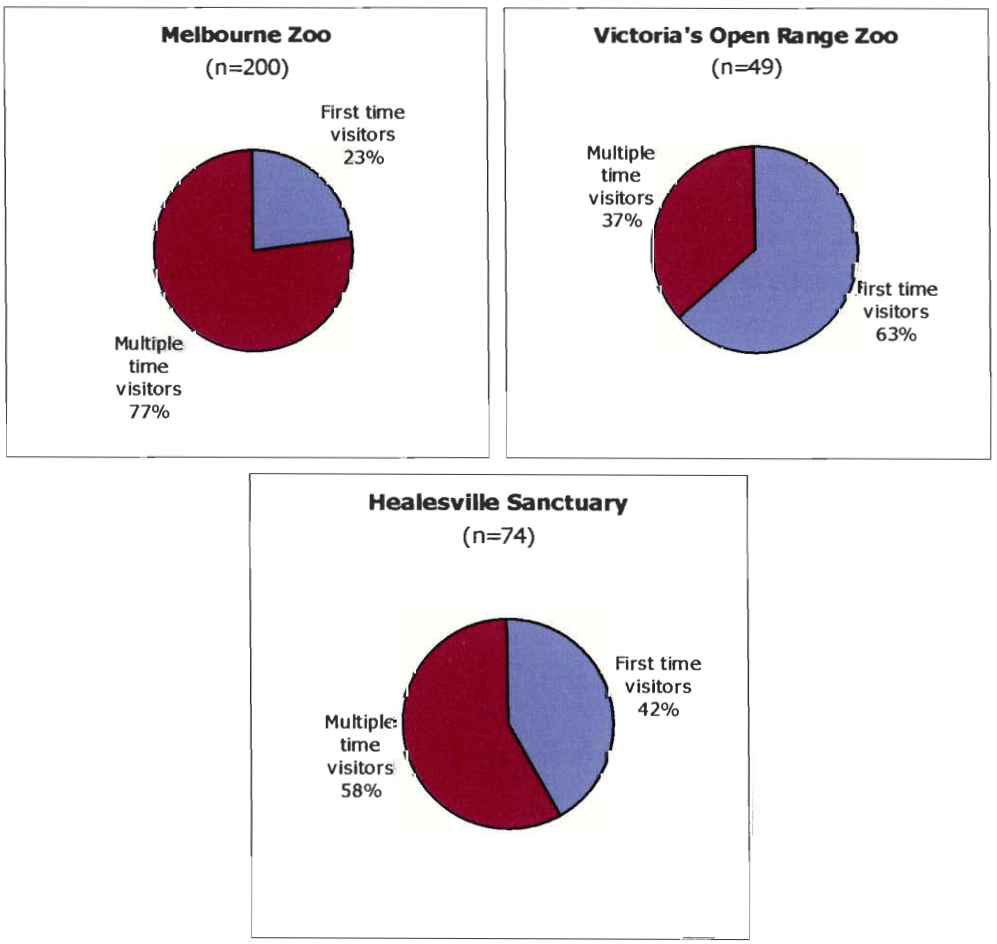
C.1 Data Concerning Previous Visitation to Zoos Victoria Properties

To determine which of the three properties of Zoos Victoria participants have visited in the past, how long ago it was and how satisfied they were there, questions of previous visitations were asked.

Previous visitation (on-site)

The pie charts below show the visitation at each property separately. The majority of participants at Melbourne Zoo and Healesville Sanctuary were return visitors, while most participants at Victoria's Open Range Zoo at Werribee were first-time visitors (Figure 31).

Figure 31. Previous visitation



Time of last visit (on-site)

Of participants who had visited previously, most of Melbourne Zoo (47.1%) and VORZ (43.8%) participants had been to the location within one year, whereas most visitors to Healesville Sanctuary (46.3%) last visited more than five years ago.

Previous visitation to other ZV properties

At each on-site location, about 50% of participants have been to the other two properties of Zoos Victoria, with the exception of Healesville Sanctuary visitors: 25% of them have been to VORZ in the past.

Previous visitation (off-site)

Of participants off-site, 60% had visited Melbourne Zoo previously, while only 30% and 25% of participants had visited Healesville Sanctuary and VORZ, respectively.

Time of last visit (off-site)

The majority of off-site participants who had visited Melbourne Zoo (47.9%) and VORZ (50.0%) previously had visited them between one to five years ago. Most participants who had visited Healesville Sanctuary (54.2%) previously had visited there more than five years ago.

Rating of overall experience

Participants at each site were asked to rate their overall experience at the Zoos Victoria properties on a scale from one to five, one being "bad" and five being "good." The average response for on-site participants to each of the three locations was 4.5 or over. The average responses for off-site participants were slightly lower, falling between and average rating of 4.4 (Melbourne Zoo) to 4.1 (VORZ and Healesville Sanctuary) (Figure 32). The higher average ratings by on-site participants could have been the result of a bias due to the fact that the participants had been present

at the site while completing the survey; being within the zoo environment may have influenced participants to rate their experience higher.

Figure 32. Overall rating of last visit

Rating	**MZ (n=200)**	**VORZ (n=49)**	**HS (n=74)**
1 (bad)	0%	0%	0%
2	1%	0%	0%
3 (neutral)	2%	8%	5%
4	14%	20%	20%
5 (good)	78%	49%	61%
NR	7%	22%	14%
Average on-site rating:	4.8	4.5	4.6
Average off-site rating:	4.4	4.1	4.1

C.2 Purpose of Visit Questions (On-site surveys only)

Knowing why visitors came to the zoo was useful in determining whether there was a correlation between motivations for visiting and opinions on interactive multimedia technologies.

Purpose of visit

More than 50% of participants at each on-site location indicated that they came to the zoo to "see the animals" and more than 40% of on-site participants indicated that they came to the zoo as a "family outing" (Figure 33).

Figure 33. Purpose for visiting

Purpose	**MZ (n=200)**	**VORZ (n=49)**	**HS (n=74)**
Family outing	49%	57%	42%
Bringing visiting friends	6%	18%	26%
To see the animals	56%	53%	51%
To see *Trail of the Elephants*	35%	N/A	N/A
Attending a function	1%	2%	0%
As part of a school group	3%	4%	1%
To see a specific exhibit	13%	2%	5%
Other	6%	6%	15%

Time of last visit to the ZV website

Of the participants who had been to the website, most had visited within the last year: 96.2% at Melbourne Zoo, 60.0% at Healesville Sanctuary, 66.7% at VORZ and 80.0% off-site.

C.3 ***Trail of the Elephants*** Exhibit Results

Of the 35% of visitors who stated the *Trail of the Elephants* as one of the reasons for visiting Melbourne Zoo, 24% have used the interactive multimedia stations. 88% of these respondents said that the stations had a "positive effect" on their experience at Melbourne Zoo. The other 12% said stations had "no effect" on their experience at the zoo. No respondents stated that the stations had a negative effect on their experience at the zoo.

Appendix D: Gantt Chart