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Adoption of WWWPages Among New Zealand Wineries

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Abstract

This paper uses diffusion of innovations theory to explain the adoption of WWW pages amongst wineries and includes the criticisms of diffusion of innovations theory such as pro-innovation bias, individual bias, recall problems and equity issues .The findings from two polls of WWW sites for NZ wineries undertaken six months apart are reported. The information collected indicates the trends in the adoption of WWW pages amongst small businesses over the 1999 – 2000 year. Trends in WWW page currency, design, content and administration are reported.

Keywords

Business-to-consumer web site, Regional small business Internet use, Web site content

BACKGROUND

Articles about the web in the popular press suggest that designers and owners exploit the modern capabilities of the web. Yet little is known about actual innovation rates in real industries. Preliminary studies point to adoption of web technologies at a much more basic level. In their study of the content and form of almost 500 web sites, Bucy et al. (1999) found that the vast majority of sites did not feature even basic capabilities such as video and audio links or web cameras. The study by Bucy et al. (1999) is an example of the first attempts to analyse a sample of web sites on the basis of content and design characteristics.

The aim of this study is to analyse the content and design of web sites for regional small business over a period of time to establish patterns of web site adoption. It uses diffusion of innovation theory to explain the results of a longitudinal analysis of winery web site content and design. The analysis suggests that while adoption of web sites among wineries is rapid, the technology adopted is simple and there is a degree of rejection and reinvention occurring. Although innovation of diffusions theory is well established, it has a number of valid criticisms that are worth addressing. In the next section, the use of diffusion of innovations theory is explored including some criticisms of the theory. The section concludes with the approach taken in this research to avoid such weaknesses in innovation research and the characteristics of innovation are presented.

DIFFUSION OF INNOVATIONS

Innovation diffusion is defined by Rogers (1995) as the process by which an innovation is communicated through certain channels over time among the members of a social system. Diffusion of innovations theory helps explain how innovations diffuse throughout any social system.

Diffusion of innovations theory has been used extensively throughout IT literature to explain the diffusion of IT innovations into society. Huff and McNaughton (1991) use diffusion of innovations theory to explain the adoption of laptop computers in a large Canadian financial institution. Diffusion of innovations theory has also been used to understand Internet in terms of growth patterns (Rai & Samaddar 1998) and rate of adoption (Prescott & Slyke 1997). Hull and Kaghan (2000) report that researchers and scholars are returning to the field of innovation studies for new perspectives and insights from a theory that was developed more than 50 years ago and criticised widely throughout the 1970's.

Diffusion of innovations theory is used to understand the real world and to sometimes simplify its complexities. Such simplifications have led to criticisms of diffusion of innovations theory. There are four main criticisms of diffusion of innovations theory: pro-innovation bias, individual blame bias, recall problem and equity issues. Rogers (1995) acknowledges these criticisms and recommends approaches to be taken to overcome the weaknesses of the theory. Each of the criticisms and suggestions for overcoming each problem are now addressed.

The first criticism of diffusion of innovations theory, possibly the criticism with the most severe implications, is *pro-innovation bias.* Pro-innovation bias refers to the implication of diffusion research that an innovation should

be adopted and is appropriate to be adopted by all members of a social system. The suggested remedy is to keep an open mind to investigating failed, as well as successful, adoption and rejection and reinvention (Rogers 1995). IT researchers are well aware of failures to adopt technological innovation. Research by Aldridge et al (1997) suggests that 20% of businesses will drop their web site because of unmet expectations. The rejection of Internet technology is evident in the phenomenon of Internet 'churn' where users try the Internet but do not adopt it as commented on by Gibbel (1997).

The second criticism of diffusion of innovations theory is the tendency to blame individuals for not uptaking the innovation without looking further into the problem. This is known as *individual blame bias* which is the tendency for diffusion research to side with the change agents rather than the individual potential adopters. To address this issue, Rogers (1995) suggests that researchers avoid using the individual as the unit of analysis.

Speaking with individual business owners also brings the problem of relying on what the individual can reliably tell the researcher. This is known as the *recall problem* which refers to the tendency for diffusion research to rely on interviewees recall of events and actions. Rogers (1995) suggests researchers use methods that don't rely on recall data such as longitudinal studies to overcome this problem.

Another danger with innovation research projects is that majority groups become further disadvantaged by the innovation. Such *equity issues* occur in innovation research when the gap between the 'haves' and 'havenots' is widened as a result of the adoption of an innovation. The suggested remedy is to be aware of the equity issues and where possible design diffusion studies to minimise the impact of the adoption of an innovation on a minority group or encourage disadvantaged groups to develop adoption programs of their own (Rogers 1995).

This study takes the criticisms of diffusion of innovations theory into account through several initiatives. Firstly, by including successful web sites as well as those that have discontinued their web pages, there is less focus on only successful innovation and therefore pro-innovation bias. Secondly, by using the winery business as the unit of analysis rather than the individual manager of the winery the individual unit of analysis is avoided. Thirdly, through collecting data over a period of time to build up a 'moving picture' of the diffusion process rather than a 'snap shot' of the current situation eliminates any reliance on recall data. Finally, by exploring the population of New Zealand Wineries without choosing case studies that showcase only successful projects the study does not encourage inequity gaps to widen.

Innovation Characteristics

Researchers using diffusion of innovations theory to explain technology innovation use the characteristics of innovation adoption. In their project to establish a community information network Vaughan and Schwartz (1999) use the characteristics of innovation adoption to plan and design their community web page. These are motivation (represented by relative advantage and compatibility), complexity, trialability and observability.

- Motivation refers to the motivation behind the adoption. In addition to economic factors, variables such as reputation and culture can also be players.
- Complexity suggests that innovations that are easy to understand and use are adopted more readily.
- Trialability suggests that innovations that allow potential adopters to experiment with the technology are more readily adopted.
- Observability refers to innovations that can be introduced in an environment where there is opportunity to observe implementations in a similar setting close by are more readily adopted.

In this study motivation, complexity, trialability and observability issues are used to explain the trends in winery web site content and design. The issue of rejection where the innovation is experimented with but not accepted and reinvention where a previously rejected innovation is modified, experimented with, and subsequently adopted, is also covered to provide a balanced perspective of winery web site adoption.

METHOD

The methodology chosen for this study is a longitudinal poll of New Zealand winery web sites to monitor trends in WWW content and design over time. Conducting the poll at six month intervals and visiting the web site to record data mean that there is no reliance on interviewees to recall information. The web sites were located through the NZ wineries web site, which lists 236 vineyards and wineries. The site is maintained by the Wine Institute of New Zealand (1999) as part of its policy to represent the wine industry in all matters that require a coordinated approach. The list is published online at http://www.nzwines.com/wines.

The first poll took place in November 1999. Thirty-four winery web sites were surveyed. The second poll took place in May 2000. Eighty-five web sites were surveyed. Between November 1999 and May 2000 there was more than a 100% increase in locatable winery web sites, from 34 to 86. This represents a rapid adoption of web site technology among New Zealand wineries.

The number of pages on the site, menu button type and location, and single or multiple home page design was recorded for each web site. Some general information such as the URL, vineyard name and vineyard location were also recorded. The content of the web sites was categorised and recorded as: historical content, information on the winery philosophy, family, soil types, topographical location, awards, ISO certification, quotes from reviewers, type of pictures (family, vineyard and marketing), information recorded about the winemaker (experience, techniques and qualifications), ordering facilities (distributor contact details, electronic order form, mail order form), news (product releases, exhibition news and personal news), currency of the information, visitor information (recipes, cellar guides, community information, local and international visitor information), links to other web pages, customer surveys, and mailing list opportunities.

RESULTS

The results of this study are analysed using theory of innovations characteristics of adoption to explain the rapid adoption of web pages among New Zealand wineries. As mentioned in the literature section, these characteristics are motivation, complexity, trialability, observability, and rejection and reinvention.

Motivation

Theory of diffusion of innovations suggests that the presence of motivation to implement new technology positively affects the rate of adoption. Without speaking to the wineries, it is possible to work out the intent of the web site from its content such as links, type of information given and the pictures shown. This approach gives a more realistic representation of motivation because it discounts any interviewee bias and records actions rather than intentions.

Where wineries provide links on their pages, the links lead away from competitors. Hot links back to relevant information in the NZwine web site are rare although links to such material could be useful. In November 1999 around a third (34%) had links to other related web sites including online wine journals, wine sites, associated local businesses and industry associations. This percentage decreased to just over a quarter (26%) of all web sites in the May 2000 poll although the frequency doubled to 22 meaning that around 12 of the new sites in the May 2000 poll included links to other web sites. This result suggests that wineries adopt websites to promote themselves and to maintain their reputation as leaders in their field.

Information provided on the winery web sites provides some insight into the intended reader of the site. Apart from the business information, some wineries choose to provide news of wine releases, coming wine conventions and interesting news of a personal nature. In November 1999, fifteen of the web sites (43%) provided information about the local community, 23 percent included suggestions for recipes (23%) to complement wines and 17 percent provided a cellaring guide (17%) to suggest how long wines can be stored and when they are at their best for drinking. Six months later, wineries provided slightly less personal news (14%) but around the same amount of news releases and convention news. The inclusion of social and event information suggests that wineries are not motivated by economic gains only. There is a desire to provide informative material and this is seen as a means to economic gain.

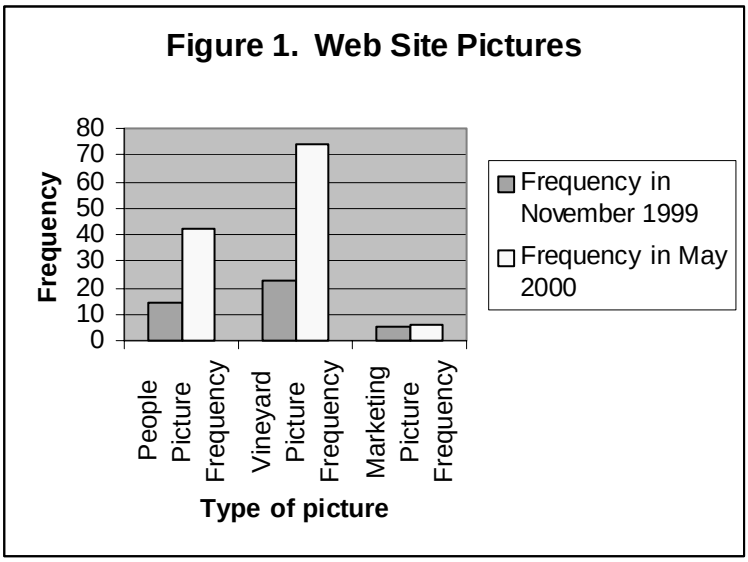
Pictures shown on the web pages also provide some insight into the intended reader of the pages. Among the winery web pages, depicting local surroundings and the winery were popular. In November 1999 two thirds (66%) of web sites had pictures of their own vineyard. Well over one third (40%) had photos of the family and vineyard staff. Mostly these photos were semi-informal and some included children and family pets. Six months later more than three quarters (86%) of the wineries use pictures of their own vineyard and almost half (49%) have pictures of the owners. Marketing pictures of generic subjects that have no relation to the vineyard or staff remain unpopular (7%) (see figure 1).

The type of pictures used suggests that wineries like web visitors to know about the winery surroundings and the people who own the winery. This is also a motivation to represent their reputation and superiority on the web. The selling point of many of the wines offered by New Zealand wineries is the individuality and small production sizes so they would not seek to appear mass marketed on their web site.

In summary, it appears that wineries are motivated to adopt web sites through economic gain, to maintain their reputation and to provide service to their customers.

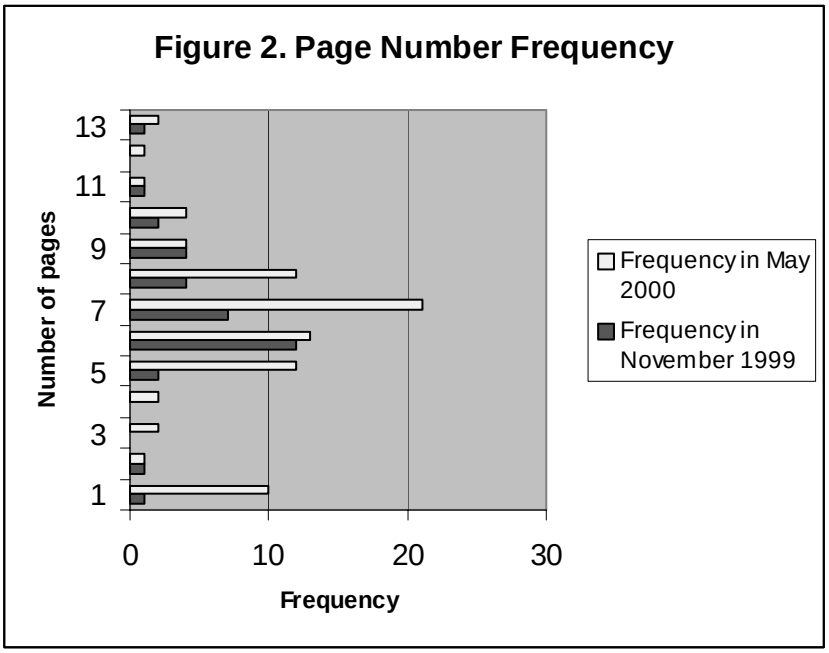
Complexity

Theory of innovations adoption suggests that the complexity of an innovation positively affects the rate of adoption. The winery web sites choose simple designs. The simplicity of winery web pages is reflected in the number of pages on the site, and in the page and menu design.



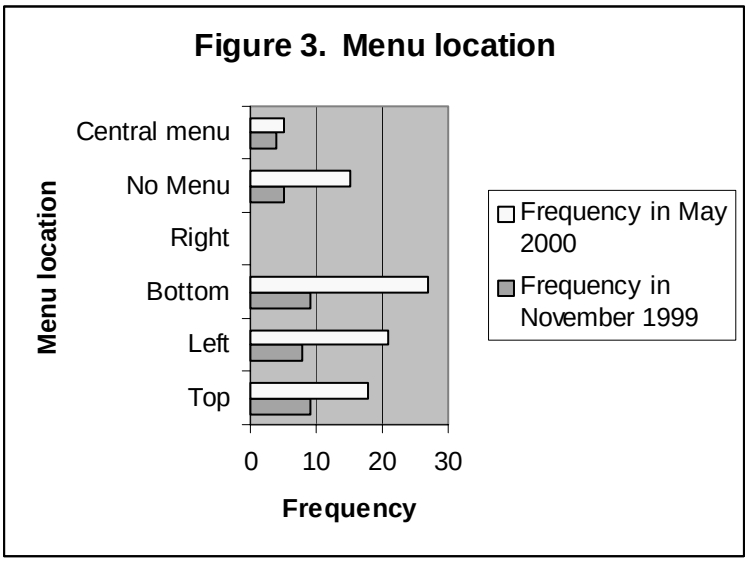
1999 N=34
2000 N = 85

In November 1999 more than half (54%) of the winery web sites consisted of six to seven separate web documents linked by hyperlinks (see figure 2). In May 2000 around half of the pages had between five and eight pages. This result can be explained by the diversification of web site developers. In November 1999 there was one major developer. By May 2000 there were many different developers designing winery web pages, because of industry changes. The relatively small number of pages per web site reflect simplicity in design.



1999 N = 34
2000 N = 85

An increasing design trend is to have a one screen home page that launches into several options. In November 1999 roughly half (49%) of the web sites had a home page that fitted on one screen with the remainder of web sites requiring the user to scroll down to be able to see the rest of the document. By May 2000 more than three quarters (83%) of winery web sites used a one screen home page. This represents an increase of 25 percent and a move to a more structured and easy-to-use web page design.



1999 N= 34
2000 N = 85

Ease of navigation can be simplified by providing menus for the user to choose from. In November 1999 the majority (86%) of web sites employed a menu for navigation (see figure 3). There was equal preference for top, left and bottom menu bars (25%, 23%, 26% respectively). Four of the sites utilised a menu at the centre and many duplicated the menu bars. For example, a major menu bar may be placed to the left and a smaller menu bar along the top of the page. In May 2000 there are more web sites with a bottom menu bar (31%) and the remainder are top and left menu bars (21%, 24% respectively). Bottom menu bars are sometimes difficult to find because the user is required to scroll to the bottom of the page. However, with the rise in popularity of one-screen home pages, the disadvantage of scrolling to the bottom menu bar is diminished. Perhaps this is why the bottom menu bar has become so popular. It was surprising that in May 2000 there were 15 web sites that did not use a menu. Many of these were new entries. The popularity of the central menu had slowed to six percent by May 2000 but the web sites still used duplicated menu bars. This result shows simplicity in menu and navigation design.

In summary, this study suggests that simplicity in web site design encourages rapid adoption of web technology.

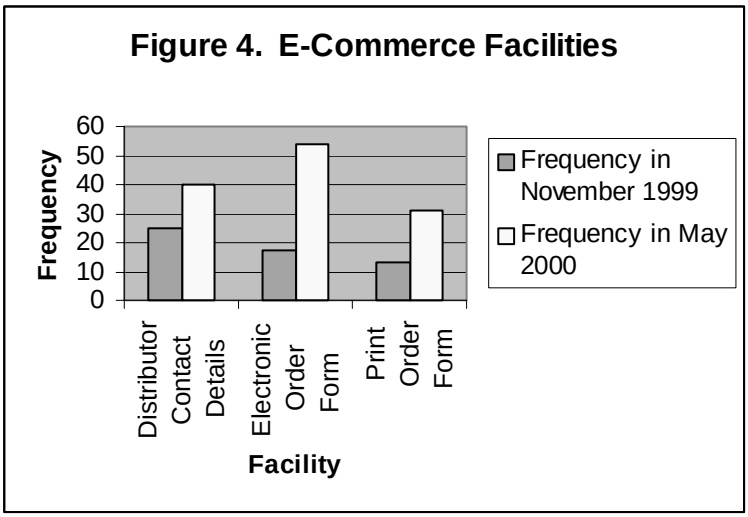
Trialability

Theory of diffusion of innovations suggests that trialability of an innovation positively affects the rate of adoption. This study provides evidence of the wineries experimenting with the provision of e-commerce facilities and news.

Three approaches to e-commerce facilities that have been identified in this study among wineries are: provision of a list of distributor contact details, electronic order forms and order forms that can be printed and sent either by fax or post. In November 1999 more than two thirds (71%) of the web sites listed the details of international and national distributors (see figure 4). Almost half (49%) of the web sites provided an electronic order form. Over one third (37%) encouraged prospective buyers to print out the order form and submit it by fax or post. Often a combination of distributor addresses, electronic forms and free fax or free post alternatives are available. In May 2000 less than half (47%) of the web sites listed the details of international and national distributors. This represented an overall decrease of more than 20 percent. Almost two thirds (63%) of winery web sites provided an electronic order form, representing an increase of ten percent. The print order form remained the same.

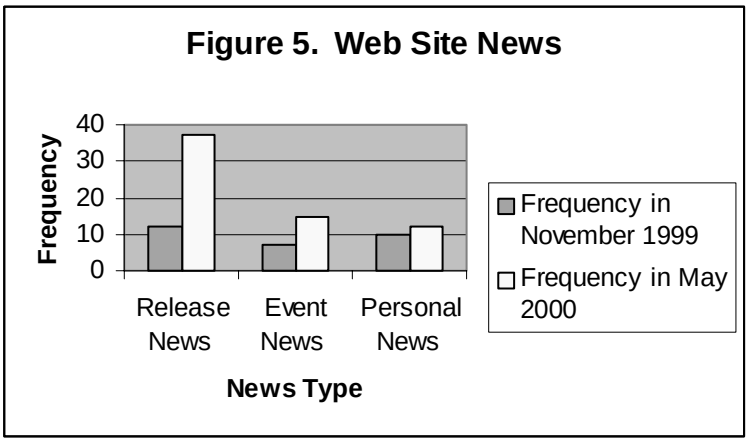
These results suggest that web sites have experimented with providing e-commerce facilities in several different forms. It appears that providing dealer information has proved less successful in the overall situation than providing an electronic order form.

Winery web sites have also experimented with the style and type of news to be provided on the site. In November 1999 over one third (34%) of the web sites reported news of recent releases of wine vintages (see figure 5). Seven (20%) of the web sites reported news of conferences, wine festivals and other relevant local



1999 N=34
2000 N=85

events. Ten (29%) of the sites included personal news such as birth announcements, details of family holidays overseas and family illness. In May 2000 the proportion of winery web sites reporting news of recent wine releases and upcoming events had remained about the same. However, the inclusion of personal news had fallen from almost 30 percent to under 15 percent. This suggests that wineries are experimenting with the type of news to provide on the web pages.



1999 N=34
2000 N=85

In summary, this study suggests that provided that wineries have a reasonable amount of control over the design of their web site and their ability to make changes periodically, web site technology offers trialability which allows wineries to adapt their web site to their own needs thus increasing the rate of adoption of the technology.

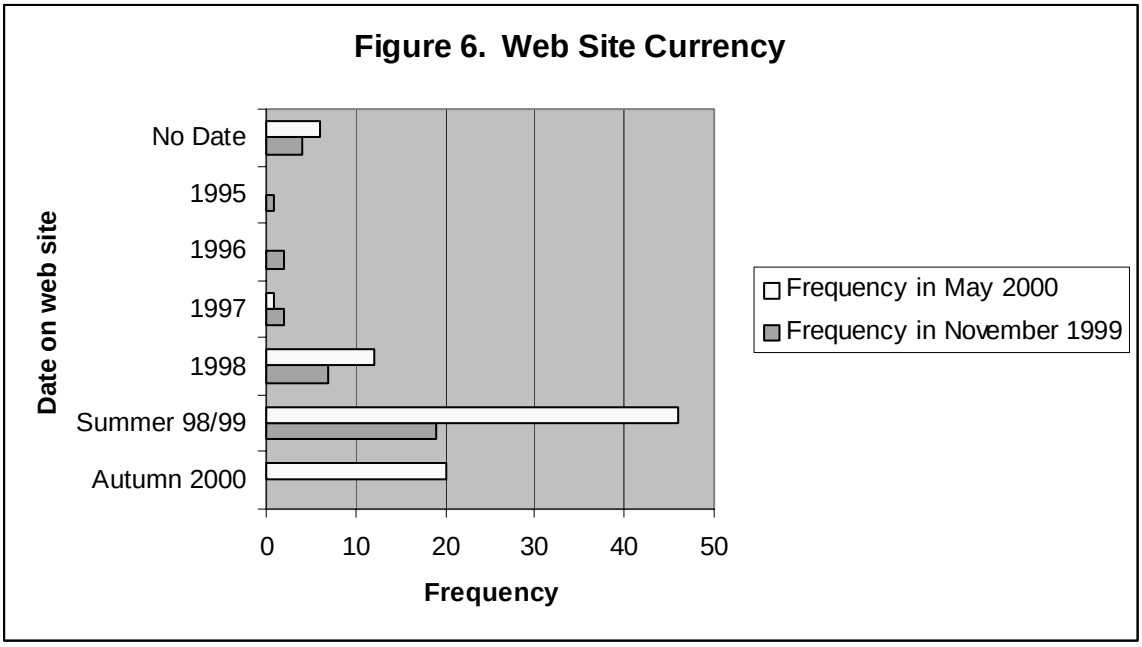
Observability

Theory of innovations diffusion suggests that the observability of an innovation positively affects the rate of adoption. The regional growth of winery web sites suggests that observability plays a part in the adoption of winery web pages. Some regions have a higher concentration of winery web sites. In November 1999 the largest concentration of winery web sites was in the tourist towns of Marlborough (26%) and Martinborough (21%) which are close to the capital Wellington and to complimentary tourism attractions. In May 2000, the Martinborough winery web sites had increased from seven to 13 while the number of Marlborough web sites remained the same. The largest growth regions were in the agricultural regions of Blenheim, Auckland and Hawkes Bay. In geographical areas where there are just one or two winery web sites among the community there has been little growth over the six months. Hence, the observability of winery web sites owned by community members may also be responsible for the high rate of adoption.

Rejection and reinvention

As suggested by critics of adoption of innovations theory, as the wineries experiment with the technology they reinvent and abandon web pages. Of the 34 web sites included in the November 1999 poll, 14 were not locatable in May 2000. The disappearance of four of these 16 was explained by the winery no longer being listed as a business. Four could not be found because the web site had been removed. The remaining six web sites were temporarily unavailable while the web site underwent a total redevelopment. Of the May 2000 winery web site poll, twenty web sites were continuing and 66 were new.

In addition to the four winery web sites that were removed, there were 12 web sites in the November 1999 poll that were more than two years old and appeared as though they had been posted on the web and forgotten about. In the May 2000 poll there were a similar number of web sites that had not been updated in the last two years.



1999 N = 34
2000 N = 85

SUMMARY

Growth in New Zealand winery web sites follows the global trends with a 100% increase in web sites over a six month period. This study has also found that New Zealand winery web sites are keeping with a simplistic web design despite the maturation of much more sophisticated internet technology. Although a diversification of web developers has occurred, the average winery web site consists of around six to seven linked web documents, and the majority of designs use a menu for navigation. It appears that a simple web page design suit wineries best.

Although the adoption rate is very high, there is some rejection occurring. This study found that some wineries are abandoning their web sites rather than maintaining them. Currency remains an issue, with only 20% of web sites current within six months of the access date, a statistic that has remained the same from November 1999. The May 2000 poll found that outdated sites remained posted on the web and appeared to have been abandoned. Outdated web pages create uncertainty for the customer because it is difficult to tell if the establishment still exists. Availability issues with ordering product may also arise.

The trends in winery web site content and design identified in this study suggest that wineries are implementing similar web site designs to the ones they see at other winery web sites. The tendency to create web sites that provide links to other web sites or that encourage interaction with the customer is limited. The currency issues also suggest that many web sites are posted on the world wide web with little thought for their maintenance and upkeep. Perhaps there is a perception amongst wineries that a mere presence on the web is required to do business on the web. In future studies it may be important to make the distinction between wineries that adopt the idea of having a winery web site and those that go one step further to adopt the process of using the web page as part of the business.

CONCLUSION

This study has used the adoption of innovations theory to explain the trends in winery web site development over a six month period from November 1999 to May 2000. The trends were analysed in terms of motivation, complexity, trialability, observability and rejection/reinvention.

Using the adoption of innovations theory as a tool for explanation, it is suggested that the high rate of adoption of winery web sites is due to:

- High motivation to adopt based on economic and reputation gains.
- Ways to avoid complexity through simple but effective web site designs.
- Opportunities to experiment with the technology and to adapt the technology to the specific needs of the business.
- Opportunity to observe the web page development of other members of the winery community.

The adoption rate of web sites is affected by some wineries rejecting web site technology either actively through removal of the site from the web or inactively through abandoning the web site. Others re-invent their web-sites after initial implementation to suit their specific needs.

It is thought that having a web site will not suit all wineries. The challenge for future study is to track the adoption rate over the next period and to analyse abandoning and continuing winery web sites. This analysis will reveal more about the maturation of Internet technology. We may see web developers and owners adopting more complex Internet capabilities or it may be that developers and owners will continue to find simple Internet adaptations suitable to their needs.

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