

An investigation of e-business use by Australian wineries

Barbara Roberts ¹
Edmond Fitzgerald ²

¹Department of Economics and Resources Management,
University of Southern Queensland
e-mail: Barbara.Roberts@usq.edu.au

²Faculty of Business,
University of the Sunshine Coast
e-mail: efitzger@usc.edu.au

Abstract

This study investigates the nature, extent and benefits of e-business adoption by Australian wineries. Exploratory and confirmatory data has been collected in a pilot study using semi-structured interviews with several wineries. A survey of all Australian wineries will follow. The data will be analysed to: 1) determine the nature, extent and benefits of e-business adoption by wineries; and 2) identify significant factors that currently influence e-business usage by wineries. Contributions to theory are expected in the areas of adoption and diffusion of e-business, and to practice with regard to strategic directions involving e-business.

Keywords

e-business, e-commerce, IT adoption and diffusion, Australian wine industry

INTRODUCTION

The adoption levels of e-business by Australian wineries will be investigated in order to identify their nature, extent and perceived benefits. Identification of significant factors that influence the various adoption levels and e-business strategies of wineries will also be a priority in order to understand, explain and describe the current situation. Contributions to theory and practice are expected.

BACKGROUND TO RESEARCH

Government has higher confidence in e-business benefits than businesses

Government reports into the use of e-business by small and medium size enterprises suggest that while the potential benefits of e-business are significant, for example by improving competitiveness via increased revenue and reduced costs, many businesses do not appreciate the relevance or opportunity that e-business presents. Furthermore, the reports suggest that businesses are risking failure by their lack of initiative and entrepreneurial behaviour (Brown 2002; NOIE 2000, 2002; Parker & Papandrea 2002).

The Australian Government, through organisations such as NOIE (The National Office for the Information Economy), RIRDC (the Rural Industries Research and Development Corporation) and national consumer organisations funded by government such as SETEL (Small Enterprise Telecommunications Centre), acting as proponents of change, champion the uptake of e-business for the good of the Australian economy and health of Australian business.

The rate of uptake of e-business by Australian businesses in general, and Australian small and medium size enterprises (ASMEs) in particular, is judged by these government agencies as slow, and “not commensurate with expectations” (Brown 2002, p. 3). The adoption and diffusion rates of e-business in practice do not match the adoption rates that the government desires, and a gap appears to have emerged in the level of benefits from e-business use predicted by theory and those obtained in practice. This study’s detailed examination of the adoption and diffusion of e-business within the wine industry may improve understanding of the major forces that influence what happens in practice, and why. In turn this may give further insight into the actual and theoretical benefits of e-business.

Reasons for selecting a single industry

The decision to limit the scope of the research to a single industry ensures that the units of analysis used in the research share a common industrial and market environment, thus reducing the impact of confounding factors such as those introduced by differing environments and industries. The common industrial environment will decrease the generalisation of research findings on the one hand, but on the other will increase the study's internal validity, and hence increase the quality of the contributions to theory and practice.

Selection of wine industry

The wine industry was selected for this study as it is potentially a fertile area for the implementation of e-business. The industry covers a wide range of activities from agricultural production and manufacture to marketing; it is a large and growing industry that is increasingly important to Australia; it is also increasingly linked with the tourism industry, providing additional opportunities for growth and strategic partnerships and collaboration.

The wine industry has a current annual export value of over 2 billion dollars, with exports continuing to grow in volume and value. While domestic sales are currently roughly equivalent to export sales, the prospect for growth is much higher in the export markets (McGrath-Kerr Business Consultants Pty Ltd 2002; WFA & AWBC 2000). The major export destinations of the UK, the US, Canada, Germany and Europe all rank highly in terms of their e readiness, as does Australia, rated sixth in 2002 (Economist Intelligence Unit 2002). Continued growth in sales, particularly exports, is critical to the future maintenance of a healthy stock level (supply) to sales (demand) ratio (WFA & AWBC 2000). Wine is judged to be a suitable product for e business because the marketing of wine is information intensive - for example: regional, varietal and winery reputation information (Aplin 1999).

Winery numbers and size

The number of wineries in Australia in 2003 is listed as 1625 in the printed version of the ANZ Wine Industry Directory, with 1622 listed in the electronic database version of the same directory (Winetitles 2003). The winery companies vary greatly in size, and there is increasing consolidation resulting in larger and larger wine companies. Of the 1622 individual wineries, 100 of them are part of a parent wine company. Twenty-three wine companies own more than one winery, and amongst these companies, the winery numbers range from fourteen to two. The nine wine companies owning three or more wineries dominate the top 20 rankings of Australian wine producers using a number of different metrics, including tonnage of grapes crushed, vineyard holdings, sales of branded wine and exports. The Australian wine industry is dominated by four major wine producing companies - Southcorp Wines, BRL Hardy, Orlando Wyndham, and Beringer Blass, which together account for 70% of wine production. For the ten-year period up to 2002, total winery numbers increased at the rate of one every five days, while during the three years 2000 – 2002 the rate has increased to one every three days. Most of the new wineries are small, with annual production of less than 100 tonnes (Australian Wine Online 2003).

Individual wineries vary significantly in size and corporate structure. The large wine companies, formed mainly through mergers and takeovers, have contributed greatly to the growth of Australia's wine industry by generating sufficient market strength, economy of scale, and capacity to develop a global market. Increasing corporatization and alliances also enable wine companies to establish a wide network of contacts, and the capacity to appoint staff to key global positions (Anderson 2001). For example, the Southcorp group, Australia's largest wine producer, is now one of the top ten wine companies (by size) in the world. Southcorp controls over twenty major brands including Penfolds, Lindemans, Rosemount Estate and Wynns and accounts for approximately 30% of sales to each of the domestic and export wine markets (Australian Wine Online 2003).

The wine company as the unit of analysis

The unit of analysis for this study is the parent wine company. Information from case study interviews already conducted with several wine companies that own multiple wineries has verified that e-business strategy formulation and implementation occurs at the corporate level rather than at an individual winery level. However, for ease of discussion, the term "winery" will be used to represent a wine company, regardless of the number of individual wineries listed under the wine company name.

The position of the winery is central in the wine industry. Wineries buy from grape growers and other suppliers (e.g. glass and packaging) to produce a large variety of wine products, and then actively market their product to suppliers, distributors, retail outlets and individual consumers. Wineries conduct transactional relationships with almost all stakeholders in the industry. As e-business supports and enables transactional relationships, significant potential exists for wineries to adopt and use e-business as part of their business strategy.

Research suggests that the benefits of e-business adoption by wineries are the same as the benefits identified for other industry sectors: lower production and overhead costs; provision of better services to customers, partners and media; as well as gaining a competitive advantage in marketing (Major 2000a).

RESEARCH TOPIC

Before the difference in the level of benefits of e-business predicted by theorists and practitioners can be assessed, it is necessary to have a detailed understanding of current e-business practice. It is necessary to understand how wineries currently use e-business in practice in order to identify factors that significantly affect their e-business adoption and implementation decisions. It is also important to collect information on how wineries judge the benefits of e-business, and where in the supply and value chain the benefits are identified and assessed.

Research question

Following from the above discussion, the overarching research question to be addressed by this study is:

What are the nature, extent and benefits of e-business adoption by Australian wine companies?

LITERATURE REVIEW

Definitions of e-business and e-commerce

'E-business' is a term widely used to describe a varying range of Internet-based activities. The term 'e-commerce' is also often used to describe a similar range of Internet activity, and the degree of overlap between the various definitions and functional uses of the terms e-business and e-commerce is very high. Most definitions are general in nature, as the following examples demonstrate.

"E-business can be defined as publishing information and performing different types of transactions, or chains of them, electronically over Intranets, Extranets, and the Internet. This may be within organisations, or between them, and with the involvement of individual customers" (Bakry 2001).

"As a way of doing business, e-business refers to the use of business processes that leverage technology – and especially the Internet and World Wide Web (the Web) – to maintain or create competitive advantage" (McKie 2001).

A recent OECD (2002) definition of e-commerce, with an emphasis on its transactional nature and explicitly including the three areas of business-to-consumer (B2C), business-to-business (B2B) and business-to-government (B2G) reads:

"The sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public and private organizations, conducted over the Internet. The goods and services are ordered over those networks, but the payment and the ultimate delivery of the good or service may be conducted on or off-line."

In this paper the terms e-business and e-commerce are used as follows. E-business will be used in the broadest sense, and refer to all business processes that use the Internet. The term e-commerce will be restricted to the conduct of online transactions, in line with the OECD definition given above. E-commerce is therefore a subset of e-business. E-business will include activities that support business transactions, such as e-mail, Internet research, publishing business data and marketing, on-line banking, as well as e-commerce transactions.

Economic and other benefits of e-business

Much has been written about the uptake, benefits, barriers and consequences of e business (NOIE 2000; Parker & Papandrea 2002; Rodgers, Yen & Chou 2002). The Australian Government, through various departments and agencies, promotes the adoption of e business by ASMEs in particular (Brown 2002) because of the perceived benefit that e business is expected to contribute to the future of the Australian economy. The economic effects of e business adoption are described under a variety of labels such as 'new' (Porter 1998), 'online' (Dunt & Harper 2002), 'Information' and 'Internet' (Allen Consulting Group 2002). Michael Porter's (2001, p. 65) claim that "Internet technology provides better opportunities for companies to establish distinctive strategic positionings than did previous generations of information technology" supports the high confidence shown in e business by government bodies and many business analysts (Anderson 2000; NOIE 2000).

Two major benefits of e-business adoption are commonly identified as (Allen Consulting Group 2002; OECD 2002):

- Reduced costs; and
- Increased demand through increased services and new markets.

These benefits directly flow from the Internet's intrinsic characteristics of providing low-cost and high-speed global communication, effectively reducing the impact of geographic position, and extending presence in the marketplace to twenty-four hours a day, seven days a week. Other benefits of e-business adoption promoted by NOIE are to gain competitive advantage, provide new ways of generating revenue, improve relationships with suppliers, improve services to clients, increase collaboration in the supply-chain, and improve business practices through the development of new business models built around the capability of networking (NOIE 2002). The assessment of e business benefits is acknowledged to be complex however, and includes a combination of direct and indirect, and short and long-term benefits (Poon & Swatman 1997).

E-business adoption leads to change in business and industry structures

A review of the literature identifies e-business as a transforming technology that results in significant changes for businesses (Bakry 2001; Porter 2001; Tetteh & Burn 2001). It is commonly accepted that adoption of e business has the potential to alter industry structures and business models (Mahadevan 2000; Srinivasan, Lilien & Rangaswamy 2002; Wen, Chen & Hwang 2001). Examples of new business models made possible by the growth of e-business are online exchanges, consortia, and e markets (Hoffman, Keedy & Roberts 2002).

E-business is also considered by some as a disruptive technology requiring a paradigm shift for which no adequate prescription or formula has yet been developed, and which challenges managers to re think, re define, re examine, re engineer and re invent business strategies and processes (Dhillon, Cossa & Hackney 2001; Lee 2001). This makes strategic planning all the more difficult because of the uncertainty of factors to be considered, and the unknown consequences that will result (Porter 2001).

Lack of strategic planning for e-business in the wine industry

The Australian wine industry enjoys a long history of careful planning and cooperation between all national stakeholders in managing the long-term health of the industry. For example, the current strong growth is the realisation of the Vision 2025 plan launched in 1996 (WFA & AWBC 2000). However, there is little evidence that industry-level planning for strategic deployment of e-business, and e commerce in particular, is occurring. Key industry documents used to report strategic plans or analyses of the current and future wine markets rarely make mention of the Internet let alone potential benefit from e business (ACIL 2002; QW&GPA 2001; WFA & AWBC 2000).

Little research into the role that e business might play in the business strategy of wineries has been conducted. The work that has been done is either limited to particular geographic locations within Australia or is very general in nature (e.g. Aplin 1999; Major 2000b; Sellitto 2002). While use of the Internet for basic e-business activities such as e-mail, Internet research, and gaining online wine export approvals are becoming standard for many wineries, the adoption levels of e-commerce by wineries are reported to be low (Sellitto 2002).

Practice and theory

This research into the practice of e-business adoption by wineries will be related to selected theories on adoption and diffusion of innovations in order to see how well the theories help explain the practice. In so doing, some refinement or extension to theory may be possible. It is expected that this study will contribute to theories of adoption and diffusion of technology innovations, in particular as they relate to web technologies and e-business.

Existing theories relating to adoption and diffusion of innovations that use organisations as their unit of analysis have greater relevance to this research than those that deal with adoption and diffusion of innovations by individuals, due to the vastly different nature of the unit of analysis. One such theory is examined next.

Diffusion of Innovation Theory

A dominant theory relating to the way that innovations are first adopted and the rate at which subsequent adoption and usage diffuses through the population of potential users is Rogers' (1995) **Diffusion of Innovation (DOI) theory**. The DOI theory posits that the percentage of adoption as a function over time follows an S-curve and includes the concept that a critical mass of about 10-25% adoption is required for the innovation to "take off". The theory also posits that the major sources of factors (independent variables) influencing adoption rates by organisations are characteristics of the innovation itself and characteristics of the adopting organisation, some positively (+) and some negatively (-) as depicted in Figure 1.

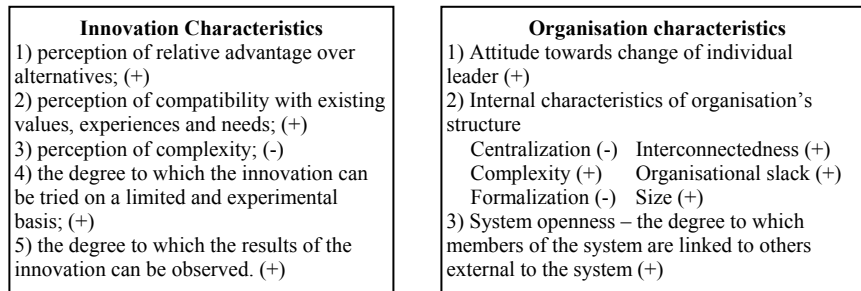


Figure 1: Independent variables related to innovation adoption by organisations from Rogers' DOI theory (1995)

The extent of impact of the identified factors varies, and the boundaries between some factors is indistinct, with organisation size for example possibly influencing organisational slack and masking other aspects such as technical expertise and available resources (Rogers 1995).

Trust, Risk and Knowledge of Internet Technologies adds to complexity of e-business

E-business is complex in nature and requires specific knowledge and skills. Lack of relevant knowledge has been identified as a significant barrier to web technology adoption (Chatterjee, Grewal & Sambamurthy 2002; Nambisan & Wang 2000). Adoption decisions are also complicated by factors that are directly related to, and to some degree specific to the nature of the Internet. Security and trust issues emerge as significant factors for the Internet, and these are considered next.

Building trust and confidence involves addressing consumer concerns, and the legal and financial risks unique to the use of web technology (NOIE 2000; Schoder & Yin 2000). For consumers, privacy and security concerns are major barriers to buying online, negatively impacting on the future growth of online markets (Miyazaki & Fernandez 2001). Addressing trust and risk issues are major, complex tasks in the development of e business strategy (Hoffman, Novak & Peralta 1999; Urban, Sultan & Qualls 2000). Consideration must be given to: increasing reliance on digital assets; increasing vulnerability to cyber crime and fraud; having a mechanism for reliably assessing different risks; integration with existing systems; and loss of control of infrastructure and business processes as more stakeholders become involved (Czuchry, Yasin & Bayes 2001; Jones et al. 2000; Kandra 2001; Radding 1999).

Contribution to theory

As illustrated in Figure 1, many factors contribute to the adoption rates of innovations by organisations, and e-business is acknowledged in the literature as having complex characteristics. A combination of organisation and innovation factors will be considered in this research, along with consideration of the potential impact of external contextual factors such as the influence of others in the supply chain, which are not included in DOI theory.

RESEARCH PROPOSITIONS

By collecting information that allows the current nature and extent of e-business adoption to be described and quantitatively analysed, various propositions derived after reviewing literature will be explored. The first proposition predicts where in the chain of winery processes most e-business processes will take place. The second proposition predicts that critical factors influencing adoption behaviour will not be limited to characteristics of the innovation or the adopting organisation, but will also come from other sources (for example, other stakeholders in the supply chain). The third proposition predicts that most e-business benefits will derive from B2B interactions, which are largely hidden from public view, rather than from the B2C processes, which are more visible and have thus far attracted the majority of academic attention. The fourth

Roberts, Fitzgerald (Paper #278)

proposition predicts that the perception of e-business as a complex innovation contributes to businesses choosing either not to adopt or to adopt at low levels. This last proposition is based on DOI theory of the negative impact of complexity in innovations and the many research papers that claim that lack of e-business knowledge and skills is a common barrier.

- P1: E-business usage by wineries will almost entirely occur in the post-production marketing stage of operations.
- P2: Some critical factors influencing e-business adoption by wineries will derive from external contextual sources.
- P3: The benefits for wineries of B2B e-business adoption are greater than B2C e-business adoption.
- P4: An increase in the complexity of e-business processes is positively related to perceptions of increasing management risk.

METHODOLOGY

The research design consists of two major stages of data collection. The first stage is the conduct of interviews with several winery representatives in order to identify and explore factors that act as motivators, facilitators or barriers to the adoption of e-business technologies. The second stage of the study will consist of a mail survey of all Australian wineries, aimed at collecting statistical data on their actual usage patterns of e-business, as well as exploring the significance of the identified factors that act as the major drivers and barriers for the population. The census will ensure that no assumptions are made that will limit the findings, and ensure the nature and extent of e-business use by wineries can finally be described and analysed. The initial interviews are considered necessary in order to identify the relevance of factors identified during the literature review to the wine industry, and to discover if other factors exist that may be industry specific or not yet covered in the literature review.

INITIAL DATA COLLECTION AND ANALYSIS

Case study interviews

To date, face-to-face interviews have been conducted with representatives from nine different wineries. Exploratory and descriptive data was gathered on the different ways e-business is currently being used within each winery. Perceptions of benefits and barriers were also sought, and the respondents provided their opinions on the way these act as critical factors in shaping current and future usage. Consent for the interviews was granted on condition that the wineries would not be identified in any published report. While the assurance of anonymity precludes provision of detailed background information for a specific winery on the one hand, on the other it delivers the significant advantage of allowing respondents to provide detailed and frank information without the worry of divulging commercially sensitive information.

The nine wineries represent a broad range of company structure, size and position within the industry, with five of them consistently listed in Australia's top 20 wine companies, and two in the top five companies. See Table 1 for rankings by three different metrics.

Rank 2002	By Tonnes Grapes Crushed	By Sales of Branded Wine	Top Wine Exporter by Value
1	BRL Hardy	Southcorp Wines	Southcorp Wines
2	Southcorp Wines	BRL Hardy	BRL Hardy
3	McGuigan Simeon Wines	Orlando Wyndham	Orlando Wyndham
4	Orlando Wyndham	Beringer Blass	Beringer Blass
5	Beringer Blass	De Bortoli	Casella Wines
6	De Bortoli	Miranda Wines	Cranswick Premium Wines
7	Cranswick Premium Wines	McGuigan Simeon Wines	McGuigan Simeon Wines
8	Miranda Wines	McWilliam's Wines	Riverina Estate
9	Casella Wines	Casella Wines	Miranda Wines
10	McWilliam's Wines	Angoves	Angoves
11	Kingston Estate Wines	Cranswick Premium Wines	Lion Nathan Wine Group
12	Riverina Estate	Yalumba	Yalumba
13	Wingara Wine Group	Riverina Estate	Kingston Estate Wines
14	Yalumba	Brown Brothers Milawa Vineyard	Andrew Peace Wines
15	Angoves	Lion Nathan Wine Group	McWilliam's Wines

16	Zilzie Wines	Tyrell's Vineyard	McPherson Wines
17	Andrew Peace Wines	Kingston Estate Wines	De Bortoli
18	Peter Lehmann Wines	Peter Lehmann Wines	Tyrell's Vineyard
19	Lion Nathan Wine Group	Wingara Wine Group	Peter Lehmann Wines
20	Beelgara Estate	McPherson Wines	Wingara Wine Group

Table 1: 2002 Rankings of Australia's top wine companies by three different metrics, with data sourced from Australian Wine Online (2003).

Using the tonnage ranges published in the 2003 ANZ Wine Directory, one winery falls into the 100-249 range, another into the 2,500 – 4,999 range, another in the 5,000 – 9,999 range, with three in the 10,000 – 19,999 range, and the remaining three in the over 20,000 range. All wineries are engaged in export of wine, and all are using the Internet in some capacity in the running of their business. Six of the wineries are privately owned while three are publicly listed. Of the private wineries, four are family owned, one is owned by private shareholders, and one is owned by an international company. Employee numbers ranged from 12 to over 2000, illustrating a huge variance in size and capacity.

All respondents were volunteered by their company as knowledgeable informants, and all were confident in their ability to portray the e-business activities of their own winery with a high degree of accuracy. The interviews were conducted in a semi-structured way, with a set of basic questions covering the winery's use of Internet technologies and strategies. For example, e-mail usage was discussed as well as Internet usage in B2B - with suppliers, trading partners and business customers such as distributors and retailers; in B2C – public websites and mailing lists; and in B2G – with gaining online wine export approvals and online Customs clearances, the latter mandatory by December 2003. As well as actual usage of e-business, barriers and drivers were discussed at length.

The interviews ranged in length from 50 to 90 minutes. They were taped with the consent of each respondent, and an average of eight to ten hours has been spent transcribing each interview. The cross-case analysis of the empirical data is continuing using pattern-matching techniques, but several major results have emerged which will be briefly discussed now, and which will influence the design of the forthcoming survey stage.

Preliminary findings from the interviews

E-business usage by wineries is variable but increasing steadily. The impact in terms of process change and delivered benefits is greatest in B2B and B2G, and it is anticipated that these areas will continue to dominate for the next 12-18 months with much more change on the way. One of the most significant of the preliminary findings is that e-business usage by wineries is heavily influenced by other more powerful stakeholders in the supply chain. In particular, two key stakeholders driving e-business adoption decisions are 1) the large retailers such as Coles and Woolworths, in their role as major winery business customers, and 2) the Australian Government, through the provision of online processes for export approvals, and mandating of online processes for customs clearance by December 2003. In both of these situations, the wineries are reacting to external network forces, rather than being driven by perceived benefits of e-business adoption per se. For example, the major retailers are currently dictating the adoption of EANnet by the large wineries as an electronic, internet-based mechanism for transferring reliable and standardised product information and images(EANnet 2001). This strategy by the retailers to drive down their own costs in turn drives e-business strategy for the wineries, and involves process change with internal computer systems. Interview respondents also reported that major retailers and distributors had a direct impact on their B2C strategy by effectively locking out the option of direct online sales to individual consumers, due to the conflict this would create with existing sales channels. This factor explains the apparent lack of innovativeness and lack of online ordering facilities displayed in many of the public web sites of the large wineries.

Another recurring theme from respondents, when asked to comment on their usage of e-business, was that there was little point in raising the level of usage to a point that was out of step with others in the industry, particularly their suppliers and business customers with whom they have most transactions. Once again, this theme demonstrates that the actions and processes of other stakeholders in the industry supply chain are critical factors in influencing levels of e-business adoption by wineries.

E-mail has significantly improved the level and speed of communication but not necessarily reduced the cost of communication, while intranets for internal staff and extranets for trading partners were reported to have produced substantial benefits. E-business was also not perceived as a complex innovation, and complexity issues relating to technical knowledge, expertise, and Internet-related trust and risk concerns did not emerge as having any significant impact on e-business adoption decisions. Feedback on this last preliminary finding was consistent from all respondents, regardless of size and position within the industry.

Future work and implications

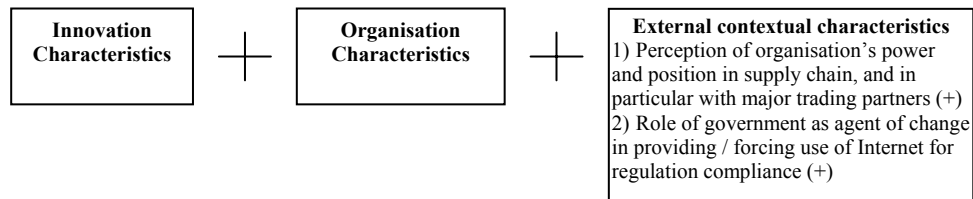


Figure 2: Proposed model of sources of factors that significantly impact on e-business adoption, prepared for this paper

An explanatory model that takes into account characteristics of the external supply chain and the regulatory environment in addition to factors summarised in Figure 1 is shown in Figure 2:

After the cross-case analysis of the interview data is complete and key factors from both the literature review and empirical data identified, a mail survey of all wineries will be undertaken to see if the qualitative findings from the first stage are supported using a quantitative approach. The major constructs that will be explored include the following perceptions by winery management of: 1) the relative advantage of e-business over alternatives and consequent perception of benefits; 2) the winery's organisational and technical capacity to adopt at their desired strategic level; 3) the winery's level of power within the supply chain with respect to major trading partners, and how this affects strategic decisions; and 4) the role of the Australian Government in deploying e-business processes to manage regulation compliance.

It is planned to analyse the data using factor analysis and other standard statistical functions.

REFERENCES

- ACIL 2002, Pathways to profitability for Small and Medium Wineries, ACIL Consulting.
- Allen Consulting Group 2002, Australia's Information Economy : The Big Picture, NOIE, Melbourne.
- Anderson, D 2000, 'Creating and nurturing a premier e-business', Journal of Interactive Marketing, vol. 14, no. 3, pp. 67-73.
- Anderson, K 2001, 'Prospects ahead for the wine industry', The Australian Grapegrower and Winemaker, vol. 434, no. April 2001.
- Aplin, J 1999, 'E-commerce in wine: benefits and barriers', Wine industry Journal, vol. 14, no. 6, pp. 87-91.
- Australian Wine Online 2003, Australian Wine Industry Overview, Australian Wine Online, viewed 14/08/2003 <<http://www.winetitles.com.au/awol/overview/wineries.asp>>.
- Bakry, SH 2001, 'A strategic view for the development of E-Business', International Journal of Network Management, vol. 11, no. 2, pp. 103-12.
- Brown, E 2002, Accelerating the up-take of e-commerce by small and medium enterprises, Small Enterprise Telecommunications Centre (SETEL).
- Chatterjee, D, Grewal, R & Sambamurthy, V 2002, 'Shaping up for E-Commerce: Institutional enablers of the organizational assimilation of web technologies', MIS Quarterly, vol. 26, no. 2, pp. 65-89.
- Czuchry, AJ, Yasin, MM & Bayes, P 2001, 'Are you in control of your e-commerce strategy?' Information Strategy: The Executive's Journal, vol. 17, no. 3, pp. 6-11.
- Dhillon, G, Cossa, D & Hackney, R 2001, 'Interpreting the role of disruptive technologies in e-business', Logistics Information Management, vol. 14, no. 1/2, pp. 163-70.
- Dunt, ES & Harper, IR 2002, 'E-Commerce and the Australian Economy', The Economic Record, vol. 78, no. 242, pp. 327-42.
- EANnet 2001, Coles Supermarkets EANnet Supplier Information, EANnet Australasia, viewed 5/8/03 2003, <http://www.ean.com.au/media/FILES/web_site/EANnet/Coles%20Announcement.pdf>.
- Economist Intelligence Unit 2002, The Economist Intelligence Unit e-readiness rankings, July 2002, ebusinessforum.com, viewed 18/2/03 <http://www.ebusinessforum.com/index.asp?layout=rich_story&doc_id=5768>.

- Hoffman, DL, Novak, TP & Peralta, m 1999, 'Building Consumer Trust Online', *Communications of the ACM*, vol. 42, no. 4, pp. 80-5.
- Hoffman, W, Keedy, J & Roberts, K 2002, 'The unexpected return of B2B', *The McKinsey Quarterly*, no. 3, pp. 97-105.
- Jones, S, Wilikens, M, Morris, P & Masera, M 2000, 'Trust Requirements in E-Business', *Communications of the ACM*, vol. 43, no. 12, pp. 80-90.
- Kandra, A 2001, 'The Myth of Secure E_Shopping', *PC World*, July, pp. 29-32.
- Lee, C-S 2001, 'An analytical framework for evaluating e-commerce business models and strategies', *Internet Research: Electronic Networking Applications and Policy*, vol. 11, no. 4, pp. 349-59.
- Mahadevan, B 2000, 'Business models for internet-based e-commerce', *California Management Review*, vol. 42, no. 4, pp. 55-69.
- Major, M 2000a, 'E-business opportunities for wine producers', *Wine industry Journal*, vol. 15, no. 6.
- 2000b, 'E-business opportunities for wine producers', *Wine industry Journal*, vol. 15, no. 6, pp. 89-95.
- McGrath-Kerr Business Consultants Pty Ltd 2002, *The National Winegrape Outlook Conference, Winegrape Growers' Council of Australia In*, viewed 4/2/2003 2003, <<http://www.awbc.com.au/information/pdfs/2002NWOCFINAL.pdf>>.
- McKie, S 2001, *E-Business Best Practices*, John Wiley & Sons, Inc., New York.
- Miyazaki, AD & Fernandez, A 2001, 'Consumer Perceptions of Privacy and Security Risks for Online Shopping', *The Journal of Consumer Affairs*, vol. 35, no. 1, pp. 27-44.
- Nambisan, S & Wang, Y-M 2000, 'Web Technology Adoption and Knowledge Barriers', *Journal of Organizational Computing and Electronic Commerce*, vol. 10, no. 2, pp. 129-47.
- NOIE 2000, *Taking the Plunge 2000*, National Office for the information Economy.
- 2002, *The benefits of doing business electronically - e-Business*, National Office for the Information Economy, viewed 4/12/02 <<http://www.noie.gov.au/projects/ebusiness/Advancing/benefits/index.htm>>.
- OECD 2002, *Measuring the information economy 2002*, OECD, viewed 20/11/2002 <<http://www.oecd.org/pdf/M00036000/M00036089.pdf>>.
- Parker, R & Papandrea, F 2002, *The rural and regional guide to e-commerce*, Rural industries Research and Development Corporation, Canberra.
- Poon, S & Swatman, P 1997, 'Small Business use of the Internet', *International Marketing Review*, vol. 14, no. 5, pp. 385-402.
- Porter, ME 1998, 'Clusters and the new economics of competition', *Harvard Business Review*, vol. 76, no. 6, pp. 77-90.
- 2001, 'Strategy and the Internet', *Harvard Business Review*, vol. 79, no. 3, pp. 63-78.
- QW&GPA 2001, *Strategic Plan 2001 - 2006*, Queensland Wine & Grape Producers Association, viewed 27/11/2002 2002, <<http://www.sd.qld.gov.au/dsdweb/docs-bin/invest/qldwinestrategy.pdf>>.
- Radding, A 1999, 'Overcome the Web-Transaction Barrier', *information Week*, no. 765, 13/12/1999, pp. 153-6.
- Rodgers, JA, Yen, DC & Chou, DC 2002, 'Developing e-business: a strategic approach', *Information Management & Computer Security*, vol. 10, no. 4, pp. 184-92.
- Rogers, EM 1995, *Diffusion of Innovations*, 4th edn, The Free Press, New York.
- Schoder, D & Yin, P-L 2000, 'Building Firm Trust Online', *Communications of the ACM*, vol. 43, no. 12, pp. 73-80.
- Sellitto, C 2002, *Perceived Barriers to Internet Adoption: a study of Victorian regional wineries*.
- Srinivasan, R, Lilien, GL & Rangaswamy, A 2002, 'Technological Opportunism and Radical Technology Adoption: An Application to E-Business', *Journal of Marketing*, vol. 66, no. July, pp. 47-60.
- Tetteh, E & Burn, J 2001, 'Global strategies for SME-business; applying the SMALL framework', *Logistics Information Management*, vol. 14, no. 1/2, pp. 171-80.

Urban, GL, Sultan, F & Qualls, WJ 2000, 'Placing Trust at the Center of Your Internet Strategy', Sloan Management Review, vol. Fall, pp. 39-48.

Wen, HJ, Chen, H-G & Hwang, H-G 2001, 'E-commerce Web site design: strategies and models', Information Management & Computer Security, vol. 9, no. 1, pp. 5-12.

WFA & AWBC 2000, The Marketing Decade - Setting the Australian Wine Marketing Agenda 2000 >> 2010, Winemakers' Federation of Australia and Australian Wine and Brandy Corporation, viewed 26/6/02 2002, <http://www.awbc.com.au/news/marketing_decade_pdf/Marketing%20Decade.qxd.pdf>.

Winetitles 2003, The Australian and New Zealand Wine Industry Directory, 21st edn.

COPYRIGHT

Barbara Roberts and Professor Edmond Fitzgerald © 2003. The authors assign to ACIS and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ACIS to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the authors.