

THE E-READINESS OF THE AUSTRALIAN TIMBER AND WOOD SECTOR

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ABSTRACT

This paper explores the issues surrounding the e-readiness of the Australian timber and wood products industry. A business organisation's e-readiness is a measure of its e-business environment, and a collection of factors that indicate how amenable a business is to information communications and technologies (ICT) based opportunities. A survey tool was developed and used to assess a number of factors including the extent of usage of ICT within the Australian timber sector, the sector's general business environment, the degree to which e-business is being adopted by the sector, the availability of services to support e-businesses, and the extent to which the business organisations within this sector are moving to e-business.

This paper presents an overview of the statistical analysis of the survey responses. The analysed data provides a snapshot of the current level of e-business capacity within the timber sector. The analysis of the survey data also identifies barriers, real or perceived, that limit the move by the timber sector to e-business.

This timber sector is characterised by two tiers. Tier 1 players are few in number, being national/global players well versed in strategy, management practices and ICT. Tier 2 players on the other hand tend to be small and medium enterprises (SMEs) operators. SMEs are characterised by lower levels of resources generally, including financial resources, technical expertise and tend to focus on operational issues rather than taking a strategic view. In Australia, the tier 2 players also tend to be located in regional and rural areas. The survey results indicated that there is a considerable lag in the use of ICT within tier 2 operators.

INTRODUCTION

Australian forest and wood products industry sector form an important element of the Australian economy, with a turnover exceeding 14 billion dollars per year. The industry contributes seven and half per cent of the manufacturing output of the gross domestic product (2003). Overall the industry sector supports 674 hardwood mills and 268 softwood mills along with 30 panel board mills employing 78 400 people in the 2000/2001 year (Australian Bureau of Agricultural and Resource Economics 2003). The forestry industry is growing in importance in Australia.

The Australian timber industry is characterised, as is the case in most other industry sectors, by two tiers. Tier 1 players are few in number, being global/national players well versed in strategy, management practices and information management systems. These corporations are comprised of many branch sites. Tier 2 players on the other hand tend to be small and medium enterprises (SMEs). SMEs are characterised by lower levels of resources generally, including financial resources as well as technical expertise and tend to focus on operational issues rather than taking a strategic view. In Australia, they also tend to be located in regional and rural areas (Sharma, Carson & DeLacy 2000, p. 159).

E-commerce is considered to provide substantial benefits to business, particularly small business. It enables new ways of working to emerge and facilitates an organisation's reengineering. Benefits from e-commerce can be argued to be greater for SMEs since traditionally they have operated in an uncertain and dynamic environment (Gessin 1996; McRea 1996; Murphy & Daley 1999; Nooteboom 1994).

SMEs have a critical role to play in the economy. Despite advances in information technology and acceptance by large Tier 1 organisations of such technologies, the same level of adoption is not evident amongst SMEs (Bode & Burn 2002; Knol & Stroeken 2001). E-business has been driven by a number of technologies, such as the internet, world-wide-web, distributed computing environments and middleware (Pease, W 2001). Schuette (2000) describing the internet as becoming established in business in the same way as the telephone transforming the way that business is conducted. In the same way that e-commerce has brought business benefits collaborative commerce or c-commerce is the next wave of innovation in e-business enabling technologies. C-commerce is a paradigm where organisations can benefit by sharing resources and real time data, relationships may be built both vertically along a supply chain or horizontally among the industry (Pease, W. & Rowe 2005). C-commerce considers how to optimise the performance of the entire supply chain, so that decisions are driven by the end consumer demand (Ireland & Bruce 2000). Popp (2000) discusses how collaboration is when organisational boundaries are blurred as partnerships are formed with Barratt (2004) adding that collaboration is a move away from an adversarial relationship between trading partners toward a win-win relationship (2001).

The internet has the potential to succeed as a gateway to web-based EDI for small and medium sized enterprises a level of e-readiness must exist in the industry for the diffusion of the technology to succeed. Web-based EDI for use in e-business is an innovation, Rogers (1995) set out a set of circumstances which expedite the adoption and success of an innovation. These circumstances are, if a competitive advantage was evident, if the innovation could be efficiently and smoothly integrated with existing systems, and meshed with how the organisation perceived itself, if the innovation was not too complex, was trialable and could be observed in operation. The Economist Intelligence Unit (2004) echo Rogers (1995) claims with the comment that when the advantages of using the internet are uncertain, the adoption rates will be low.

E-readiness for a country is described by the Economist Intelligence Unit (2004) as a “measure of its e-business environment ... that indicate how amenable a market is to internet-based opportunities”. The factors taken into account include a country's technology infrastructure, the general business environment, the percentage of businesses and consumers using e-business, the availability of e-business services and social and cultural conditions that impact on internet usage. The c-commerce readiness of the Australian timber and wood products industry is also important because of the ability to improve productivity in the industry.

Within the 64 countries measured, in 2004 Australia had a rank of twelfth down from ninth in 2003, the drop in rankings largely accounted for by the low percentage of broadband internet access with just four per cent of Australians having broadband in 2004 (Economist Intelligence Unit 2004). In order to establish the level of e-readiness in the Australian timber and wood products industry a questionnaire was sent to a number of organisations from the industry to gauge the extent of use of internet technologies within the timber sector.

The questionnaire will be important to ascertain a baseline of how the industry views information systems and e-business now, the level of information systems infrastructure and knowledge present in the industry at present and the issues facing the industry now and in the future. As the forestry and wood products industry is so compartmentalised with no strong industry identity, there is little information on information systems in the industry and this

questionnaire will help to fill this gap. (Forest and Forest Products Employment Skills Company Limited 2003)

METHODOLOGY

This is a descriptive study designed to collect data on how organisations in the Australian Timber and Wood Products industry manage business-to-business communication in the supply chain. Current issues, future goals and strategies for using business-to-business communication within the industry were targeted.

There is a lack of an information gathering point for this industry such as a central organisation that covers the forest and wood product industry in Australia. This has made compiling a list of forest and wood product organisation addresses difficult. To gain a sample from the most complete data resource available, it was decided to use an existing industry database which gathered data on the target population (Zikmund 2003).

The Forest and Wood Products Research and Development Corporation (FWPRDC) commissioned an industry data collection survey to gain a central data resource, which the Forest and Forest Products Employment Skills Company Limited (FAFPESC), carried out. This survey was designed to capture information about the industry from the growing of trees to the manufacture of sophisticated end products. One of the objectives of the study was to develop and maintain a database of industry appropriate data, including names and addresses of industry members (Forest and Forest Products Employment Skills Company Limited 2003).

FAFPESC used a Participatory Action Research (PAR) approach to the collection of data as they felt that PAR provided the means for better communication and ownership of the project by industry members. FAFPESC used all their available contacts to prepare a list of industry organisations, collected from industry, government and commercial sources. Only those organisations with contact telephone numbers were included in the FAFPESC study, a total of 14900 organisations. These organisations contact details were verified by a call centre organisation, Strahan Research, and 9000 addresses were entered in an industry database. A random sample of 2000 names and addresses was requested from FAFPESC and these names and addresses were used to direct the survey.

The respondents were asked to state which category of the timber and wood product industry they fitted into, using sectors defined by FAFPESC in their 2003 study. The sectors are forest growing and management, harvesting and haulage, sawmilling and processing, timber products manufacturing, wood panel/ board production and manufacturing, pulp and paper manufacturing and timber merchandising. These sectors were defined as follows. Forest growing and management is the growing management and maintenance of timber resources. Harvesting and haulage covers the processes associated with harvesting timber, for example timber felling, haulage. Sawmilling and processing, are the business connected with the processing of logs and other forms of raw timber in timber mills, factories and merchant premises. Timber products' manufacturing is linked to using the processes coupled with machining timber to produce components and articles. Wood panel/ board production and manufacture, organisations associated with the manufacture of boards, panels or veneer. Pulp and paper manufacture is the pulping of raw material and the manufacture of paper. The timber merchandising sector undertakes the activities involved with selling timber either through wholesalers or trade and retail outlets (Forest and Forest Products Employment Skills

Company Limited 2003).

The survey was administered through the post, the packet containing a letter describing the intent of the survey, the instrument and a glossary for some of the technical terms and a description of the industry sectors. A copy of the instrument is attached as appendix A.

ANALYSIS

A total of 242 respondents replied to the survey. The respondents indicated the industry sector in which they operated. A total of 341 responses were received. This indicates that a number of the respondents operated across multiple sectors. This data is presented in Table 1.

Industry Sector	Frequency	Percent (%)
Forest growing and management	22	6.5
Harvesting and haulage	32	9.4
Sawmilling and processing	61	17.9
Timber products manufacturing	118	434.6
Wood panel/Board production and manufacturing	15	4.4
Pulp and paper manufacturing	5	1.5
Timber merchandising	88	25.8
Total	341	100

Table 1: Industry sector response

Business size (Number of employees)	Frequency	Percent (%)	Cumulative percent (%)
1-4	70	19	29
5-19	78	32.4	61.4
20-99	74	30.7	92.1
100 - 199	10	4.1	96.3
200 or more	9	3.7	100
Total	241	100	

Table 2: Number of respondents compared with size of business

Table 2 shows the data relating to the size of the business and the number of respondents 96.3% of organisations had fewer than 200 employees. This data is in good general agreement for that reported by the Australian Bureau of Statistics (2005). There is no universal definition of Small to Medium Enterprises (SME), but it is generally accepted that organisations that employ less than 200 employees are SME's. This means that most of the organisations in the Australian timber and wood products industry are tier 2 organisations and SME's.

Business size (Number of employees)	Computer use					
	Yes		No		Total	
	Count	Percent (%)	Count	Percent (%)	Count	Percent (%)
1-4	62	26.0	7	2.9	69	28.9

5-19	74	31.1	4	1.7	78	32.8
20-99	73	30.7	1	0.4	74	31.1
100 - 199	9	3.8	0	0	9	3.8
200 or more	8	3.4	0	0	8	3.4
Total	226	95.0	12	5	238	100

Table 3: Computer use compared with size of business

Table 3 shows the data relating to the size of the business and the use of computers. A relationship does exist between the employment size of a business and the likelihood that the business will use information technology. One respondent or 0.4% in the 20-99 employees category did not use computers, with all respondents employing 100 or more employees using computers. In the 1-4 employee category there were 69 respondents, of these 7 (10.1%) did not use computers. In the 5-19 employee category 4 respondents (5%) did not use computers both these rates of computer use are approximately the same rate of computer use for manufacturing and retailing industries identified in the Australian Bureau of Statistics report (2005). This means that computer use in the Australian timber and wood product industry is similar to that found in other Australian industry sectors.

Business size (Number of employees)	Internet Access					
	Yes		No		Total	
	Count	Percent (%)	Count	Percent (%)	Count	Percent (%)
1-4	56	23.4	14	6.0	70	29.4
5-19	72	30.1	6	2.5	78	32.6
20-99	71	29.7	2	0.8	73	30.5
100 - 199	10	4.2	0	0	10	4.2
200 or more	8	3.3	0	0	8	3.3
Total	217	90.7	22	9.2	239	100

Table 4: Internet access compared with size of business

Table 4 shows the data relating to the size of the business and having internet access. Again there is a relationship between the employment size of a business and the likelihood that the business will have internet access. Two respondents or 0.8% in the 20-99 employees category did not have internet access, with all respondents employing 100 or more employees having internet access. In the 1-4 employee category there were 70 respondents, of these 14 (20.0%) did not have internet access. In the 5-19 employee category 6 respondents (7.7%) did not have internet access both these rates of internet access are slightly above the rate of internet access for manufacturing and retailing industries identified in the Australian Bureau of Statistics report (2005). This means that computer use in the Australian timber and wood product industry is slightly above the level in Australian industries such as construction, retail trade and wholesale trade.

Business size (Number of employees)	Internet Access							
	Dial-up		ADSL Broadband		Cable		ISDN	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
1-4	37	17.3	14	6.5	2	0.9	1	0.5
5-19	33	15.4	32	15.0	1	0.5	2	0.9

20-99	26	12.1	35	16.3	2	0.9	3	1.4
100 - 199	0	0	6	2.8	0	0	1	0.5
200 or more	0	0	1	0.5	1	0.5	2	0.9
Total	96	44.8	88	41.1	6	2.8	9	4.2

Business size (Number of employees)	Internet Access continued					
	LAN, WAN or MAN		Other		Total	
	Count	(%)	Count	(%)	Count	(%)
1-4	0	0	2	0.9	56	26.1
5-19	1	0.5	0	0	69	32.3
20-99	5	2.3	0	0	71	33.0
100 - 199	2	0.9	1	0.5	10	4.7
200 or more	4	1.9	0	0	8	3.8
Total	12	5.6	3	1.4	214	100

Table 5: Internet access type compared with size of business

Table 5 shows the data relating to the size of the business and the type of internet access. The main type of access is dial-up modem, although this reflects the large number of SME's in the sample as no organisations employing over 100 employees used dial-up modems for internet access. For those organisations employing 1-4 employees 37 respondents (66.1%) were using dial-up modems, this may well reflect their remote or rural nature with a number of comments made on the survey that ADSL broadband was not yet available to them. 14 Respondents (25.0%) used ADSL broadband 2 respondents (3.6%) using cable with another 2 respondents (3.6%) using other means and 1 respondent (1.8%) using ISDN. For those organisations employing 5-19 employees 33 respondents (47.8%) were using dial-up modems. 32 Respondents (46.4%) used ADSL broadband, 1 respondents (1.5%) using cable, 1 respondent (1.5%) using a LAN, WAN or MAN, 2 respondents (2.9%) using ISDN with another 2 respondents (2.9%) using other means. For organisations employing 20-99 employees, 26 respondents (36.6%) were using dial-up modems. 35 Respondents (49.3%) used ADSL broadband, 2 respondents (2.8%) using cable, 3 respondents (4.2%) using ISDN and 5 respondents (7.0%) using a LAN, WAN or MAN. For organisations employing 100-199 employees no respondents were using dial-up modems. 6 Respondents (60.0%) used ADSL broadband, no respondents using cable, 1 respondent (10.0%) using ISDN, 2 respondents (20.0%) using a LAN, WAN or MAN and one respondent (10.0%) using other means. For organisations employing 200 or more employees no respondents were using dial-up modems. 1 Respondents (12.5%) used ADSL broadband, 1 Respondents (12.5%) using cable, 2 respondents (25.0%) using ISDN, 4 respondents (50.0%) and using a LAN, WAN or MAN.

These results show the increase in importance of broadband internet access as the employment size increases, until the organisation employs over 100 employees where the network technologies such as LAN, WAN's and MAN's assume greater importance. The Australian Bureau of Statistics report (2005) found that ADSL broadband access was the most popular type of internet access with 67% of business identifying it as the main type. This means that the Australian timber and wood products industry is slower than Australian businesses as a whole at adopting ADSL broadband technology which may be the result of

the organisations being located in rural and remote areas.

Business size (Number of employees)	The organisation maintains an information systems strategic plan					
	Yes		No		Total	
	Count	Percent (%)	Count	Percent (%)	Count	Percent (%)
1-4	4	1.7	64	27.2	68	28.9
5-19	7	3.0	69	29.4	76	32.4
20-99	11	4.7	61	26.0	72	30.7
100 - 199	4	1.7	6	2.5	10	4.2
200 or more	7	3.0	2	0.8	9	3.8
Total	33	14.1	202	85.9	235	100

Table 6: The organisation maintains an information systems strategic plan compared with size of business

Table 6 shows the data relating to the size of the business and whether they maintain an information systems strategic plan. The data shows that 202 respondents (85.9%) do not maintain a strategic plan of how they will support their business objectives with information systems. For organisations employing 1-4 employees 4 respondents (5.9%) maintain an information systems strategic plan. Organisations employing 5-19 employees 7 respondents (9.2%) maintain an information systems strategic plan. Organisations employing 20-99 employees 11 respondents (15.3%) maintain an information systems strategic plan. Organisations employing 100-199 employees 4 respondents (40.0%) maintain an information systems strategic plan. Organisations employing over 200 employees 7 respondents (77.7%) maintain an information systems strategic plan.

The importance of maintaining an information strategic plan increases with employment size, but the knowledge that 22.3% of tier 1 organisations do not maintain a plan despite an obvious large investment in information systems bears out Scupola's (2002) comments about SME's that they adopt technology just by chance with no formal planning procedure. Jocusen (2004) details the links between strategic marketing decision making process, the quality of those decisions and the performance of the organisation. Jocusen (2004) argues that decision makers in SME's 'tend to make extensive use of learned competencies in the form of 'perceived' rationality and the use of rudimentary analytical tools as well as the 'extensive use of inherent competencies mostly in the form of intuition and gut feel'. Pease and Rowe (2003) postulate that Australian SME's adopt innovation if forced to by outside forces or just by chance rather than the result of a strategic decision.

Business size (Number of employees)	The organisation uses electronic data interchange							
	Yes		No		Don't know		Total	
	Count	Percent (%)	Count	Percent (%)	Count	Percent (%)	Count	Percent (%)
1-4	1	0.4	63	26.5	6	2.5	70	29.4
5-19	6	2.5	65	27.3	5	2.1	76	31.9
20-99	9	3.8	58	24.4	6	2.5	73	30.7
100 - 199	3	1.3	7	2.9	0	0	10	4.2

200 or more	5	2.1	3	1.3	1	0.4	9	3.8
Total	24	10.1	196	82.4	18	7.5	238	100

Table 7: The organisation uses electronic data interchange compared with size of business

Table 7 shows the data relating to the size of the business and whether they use EDI. There is again a relationship between employment size and the use of EDI also despite the definition of EDI being included in the glossary 18 respondents (7.5%) including one respondent from an organisation employing over 200 employees not being sure if they used EDI or not. For organisations employing 1-4 employees 1 respondent (1.4%) use EDI. Organisations employing 5-19 employees 6 respondents (7.9%) use EDI. Organisations employing 20-99 employees 9 respondents (12.3%) use EDI. In organisations employing 100-199 employees 3 respondents (30.0%) use EDI and for organisations employing over 200 employees 5 respondents (55.5%) use EDI.

This data illustrates that for traditional EDI to be an important part of an industry the organisation must be of a size to employ at least 100 people. The barriers of cost, complexity and lack of technical skills are acting to stop SME's from gaining the increases in productivity that EDI can bring. A number of comments were made on the survey such as "Personal contact with business partners remains a priority, higher than that of other impersonal communications" and "The need for face to face contact to establish better feelings and relationships" that indicated that respondents were afraid of losing personal contact with trading partners by using electronic forms of communication.

Business size (Number of employees)	The organisation uses supply chain management							
	Yes		No		Don't know		Total	
	Count	Percent (%)	Count	Percent (%)	Count	Percent (%)	Count	Percent (%)
1-4	3	1.3	61	25.5	6	2.5	70	29.3
5-19	6	2.5	64	26.8	7	2.9	77	32.2
20-99	4	1.7	61	25.5	9	3.8	74	31.0
100 - 199	2	0.8	6	2.5	1	0.4	9	3.7
200 or more	3	1.3	5	2.1	1	0.4	9	3.8
Total	18	7.6	197	82.4	24	10.0	239	100

Table 8: The organisation uses supply chain management compared with size of business

Table 8 shows the data relating to the size of the business and whether they use SCM. There is again a relationship between employment size and the use of SCM also despite the definition of SCM being included in the glossary 24 respondents (10%) not being sure if they used SCM or not. For organisations employing 1-4 employees 3 respondent (4.3%) use SCM. Organisations employing 5-19 employees 6 respondents (7.8%) use SCM, an identical number to those using EDI. Organisations employing 20-99 employees 4 respondents (5.4%) use SCM. In organisations employing 100-199 employees 2 respondents (22.2%) use SCM and for organisations employing over 200 employees 3 respondents (33.3%) use SCM.

This data shows that for this industry SCM has a lower priority than traditional EDI 33.3% using SCM compared to 55.5% using EDI for organisations employing more than 200 employees. Management of the supply chain is done with the intent of improving customer service levels, cycle time reduction, increased inventory turnover leading to agile supply chains (Christopher & Towill 2000). Improvements in these functions increase the effectiveness of business processes leading to improved organisational performance (Power & Sohal 2002; Prem PremKumar 2003). In a study done by Fawcett and Magnan 88 percent of all respondents rated supply chain management as a critical business strategy.

CONCLUSIONS

The study shows that the Australian timber and wood products industry is inline with current computer and internet use compared to the report on the Australian industry as a whole. For both computer and internet use there is a relationship between the employment size of a business and the use of technology. The relationship between employment size and the means of accessing the internet is the difference in the choice of connection means. The choice of connection moves from dial-up modems in small businesses, ADSL broadband with medium businesses in the tier 1 businesses and networking technologies with the larger tier 2 organisations. This question also showed that the industry was behind Australian businesses in general in the adoption of ADSL broadband. The questions on the maintenance of an information systems strategic plan and the use of EDI and SCM identified a lack of planning and a lack of awareness in the use of technology to support business objectives. The Australian timber and wood products industry in its failure to use e-commerce to gain competitive advantage in the marketplace has not positioned itself to be able to take advantage of the benefits of c-commerce.

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