

Internet-based Electronic Commerce: Perceived Benefits and Inhibitors

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Abstract

Various forms of electronic commerce have impacted business over the past century. However it is the growth of the Internet that has revolutionised the nature of electronic commerce, as it is known today. Or has it really? Despite the endless claims of the benefits from Internet based Electronic Commerce (IEC), around the world Small to Medium-sized Enterprises (SMEs) are slow in their uptake of it. Furthermore, it is suggested that IEC is impacting business methods to the extent that companies and countries falling behind run the risk of being uncompetitive in the future. With this in mind a closer look is needed at the benefits and the inhibitors to IEC. This paper focuses specifically on the Victorian manufacturing sector. It shows, amongst other things that a shift from hype to proven benefits will be needed before the implementation of IEC is taken more seriously.

Keywords

Electronic Commerce; SME; IS Planning; IS Problems and Failures; Research; User needs; Attitudes; Organizational Change.

INTRODUCTION

This paper presents results of a research project aimed at determining the inhibitors to the takeup of Internet based technologies by manufacturing industries in Victoria. In doing this we have also collected perceptions of manufacturing industries of the possible benefits that might be obtained from the technology. The research results are compared qualitatively with a much larger, Australian wide, survey of manufacturing industries. The results cannot be compared quantitatively as there were fundamental differences between instruments and populations. The larger study is used to show what inhibitors and perceived benefits are common to a Victorian study and an Australian study.

The Internet's exploration and growth has been driven by claims of, amongst other things, unprecedented global reach, ease of access to information, lower transaction costs leading to lower prices, larger choices tailoring products to individuals' needs and the ability for Small to Medium-sized Enterprises (SMEs) to compete equally with large firms (Global Information Infrastructure Commission 1996; OECD 1997; AusInfo 1998; Australian Electronic Business Network 1998; Crawford 1998; Department of Foreign Affairs and Trade 1999).

For the purposes of this study electronic commerce conducted over the Internet is considered Internet-based Electronic Commerce (IEC). Furthermore it is limited to five functions of the Internet: email, home page, research, gathering customer information, and buying and selling.

It is suggested that IEC is impacting business methods to the extent that companies and countries falling behind run the risk of being uncompetitive in the future (Australian Electronic Business Network 1998; Crawford 1998).

Even more importantly, Australia's SMEs make up 97 percent of all enterprises in the private non-agriculture sector and more than 50 percent of private sector employment (McLennan 1997). They number around one million in Australia and are the foundation of economic activity providing a healthy source of innovation and surging employment opportunities, which therefore makes their success of great importance to Australia's prosperity (Australian Electronic Business Network 1998).

Despite the endless claims of the benefits from IEC, around the world SMEs are slow in their uptake of it (Crawford 1998). Regardless of which developed country in the world that one examines, motivating manager participation in innovative electronic commerce has been difficult (Australian Electronic Business Network 1998). In line with this pattern, the level of uptake of IEC by Victorian Manufacturing SMEs (VM-SMEs) has been narrow (Moussi and Davey 2000).

Empirical studies have found that the Internet is being predominantly used by SMEs as a communication channel and to a lesser extent, as a document transfer and advertising channel (Poon and Swatman 1997). Research has also found that companies that use the Internet as a trade channel do not always extend their offers to the global market, hence under-utilising the global dimension of the Internet (Ranchhod, Hackney et al. 2000).

Victoria is Australia's leading manufacturing state with the highest employment and turnover rates (McLennan 1999b):

- 33 percent of total employment in manufacturing sector; and
- 33 percent of manufacturing sector's total turnover.

The manufacturing sector is an important area to study for the following reasons:

- Fundamental economic sector comprising 8% of total business in Australia (McLennan 1999a); and
- Total manufacturing sector employs approximately 1 million people in Australia generating around \$200 million in operating income (McLennan 1999c).

SMEs in the manufacturing sector are important to study for the following reasons:

- They employ over half a million people (50 percent of total manufacturing sector) generating around \$80 million in operating income (40 percent of total manufacturing sector) (McLennan 1999c); and
- The level of Internet use in this sector is narrow (Moussi and Davey 2000).

DEFINITION OF SMEs

The Australian Bureau of Statistics (McLennan 1997) bases its definition of small business on the report produced by the House of Representatives Standing Committee on Industry, Science and Technology called Small Business in Australia – Challenges, Problems and Opportunities 1990, where a business is considered small if it meets certain characteristics. These include being independently owned and operated; closely controlled by owners/managers who also contribute most and if not all of the operating capital; and with owners/managers being the principal decision-makers. The report includes a size component but only as a qualification to the above definition and the belief is that it should not overshadow it. For manufacturing industries specifically, it includes those companies employing less than 100 employees.

The Australian Bureau of Statistics states that there is no universally adopted standard definition for larger sized businesses however they use the term Medium sized businesses to refer to businesses employing 20 – 199 people and Large businesses refer to businesses employing 200 or more people.

For the purposes of this report:

- A micro business employs between 1 – 5 people;
- A small business employs between 5 - 20 people;
- A mini-medium business employs between 21 – 50 people;
- A medium business employs between 51 – 200 people; and
- A large business employs more than 201 people.

Note: It was difficult to come up with a name for the companies employing 21 – 50 staff. Initially the author was going to group two categories together to make up one, however the data produced some interesting results for this category and it was decided to keep it separate from the rest. The most logical name seems to be “small to medium”, however the term small to medium is used in industry to mean a whole group of companies (as in small to medium sized enterprises) and this would have led to confusion for this paper and subsequent papers. The term mini-medium implies smaller than medium but larger than small and is what was finally decided upon.

RESEARCH METHOD

A major study by the Australian Bureau of Statistics (ABS) has shown a number of reported benefits and inhibitors to uptake of IEC (McLennan 1999a). Using this as a basis, this study has searched for more detail on benefits and inhibitors.

Our study was conducted as a partnership between RMIT University and the Australian Industry Group (Ai Group). Ai Group is a representative body for small to medium-sized manufacturing companies in Australia (12,000 members of which 7,500 are Victorian based). It looked at 300 businesses in the Victorian manufacturing sector. These businesses were selected at random from the membership database of Ai Group and surveyed with a “fax-back” survey. 147 valid responses were obtained. Preliminary results are presented here and the survey is being followed up with detailed illustrative case studies.

IEC IN THE MANUFACTURING INDUSTRY

The diffusion of personal computers into the Manufacturing sector has been very fast. ABS figures show that (McLennan 1999a):

- In the year 1993 – 1994 50% of Manufacturing Firms had PC's (page 5)
- By the year 1997 – 1998 this number grew to 69% (page 6)

Similarly Internet use has been rapidly expanding in the industry sector. As can be seen in Table 1, for the year ending 1998:

- 31% of Manufacturing Firms had Internet Access
- 29% had Email Access, and
- 6% had a Home Page

Company size by employee number	Internet Access	Email	Home Page
	%	%	%
1 – 4	24	23	4
5 – 19	32	31	8
20 – 99	56	54	21
> 100	87	85	58
Total	29	28	6

Table 1: Extract from Table “Business use of PCs and the Internet, by employment size” (page 7)

Table 1 shows that large business has taken up the Internet almost fully, in terms where the creation of a home page is a measure of the fuller implementations of an Internet business system. This table also shows that small business has almost no mature use of the Internet at all.

The number of businesses, in our study, using the Internet was found to have similar patterns to the ABS figures, which are displayed in Table 2 below. The higher figures for use of the Internet for email and such can be ascribed to the time interval between our study and the earlier ABS study.

Company size by employee number	Internet Access	Email	Home page	Research	Gathering customer Information	Buying and Selling
	%	%	%	%	%	%
1 – 5	29	14	14	14	0	14
6 – 20	55	53	23	30	25	15
21 – 50	76	76	53	45	32	26
51 – 200	89	82	50	61	42	5
> 201	92	79	63	67	63	8
Total Population	74	69	44	47	36	14

Table 2: Use of the Internet for: email, home page, research, gathering customer information, and buying and selling.

IEC PERCEIVED BENEFITS

It can be argued that IEC will eventually produce business processes of a fundamentally different nature. To determine where business is with respect to accepting the change, we compare perceived benefits of IEC from businesses surveyed by the ABS with the results from our study.

ABS Results

The ABS survey (McLennan 1999a) highlights that manufacturing firms in Australia are similar to the firms from other industry sectors in terms of their stated perception of benefits of the Internet.

Benefits	Total Australian Population %	Manufacturing firms %
Reduced business cost	27	22
Broader client exposure	27	30
Better access to information/services	86	71
Facilitates doing business across time zones	30	27
Improved customer satisfaction	23	21

Table 3: Extract from Table “Businesses with Internet access at 30 June 1998: Benefits of Internet use, by Industry” (page 12)

However our interest is in smaller businesses as it has been shown that SMEs are not taking up the Internet at the same rate as larger business (Crawford 1998). In the same study the ABS figures show that perceptions vary across industry by size of business.

Company size by employee number	Reduced business cost %	Broader client exposure %	Better access to information /services %	Facilitates doing business across time zones %	Improved customer satisfaction %
1 – 4	28	23	86	30	23
5 – 19	27	26	86	29	24
20 – 99	26	42	85	31	21
> 100	35	43	93	35	29
Total	27	27	86	30	23

Table 4: Extract from Table “Businesses with Internet access at 30 June 1998: Benefits of Internet use by employment size” (page 12)

There is a clear trend for smaller business to have less faith in the Internet apart from the benefit of obtaining business information. The set of ABS perceived benefits, however, seemed to be more restricted than necessary. Our survey sought to widen the range of perceptions for respondents to choose from and hence several were added as set out below.

Perceived Benefits

The ABS study looked for the following perceived benefits from use of the Internet:

- Reduced business cost
- Broader client exposure
- Better access to information/services
- Facilitates doing business across time zones
- Improved customer satisfaction

Our study extended the list of perceived benefits to:

- Goods to market faster
- Cheaper/more efficient communications
- Access to global markets
- Lower transaction costs
- Improved customer service
- Increased sales (greater customer base)
- Cheaper research (ease of access to vital business information)
- Financial benefits derived from use of Internet outweigh cost of implementation
- Cheaper product promotion (on-line brochures etc)
- Improved Image (being seen as innovative and technologically apt)
- Shorter payment cycles
- Improved product quality (through ease of research)

The Top 5

An indication of perceived relative importance for each factor was sought. The technique we chose was to, first break down the results by company size, then to count the number of respondents choosing each factor. The five factors with the highest count were considered the “top five” most important factors. The results for each company size are reported in table 5 for “perceived benefits” and table 7 for “inhibitors” below.

To determine which factors were having the greatest influence across the surveyed group we constructed a table showing the “top five” perceived benefits for each company size:

Company size by employee number	1 – 5	6 – 20	21 – 50	51 – 200	> 201	Total Population
1	Goods to market faster	Improved customer service	Cheaper/ more efficient comm’n	Cheaper/ more efficient comm’n	Cheaper/ more efficient comm’n	Cheaper/ more efficient comm’n
2	Improved customer service	Cheaper/ more efficient comm’n	Improved Image	Cheaper research	Cheaper research	Improved customer service
3	Increased sales	Improved Image	Improved customer service	Improved Image	Improved customer service	Cheaper research
4	Shorter payment cycles	Cheaper research	Access to global markets	Improved customer service	Cheaper product promotion	Improved Image
5	Cheaper product promotion	Increased sales	Cheaper product promotion	Access to global markets	Access to global markets	Access to global markets

Table 5: Top five benefits by company size: Companies all used the Internet (Those with no Internet access were not required to answer this question).

As a result of an open question on the survey a number of additional benefits were added by respondents:

- Some industries require it. Eg Car industry
- Easier access to supplier product data
- Simpler much faster than any other way
- No paper needed
- Access to more suppliers
- Faster communication
- Access to market intelligence
- Alternative supply sources

Summary

Smaller businesses see the Internet more in terms of efficiency of current processes. They see the Internet as a new channel to customers, increasing service, moving goods more effectively and finding new sales. Larger firms know that this picture of the Internet is not real. They see it as a communication mechanism with currently involved customers, as a means of gathering data from a wider information source, and helping with image. This perception mismatch is obviously a problem with smaller businesses making realistic plans for the incorporation of the Internet into the appropriate business processes.

IEC INHIBITORS

As noted in Table 1 above as well as the literature, the uptake of IEC has been slower than anticipated by SMEs. An obvious question is, what are the inhibitors to full use of the Internet that preclude small business from taking advantage of the technology?

ABS Results

In the same report, the ABS has found the following inhibitors to use:

Company size by employee number	Not suited to nature of business	Technical difficulties	Costs	Lack of skills or appropriate training	Security concerns
	%	%	%	%	%
1 – 4	14	15	24	20	24
5 – 19	25	20	25	29	29
20 – 99	14	14	26	38	40
> 100	16	39	33	27	54
Total	18	17	25	25	28

Table 6: Extract from Table “Businesses with Internet access at 30 June 1998: Factors which limit greater use of the Internet, by employment size” (page 13).

As with the set of ABS’s perceived benefits, the list of inhibitors seemed to be more restricted than necessary. Again our survey sought to widen the range of perceptions for respondents to choose from and hence several were added as set out below.

Inhibitors

The ABS looked for the following inhibitors to use of the Internet:

- Not suited to nature of business
- Technical difficulties
- Costs

- Lack of skills or appropriate training
- Security concerns

Our study extended the list of inhibitors to:

- Cost
- Time
- Making it a priority
- Fear of the unknown
- Don't understand the terminology
- Security (concerned about privacy, confidentiality and authentication)
- No knowledge of courses available (and which ones were reputable)
- Not aware of the benefits
- Not convinced that benefits are real
- Staff will abuse it
- No computer(s)
- Not possible to connect to the Internet
- Not willing to take the risk with such a new technology

Once again to determine which factors were having the greatest influence across the surveyed group we constructed a table showing the “top five” inhibitors for each company size:

Company size by employee number	1 – 5	6 – 20	21 – 50	51 – 200	> 201	Total Population
1	Time	Time	Time	Time	Security	Time
2	Not convinced that benefits are real	Making it a priority	Making it a priority	Security	Time	Making it a priority
3	Cost	Not convinced that benefits are real	Security	Making it a priority	Cost	Security
4	No Computer	Cost	Cost	Cost	Making it a priority	Cost
5	Making it a priority	Security	Not convinced that benefits are real	Not convinced that benefits are real	Staff Abuse	Not convinced that benefits are real

Table7: Top five inhibitors by company size: Total population i.e. all those who use the Internet and those who don't

Just as we did with perceived benefits we allowed respondents to add their own suggestions, which revealed the following additional items:

- No Internet sales for 2 years

- Customers not Internet literate
- Don't have a modem
- Convincing management of benefits
- Educating users
- Fear of the unknown by the end consumer
- Am sure customers will not use the Internet to find us
- Fear of Viruses
- Doesn't suit other industry partners
- All customers in Melbourne Metropolitan Area
- No Difficulties
- Parochial (narrow) market
- Company not ready
- Customers unlikely to buy from Internet

Summary

It can be seen from Table 7 that, while the factors are similar for each size of company, large companies are less concerned with whether the benefits of the Internet are real or not. It can also be seen that security issues are not seen as such a high priority by the very small firms. Until benefits of the Internet are perceived as being more real by small business it is unlikely that it will be made a priority.

CONCLUSION

Large studies such as the ABS study have shown that there are a range of perceived benefits and inhibitors to the use of the Internet. By studying a particular industry in depth additional perceptions have been gathered. These additional perceptions show that the environment of SMEs is more complex than that shown in the larger studies. In real businesses the place of the Internet is seen in the environment of current business processes. Hence uptake is dependent upon models that incorporate use of the Internet within the structure of current practices. Total restructure of business practices in SMEs is unlikely given their slow uptake of the basic functions of the Internet.

In addition our study has shown that smaller businesses see the Internet more in terms of efficiency of current processes. They see the Internet as a new channel to customers, increasing service, moving goods more effectively and finding new sales. Larger firms know that this picture of the Internet is not real. They see it as a communication mechanism with currently involved customers, as a means of gathering data from a wider information source, and helping with image. This perception mismatch is obviously a problem with smaller businesses making realistic plans for the incorporation of the Internet into the appropriate business processes.

Finally, until benefits of the Internet are perceived as being more real by small business it is unlikely that it will be made a priority. So unless the Internet is seen as a priority for business it is unlikely that time and money will be allocated to its implementation. If Governments and Internet solution companies wish to increase the use of the Internet by small business there needs to be a shift from hype to proven benefits.

The next stage in this research that has been commenced is to look in detail, through targeted case studies, at the processes that are appropriate for small business to leverage technology.

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