The role of information in business operations and success: A study based on Ontario medium-sized business

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Information professionals need to know the sources and approaches used by the business community to gather information in order to serve them well. Information professionals also need to demonstrate the role of their services in business success to justifying funding and support. These are the issues investigated in the survey conducted to the medium-sized business in Ontario during the summer of 1996. This paper will discuss these questions based on the results of the survey.

Les professionnels de l'information ont besoin de connaître les sources et les approches utilisées par le monde des affaires pour recueillir l'information afin de bien les servir. Les professionnels de l'information ont également besoin de démontrer le rôle de leurs services dans le succès des affaires pour justifier les fonds et les appuis. Ce sont les points étudiés dans le sondage conduit auprès des entreprises de grandeur moyenne en Ontario au cours de l'été 1996. Cet article discutera de ces questions basé sur les résultats du sondage.

Background of the study

The importance of information to business operations is very apparent in this competitive economic environment and information society. Various kinds of information services have been provided to the business community, including publicly funded ones such as the public library business information services. To serve the business community well, information professionals need to know the sources and approaches used by the business community to gather information. To justify the funding of their services, information professionals need to demonstrate the value of their services to business. This paper will address these issues to demonstrate the role that information plays in business operations and success. The paper is based on the results from a survey of Ontario medium-sized businesses carried out in the summer of 1996.

The survey is part of a larger project sponsored by the International Development Research Centre (IDRC) to measure the impact of information on business development. The goal of the project is to measure this impact in China by a mathematical model called LISREL. The first phase of the project aimed at the small business sector in Shanghai, China and the second phase the medium-sized businesses in that city. To gain experience with the methodology, pilot studies in Canada were carried out in both phases before embarking into the China part.

This project studied small and medium-sized businesses separately to reduce the number of variables involved in each phase and also to determine the difference between the two if there is any. Some earlier papers (e.g. Antila-Olkku and Koskiala 1995) assumed that the size of a business does not influence its use of information while others (Roberts and Clifford 1984) found that the size does make a difference. A comparison between small and medium-sized businesses in Canada made in the course of this study revealed interesting similarities and differences. This paper, however, will focus only on the Ontario medium-sized business study, specifically the sections which deal with the type of information sources used in business operations and the relationship between business success and the use of public library, a specific kind of information source. Results from the small business studies in China and Canada have already been reported (Vaughan and Tague-Sutcliffe 1996; Vaughan et al. 1997).

Method

Following the small business survey carried out in the spring of 1995, the medium-sized business survey was conducted in the summer of 1996 to validate the results from the previous phase. Although the sampling frame of the small business survey was London, Ontario, the medium-sized business survey targeted the whole province of Ontario because there are not enough medium-sized businesses in the London area.

There are different ways of defining the size of a business, one of the most common is by the number of employees. It would be ideal to include criteria other than the number of employees in the definition. However, given the availability of such data and the possibility of compiling a list of such businesses, the number of employees alone was used as the criterion. Based on our experience in the small business study and consultation with business experts, it was decided to define a medium-sized business in Ontario as hiring between 100 to 500 employees.

The next step was to find a complete list of Ontario businesses which fit this definition. Exploration of different sources led to the choice of Dun and Bradstreet Canadian business database produced by Dun and Bradstreet Information Services. There are 2280 Ontario businesses of this size listed in the database. After a

preliminary scan eliminating businesses that do not fit the scope of this study, such as non-profit organizations, 2,068 businesses remained.

A self-administered questionnaire (see Appendix), together with a cover letter and a postage paid return envelope, was sent to all these 2,068 businesses. For ethical reasons, the subjects were guaranteed anonymity and there was no identifying information in the questionnaire. To encourage subjects to participate in the study, a free Internet workshop to be offered in three locations across Ontario (London, Toronto, and Ottawa) was promised to everyone responding to the survey. Another envelope was thus included in the survey package to allow subjects who wished to attend the workshop to identify themselves.

Of the 2,068 survey packages mailed, seventy (3.4%) were returned due to wrong addresses. The number of completed questionnaire returned by the deadline was very small. Follow-up phone calls were then made to a sample of businesses. The phone calls revealed that many mailed survey packages failed to reach their intended destinations for various reasons. For example, a large number of people to whom the package was sent to had left the organizations. The mailed packages were thus not opened and then lost. Many people who answered the phone had not seen the survey package. Some of them were actually interested in participating in the study and a second survey package was then sent to them.

A total of 114 completed questionnaires were returned which results at a very low return rate of 6%. However, given the fact that a large number of survey packages did not reach their destinations, this figure grossly under-represented the real return rate. Based on the estimates of the research assistants who made the follow up phone calls, about 30% of the mailed packages did not end up at the right places. Therefore, an adjusted return rate of 10% would be closer to reality. It is not unusual for questionnaire surveys aimed at the business community to end up with a low return rate. For example, a recent business survey jointly conducted by the Institute for Small business, Bank of Montreal and The Center for Creative Leadership, San Diego resulted in a return rate of 3.3% (The Institute for Small Business and The Center for Creative Leadership 1995, 7).

In analysing the factors that contributed to the low return rate of the survey, it is realized that the time of the year in which a survey is conducted is an important factor. This survey was conducted in summer, a season when more people take vacations and many organizations are under-staffed. Another factor is the quality of the mailing list. The Dun and Bradstreet database used was not very up-to-date for Canadian businesses.

Data analysis and results

1. Ranking of different types of information sources used

Business people obtain information through different types of sources which are not limited to formal ones such as libraries or information centers. As Menou noted, some earlier impact studies tend to equate information with formal information products and services. He stated: "Trying to assess the impact of information without paying equal attention to informal information as to formal systems and services would be a gross mistake" (Menou 1995, 465). Thus, this study investigated the use of both informal and formal information sources in business operations. Formal information sources are those in the form of written records including, but not limited to, libraries and government publications. Informal information sources are those carried by people such as customers and business colleagues.

Section E of the Questionnaire (see Appendix) asked respondents to rate their use of different kinds of information sources in a seven-point scale from 1 (very poor) to 7 (excellent). The percent of respondents falling into each rating scale for each type of information sources are summarized in Table 1. For example, 13.9% people rated their use of information from customers as excellent while 4.5% did so for information from trade conventions and business colleagues.

The average rating scores were calculated for each type of information sources and listed at the last column of Table 1. The type of information sources in Table 1 are ordered by these average scores. That is, information from customers has the highest average rating score of 5.35 while information obtained from friends and relatives has the lowest average rating score of 3.19.

TABLE 1: USE OF DIFFERENT TYPES OF INFORMATION SOURCES

Sources of Information	1	2	3	4	5	6	7	Avg.
customers	0%	0.9%	5.6%	11.1%	36.1%	32.4%	13.9%	5.35
newspapers, magazines etc.	1.9%	2.8%	12%	28.7%	38%	15.7%	0.9%	4.49
government publications, statistics	1.8%	9.2%	14.7%	26.6%	31.2%	11%	5.5%	4.31
Internet, other databases	7.5%	13.2%	19.8%	14.2%	22.6%	16%	6.6%	4.06
libraries, information centres	9.3%	24.3%	25.2%	19.6%	11.2%	6.5%	3.7%	3.34
friends, relatives	18.4%	21.4%	11.2%	25.5%	18.4	5.1%	0%	3.19

Examining the order of information sources in Table 1, it is apparent that informal information sources ranked higher than formal ones with the exception of "friends and relatives" category which ranked lowest. To determine if the overall rating scores for informal sources are significantly higher than that of the formal sources, two summary scores are calculated for each respondent with one being the average score of all informal sources and the other the average score of all the formal sources. A Wilcoxon Matched-Pairs test was conducted on these summary scores and a statistically significant difference was found ($p<0.01$). It can be concluded that the informal information sources are better used than the formal ones.

Respondents in the survey were also asked to rate their overall use of information resources in the same seven point rating scale as reported above (see question 6, section D of the questionnaire). This question was asked in a separate section which precedes the section that asked detailed ratings of different information sources to avoid possible bias resulting from the detailed questions. This overall rating score reflects how business people perceive their overall use of information resources regardless their actual use of different types of information sources. To determine if there is a relationship between this overall rating score and the two summary scores for informal and formal sources reported above, two Spearman correlation tests were conducted. The results show that there is a highly significant relationship between this overall rating score and the summary score for

formal information sources (P<0.001). However, there is no relationship between this overall rating score and the summary score for informal information sources. In other words, respondents' self perception of overall use of information resources depends on their use of formal information sources, not the informal ones.

2. Relationship between information use and business success

Once we know the type of information sources used by the business community, the next question to investigate is whether the use of information helped business success. Although there is plenty of anecdotal evidence showing how information helped businesses especially in terms of money and time it saved (Mobley 1995), systematic studies linking the use of information to business profitability and success are almost non-existent as pointed out by White and others (White et al 1982, 11). A thorough literature search conducted recently still revealed very little on the topic since the study by White et al.

The study reported in this paper made an attempt to investigate the relationship between business success and the use of a specific type of information source: the public library. Data were collected on the use of public libraries and business success measures in the following way.

2.1 Use of Public Libraries

Section F of the survey questionnaire asked respondents to report their use of public libraries for business purposes (see Section F of the Appendix). "Have you or other employees in your business used a public library (including phoning the library) **in connection with your business** in the past year?" was the first question asked in the library use section of the questionnaire. Words "in connection with your business" were in boldface in the original questionnaire to ensure that the use of public libraries for personal purposes was excluded. Fifty-one respondents (45.5%) answered "yes" to the question while 54.5% answered "no".

2.2 Business success measures

To collect data on business success, a set of business performance measures are needed. What would be the appropriate measurements that are also possible for data collection? After extensive consultation with researchers at university business schools and a literature search, eight measurements such as net profit growth, return on equity, return on sales etc. are used (see Section B of the Appendix). Respondents were asked to rate their own business performance in these eight aspects in a seven point scale (from 1 for very poor to 7 for excellent). The same measurement figure, for example net profit growth, will mean different level of success for different types of business operating in different environments.

To make the rating scores of different businesses comparable and meaningful, respondents were instructed to compare their own business with other businesses of the same type in Ontario when making the rating. The position of the business relative to competition was also emphasized in the rating.

It could be argued that the actual performance figures (the actual net profit figures for example) would be more valid and reliable than this type of self-rating data. However, our previous experience in the small business survey showed that actual business performance figures such as net profit are very sensitive to business people and they are not willing to provide this kind of figures (Tague-Sutcliffe et al 1995). Extremely few people provided this figure in that survey which made data collection on that question unsuccessful. Other researches involving collecting factual business performance data encountered this same difficuty. It has been recommended that perceptual measures for financial performance be used when factual ones are unavailable (Lefebvre and Lefebvre 1996, 72). It has been found that business-persons' perceptual data on financial performance correlate with the factual data (Dess and Robinson 1984).

Although the actual business performance figures are too sensitive to obtain in a survey, I thought business people may be willing to provide this information in categorical ranges (eg. between 10% to 20%). So Section C of the questionnaire solicited responses in this form on three business performance measures: return on equity, return on sales, and business growth in total assets. The sensitivity estimate on this issue turned out to be correct as most respondents answered the questions in this section. Data collected in this section were then used to check the validity and reliability of the self-rating data collected in Section B of the questionnaire by testing a correlation of answers between the two sections. A Spearman correlation coefficient test found a highly significant relationship between the two ($p<0.01$). This provided evidence that the self-rating data collected in Section B are valid and can thus be used as indicators of business success.

2.3 Examining the relationship

A single business success indicator figure was calculated for each business participating in the study by averaging the eight self-rating scores on Section B of the questionnaire and rounded to the nearest integer. All businesses participating in the study were also divided into two groups based on their responses to Section F of the questionnaire: those who had used a public library for business purposes and those who had not. The hypothesis that there is a relationship between business success and the use of public libraries was then tested by conducting a Mann-Whitney test comparing the business success figures of the two groups. A significant difference ($p<0.05$) was found between the two groups and those

businesses that had used a public library have higher business success figures on average. This suggests that businesses which used public libraries are more successful than those which did not. Although a causal relationship between the two variables has yet to be established, this finding at least provides evidence for the usefulness and importance of public library services to the business community.

Conclusions and discussion

Informal information sources are more important and better used than formal sources in business operation. However, business people's self perception on their overall use of information resources depends on how well they use the formal information sources rather than the informal ones. These two seemingly contradictory results can be interpreted as suggesting that business people place more weight on formal information sources in their perception of information although they actually use more informal information sources in practice. A study conducted to some UK businesses on information use reached similar conclusions: "It is interesting to note that the definition and perception of information is that coming from formal, external sources. Information which is in constant use and which is the core of the company's business (from sales, marketing, production, clients and suppliers) is not described in this way" (Abell and Winterman 1995, 49).

With this knowledge in mind, information professionals serving the business community should tailor their services so that informal information channels are well used. For example, the public library, which traditionally provides formal written information, should also organize activities or programs that offer their patrons opportunities to exchange information in an informal setting. The annual small business fair organized by the London Public Libraries is a very successful event where business people including business owners, financial service people, and lawyers gather and exchange all kinds of business information. This event also helped the library to promote awareness of its business information services.

Information does play a positive role in business success. This is supported by the evidence that the use of public library, one of the formal information sources studied, is linked to business success. Businesses that used public library services have a higher average business performance indicator (measured by net profit, return on equity, return on investment, etc.). Further studies are needed to establish a firm causal relationship which can help the public library in justifying its funding and support and, more importantly, demonstrate the value of the public library to the business community.

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Appendix : The Questionnaire

A. Business Profile

(1) Type of business (please choose one that best describes your business)

Manufacturer □ Wholesale/distributors □
Retail □ Other (please specify) □
Service □

(2) Number of full-time employees
(3) Number of part-time employees
(4) Number of years in business

B. Business Performance

Compared with other businesses of the same type in Ontario, how would you rate your business with respect to the following:

Use the numbers on the following scale for your answers:

very poor 1 | poor 2 | fair 3 | satisfactory 4 | good 5 | very good 6 | excellent 7

(1) Cash flow _____
(2) Revenue growth relative to the competition _____
(3) Net profit growth relative to the competition _____
(4) Sales growth relative to the competition _____
(5) Market share gains relative to the competition _____
(6) Return on equity relative to the competition _____
(7) Return on sales relative to the competition _____
(8) Return on investment relative to the competition _____

C. Could you also provide thefollowing figures?

(Please check the most appropriate entry)

(1) % change on return on equity from previous year

NEGATIVE □ 0 - 5% □ 6 - 10% □ 11 - 15% □

16-20% □ 21-25% □ OVER 25% □

(2) % change on sales from previous year

NEGATIVE □ 0 - 5% □ 6 - 10% □ 11 - 15% □

16-20% □ 21-25% □ OVER 25% □

(3) Your business growth in total assets in the last fiscal year:

NEGATIVE □ 0 - 5% □ 6 - 10% □ 11 - 15% □

16-20% ☐ 21-25% ☐ OVER 25% ☐

D. Please tell us about your business

Use the numbers on the following scale for your answers:

very poor poor fair satisfactory good very good excellent 1
2 3 4 5 6 7

(1) Availability of financing _____
(2) Geographical location _____
(3) Technical expertise _____
(4) Marketing expertise _____
(5) Competence of employees _____
(6) Use of information resources (including economic information, technical information, etc.) _____
(7) Other important conditions (please specify): _____

E. Please indicate the usage of the following information sources in your business over the last three years

Use the numbers on the following scale for your answers:

very poor poor fair satisfactory good very good excellent
1 2 3 4 5 6 7

(1) Friends and relatives _____
(2) Customers _____
(3) Business colleagues, business associations, conventions, trade shows _____
(4) Laws, governmental regulations and statistics _____
(5) Libraries, information centres _____
(6) Books, newspapers, magazines, media etc. _____
(7) Internal and external databases, Internet _____
(8) Others (please specify): _____

F. We are also interested in the use of public libraries by Ontario businesses

(1) Have you or other employees in your business used a public library (including phoning the library) **in connection with your business** in the past year?
Yes ☐ No ☐
If you answered no, please go to question 6.
(2) What is the name of the public library that you used?
(3) What kinds of material did you use?
(4) Did you consult library staff to find the information you were looking for?
Yes ☐ No ☐
Explain, if necessary:
(5) Do you usually get what you were looking for?
Yes ☐ No ☐
(6) What would be the impact **on your business** of closing the public library?

References

Abell, Angela, and Vivienne Winterman. 1995. Clothing and textile industries case study: Impact of external factors on information use. In *Information culture and business performance*, ed. Anne Grimshaw. Hertfordshire, UK: University of Hertfordshire Press.

Antila-Olkku, A., and S. Koskiala. 1995. The library as an information management opportunity for SMEs to explore. *FID News Bulletin* 45: 50-51.

Dess, G., and R. B. Robinson, Jr. 1984. Measuring organizational performance in the absence of objective measures. *Strategic Management Journal* 5: 265-73.

The Institute for Small Business, Bank of Montreal and The Center for Creative Leadership, San Diego. 1995. *Entrepreneurial success factors: linking leadership and growth.*

Lefebvre, Élisabeth, and Louis A. Lefebvre. 1996. *Information and telecommunication technologies: The impact of their adoption on small and medium-sized enterprises.* Ottawa, Canada: International Development Research Centre.

Menou, Michel J. 1995. The impact of information — I. Toward a research agenda for its definition and measurement. *Information Processing and Management* 31: 455-477.

Mobley, Emily. 1995. Libraries and productivity: A report to the Governor's Conference on Libraries and Information Services, 1990. *Indiana Libraries* 14: 23-26.

Roberts, N., and Clifford, B. 1986. Regional variations in the demand and supply of business information: A study of manufacturing firms. *International Journal of Information Management* 6: 171-83.

Tague-Sutcliffe, J., L. Vaughan, and C. Sylvain. 1995. Using LISREL to measure the impact of information on development: London Site Pilot Study. In *Making a difference: Measuring the impact of information on development,* 135-151. Proceedings of a workshop held in Ottawa, Canada, 10-12 July 1995. Ottawa: International Development Research Centre.

Vaughan, Liwen Qiu, Jean Tague-Sutcliffe, and Pat Tripp. 1996. The value of the public library to small business, *RQ,* 36(2), 262-269.

Vaughan, Liwen Qiu, and Jean Tague-Sutcliffe. 1996. A statistical assessment of the impact of information on small business success. In *The digital revolution: Assessing the impact on business, education and social structures,* 35-41. Proceedings of the ASIS Mid-Year Meeting, San Diego, California, May 18-22, 1996.

White, Brenda, Richard Bennett, and Rosemary Shipsey. 1982. *Information and the small manufacturing firm.* British Library Research and Development Department BLRD report 5729. Edinburgh: Capital Planning Information Ltd.