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RESEARCH, DEVELOPMENT AND COMMUNICATION
IN THE CANADIAN ECONOMY

Russel M. Wills
April 1979

Department of Communications
Contract #OSC-78-00253

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EXECUTIVE SUMMARY

This work contains the first analysis by the author of two surveys conducted by the Ministry of State for Science and Technology in 1978, a survey of the industrial concentrations of R&D products, activities, facilities, locations, and personnel in the private sector, and a survey of the information channels actually used by this sector to acquire technical information to perform R&D and related activities.

Research and development contributes to national economic growth only when it is manifested in some tangible products or process and is successfully utilized or marketed, and it is estimated that 80-90 per cent of investment capital in a new product occurs after the R&D stage. Thus it is thought that government policy has given undue emphasis to raising the amount of Canadian R&D, and it is found that a main result of government tax incentive measures in the form of R&D writeoffs is to encourage firms to substitute and report advertising and marketing expenditures for those R&D. The decision of managers to "fund" R&D, it is thought, is thus often based more on an aversion to paying taxes than to any commitment to innovation. The main results of the surveys are as follows:

(1) It was found that manufacturing industries and service industries (including communications, engineering and scientific services to all industry) each perform about 45-46 per cent of the industrial R&D, by labour force. Of the industrial service sector, about half does consulting R&D with one or more of the resource industries, and about half does consulting work with the electrical, electronics, and telecommunications industries.

(2) A considerable percentage of R&D in Canada is dispersed in multidisciplinary scientific and engineering consulting groups, and often the products of such R&D are customized to a specific one-time need and do not result in mass-produced products.

(3) With electrical products/electronics sector R&D, many firms provide components for systems. One sees few firms whose product is the provision of an entire electronics system, which are provided mainly by foreign multinationals.

(4) Variations in both the extent and frequency of use of the information channels used to search for new technology were examined with respect to company size and company ownership type (foreign-owned multinationals, Canadian-owned multinationals, and Canadian domestic companies). In general as one goes from large to small-size companies, the extent of use and frequency of use of all information channels decreases, with the exception of "clients and suppliers". Small and medium sized Canadian companies rely excessively on suppliers -- often agents of foreign-owned multinationals who have a vested interest in selling a particular and perhaps inappropriate product -- as a source of technical information.

(5) Commercial information services and research organizations are used by few respondents sampled in Canada as sources of technical information, although respondents in large companies tend to use these channels more often and more extensively than those in small Canadian companies.

(6) Government agencies are not extensively used by any type of company as a source of technical information, but respondents in Canadian-owned multinationals constitute the largest percentage of users of government agencies at the weekly or the monthly rate of use, and respondents in large companies (all three types of ownership), constitute more than half of all users.

(7) The source of technical information utilized most extensively and most frequently by all types of companies is that of "experts, colleagues and associates". Information -- both new awareness of some technology and knowledge of how to implement it -- is transferred in the private sector mainly via personal contact.

I N T R O D U C T I O N

The first analysis by the author of two surveys done at the Ministry of State for Science and Technology in 1978 are presented, a survey of the Research and Development (R & D) capabilities in the Canadian private sector, with special attention to the R & D capabilities in the electrical products, communications, and service sectors, and a survey of information channels actually used by the private sector to acquire scientific and technical information. The first part delineates in what sectors R & D activities, products, personnel, and facilities are concentrated in the private sector, while the second part examines the information channels actually used by this private sector to acquire information to perform R & D and related activities.

R & D is economically useful only when it results in tangible, marketable products and processes. Research is quite different from product development and the lack of the latter sometimes arises because Canadian entrepreneurs and innovators have a great deal of difficulty in finding financing. (In a recent study the OECD (1978) notes that the Canadian banking system, although quite suited for the mobilisation of large scale loans, is quite unsuited for domestic high risk situations.) The activity of research and development, in fact, can be seen as a reflection of innovativeness - the tendency to create and utilize new products and processes, and a great deal of innovation in Canada is now occurring in parts of what has come to be called the information sector. Historically this concept was first given content by Fritz Machlup in a classic 1962 book, The Production and Distribution of Knowledge in the U.S. Economy. By knowledge industries Machlup included all communications industries (T.V., radio, newspapers, etc.), all education, all R & D, and all information machines and services in that order. Working with 1958 data Machlup found that this sector comprised approximately 29% of the U.S. economy at that time and was growing at twice the yearly rate of the other sectors. M. Porat, realizing that the main activity of many industries (such as finance and banking) is predominantly of an informational search and transferal nature, attempted a more comprehensive definition of the "information sector" to include the following: All industries whose final product is information, (T.V., Cable, videodisc, software applications industries, information search firms, etc.), all industries whose major intermediate product is information but whose final product usually goes under a different name (finance, insurance, research firms, etc.), and all industries which make and service the information technologies (computers, computer telecommunication systems etc.) (Porat 1974)

In this work we shall understand the information sector as simply encompassing all economic activity concerned with the production, manipulation, reproduction, and distribution of information. We shall limit our discussion to the private information sector and therein include also the informational activities of non-information industries, such as computer

aided design and process control in manufacturing. In fact given the centrality of one technology - the microprocessor - in information sector growth, we might simply think of the private information sector as all those industries whose capital expenditures are being affected by the applications of microprocessors.

Microprocessors consist of dozens of thousands of transistors in a few square millimeters. They are often several thousand times less expensive than computers of a couple decades ago and are several hundred thousand times smaller. This tiny technology will be eventually used in all information processing activities in industry and is effecting a world class revolution comparable in its effects to the industrial revolution. The applications of this technology will effect major structural changes in the Canadian economy for consumer electronics, electronics components, telecommunications, computers, office and industrial machinery, design, control, and instrumentation equipment, systems electronics, the service sector, the resources sector, and manufacturing as a whole.

But to jump from this realization to the claim that Canada is becoming a "post industrial society" is absurd. We don't as yet have that much industrial activity to be "post" to. The issue rather is this: Can information products and processes become our industry? As of this writing it is generally acknowledged that Canada has for example, the world advantage in technology in TV-information systems, Telidon. Within two years, the British or some other country will have sufficiently modified their system and be marketing it worldwide. Are the results predictable? Why is that?

PART I: RESEARCH AND DEVELOPMENT

A Measure of Innovativeness

During the past year, a great deal of attention by several government departments and a provincial-federal first ministers' conference has been focused on research and development in Canada, understood by the government as "Investigative work carried out to acquire new scientific and technological knowledge, to devise and develop new products or processes, or to apply newly acquired knowledge in making technically significant improvements to the existing products or processes". (MOSST Background Paper, 1978); but these - acquiring of new scientific knowledge, and devising new products are quite different economic activities. Besides the minimal job provision for scientists and engineers, research and development contributes to national economic growth only when it is embodied or manifested in some tangible product or process and is successfully utilized or marketed. From the successful creation of a new idea through prototype and commercially feasible production, through market entry, market research, to market profit are many stages and many barriers to each stage. Often, venture capital must be found to turn the idea into a product, but it is notoriously difficult in Canada to find venture capital much less for product development than for the marketing

and production of proven, successful products. Anyone who regularly reads the Globe and Mail can point to several instances like that of the Canadian who recently successfully invented and produced a mechanism selling for about thirty dollars per unit, which, when inserted on the fuel line of virtually any internal combustion engine, will increase fuel efficiency by 5 to 29%. This device, of which it is estimated will be on 85% of cars in the world within 20 years, was bought by a British firm after the inventor tried unsuccessfully, for several years, to find Canadian development capital, and is now being mass manufactured for placement on cars.

But there are even barriers to export from Canada since multinational "parents", as they are called, often prevent Canadian subsidiaries from exporting via agreements for access to and use of technology. The subsidiary is prevented from altering an innovation and marketing it outside Canada.

Research and development then is merely one part of the chain from new ideas to successful profit, and it has been often estimated that 80 to 90 per cent of investment capital of a new product occurs after the R & D stage. It is perhaps better to think of research and development as a substitute measure for innovativeness, the tendency to create or adopt new products and processes. This is not to claim that the cost of R & D is the same as the cost of innovation, but merely that the more innovative a firm is, the more it uses state-of-the-art technology (created by R & D or adopted from other sources) in its products and/or operations. That is what "innovative" means. If this way of thinking is accepted, then we must see that the government position of merely increasing the amount of R & D which is performed in Canada, or even R & D performed by Canadians, is not a sufficient way to aid industries. We cannot make Canadian companies more innovative simply by trying to increase the amount of Canadian R & D. We might increase the amount of R & D by enacting tax and financial measures to aid Canadian innovators and entrepreneurs, of which there are many. But before examining those matters let us first look at the present funding and performance of Canadian R & D.

R & D Data for Canada

As can be seen from Table One, the total intramural^{**} Industrial R & D, it is thought, is centered in several manufacturing industries in Canada. The industries account for about 85% of all the intramural R & D expenditures, and the "electrical products" industry is the single largest performer of intramural R & D, accounting for about 30% of all industrial R & D expenditures.

* See, for example, Report of the Senate Special Committee on Science Policy, A Science Policy for Canada, Vol.2, 1972, p. 395 or E. Mansfield et al., Research and Development in the Modern Corporation (MacMillan, 1970) Ch.2.

** Intramural R & D expenditures are defined as all funds used for in-house R & D in an industry, including work financed by others.

TABLE 1

TOTAL INTRAMURAL R&D EXPENDITURES, BY INDUSTRY

1971-77

CURRENT DOLLARS (\$ MILLIONS)

	1971	1972	1973	1974	1975	1976	1977
Primary Industries	17.3	26.7	29.9	35.3	40.8	41.3	49.5
%	3.7	5.8	5.9	5.8	5.9	5.3	5.8
Manufacturing Industries	405.7	386.5	430.3	516.7	571.6	645.0	679.2
%	86.8	84.2	85.4	84.6	82.6	82.6	82.4
Service Industries	44.5	46.3	43.8	58.9	79.8	94.8	99.7
%	9.5	10.0	8.7	9.6	11.5	12.1	11.8
TOTAL	467.5	459.5	504.0	610.9	692.2	781.1	846.4
%	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Statistics Canada

With regard to source of funding, the private sector in Canada provides about 30% of the funding for R & D, as can be seen from Table 2, with government providing funds for almost half of the entire R & D expenditures.

TABLE 2

PERCENTAGE DISTRIBUTION OF R&D EXPENDITURES
BY SOURCE OF FUNDS

	1963	1971	1977
Government	52.3	50.7	48.3
Business Enterprises	31.2	32.4	34.9
Universities	13.4	12.4	11.8
TOTAL R&D (a)	100.0	100.0	100.0

SOURCE: Statistics Canada

a) Includes private non-profit organizations and foreign sources.

But in most industrialized countries, the private sector is the source of 40 to 50% of the funding for research and development.

When we look at the percentage distribution of R & D expenditures by performer instead of source of funds in Table 3, we see that in Canada only about 40% of R & D is performed by the private sector, while in most industrialized countries, 50 to 65% of R & D is privately performed. This lack becomes especially critical when we remember that private sector R & D more often results in commercially marketable products than R & D performed in government laboratories.

TABLE 3
PERCENTAGE DISTRIBUTION OF R&D EXPENDITURES
BY PERFORMER

	1963	1971	1977
Government	41.7	33.6	31.4
Business Enterprises	38.7	41.4	44.2
Universities	19.6	25.0	24.4
TOTAL R&D	100.0	100.0	100.0

SOURCE: Statistics Canada

International Indicators

In terms of international indicators, Table 4 shows, for selected OECD countries, the ratio of Gross Expenditures on Research and Development to Domestic Product, (GERD/GDP), a common international indicator used to delineate the percentage of the domestic product of any country going to research and development. For Canada, this ratio has been consistently one per cent or less, while for many OECD countries, the ratio is approximately 1.5% to 2% of GDP. Only Denmark had a lower figure in 1975.

In terms of foreign performance of Canadian R & D, about 40 to 50% of all R & D through the various industries is done by foreign controlled companies in Canada. In manufacturing, for example, in which Canadian intramural industrial R & D centers, about 50% is done by Canadian controlled companies, and about 50% is done by foreign controlled companies, of which the majority are American.

TABLE 4

GERD AS A PERCENTAGE OF GPD FOR 10
OECD COUNTRIES

	1963	1973	1974	1975	1976
Australia	-	1.2	-	-	-
Canada	1.0	1.0	1.0	1.0	-
Denmark	-	1.0	-	1.2	-
France	1.6	1.8	1.8	1.9	-
Germany	1.5	2.1	2.2	2.2	2.1
Japan	1.3	1.9	2.0	-	-
Netherlands	2.3	1.9	2.0	2.1	2.1
Sweden	1.5	1.5	1.6	1.6	-
U.K.	2.6	1.9	-	-	-
U.S.A.	3.5	2.4	2.3	2.4	2.3

SOURCE: OECD: Science Resources
Newsletter, No. 2, Spring, 1977

In summation, the above tables show us that Canadian R&D is low in comparison with industrialized countries and that there is a serious deficiency in the industrial sector, both as a source of funds for R & D and as an actual performer.

Results - Research and Development in the Electrical Products,
Communications, and Service Sectors

Now in spite of this grim picture, one portion of the Canadian economy in which some product research, development and applications are blossoming, in spite of governmental policy, is the industrial service, electrical products and communication sectors. During 1978, I surveyed several thousand firms in the Canadian private sector to obtain data on their products, research and development facilities, locations, activities, and personnel. (Wills, 1978).

In the Directory survey, which is organized according to the SIC (Standard Industrial Classification) number of the firms' main product, I was interested in delineating the R & D capabilities of (1) the traditional industries which the SIC system adequately handles; (2) the industrial service sector - comprising the consulting services predominantly to one industry or a group of related industries (such as resources), plus the engineering, scientific, and computer consulting services - all of which do a great deal of intra industry R & D and therefore cannot be classified under the SIC system as "services incidental to" any specific SIC industry; (3) in addition to R & D groups having separate budgets from parent

support organizations, I was also concerned with R & D performed by smaller groups which may ordinarily be a part of an organizations production facilities. In the micro-processor, peripherals, software applications companies complex in Santa Clara country, the "Silicon Valley", much of the useful product research and development is done by this type of group. I was, of course, also interested in obtaining R & D information on the "hard" parts of the Canadian communication sector, any computer and peripheral companies, software applications companies, microprocessor companies, computer-telecommunications systems companies, and so forth.

Much more must be said about "services", but let us first examine some preliminary results of the survey. If we look at R & D in manufacturing alone, without adding in the service consulting groups which provide customized R & D services to manufacturing, we see, in Table 5, that electrical products industries are still the largest sector (23%) followed by the chemical industries (21%), followed by machinery (13%).

TABLE 5

PERCENT OF R & D BY INDUSTRY
BY LABOUR FORCE
CANADA 1978

(Manufacturing Industries)

<u>INDUSTRY</u>	<u>PERCENT</u>
Food	9%
Rubber and Plastics	3%
Textiles	2%
Paper	5%
Primary Metal	6%
Metal Fabricating	5%
Machinery	13%
Transportation	5%
Electrical Products	23%
Non-Metallic Minerals	3%
Petroleum	5%
Chemicals	21%
All Manufacturing	100%

SOURCE: Directory of Scientific & Technological Capabilities in Canadian Industry, 1977, MOSST, 1978.

If we merge telecommunications services with other types of services and look at the amount of R & D by labour force, by industry, we see in Table 6 that the manufacturing sectors and business services sectors (comprising communication, engineering and scientific services) both do about 45 to 46% of the industrial R & D in Canada. Now even assuming that there is a non-linear relation between any industry's R & D expenditures and the number of people performing R & D in that industry, these figures are at wide discrepancy with Statistics Canada data for the manufacturing and services industries contributions to R & D expenditures (Table 1).

TABLE 6

PERCENT OF R & D, BY INDUSTRY
BY LABOUR FORCE, CANADA 1978
(All Industries)

<u>INDUSTRY</u>	<u>PERCENT</u>
Agriculture, Forestry, Fishing Mining (combined)	7%
Manufacturing	45%
Construction	1%
Services, including communication, engineering and scientific services to all industry	46%
Transportation and utilities	1%
TOTAL	100%

SOURCE: Directory of Scientific & Technological
Capabilities in Canadian Industry, 1977,
MOSST, 1978

To understand why this discrepancy arises and whether it represents something real and significant, or merely reflects definitional differences, we must examine the R & D groups appearing under "service" in the Directory.

When economists speak of service, they traditionally mean things like wholesale and retail trade, food services, entertainment, and so forth, that is, predominately services to consumers. We do not, but include predominantly services to industry. Now if we realize that the criterion of placing a group in this category was that it had a multiple product field which could not be classified under any SIC group, and could not be associated with any single industry and that the predominant activity of the service group is

consulting, we realize that a considerable percentage of R & D in Canada is dispersed in such multi-industry scientific and engineering groups and that often the product of such R & D is customized to a specific one shot need and does not necessarily result in a mass produced item.

Secondly the discrepancy arises not merely because of definitional differences but because the SIC system used to classify industries is archaic, more appropriate for the early twentieth century. In present Statistics Canada data, aggregations of industries such as computer software industries and computer peripheral industries are sometimes classified as "Office Equipment" and are listed under manufacturing instead of communications or services, while in the Directory we have listed such companies under engineering and scientific services. In the early twentieth century, the SIC classification made some sense since one of the first main uses of computers was in the office. But now their uses have exploded throughout all industries - from computer-aided design and process control in resources industries and manufacturing to a wide diversity of uses in the service industries themselves, and the SIC categories which we now use to classify industries often obfuscate such trends in the data.

But what does this service sector do? Although computer analysis of this sector is currently under way, preliminary analysis reveals that about half of the service sector does consulting with one or more of the resources industries and about half does consulting work in the electrical, electronics products, telecommunications field. Again, what is significant here is not the amount of R & D but the form in which it is presented - often consulting on a specific customized product.

* Another feature of the electrical products/electronics sector one notices is that most firms provide components for systems. One sees many companies whose main products for example, are things like "electrical test and instrumentation equipment, industrial switching and control equipment, power conversion equipment, special devices for automation, test equipment for switching systems, cable interface devices, and so forth". One sees few firms whose product is the provision of an entire electronics system, which are provided mainly by multinationals for whom Canadian companies supply components. When one does see Canadian companies whose product is the provision of an entire electronics system, the company often is an engineering consulting firm. The implications of this situation are discussed in Part Three.

* In the Directory this includes parts of the electrical products sector of manufacturing, parts of communication, and a large portion of service to industry.

PART II: SEARCH CHANNELS FOR TECHNICAL INFORMATION

There are, of course, ways of developing products besides originating the idea of the product, that is, doing research. One may simply buy the information to assemble the product - Canadian companies often "buy" information for products through licencing agreements - or one might search for the information.

Now one of the problems in Canada is that the data upon which to base industrial policy is sometimes unreliable, as we have seen in the case of R & D data. In analyzing a survey conducted by the Ministry of State for Science and Technology, I was interested in the actual information channels used by members of Canadian companies as a source of technical information and in patterns of search between (a) small, medium and large sized companies, (b) between foreign-owned multinationals, Canadian-owned multinationals, and Canadian domestic companies, and finally, in assessing the implications of these findings for the development of technologically-intensive, competitive Canadian companies.

In 1977-78 the Ministry of State for Science and Technology surveyed respondents in several hundred Canadian companies, asking them among other questions, what channels they used to search for scientific and technical information and how often these channels were used. Respondents ranged from presidents and corporate planners, to research directors and engineers. The selection of the survey population is described in Appendix III. Responding companies were then classified by personnel at the Financial Post's S.V.P. Service and by the author into the following three categories: foreign-owned multinationals, Canadian-owned multinationals and Canadian domestic companies.

Foreign-owned multinationals are simply foreign owned companies having one or more subsidiaries in Canada. Canadian owned multinationals are Canadian incorporated firms which are not controlled by foreign companies and whose subsidiaries have half or more of their equity share capital owned by a Canadian parent, and Canadian domestic companies are Canadian companies without any foreign subsidiaries.

It is customary to apply the term "multinational" only to companies which have operations in three or more countries, but for the purpose of study, Canadian multinationals were Canadian companies which have successfully penetrated the American (or some other foreign) market. (Definitions of multinationals are discussed in Appendix IV). I was interested here in successful strategies of searching for information. There were a total of 478 respondents. Of these, questionnaires from 457 respondents were found suitable for purposes of analysis.

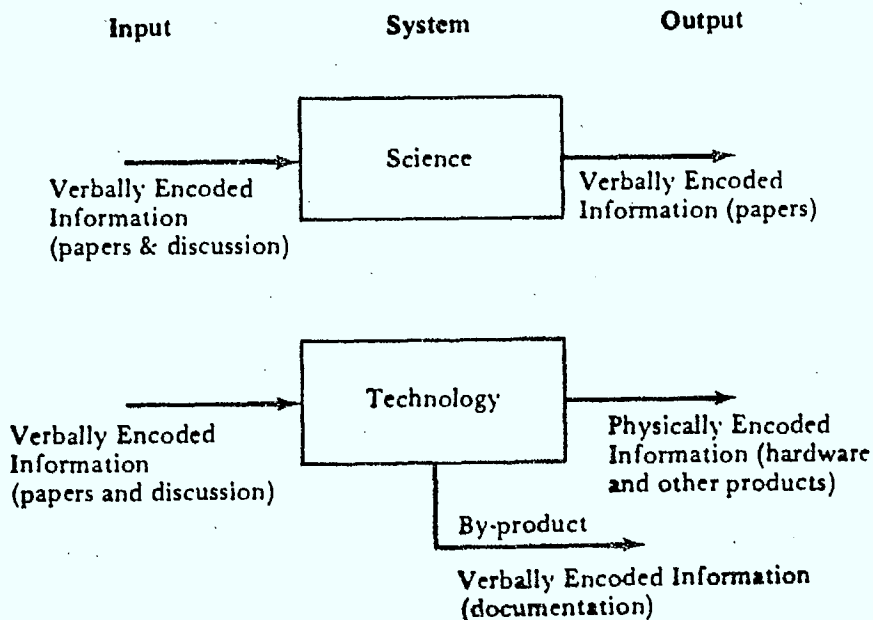
It should be emphasized that, while the respondents cover a wide range of industrial sectors, concentrating in manufacturing, the sample was not selected by the author and does not represent a random stratified sample frame and the responding companies in any sector do not proportionally represent all companies in that sector but

deviate in the manner described in Appendix III.

We are interested then in the different patterns of searching for STI between foreign-owned multinationals, Canadian-owned multinationals, and Canadian domestic companies, and how these patterns vary over company size.

SCIENTIFIC AND TECHNICAL INFORMATION

Little is precisely known about the role of research and development and technology in national economic growth, but it is thought to be substantial, when it is combined with the availability of other factors, such as development capital, market expertise and so forth. If we think of technology as composed of "embodied" information, of hardware and related products, we realize that technology transfer between countries or between companies may occur simply by the purchasing of such hardware (a central way technology enters Canada) or by obtaining the technical information needed to construct and operate such hardware, (via searching for such information or simply purchasing it via licencing agreements and managerial fees). A private sector technologist needs information to understand and formulate problems, and further information to develop solutions. With both science and technology then, the inputs consist of verbal information in the form of papers and discussions.



Source: Allen (1977)

However, when we turn to the outputs of scientific and technical activity, we see some striking differences.

In science, the outputs, like the inputs, are also verbally encoded information (usually in the form of papers), but with technology, the outputs are physically encoded information in the form of hardware and related products: here verbal information is merely a by-product of outputs in the form of documentation of hardware. (Allen, 1977)

This is not a trivial distinction.

Since the technologist must obtain his or her information via either docoding and transposing physically encoded information or by direct personal contact with others, providing information in technology does not involve the collection, organization and distribution of printed publications to the same extent that it does in science. As Allen (1977) at MIT has written, if "one were to develop an optimum system for communication in science, there is no reason to suspect that it would be at all appropriate for technology", and it is precisely technology, technical information at a utilizable stage, that we are interested in here.

Before we can design efficient systems to provide scientists, engineers and others in the private sector with technical information necessary for their work, much more must be known about the use population in Canada.

In the sixties and early seventies, there were a large number of "user studies" of STI, mainly in the United States, seeking to (1) determine the effectiveness of information channels and (2) examine the criteria which governs the selection of any channel. Until quite recently, however, studies have not differentiated between these two goals. In other words, it has been implicitly thought that the effectiveness of an information channel is the main criterion which governs selection of that channel.

It has been found, however, that there exists no relation whatsoever between channel effectiveness and the extent to which any given information channel is used. Allen (1977) finds that engineers, act "in a manner which is intended not to maximize gains, but rather to minimize loss. The loss to be minimized is the cost in terms of effort, either physical or psychological, which must be expended in order to gain access to an information channel". Engineers, thus seem to follow a "law of least effort", which states that individuals when selecting several paths to a goal will base their selection upon a single criterion of least average rate of probable work.

* Many firms are in fact finding it easier now to enclose micro-computer equipment in glue so it will self-destruct when opened rather than to use the patent system. This is to prevent this physical decoding of the product.

If little is known about how individuals search for technical information, less is known about whether or how channel use varies over company size in Canada, or how channel use varies between Canadian based multinationals and Canadian domestic companies.

In the present study, respondents were asked the following question: "Which of the following channels do you use as a source of scientific and technical information, and how often do you use them?". Possible information channels were as follows:

- 1) libraries
- 2) trade associations
- 3) seminars, conventions, exhibits
- 4) company sales force
- 5) suppliers
- 6) clients and customers
- 7) government agencies
- 8) commercial information services
- 9) research organizations or consultants
- 10) experts colleagues and associates
- 11) magazines
- 12) newspapers

Description of the Survey

Size

Of the 457 questionnaires found suitable for purposes of analysis, 150 (35%) were from respondents in small sized companies (1 - 100 members), 119 (26%) were from respondents in medium sized companies (101 - 500 members), and 179 (39%) were from respondents in large size companies (more than 501 members).

Industrial Sector

206 of the respondents (45%) were from manufacturing companies; 36 respondents (8%) were from mining companies; 66 respondents (15%) were from construction companies; 41 respondents (9%) were from communication companies; 34 (7%) respondents (16%) were from service companies. The individual variation of size over industrial sector is given in Table 1.

Company Type

Of the 457 respondents, we were able to determine whether 443 were associated with a foreign owned multinational, a Canadian domestic company, or a Canadian owned multinational. Of these 443 respondents, 114 (32%) were from foreign owned multinationals, 224 (51%) were from Canadian domestic companies, and 75 (17%) were from Canadian owned multinationals. As can be seen in Table II, the foreign owned and Canadian owned multinationals are mainly large, while the Canadian companies surveyed are mainly small. Almost 56% of the foreign owned multinationals surveyed are large, with only 15% small sized. For the Canadian owned multinationals, 72% are large with only 13% small sized, and for the Canadian domestic companies, only 16% are large, while 57% are small sized.

TABLE I.

CROSS TABULATION OF
TYPE-INDUSTRY BY SIZE

		GLDSIZE						
COUNT		I						
ROW PCT		ISHALL		MEDIUM		LARGE	ROW	
COL PCT		I		I		I	TOTAL	
TOT PCT		I		I		I		
TYPE		I		I		I		
MANUFACTURING	1	I	81 I	I	59 I	I	66 I	206
		I	39.32 I	I	28.64 I	I	32.04 I	45.08
		I	50.94 I	I	49.58 I	I	36.87 I	
		I	17.72 I	I	12.91 I	I	14.44 I	
MINING	2	I	10 I	I	10 I	I	16 I	36
		I	27.78 I	I	27.78 I	I	44.44 I	7.88
		I	6.29 I	I	8.40 I	I	8.94 I	
		I	2.19 I	I	2.19 I	I	3.50 I	
CONSTRUCTION	3	I	28 I	I	20 I	I	18 I	66
		I	42.42 I	I	30.30 I	I	27.27 I	14.44
		I	17.61 I	I	16.81 I	I	10.06 I	
		I	6.13 I	I	4.38 I	I	3.94 I	
COMMUNICATION	4	I	14 I	I	7 I	I	20 I	41
		I	34.15 I	I	17.07 I	I	48.78 I	8.97
		I	8.81 I	I	5.88 I	I	11.17 I	
		I	3.06 I	I	1.53 I	I	4.38 I	
UTILITY	5	I	3 I	I	11 I	I	20 I	34
		I	8.82 I	I	32.35 I	I	58.82 I	7.44
		I	1.89 I	I	9.24 I	I	11.17 I	
		I	.66 I	I	2.41 I	I	4.38 I	
SERVICE	6	I	23 I	I	12 I	I	39 I	74
		I	31.08 I	I	16.22 I	I	52.70 I	16.19
		I	14.47 I	I	10.08 I	I	21.79 I	
		I	5.03 I	I	2.63 I	I	8.53 I	
COLUMN TOTAL			159		119		179	457
			34.79		26.04		39.17	100.00

NUMBER OF MISSING OBSERVATIONS = 11

TABLE II.

*** SIGMA SPSS ---- RELEASE 7.0 ***

***** C R O S S T A B U L A T I O N O F * * * * *

MULTITYP TYPE-CONTROL OF ORGANIZATION BY SIZE

		OLDSIZE				
COUNT		I				
ROW	PCT	IS	SMALL	MEDIUM	LARGE	ROW
COL	PCT	I				TOTAL
TOT	PCT	I	1	2	3	
MULTITYP		I	I	I	I	
	1	I	22	42	80	144
FOR-OWNED	MULTINA	I	15.28	29.17	55.56	32.51
		I	13.84	36.52	47.34	
		I	4.97	9.48	18.06	
		-I-	-I-	-I-	-I-	-I-
	2	I	127	62	35	224
CANADIAN	COMPANY	I	56.70	27.68	15.63	50.56
		I	79.87	53.91	20.71	
		I	28.67	14.00	7.90	
		-I-	-I-	-I-	-I-	-I-
	3	I	10	11	54	75
CANOWNED	MULTINAT	I	13.33	14.67	72.00	16.93
		I	6.29	9.57	31.95	
		I	2.26	2.48	12.19	
		-I-	-I-	-I-	-I-	-I-
	COLUMN		159	115	169	443
	TOTAL		35.89	25.96	38.15	100.00

NUMBER OF MISSING OBSERVATIONS = 25

Results

The question(s) which must be answered is whether (and how) the companies can acquire technological information in a more efficient and less costly way so that product development will be improved in the Canadian private sector.

(1) We first eliminated possible variations in channel use due to size differences and compared the most frequently used channel between respondents in (a) small foreign owned multinationals vs. small Canadian companies (b) medium sized foreign owned multinationals vs. medium sized Canadian companies, and (c) large foreign owned multinationals vs. large Canadian companies. These results are summarized in Table III. (It was felt that there were not enough Canadian owned multinationals of varying size in the population for valid comparison purposes of this type.)

(2) The results of extent and frequency of use of each information channel by respondents in small, medium and large sized companies are summarized in Appendix I.

(3) These same results for respondents in companies of varying ownership structure - foreign owned multinationals, Canadian owned multinationals, and Canadian domestic companies - are summarized in Appendix II.

(4) In general, as one goes from large to small-sized companies, the extent of use and frequency of use of all information channels decreases, with the exception of clients and suppliers. Respondents in both medium sized Canadian companies and small sized Canadian companies cite suppliers as among the three most frequently used sources of technical information, while respondents in medium sized and small sized foreign owned multinationals do not. Small and medium sized Canadian companies rely excessively on suppliers (usually agents of foreign owned multinationals) who have a vested interest in selling a particular and perhaps inappropriate product as a source of technical information.

(5) Commercial information services and research organizations are used by few respondents sampled in Canada as sources of technical information, although respondents in large companies tend to use these channels more often and more extensively than those in small companies.

(6) Although governmental agencies also are not extensively used by respondents in any type of company, respondents in Canadian-owned multinationals constitute the largest information source at the weekly or monthly rates of use, and those in large companies (of all three types of ownership), constitute more than half of the users.

TABLE III

Most Frequently Used Sources of STI
(decreasing order of use)

Large Foreign Owned Multinationals
(80 Respondents)

1. experts and colleagues
2. trade associations
3. seminars and conventions

VS. Large Canadian Companies
(35 Respondents)

1. experts and colleagues
2. trade associations
3. libraries

Medium Sized Foreign Owned Multinationals
(42 Respondents)

1. experts and colleagues
2. company sales force
3. seminars and conventions

VS. Medium Sized Canadian Companies
(62 Respondents)

1. experts and colleagues
2. suppliers
3. company sales force

Small Foreign Owned Multinationals
(22 Respondents)

1. experts and colleagues
2. company sales force
3. newspapers

VS. Small Canadian Companies
(127 Respondents)

1. experts and colleagues
2. suppliers
3. newspapers

(7) The source of technical information utilized most extensively and most frequently by all types of respondents is that of "experts, colleagues, and associates". Information -- both new awareness of some technology and knowledge of how to implement it -- is transferred in the Canadian private sector mainly via personal contact.

Let us now examine policy implications and the relevant areas of future research.

PART III: POLICY IMPLICATIONS AND FUTURE RESEARCH

(1) Rather than concentrating on increasing the amount of R&D performed in Canada, concentrate on increasing the adoption, diffusion and application of existing state-of-the-art technology from all available sources. Funds should be made available to start several centers whose purpose is the encouragement of diffusion and adoption of informatics technology in the private sector.

Certainly as a long-term goal, no one would disagree with the aim of increasing the amount of Canadian R&D. However, given the massively high U.S. ownership of most Canadian industry and the population differences between Canada and the United States, there are compelling economic reasons for Canadians to obtain much, if not most, new technology from foreign (U.S.) sources instead of creating it by doing R&D. The size differential between the U.S. and Canada forces any firm operating in the Canadian market always to take into account the increased Canadian R&D costs per unit of output. Although research in the diffusion of new technology through the Canadian private sector is scant, Globerman has conducted three such studies -- (1975, 1975, 1976) the diffusion of numerical control machine tools, new presses to eliminate water in paper-making, and of tufting equipment in the manufacturing of carpets, duplicating diffusion studies of E. Mansfield in the U.S. In all cases the rate of adoption by firms was significantly slower in Canada than in the United States, and slower than in Europe for the water-press. It is thus astonishing that there presently exists only one federal government agency (the Technical Information Service of the National Research Council, whose budget last year was \$2 million), whose purpose is productivity improvement via utilization of state-of-the-art-technology. We cannot realistically expect Canadian firms to do the sort of R&D done across the board by U.S. firms. Obviously Canada must specialize in areas of special advantage.

Given the clear economic advantages of adopting state-of-the-art-technology we must look at the factors responsible for our slower adoption rates. These may be classified into those of a structural nature which we cannot change, such as higher tooling costs per unit of finished product arising from the population differences between the U.S. and Canada, and those we can change,

such as the quality of Canadian management. Funds should be made available to start at least one world class institute for the training of Canadian managers.

(2) Make incentives of the order of \$100 to \$200 million per year available for a minimum of five years to expand existing firms and encourage the formation of large-scale mergers and consortia in the high-technology areas of systems electronics and micro-processors. We have seen that a large part (46 per cent) of R&D and related activities in Canada lie in the industrial service sectors, and comes in the form of customized consulting on specific projects -- some groups serving a multiplicity of industries. Consequently such R&D seldom results in standardized mass products. Also a feature of the electronics sector as we have seen is that many firms provide components for systems instead of entire systems themselves.

(3) Technological information, we have seen, is transferred in the Canadian private sector mainly via personal contact. Policy for the improving of the dissemination of technical information in Canada, therefore, must be directed towards those instances involving human carriers -- linking agencies (Rogers, Rogers, Wills, 1976), employee migration (Shapiro, 1967), etc. The best way to transfer technology is to move a human carrier. In the United States, Roberts and Wainer (1971), show effective transfer of space technology to the private sector from universities, for example, only in those cases in which engineers left the university laboratories to create their own businesses, and Shapiro cites the findings by the Engineering Manpower Commission of the Engineers' Joint Council that the turnover in industries classified as "electrical, electronics, aircraft and parts, communications, instruments, and research and development", is 12.1 per cent. Each time an engineer moves to a new company, he or she brings a certain amount of proprietary information, ensuring that any company is not far behind his competitors. The engineer also knows how to apply the information to the new context, and for competent transfer of technology we must utilize this human ability to restructure, to fit the puzzle together again.

(4) Since so many small and medium-sized Canadian companies -- both subsidiaries and non-subsidiaries of multinationals -- use suppliers as a source of technical information, we should investigate, beyond the few existing case studies, the exact terms and mechanisms of licensing and arms-length agreements for technical information among these companies, to see how they affect flows of technology into and across the Canadian private sector, and how such can be altered to Canada's economic interests.

(5) Eliminate the corporate capital gains tax on information industries.

In 1977 the government extended the investment tax credit to include credits for both current and capital R&D expenditures, the

credits ranging from 5 to 10 per cent of existing R&D expenditures, depending on the region. Companies were then allowed in 1978 to deduct an additional 50 per cent of that amount by which R&D expenditures exceeded the average of those incurred in the preceding three year period, (thus automatically excluding any significant incentive and benefits to small companies to start their own R&D) because a three year average of nothing is still nothing. Finally in 1978 there was an indefinite extension of the R&D investment tax credit and an increase to 10 or 20 per cent depending on the region and 25 per cent for small Canadian controlled businesses.

Although it is extremely difficult to get evidence on this point, it seems that a main effect of the government tax incentive measures in the form of R&D write-offs is to encourage firms to substitute and report advertising and marketing expenditures for those of R&D, and this decision to fund R&D is thus based more on managers aversion to paying taxes than to any commitment to innovation. In site visits by the author to six large Canadian companies, whose increased R&D tax write-offs in the last fiscal year totalled just under \$22 million, it was found that all collectively had an increased R&D budget of just under \$5 million.

Now the above-described tax measures were enacted largely to stimulate the amount of R&D done in Canada. But, as we have seen, we must not merely increase the amount of R&D done in Canada or even the amount of R&D done in Canada by Canadians. We must increase its applicability. We are interested in increasing R&D of which the results are marketable on a world scale. One of the first things we must do is to utilize our tax structure to create a better climate for entrepreneurs and innovators in Canada. Innovating, the creation, physical production, and utilization of new products and processes, involves a great deal of risk and requires a great amount of risk capital for any firm, especially for high technology firms. We simply do not now have the vast pool of "floating" venture capital which the U.S. does and it must be built up.

(6) Encourage more adoptive R&D. New technology is internationally available immediately. Both American and Japanese firms, as is well known, frequently will copy, modify, and sell one another's products, and multinationals in Canada frequently modify U.S. technology for Canadian conditions. What we are suggesting is that Canadian companies be "legally encouraged" to adopt, modify, and where feasible sell this technology and its products in world markets.

(7) Make funds available to encourage the incorporation of microprocessors into existing Canadian products.

(8) Start an aggressive recruitment program using media techniques to move to Canada persons who have necessary high technology and managerial skills in the areas of systems electronics and microprocessors. Many countries do this and there is no reason why Canada

should not. Mitel, for example, has a think tank located at Lake Tahoe in California, whose purpose is recruitment of computer talent from the Santa Clara Valley.

(9) Incorporate awareness of existing information technology such as stand-alone floppy disc-based equipment and video disc into the present regulatory discussions of information industries. U.S. companies such as MCA and RCA are about to begin releasing video disc based programs in Canada. They will be sold like books, are completely unregulated and will render irrelevant many of the present regulatory arguments about cable, pay T.V., and telidon-like retrieval systems.

(10) A number of studies predicting vast labour displacement effects resulting from the industrial uses of microprocessors have advocated the immediate initiation of worker retraining programs. We agree with this proposal and further believe that it is an appropriate time to use the funding lever to try to upgrade parts of the Canadian university system. Just as the colonial students in Martinique in the nineteenth century would study "les grands philosophes" of France instead of learning practical development techniques appropriate to that era, in the Canadian university system in such critical and relevant subjects as communications research, it is not unusual to find students in ignorance and contempt of computer developments studying the Frankfurt school of German sociology or French structuralism.

APPENDIX I

STI Channels for Small, Medium
and Large Companies

Libraries - 39% of the respondents in small companies do not use libraries as a source of STI, as compared with non-user rates of 31% and 14% respectively for respondents in medium and large companies. Of all respondents who weekly use the library, 58% are members of large companies, and at the monthly rate, 57% are members of large companies.

Trade Associations - 24% of the respondents in small companies do not use this channel as an STI source, as compared with non-user rates of 17% and 9% for respondents in medium and large companies. Of those who use trade associations several times per week, member of large companies comprise 59%.

Seminars-Conventions-Exhibits - 16% of the respondents in small companies do not use this channel as an STI source, as compared with non-user rates of 7% and 5% respectively for respondents in medium and large companies; of those who use seminars, conventions and exhibits several times per month, respondents in large companies comprise 43% of the population (as compared with 27% for respondents in small companies).

Company Sales Forces - 31% of the respondents in small companies do not use company sales force as an STI source, as compared with a non-user of 23% for respondents in both medium and large companies. Of all weekly users of sales force, respondents in small companies comprise 43% of all users.

Suppliers - 11% of the respondents in small companies do not use suppliers as an STI source, as compared with non-user rates of 13% and 24% for respondents in medium and large companies respectively. Of all weekly users of suppliers as an STI source, respondents in small companies constitute 52% of all users.

Clients - 29% of the respondents in small companies do not use this channel as compared with non-user rates of 27% and 37% for respondents in medium and large companies.

Governmental Agencies - 18% of the respondents in small companies do not use governmental agencies as an STI source as compared with non-user rates of 26% and 17% respectively for medium and large companies. Of all weekly users of governmental agencies, respondents in large companies constitute 68%

Commercial Information Services - 69% of the respondents in small companies do not use commercial information services as an STI source, as compared with non-user rates of 56% and 38% for medium and large companies. Of the respondents in small and medium sized companies using this channel, the most frequent interval of use is several times per year.

Research Organizations and Consultants - 53% of the respondents in small companies do not use this channel as an STI source, as compared with non-user rates of 41% and 26% for medium and large companies. Only 11% of the respondents in small companies use this channel once per month or more often. The most frequent interval of use for all three sized companies is several times per year.

Experts, Colleagues and Associates - Only 13% of the respondents in small companies do not use this channel for STI, as compared with non-user rates of 8% and 3% for medium and large companies. The most frequently cited interval of use of this channel for all companies is several times per week.

Magazines - 12% of the respondents in small companies do not use magazines as an STI source as compared with non-user rates of 8% and 3% for medium and large companies.

Newspapers - 32% of the respondents in small companies do not use this channel for STI, as compared with non-user rates of 30% and 18% for medium and large companies.

The actual weekly, monthly and yearly rates of users of each channel for small, medium and large sized companies are presented in Appendix VII.

APPENDIX II

STI Channels for Multinational and Domestic Canadian Companies

Libraries - 34% of respondents in Canadian companies do not use libraries as a source of STI as compared to a non-user rate of 23% and 19% for respondents in foreign owned and Canadian owned multinationals respectively. 14% of the respondents in Canadian companies use libraries and an STI source at least on a per week as compared with a weekly usage rate of 26% for respondents in Canadian owned multinationals and 21% for respondents in foreign owned multinationals.

Trade Associations - 20% of the respondents in Canadian companies do not use trade associations as an STI source, as compared to a non-user rate of 14% and 9% for respondents in foreign owned and Canadian owned multinationals respectively. The largest weekly use of trade associations is for respondents in foreign owned multinationals followed by respondents in Canadian owned multinationals.

Seminars-Conventions-Exhibits - 12% of respondents in Canadian companies do not use seminars, conventions and exhibits as a source of STI, as compared to a non-user rate of 7% and 8% for respondents in foreign owned and Canadian owned multinationals respectively. Large foreign owned multinationals use seminars and conventions more often than large Canadian companies, and medium sized foreign owned multinationals use this channel more often than medium sized Canadian companies. If we examine the monthly rate of use, we see that 12% of the respondents in foreign owned and Canadian owned multinationals use this channel, as compared with 57% of the respondents in Canadian companies.

Company Sales Force - 33% of respondents in Canadian companies do not use company sales force as a source of STI, as compared with a non-user rate of 19% and 20% for foreign owned and Canadian owned multinationals respectively. But of all companies which use sales force for STI at the rate of at least several times per week, respondents in Canadian companies comprise most of the population (49%).

Suppliers - 16% of respondents in Canadian companies do not use suppliers as a source of STI as compared with a non-user rate of 15% and 20% for respondents in foreign owned and Canadian owned multinationals, but again of those companies who weekly or monthly use suppliers for STI, users in Canadian companies comprise more than 50% of all users at this rate.

Clients-Customers - 29% of the respondents in Canadian companies do not use clients and customers as STI sources as compared with non-user rates of 34% and 33% for respondents in foreign owned and Canadian owned multinationals, but of the weekly and monthly users of this channel, Canadian companies comprise the majority.

Government Agencies - 21% of the respondents in Canadian companies do not use governmental agencies for STI as compared with a non-user rate of 20% and 19% for respondents in foreign owned and Canadian owned multinationals. But of the weekly or monthly use of this channel, respondents in Canadian companies comprise the highest percentage of users.

Commercial Information Services - This channel is used by few. 61% of the respondents in Canadian companies surveyed do not use commercial information services for STI as compared with a non-user rate of 49% and 47% for respondents in foreign owned and Canadian owned multinationals respectively. Only 7% of the respondents in Canadian companies used this channel weekly, as compared with 12% of the foreign owned multinational respondents and 16% of the Canadian owned multinational respondents.

Research Organizations or Consultants - Research Organizations are used by almost no one in Canada as an STI source; 47% of the respondents in Canadian companies do not use this channel as compared with a 38% and a 17% non-use rate for respondents in foreign owned and Canadian owned multinationals respectively. The mean frequency of use for this channel was several times per year for all types of companies.

Experts, Colleagues and Associates - This was the most frequently cited channel for respondents in all type of companies. Only 11% of the Canadian companies' respondents did not use this channel as an STI source, as compared with 6% non-users among the foreign owned multinationals and 3% non-users among the Canadian owned multinationals. But respondents in Canadian companies use experts, colleagues and associates less often than respondents in other types of companies.

Magazines - 9% of the respondents in Canadian companies do not use this channel as compared with a non-user rate of 6% and 5% for respondents in foreign owned and Canadian owned multinationals respectively.

Newspapers - 28% of respondents in Canadian companies do not use newspapers for STI as compared with a 26% and a 20% non-user rate for respondents in foreign owned and Canadian owned multinationals respectively.

The detailed weekly, monthly and yearly rates of uses of each channel for the three types of companies are presented in Appendix VI.

APPENDIX III

Selection of the Population

Listings of Canadian companies were first provided to MOSST from the trade associations and professional societies listed below.

Association of Consulting Engineers
Business Council of National Issues
Canadian Construction Association
Canadian Gas Association
Canadian Institute of Chartered Accountants
Canadian Institute of Mining & Metallurgy
Canadian Manufacturers Association
Canadian Medical Association
Chemical Producers Association
Informatics Institute of Canada
Pharmaceutical Manufacturers Association of Canada
Purchasing Management Association of Canada

A random selection of companies was then done to conform to the sample design and provide regional representation. The proposed sample design, done on contract for MOSST, involved national representation of business establishments in six industry groups: communications, construction, manufacturing, mining, public utilities, and services.

The 1975 contribution of these sectors to the Gross Domestic Product was first calculated (see column 1 of Table IV) and then normalized to 100% (column 2). Column 3 is the sectoral breakdown of the total survey mailing, and column 4 gives the number of returns and percentage of total returns. The percentage of total returns for any sector at most (in the case of communications) deviates by 4.1% from that sector's normalized contribution to the GDP.

TABLE IV

Selection of the Population

<u>Companies</u>	<u>Contribution to 1975 GDP (%)</u>	<u>Normalized Contribution to 1975 GDP (%)</u>	<u>Numbers of Questionnaires Mailed</u>	<u>Number & Percent of Total Returns</u>
Communications	2.5	5.3	270	45 (9.4%)
Construction	7.5	16.0	761	68 (14.2%)
Manufacturing	21.4	45.0	1831	214 (44.8%)
Mining	4.3	9.0	414	37 (7.7%)
Public Utilities	2.7	5.7	198	35 (7.4%)
Services	<u>9.0</u>	<u>19.0</u>	<u>507</u>	<u>79 (16.5%)</u>
TOTAL	47.4%	100.0%	3981	489 100%

APPENDIX IV

Definitions of Foreign Owned, Foreign Controlled and Multinational Enterprises

The definition of a multinational corporation, or multinational enterprise, is really quite difficult. It is really necessary to define the size of the firm, to determine in how many countries the firm has operations and the nature of such operations. If any subsidiary has separate corporate setups does it qualify? What is the nature of management control the parent company exercises? What percentage of shares should the parent own? Should operations in a foreign country involve manufacturing facilities or does merely a sales office qualify?

For the most part, Statistics Canada collects data on foreign owned or foreign controlled corporations rather than on multinational corporations. In the CALURA data a distinction is made between the concepts of "degree of ownership" and "control". According to the CALURA (1974) any corporation is considered to be foreign controlled if 50% or more of its voting rights are known to be held outside Canada or are held by Canadian corporations which are themselves foreign controlled, and the country of control of a Canadian corporation is ascribed to the foreign country in which a majority of the voting rights are held or where the majority of the voting rights are held or where the majority of the voting right of the Canadian parent company or companies are held. Control is assigned to Canada in the CALURA data in those cases "where the holding of over 50% of the voting rights is distributed among non-associated shareholders in two or more different countries, and where the voting rights held in Canada constitute the largest single holding reported by any country".

Now adherence to this convention may lead to a company's reclassification as CALURA notes (foreign or domestically controlled) as a result of minor stock exchanges. If a stock transaction results in the transfer of ownership of the majority of shares from one country to another, the corporation would be reclassified in terms of control. To avoid such rapid swings resulting from stock transactions occurring at the margin, in the CALURA data corporations are reclassified only "when changes in ownership of the voting rights are substantial or do in fact appear to alter the potential or effective control over the management of the country". As noted by CALURA, there are certainly many cases which do not fall within the definitions of control as described above. If for example, share ownerships are diffused throughout several countries, essential control may be exercised even if the controlling interest is much less than 50% of all corporate voting rights, and there are, of course, other means besides voting rights for exercising such control, such as licencing, franchise agreements and monopolistic marketing practice.

Now under the concept of "ownership", the CALURA data classifies each corporation according to the percentage of its voting rights "which are owned by non-residents either directly or through other Canadian corporations, and the whole of the corporation is assigned to this particular degree of foreign control".

In contrast to CALURA, in the Canadian Balance of International Payments (1961-62), companies making portfolio investments (as opposed to direct investments) are not treated as foreign controlled irrespective of their ownership, since portfolio investment allegedly does not result in any significant degree of control over Canadian industry. The main difference however, between the CALURA and Balance of Payments data is as follows: "Foreign ownership as used in the DBS report refers to the proportionate share of non-residents in the capital (at book value) of a corporate or group of corporations. Capital as used in the series covers "long-term debt and equity (including retained earnings) employed in Canada." CALURA data, in other words, deals with each corporation as an entity, assigning ownership of the entire corporation according to percentage of voting shares, while in the Balance of Payments data only the part of the capital (including long term debt) employed in Canada which is owned by non-Canadians is assigned as non-resident owned.

With respect to the concept of foreign control, the DBS series includes a small number of companies as "non-resident controlled", in which control is exercised without major ownership, and also excludes some companies for which major ownership resides with non-residents but in which control is exercised by residents. A reconciliation of the CALURA and DBS data on foreign controlled companies is thus not possible.

The Foreign Investment Review Agency (1976) of the Department of Industry, Trade and Commerce is more directly concerned with a definition of the multinational corporation or multinational enterprise. Citing Vernon, they view the multinational enterprise as "...simply a cluster of corporations of diverse nationality joined together by ties of common ownership and responsive to a common management strategy". It is this fact of common management strategy and the ability to integrate economic activities simultaneously on several national markets which leads us to suspect that the multinationals STI channels differ from domestic companies in any country.

A P P E N D I X - V

SOURCE LIST FOR
CLASSIFICATION OF COMPANIES

Who Owns Whom 1976/1977 United Kingdom
Who Owns Whom North America 1976/1977
Corporate Affiliations 1977
Moody's Industrial Manual 1976
The Financial Post Corporation Service Cards
The Stock Exchange Official Year Book 1976/1977
The Financial Post Survey of Mines 1977
1977 Canadian Trade Index
Scott's Quebec Industrial Directory
Canadian Key Business Directory 1977
Ontario Subsidiaries of Foreign Manufacturing Companies

EXPLANATORY NOTE TO APPENDICES

The following data tables (Appendices VII and VIII) consist of Statistical Package for the Social Sciences (SPSS) cross tabulations run on the Xerox Sigma Nine computer of Carleton University.

Company sizes in these tables were made to correspond to current categories used by the Department of Industry, Trade and Commerce. Small companies have 0 - 100 members. Medium companies have 101 - 500 members, and large companies have 501 members or more. The original frequency of use categories for any information channel were collapsed for purposes of analysis in the following manner. "Daily" or "About once a week" became "several times per week". "2-3 times per month" and "once a month" became "several times per month", and "once in 2-3 months" or "less often" became "several times per year".

In these cross tabulations, the first number in any square is the absolute count of respondents answering a question in a certain way; the second number is the row percentage of respondents answering a question in a certain way, the third number is the column percentage of respondents thus answering, and the last number is the percentage of the total response which that square comprises. Under "row total" and "column total", the second number is the percentage of the total (row or column) which that part of the population comprises.

APPENDIX VI PROGRAM BREAKDOWN

*** SIGMA SPSS ---- RELEASE 7.0 ***

CRITERION VAR. LIBUSE BROKEN DOWN BY MULTITYP BY OLDSIZE		DESCRIPTION OF SUBPOPULATIONS EXTENT-USE OF LIBRARIES AS STI CHANNEL TYPE-CONTROL OF ORGANIZATION RECODED & COLLAPSED SIZE							
VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N		
FOR ENTIRE POPULATION			1567.0000	3.6106	2.2029	.1057	(434)		
MULTITYP	1	FOR-OWNED MULTINAT	477.0000	3.4317	1.9783	.1678	(139)		
OLDSIZE	1	SMALL	90.0000	4.0909	2.0681	.4409	(22)		
OLDSIZE	2	MEDIUM	139.0000	3.4750	2.0253	.3202	(40)		
OLDSIZE	3	LARGE	248.0000	3.2208	1.9100	.2177	(77)		
MULTITYP	2	CANADIAN COMPANY	863.0000	3.9050	2.3189	.1560	(221)		
OLDSIZE	1	SMALL	522.0000	4.1760	2.3660	.2116	(125)		
OLDSIZE	2	MEDIUM	241.0000	3.9508	2.2318	.2858	(61)		
OLDSIZE	3	LARGE	100.0000	2.8571	2.0457	.3458	(35)		
MULTITYP	3	CANOWNED MULTINAT	227.0000	3.0676	2.1347	.2482	(74)		
OLDSIZE	1	SMALL	47.0000	5.2222	2.1082	.7027	(9)		
OLDSIZE	2	MEDIUM	59.0000	5.3636	2.3355	.7042	(11)		
OLDSIZE	3	LARGE	121.0000	2.2407	1.4133	.1923	(54)		
TOTAL CASES =		468							
MISSING CASES =		34 OR 7.3 PCT.							

*** SIOMA SPSS ---- RELEASE 7.0 ***

..... DESCRIPTION OF SUBPOPULATIONS
 CRITERION VAR. TRADEUSE USE OF TRADE ASSOCIATIONS FOR STI
 BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
 BY OLDSIZE RECODED & COLLAPSED SIZE

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			1360.0000	3.1776	1.7955	.0868	(428)
MULTITYP	1	FOR-OWNED MULTINAT	430.0000	3.0282	1.7298	.1452	(142)
OLDSIZE	1	SMALL	76.0000	3.4545	2.0639	.4400	(22)
OLDSIZE	2	MEDIUM	126.0000	3.1500	1.7179	.2716	(40)
OLDSIZE	3	LARGE	228.0000	2.8500	1.6312	.1824	(80)
MULTITYP	2	CANADIAN COMPANY	728.0000	3.4019	1.9178	.1311	(214)
OLDSIZE	1	SMALL	443.0000	3.6311	1.9591	.1774	(122)
OLDSIZE	2	MEDIUM	198.0000	3.3000	1.9511	.2519	(60)
OLDSIZE	3	LARGE	87.0000	2.7188	1.5290	.2703	(32)
MULTITYP	3	CANOWNED MULTINAT	202.0000	2.8036	1.4403	.1697	(72)
OLDSIZE	1	SMALL	34.0000	4.2500	2.3146	.8183	(8)
OLDSIZE	2	MEDIUM	22.0000	2.2000	.6325	.2000	(10)
OLDSIZE	3	LARGE	146.0000	2.7037	1.2683	.1726	(54)

TOTAL CASES = 468
 MISSING CASES = 40 OR 8.5 PCT.

----- DESCRIPTION OF SUBPOPULATIONS -----
 CRITERION VAR. SEMUSE USE OF SEMINARS-CONVENTIONS-EXHIBITS
 BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
 BY OLDSIZE RECODED & COLLAPSED SIZE

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			1420.0000	3.2794	1.2465	.0599	(433)
MULTITYP	1	FOR-OWNED MULTINAT	448.0000	3.1549	1.1191	.0939	(142)
OLDSIZE	1	SMALL	77.0000	3.6667	1.6833	.3673	(21)
OLDSIZE	2	MEDIUM	127.0000	3.0238	.9997	.1543	(42)
OLDSIZE	3	LARGE	244.0000	3.0886	.9633	.1084	(79)
MULTITYP	2	CANADIAN COMPANY	737.0000	3.3963	1.3297	.0903	(217)
OLDSIZE	1	SMALL	434.0000	3.5285	1.4617	.1318	(123)
OLDSIZE	2	MEDIUM	191.0000	3.2373	1.2083	.1573	(59)
OLDSIZE	3	LARGE	112.0000	3.2000	.9641	.1630	(35)
MULTITYP	3	CANOWNED MULTINAT	235.0000	3.1757	1.2091	.1406	(74)
OLDSIZE	1	SMALL	41.0000	4.1000	2.0248	.6403	(10)
OLDSIZE	2	MEDIUM	35.0000	3.1818	1.3280	.4004	(11)
OLDSIZE	3	LARGE	159.0000	3.0000	.8987	.1234	(53)

TOTAL CASES = 468
 MISSING CASES = 35 OR 7.5 PCT.

*** SIGMA SPSS ---- RELEASE 7.0 ***

----- DESCRIPTION OF SUBPOPULATIONS -----
 CRITERION VAR. SALESUSE USE OF COMPANY SALES FORCE FOR STI
 BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
 BY OLDSIZE RECODED & COLLAPSED SIZE

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			1322.0000	3.3050	2.2990	.1149	(400)
MULTITYP	1	FOR-OWNED MULTINAT	415.0000	2.9856	2.1400	.1815	(139)
OLDSIZE	1	SMALL	54.0000	2.5714	2.0142	.4395	(21)
OLDSIZE	2	MEDIUM	120.0000	2.8571	1.9948	.3078	(42)
OLDSIZE	3	LARGE	241.0000	3.1711	2.2532	.2585	(76)
MULTITYP	2	CANADIAN COMPANY	701.0000	3.6134	2.4768	.1778	(194)
OLDSIZE	1	SMALL	420.0000	3.6842	2.5393	.2378	(114)
OLDSIZE	2	MEDIUM	179.0000	3.4423	2.3962	.3323	(52)
OLDSIZE	3	LARGE	102.0000	3.6429	2.4376	.4607	(28)
MULTITYP	3	CANOWNED MULTINAT	206.0000	3.0746	1.9719	.2409	(67)
OLDSIZE	1	SMALL	21.0000	2.6250	1.9955	.7055	(8)
OLDSIZE	2	MEDIUM	30.0000	2.7273	2.1950	.6618	(11)
OLDSIZE	3	LARGE	155.0000	3.2292	1.9378	.2797	(48)

TOTAL CASES = 468
 MISSING CASES = 62 OR 14.5 PCT.

..... DESCRIPTION OF SUBPOPULATIONS

CRITERION VAR. SUPPOSE USE OF SUPPLIERS FOR STI
 BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
 BY OLDSIZE RECODED & COLLAPSED SIZE

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			1297.0000	3.0808	1.8805	.0917	(421)
MULTITYP	1	FOR-OWNED MULTINAT	428.0000	3.1014	1.7769	.1513	(138)
OLDSIZE	1	SMALL	60.0000	2.8571	1.5584	.3401	(21)
OLDSIZE	2	MEDIUM	115.0000	2.8750	1.4882	.2353	(40)
OLDSIZE	3	LARGE	253.0000	3.2857	1.9592	.2233	(77)
MULTITYP	2	CANADIAN COMPANY	631.0000	2.9905	1.8948	.1304	(211)
OLDSIZE	1	SMALL	328.0000	2.7107	1.7245	.1568	(121)
OLDSIZE	2	MEDIUM	180.0000	3.1034	1.9257	.2529	(58)
OLDSIZE	3	LARGE	123.0000	3.8438	2.2159	.3917	(32)
MULTITYP	3	CANDOWNED MULTINAT	238.0000	3.3056	2.0324	.2395	(72)
OLDSIZE	1	SMALL	18.0000	1.8000	.7888	.2494	(10)
OLDSIZE	2	MEDIUM	27.0000	2.7000	1.7029	.5385	(10)
OLDSIZE	3	LARGE	193.0000	3.7115	2.1082	.2924	(52)

TOTAL CASES = 468
 MISSING CASES = 47 OR 10.0 PCT.

..... DESCRIPTION OF SUBPOPULATIONS

CRITERION VAR. CLUSE USE OF CLIENTS-CUSTOMERS FOR STI

BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION

 BY SIZE

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VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			1508.0000	3.7606	2.2853	.1141	(401)
MULTITYP	1	FOR-OWNED MULTINAT	514.0000	3.8939	2.3711	.2064	(132)
SIZE	1	SMALL	59.0000	3.1053	2.2084	.5067	(19)
SIZE	2	MEDIUM	147.0000	3.6750	2.1530	.3404	(40)
SIZE	3	LARGE	308.0000	4.2192	2.4902	.2915	(73)
MULTITYP	2	CANADIAN COMPANY	738.0000	3.6535	2.2502	.1583	(202)
SIZE	1	SMALL	431.0000	3.7478	2.2589	.2106	(115)
SIZE	2	MEDIUM	196.0000	3.6296	2.3091	.3142	(54)
SIZE	3	LARGE	111.0000	3.3636	2.1624	.3764	(33)
MULTITYP	3	CANOWNED MULTINAT	256.0000	3.8209	2.2356	.2731	(67)
SIZE	1	SMALL	37.0000	4.1111	2.2048	.7349	(9)
SIZE	2	MEDIUM	26.0000	2.8889	1.6159	.5386	(9)
SIZE	3	LARGE	193.0000	3.9388	2.3310	.3330	(49)

TOTAL CASES = 468

MISSING CASES = 67 OR 14.3 PCT.

..... DESCRIPTION OF SUBPOPULATIONS

CRITERION VAR. GOVUSE USE OF GOVT AGENCIES FOR STI
 BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
 BY SIZE

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VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			1457.0000	3.4202	1.8935	.0917	426
MULTITYP	1	FOR-OWNED MULTINAT	482.0000	3.5182	1.8515	.1582	137
SIZE	1	SMALL	58.0000	2.9000	1.1192	.2503	20
SIZE	2	MEDIUM	150.0000	3.7500	1.9579	.3096	40
SIZE	3	LARGE	274.0000	3.5584	1.9296	.2199	77
MULTITYP	2	CANADIAN COMPANY	748.0000	3.4470	1.9096	.1296	217
SIZE	1	SMALL	422.0000	3.4032	1.8030	.1619	124
SIZE	2	MEDIUM	226.0000	3.7049	2.0441	.2617	61
SIZE	3	LARGE	100.0000	3.1250	2.0439	.3613	32
MULTITYP	3	CANOWND MULTINAT	227.0000	3.1528	1.9258	.2270	72
SIZE	1	SMALL	41.0000	4.1000	2.0248	.6403	10
SIZE	2	MEDIUM	42.0000	3.8182	2.5620	.7725	11
SIZE	3	LARGE	144.0000	2.8235	1.6817	.2355	51

TOTAL CASES = 468
 MISSING CASES = 42 OR 9.0 PCT.

----- DESCRIPTION OF SUBPOPULATIONS -----
 CRITERION VAR. COMMUSE USE OF COMMERCIAL INFO SERVICES FOR STI
 BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
 BY SIZE

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			1876.0000	4.8103	2.4294	.1230	(390)
MULTITYP	1	FOR-OWNED MULTINAT	565.0000	4.4141	2.4704	.2184	(128)
SIZE	1	SMALL	105.0000	5.0000	2.4290	.5300	(21)
SIZE	2	MEDIUM	182.0000	4.9189	2.4763	.4071	(37)
SIZE	3	LARGE	278.0000	3.9714	2.4255	.2899	(70)
MULTITYP	2	CANADIAN COMPANY	1014.0000	5.2000	2.3100	.1654	(195)
SIZE	1	SMALL	634.0000	5.6607	2.1247	.2008	(112)
SIZE	2	MEDIUM	258.0000	4.9615	2.3595	.3272	(52)
SIZE	3	LARGE	122.0000	3.9355	2.4074	.4324	(31)
MULTITYP	3	CANOWNED MULTINAT	297.0000	4.4328	2.5419	.3105	(67)
SIZE	1	SMALL	48.0000	6.0000	1.8516	.6547	(8)
SIZE	2	MEDIUM	56.0000	5.6000	2.2706	.7180	(10)
SIZE	3	LARGE	193.0000	3.9388	2.5447	.3635	(49)

TOTAL CASES = 468
 MISSING CASES = 78 OR 16.7 PCT.

----- DESCRIPTION OF SUBPOPULATIONS -----
 CRITERION VAR. RSHUSE USE OF RSRCH ORGN'S OR CONSULTNTS FOR STI
 BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
 BY SIZE

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			1758.0000	4.3731	2.1456	.1070	(402)
MULTITYP	1	FOR-OWNED MULTINAT	555.0000	4.3023	2.1419	.1886	(129)
SIZE	1	SMALL	104.0000	5.2000	2.3306	.5211	(20)
SIZE	2	MEDIUM	152.0000	4.3429	2.2744	.3845	(35)
SIZE	3	LARGE	299.0000	4.0405	1.9824	.2304	(74)
MULTITYP	2	CANADIAN COMPANY	976.0000	4.7610	2.1617	.1510	(205)
SIZE	1	SMALL	571.0000	5.0088	2.1840	.2045	(114)
SIZE	2	MEDIUM	268.0000	4.6207	2.1178	.2781	(54)
SIZE	3	LARGE	137.0000	4.1515	2.0785	.3618	(33)
MULTITYP	3	CANOWNED MULTINAT	227.0000	3.3382	1.7330	.2102	(68)
SIZE	1	SMALL	37.0000	3.7000	2.3594	.7461	(10)
SIZE	2	MEDIUM	39.0000	4.3333	2.0000	.6667	(9)
SIZE	3	LARGE	151.0000	3.0816	1.4838	.2120	(49)

TOTAL CASES = 468
 MISSING CASES = 66 OR 14.1 PCT.

----- DESCRIPTION OF SUBPOPULATIONS -----
 CRITERION VAR. EXPUSE EXPERTS, COLLEAGUES & ASSOCIATES FOR STI
 BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
 BY SIZE

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			883.0000	2.0825	1.6229	.0788	(424)
MULTITYP	1	FOR-OWNED MULTINAT	260.0000	1.8571	1.4621	.1236	(140)
SIZE	1	SMALL	53.0000	2.4091	2.0156	.4297	(22)
SIZE	2	MEDIUM	67.0000	1.7632	1.4225	.2308	(38)
SIZE	3	LARGE	140.0000	1.7500	1.2779	.1429	(80)
MULTITYP	2	CANADIAN COMPANY	501.0000	2.3744	1.8354	.1264	(211)
SIZE	1	SMALL	301.0000	2.5294	1.9390	.1777	(119)
SIZE	2	MEDIUM	135.0000	2.3276	1.7710	.2325	(58)
SIZE	3	LARGE	65.0000	1.9118	1.5049	.2581	(34)
MULTITYP	3	CANOWNED MULTINAT	122.0000	1.6712	1.0008	.1171	(73)
SIZE	1	SMALL	16.0000	1.7778	.8333	.2778	(9)
SIZE	2	MEDIUM	21.0000	2.1000	1.9120	.6046	(10)
SIZE	3	LARGE	85.0000	1.5741	.7673	.1044	(54)

TOTAL CASES = 463
 MISSING CASES = 44 OR 9.4 PCT.

----- DESCRIPTION OF SUBPOPULATIONS -----

CRITERION VAR. MAGUSE USE OF MAGAZINES FOR STI
BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
BY SIZE

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			881.0000	2.0394	1.5640	.0753	(432)
MULTITYP	1	FOR-OWNED MULTINAT	286.0000	2.0141	1.4634	.1228	(142)
SIZE	1	SMALL	57.0000	2.5909	1.9188	.4091	(22)
SIZE	2	MEDIUM	83.0000	2.0750	1.5752	.2491	(40)
SIZE	3	LARGE	146.0000	1.8250	1.2198	.1364	(80)
MULTITYP	2	CANADIAN COMPANY	464.0000	2.1481	1.7026	.1158	(216)
SIZE	1	SMALL	274.0000	2.2276	1.8457	.1664	(123)
SIZE	2	MEDIUM	126.0000	2.1356	1.6343	.2128	(59)
SIZE	3	LARGE	64.0000	1.8824	1.2251	.2101	(34)
MULTITYP	3	CANOWNED MULTINAT	131.0000	1.7703	1.2880	.1497	(74)
SIZE	1	SMALL	26.0000	2.6000	1.6465	.5207	(10)
SIZE	2	MEDIUM	23.0000	2.0909	1.7581	.5301	(11)
SIZE	3	LARGE	82.0000	1.5472	1.0297	.1414	(53)

TOTAL CASES = 468
MISSING CASES = 36 OR 7.7 PCT.

----- DESCRIPTION OF SUBPOPULATIONS -----
 CRITERION VAR. NEWSUSE NEW OF NEWSPAPERS FOR STI
 BROKEN DOWN BY MULTITYP TYPE-CONTROL OF ORGANIZATION
 BY SIZE

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	STD ERR	N
FOR ENTIRE POPULATION			1120.0000	2.8718	2.5074	.1270	3901
MULTITYP	1	FOR-OWNED MULTINAT	350.0000	2.8226	2.5022	.2247	1241
SIZE	1	SMALL	53.0000	2.7895	2.3706	.5439	191
SIZE	2	MEDIUM	134.0000	3.8286	2.8438	.4807	351
SIZE	3	LARGE	163.0000	2.3286	2.2245	.2659	701
MULTITYP	2	CANADIAN COMPANY	601.0000	3.0201	2.5721	.1823	1991
SIZE	1	SMALL	368.0000	3.2281	2.6442	.2477	1141
SIZE	2	MEDIUM	136.0000	2.6154	2.4825	.3443	521
SIZE	3	LARGE	97.0000	2.9394	2.4487	.4263	331
MULTITYP	3	CANOWNED MULTINAT	169.0000	2.5224	2.3118	.2824	671
SIZE	1	SMALL	42.0000	4.6667	2.7839	.9280	91
SIZE	2	MEDIUM	26.0000	2.3636	2.3779	.7170	111
SIZE	3	LARGE	101.0000	2.1489	2.0106	.2933	471

TOTAL CASES = 468
 MISSING CASES = 78 OR 16.7 PCT.

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***** C R O S S T A B U L A T I O N O F *****
 MULTITYP TYPE-CONTROL OF ORGANIZATION BY LIBUSE EXTENT-USE OF LIBRARIES AS STI CHANNEL

LIBUSE

COUNT		LIBUSE					ROW	
ROW PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT		ROW		
COL PCT	ITIMES	WK	TIMES	MO	TIMES	YR	USE	TOTAL
TOT PCT	1	1	2	3	4	5	6	
MULTITYP	-----	-----	-----	-----	-----	-----	-----	-----
1	1	14	34	63	33			144
FOR-OWNED MULTINA	9.72	23.61	43.75	22.92				32.43
	21.21	38.20	37.95	26.83				
	3.15	7.66	14.19	7.43				
	-----	-----	-----	-----	-----	-----	-----	-----
2	1	32	38	78	75			223
CANADIAN COMPANY	14.35	17.04	34.98	33.63				50.23
	48.48	42.70	46.99	60.98				
	7.21	8.56	17.57	16.89				
	-----	-----	-----	-----	-----	-----	-----	-----
3	1	20	17	25	15			77
CANOWNED MULTINAT	25.97	22.08	32.47	19.48				17.34
	30.30	19.10	15.06	12.20				
	4.50	3.83	5.63	3.38				
	-----	-----	-----	-----	-----	-----	-----	-----
COLUMN	66	89	166	123				444
TOTAL	14.86	20.05	37.39	27.70				100.00

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***** C R O S S T A B U L A T I O N O F *****
 MULTITYP TYPE-CONTROL OF ORGANIZATION BY TRADEUSE USE OF TRADE ASSOCIATIONS FOR STI

		TRADEUSE					
COUNT		1					
ROW PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT		ROW	
COL PCT	ITIMES	WK	TIMES	MO	TIMES	YR	USE
TOT PCT	1	1	2	1	3	1	7
MULTITYP		-----	-----	-----	-----	-----	-----
1	1	13	1	51	1	62	1
FOR-OWNED MULTINA	1	8.84	1	34.69	1	42.18	1
	1	39.39	1	36.69	1	31.96	1
	1	2.97	1	11.64	1	14.16	1
	1	-----	-----	-----	-----	-----	-----
2	1	12	1	66	1	94	1
CANADIAN COMPANY	1	5.56	1	30.56	1	43.52	1
	1	36.36	1	47.48	1	48.45	1
	1	2.74	1	15.07	1	21.46	1
	1	-----	-----	-----	-----	-----	-----
3	1	8	1	22	1	38	1
CANOWNED MULTINAT	1	10.67	1	29.33	1	50.67	1
	1	24.24	1	15.83	1	19.59	1
	1	1.83	1	5.02	1	8.68	1
	1	-----	-----	-----	-----	-----	-----
COLUMN		33		139		194	
TOTAL		7.53		31.74		44.29	
						16.44	
							438
							100.00

***** CROSS TABULATION OF *****
 MULTITYP TYPE-CONTROL OF ORGANIZATION BY SEMUSE USE OF SEMINARS-CONVENTIONS-EXHIBITS

SEMUSE

COUNT I							ROW TOTAL
ROW PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT			
COL PCT	ITIMES	WK	TIMES	NO	TIMES	YR	
TOT PCT	I	1 I	2 I	3 I	7 I		
MULTITYP	-----	I-----	I-----	I-----	I-----	I-----	
1	I	1 I	17 I	118 I	10 I		146
FOR-OWN	MULTINA	I .68 I	11.64 I	80.82 I	6.85 I		33.03
	I	33.33 I	44.74 I	32.87 I	23.81 I		
	I	.23 I	3.85 I	26.70 I	2.26 I		
	I	-----	I-----	I-----	I-----	I-----	
2	I	1 I	12 I	180 I	26 I		219
CANADIAN	COMPANY	I .46 I	5.48 I	82.19 I	11.87 I		49.55
	I	33.33 I	31.58 I	50.14 I	61.90 I		
	I	.23 I	2.71 I	40.72 I	5.88 I		
	I	-----	I-----	I-----	I-----	I-----	
3	I	1 I	9 I	61 I	6 I		77
CANOND	MULTINAT	I 1.30 I	11.69 I	79.22 I	7.79 I		17.42
	I	33.33 I	23.68 I	16.99 I	14.29 I		
	I	.23 I	2.04 I	13.80 I	1.36 I		
	I	-----	I-----	I-----	I-----	I-----	
COLUMN		3	38	359	42	442	
TOTAL		.68	8.60	81.22	9.50	100.00	

***** C R O S S T A B U L A T I O N O F *****
 MULTITYP TYPE-CONTROL OF ORGANIZATION BY SALESUSE USE OF COMPANY SALES FORCE FOR STI

SALESUSE

COUNT		SEVERAL		SEVERAL		SEVERAL		DOESNT		ROW TOTAL
ROW PCT	ISEVERAL	TIMES	WK	TIMES	MO	TIMES	YR	USE		
COL PCT	ITIMES									
TOT PCT	I	1 I		2 I		3 I		7 I		
MULTITYP	-----I-----	-----I-----		-----I-----		-----I-----		-----I-----		
	1 I	38 I		45 I		33 I		28 I	144	
FOR-OWN MULTINA	I	26.39 I		31.25 I		22.92 I		19.44 I	35.12	
	I	39.18 I		41.67 I		33.67 I		26.17 I		
	I	9.27 I		10.98 I		8.05 I		6.83 I		
	-----I-----	-----I-----		-----I-----		-----I-----		-----I-----		
2 I	I	48 I		41 I		42 I		65 I	196	
CANADIAN COMPANY	I	24.49 I		20.92 I		21.43 I		33.16 I	47.80	
	I	49.48 I		37.96 I		42.86 I		60.75 I		
	I	11.71 I		10.00 I		10.24 I		15.85 I		
	-----I-----	-----I-----		-----I-----		-----I-----		-----I-----		
3 I	I	11 I		22 I		23 I		14 I	70	
CANOWN MULTINAT	I	15.71 I		31.43 I		32.86 I		20.00 I	17.07	
	I	11.34 I		20.37 I		23.47 I		13.08 I		
	I	2.68 I		5.37 I		5.61 I		3.41 I		
	-----I-----	-----I-----		-----I-----		-----I-----		-----I-----		
COLUMN		97		108		98		107	410	
TOTAL		23.66		26.34		23.90		26.10	100.00	

410
100.00

***** C R O S S T A B U L A T I O N O F *****
MULTITYP TYPE-CONTROL OF ORGANIZATION BY SUPPUSE USE OF SUPPLIERS FOR STI

SUPPUSE					
COUNT I	ROW PCT I	SEVERAL	SEVERAL	SEVERAL	DOESNT
COL PCT I	ITIMES WK	TIMES MO	TIMES YR	USE	ROW
TOT PCT I	1 I	2 I	3 I	7 I	TOTAL
MULTITYP	1 I	14 I	44 I	62 I	22 I
FOR-OWNND MULTINA	1 I	9.86 I	30.99 I	43.66 I	15.49 I
	1 I	22.95 I	34.65 I	36.47 I	30.56 I
	1 I	3.26 I	10.23 I	14.42 I	5.12 I
	2 I	36 I	67 I	75 I	35 I
CANADIAN COMPANY	1 I	16.90 I	31.46 I	35.21 I	16.43 I
	1 I	59.02 I	52.76 I	44.12 I	48.61 I
	1 I	8.37 I	15.58 I	17.44 I	8.14 I
	3 I	11 I	16 I	33 I	15 I
CANOWNND MULTINAT	1 I	14.67 I	21.33 I	44.00 I	20.00 I
	1 I	18.03 I	12.60 I	19.41 I	20.83 I
	1 I	2.56 I	3.72 I	7.67 I	3.49 I
COLUMN	61	127	170	72	430
TOTAL	14.19	29.53	39.53	16.74	100.00

***** CROSS TABULATION OF *****
 MULTITYP TYPE-CONTROL OF ORGANIZATION BY CLIUSE USE OF CLIENTS-CUSTOMERS FOR STI

CLIUSE						
COUNT	1	2	3	7		
ROW PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT		ROW
COL PCT	ITIMES	WK	TIMES	MO	TIMES	YR
TOT PCT	1	1	2	1	3	1
MULTITYP	-----	-----	-----	-----	-----	-----
1	20	28	42	46		136
FOR-OWND MULTINA	14.71	20.59	30.88	33.82		33.17
	37.04	29.47	31.82	35.66		
	4.88	6.83	10.24	11.22		
	-----	-----	-----	-----		
2	28	48	68	60		204
CANADIAN COMPANY	13.73	23.53	33.33	29.41		49.76
	51.85	50.53	51.52	46.51		
	6.83	11.71	16.59	14.63		
	-----	-----	-----	-----		
3	6	19	22	23		70
CANOWND MULTINAT	8.57	27.14	31.43	32.86		17.07
	11.11	20.00	16.67	17.83		
	1.46	4.63	5.37	5.61		
	-----	-----	-----	-----		
COLUMN	54	95	132	129		410
TOTAL	13.17	23.17	32.20	31.46		100.00

***** C R O S S T A B U L A T I O N O F *****
MULTITYP TYPE-CONTROL OF ORGANIZATION BY GOVUSE USE OF GOVT AGENCIES FOR STI

		BY USE						
COUNT	I	SEVERAL		SEVERAL		DOESNT		ROW
ROW PCT	ISEVERAL	SEVERAL	SEVERAL	SEVERAL	DOESNT	DOESNT	ROW	
COL PCT	ITIMES	WK	TIMES	MO	TIMES	YR	USE	TOTAL
TOT PCT	I	1 I	2 I	3 I	7 I			
MULTITYP	I	I	I	I	I	I	I	I
1	I	7 I	28 I	78 I	28 I			141
FOR OWNED MULTINA	I	4.96 I	19.86 I	55.32 I	19.86 I			32.41
	I	24.14 I	25.93 I	36.97 I	32.18 I			
	I	1.61 I	6.44 I	17.93 I	6.44 I			
	I	I	I	I	I	I	I	I
2	I	14 I	55 I	105 I	45 I			219
CANADIAN COMPANY	I	6.39 I	25.11 I	47.95 I	20.55 I			50.34
	I	48.28 I	50.93 I	49.76 I	51.72 I			
	I	3.22 I	12.64 I	24.14 I	10.34 I			
	I	I	I	I	I	I	I	I
3	I	8 I	25 I	28 I	14 I			75
CANOWNED MULTINAT	I	10.67 I	33.33 I	37.33 I	18.67 I			17.24
	I	27.59 I	23.15 I	13.27 I	16.29 I			
	I	1.84 I	5.75 I	6.44 I	3.22 I			
	I	I	I	I	I	I	I	I
COLUMN		29	108	211	87			435
TOTAL		6.67	24.83	48.51	20.20			100.00

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***** CROSS TABULATION OF *****
 MULTITYP TYPE-CONTROL OF ORGANIZATION BY COMMUSE USE OF COMMERCIAL INFO SERVICES FOR STI

COMMUSE

COUNT		COMMUSE					ROW			
ROW PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT		ROW				
COL PCT	ITIMES	WK	TIMES	MO	TIMES	YR	USE	TOTAL		
TOT PCT	I	I	I	I	I	I	I			
MULTITYP	-----	-----	-----	-----	-----	-----	-----			
1	I	16	I	23	I	31	I	62	I	132
FOR.OWND MULTINA	I	12.12	I	17.42	I	23.48	I	46.97	I	33.08
	I	39.02	I	41.82	I	35.63	I	28.70	I	
	I	4.01	I	5.76	I	7.77	I	15.54	I	
	-----	-----	-----	-----	-----	-----	-----	-----	-----	
2	I	14	I	19	I	43	I	121	I	197
CANADIAN COMPANY	I	7.11	I	9.64	I	21.83	I	61.42	I	49.37
	I	34.15	I	34.55	I	49.43	I	56.02	I	
	I	3.51	I	4.76	I	10.78	I	30.33	I	
	-----	-----	-----	-----	-----	-----	-----	-----	-----	
3	I	11	I	13	I	13	I	33	I	70
CANOWND MULTINAT	I	15.71	I	18.57	I	18.57	I	47.14	I	17.54
	I	26.83	I	23.64	I	14.94	I	15.28	I	
	I	2.76	I	3.26	I	3.26	I	8.27	I	
	-----	-----	-----	-----	-----	-----	-----	-----	-----	
* COLUMN		41		55		87		216		399
TOTAL		10.28		13.78		21.80		54.14		100.00

***** C R O S S T A B U L A T I O N O F *****
MULTITYP TYPE-CONTROL OF ORGANIZATION BY RSHUSE USE OF RSRCH ORGN'S OR CONSJLTNTS FOR STI

RSHUSE						
COUNT I	ROW PCT I	SEVERAL I	SEVERAL I	SEVERAL I	DOESNT I	ROW TOTAL
COL PCT I	ITIMES I	WK I	TIMES I	MO I	TIMES I	YR USE
TOT PCT I	1 I	1 I	2 I	3 I	7 I	
MULTITYP	-----I-----I-----I-----I-----I					
	1 I	7 I	10 I	66 I	51 I	134
FOR-OWND MULTINA	I 5.22 I	I 7.46 I	I 49.25 I	I 38.06 I	I 32.52	
	I 38.89 I	I 26.32 I	I 33.67 I	I 31.88 I		
	I 1.70 I	I 2.43 I	I 16.02 I	I 12.38 I		
	-----I-----I-----I-----I-----I					
	2 I	5 I	17 I	88 I	97 I	207
CANADIAN COMPANY	I 2.42 I	I 8.21 I	I 42.51 I	I 46.86 I	I 50.24	
	I 27.78 I	I 44.74 I	I 44.90 I	I 60.63 I		
	I 1.21 I	I 4.13 I	I 21.36 I	I 23.54 I		
	-----I-----I-----I-----I-----I					
	3 I	6 I	11 I	42 I	12 I	71
CANOWND MULTINAT	I 8.45 I	I 15.49 I	I 59.15 I	I 16.90 I	I 17.23	
	I 33.33 I	I 28.95 I	I 21.43 I	I 7.50 I		
	I 1.46 I	I 2.67 I	I 10.19 I	I 2.91 I		
	-----I-----I-----I-----I-----I					
COLUMN	18	38	196	160	412	
TOTAL	4.37	9.22	47.57	38.83	100.00	

***** C R O S S T A B U L A T I O N O F *****
 MULTITYP TYPE-CONTROL OF ORGANIZATION BY EXPUSE EXPERTS, COLLEAGUES & ASSOCIATES FOR STI

EXPUSE

COUNT I						ROW TOTAL
ROW PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT		
COL PCT	ITIMES WK	TIMES MO	TIMES YR	USE		
TOT PCT	I	I	I	I	I	
MULTITYP	-----	-----	-----	-----	-----	
1	I	81 I	34 I	21 I	8 I	
FOR-OWNED MULTINA	I	56.25 I	23.61 I	14.58 I	5.56 I	
	I	38.03 I	33.01 I	25.30 I	23.53 I	
	I	18.71 I	7.85 I	4.85 I	1.85 I	
	-----	-----	-----	-----	-----	
2	I	89 I	51 I	49 I	24 I	
CANADIAN COMPANY	I	41.78 I	23.94 I	23.00 I	11.27 I	
	I	41.78 I	49.51 I	59.04 I	70.59 I	
	I	20.55 I	11.78 I	11.32 I	5.54 I	
	-----	-----	-----	-----	-----	
3	I	43 I	18 I	13 I	2 I	
CANOWNED MULTINAT	I	56.58 I	23.68 I	17.11 I	2.63 I	
	I	20.19 I	17.48 I	15.66 I	5.88 I	
	I	9.93 I	4.16 I	3.00 I	.46 I	
	-----	-----	-----	-----	-----	
COLUMN		213	103	83	34	
TOTAL		49.19	23.79	19.17	7.85	

***** C R O S S T A B U L A T I O N O F *****
MULTITYP TYPE-CONTROL OF ORGANIZATION BY MAGUSE USE OF MAGAZINES FOR STI

MAGUSE									
COUNT	I								
ROW PCT	ISEVERAL	SEVERAL	SEVERAL	SEVERAL	DOESNT	ROW			
COL PCT	ITIMES	WK	TIMES	MO	TIMES	YR	USE	TOTAL	
TOT PCT	I	1 I	2 I	3 I	7 I				
MULTITYP	-----I	-----I	-----I	-----I	-----I				
1	I	63 I	56 I	13 I	9 I	146			
FOR-OWND MULTINA	I	43.15 I	38.36 I	12.33 I	6.16 I	33.11			
	I	30.88 I	38.10 I	31.58 I	27.27 I				
	I	14.29 I	12.70 I	4.08 I	2.04 I				
	-----I	-----I	-----I	-----I	-----I				
2	I	98 I	70 I	30 I	20 I	218			
CANADIAN COMPANY	I	44.95 I	32.11 I	13.76 I	9.17 I	49.43			
	I	48.04 I	47.62 I	52.63 I	60.61 I				
	I	22.22 I	15.87 I	6.80 I	4.54 I				
	-----I	-----I	-----I	-----I	-----I				
3	I	43 I	21 I	9 I	4 I	77			
CANOWND MULTINAT	I	55.84 I	27.27 I	11.69 I	5.19 I	17.46			
	I	21.06 I	14.29 I	15.79 I	12.12 I				
	I	9.75 I	4.76 I	2.04 I	.91 I				
	-----I	-----I	-----I	-----I	-----I				
COLUMN		204	147	57	33	441			
TOTAL		46.26	33.33	12.93	7.48	100.00			

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***** C R O S S T A B U L A T I O N O F *****
 MULTITYP TYPE-CONTROL OF ORGANIZATION BY NEWSUSE NEW OF NEWSPAPERS FOR STI

NEWSUSE

	COUNT	ROW PCT	COL PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT	ROW
				TIMES WK	TIMES MO	TIMES YR	USE	TOTAL
	TOT PCT			1	2	3	7	
MULTITYP	1	1	1	67	15	14	33	129
FOR-OWN	1	51.94	11.63	10.85	25.58	32.25		
MULTINA	1	32.84	30.00	33.33	31.73			
	1	16.75	3.75	3.50	8.25			
	2	98	26	20	57	201		
CANADIAN COMPANY	1	48.76	12.94	9.95	28.36	50.25		
	1	48.04	52.00	47.62	54.81			
	1	24.50	6.50	5.00	14.25			
	3	39	9	8	14	70		
CANOWN	1	55.71	12.86	11.43	20.00	17.50		
MULTINAT	1	19.12	18.00	19.05	13.46			
	1	9.75	2.25	2.00	3.50			
COLUMN	204	50	42	104	400			
TOTAL	51.00	12.50	10.50	26.00	100.00			

APPENDIX VII CROSS TABULATIONS OF COMPANY SIZE VS. FREQUENCY OF USE OF STI CHANNELS

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***** C R O S S T A B U L A T I O N O F *****
 OLDSIZE RECODED & COLLAPSED SIZE BY LIBUSE EXTENT-USE OF LIBRARIES AS STI CHANNEL

LIBUSE							
COUNT							
ROW	PCT	SEVERAL	SEVERAL	SEVERAL	DOESNT	ROW	
COL	PCT	TIMES	WK	TIMES	NO	USE	TOTAL
TOT	PCT	1	1	2	3	7	
OLDSIZE		-----	-----	-----	-----	-----	
	1	I	17 I	19 I	59 I	61 I	156
		I	10.90 I	12.18 I	37.82 I	39.10 I	34.82
		I	23.94 I	21.35 I	35.54 I	50.00 I	
SMALL		I	3.79 I	4.24 I	13.17 I	13.62 I	
		-----	-----	-----	-----	-----	
	2	I	13 I	19 I	47 I	36 I	115
		I	11.30 I	16.52 I	40.87 I	31.30 I	25.67
MEDIUM		I	18.31 I	21.35 I	28.31 I	29.51 I	
		I	2.90 I	4.24 I	10.49 I	8.04 I	
		-----	-----	-----	-----	-----	
	3	I	41 I	51 I	60 I	25 I	177
LARGE		I	23.16 I	28.81 I	33.90 I	14.12 I	39.51
		I	57.75 I	57.30 I	36.14 I	20.49 I	
		I	9.15 I	11.38 I	13.39 I	5.58 I	
		-----	-----	-----	-----	-----	
COLUMN			71	89	166	122	448
TOTAL			15.85	19.87	37.05	27.23	100.00

***** C R O S S T A B U L A T I O N O F *****
 OLD SIZE RECODED & COLLAPSED SIZE BY TRADEUSE USE OF TRADE ASSOCIATIONS FOR STI

		TRADEUSE						
		COUNT	I					
		ROW PCT	SEVERAL	SEVERAL	SEVERAL	DOESNT	ROW	
		COL PCT	ITIMES	WK	TIMES	MO	USE	TOTAL
		TOT PCT	I	1 I	2 I	3 I	7 I	
OLD	SIZE		-----I-----	-----I-----	-----I-----	-----I-----	-----I-----	
		1	I	7 I	37 I	71 I	37 I	152
SMALL			I	4.61 I	24.34 I	46.71 I	24.34 I	34.31
			I	20.59 I	25.87 I	36.60 I	51.39 I	
			I	1.58 I	8.35 I	16.03 I	8.35 I	
			-----I-----	-----I-----	-----I-----	-----I-----	-----I-----	
		2	I	7 I	44 I	44 I	19 I	114
MEDIUM			I	6.14 I	38.60 I	38.60 I	16.67 I	25.73
			I	20.59 I	30.77 I	22.68 I	26.39 I	
			I	1.58 I	9.93 I	9.93 I	4.29 I	
			-----I-----	-----I-----	-----I-----	-----I-----	-----I-----	
		3	I	20 I	62 I	79 I	16 I	177
LARGE			I	11.30 I	35.03 I	44.63 I	9.04 I	39.95
			I	58.82 I	43.36 I	40.72 I	22.22 I	
			I	4.51 I	14.00 I	17.83 I	3.61 I	
			-----I-----	-----I-----	-----I-----	-----I-----	-----I-----	
COLUMN			34	143	194	72	443	
TOTAL			7.67	32.28	43.79	16.25	100.00	

***** C R O S S T A B U L A T I O N O F *****
 OLD SIZE RECODED & COLLAPSED SIZE BY SEMUSE USE OF SEMINARS-CONVENTIONS-EXHIBITS

		SEMUSE									
COUNT											
ROW	PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT	ROW					
COL	PCT	ITIMES	WK	TIMES	MO	YR	USE	TOTAL			
TOT	PCT	1	1	2	3	7					
-----I-----I-----I-----I-----I-----I-----I-----											
LO SIZE	1	I	0	I	10	I	119	I	25	I	154
		I	.00	I	6.49	I	77.27	I	16.23	I	34.38
		I	.00	I	27.03	I	32.51	I	59.52	I	
		I	.00	I	2.23	I	26.56	I	5.58	I	
-----I-----I-----I-----I-----I-----I-----I-----											
MEDIUM	2	I	2	I	11	I	95	I	8	I	116
		I	1.72	I	9.48	I	81.90	I	6.90	I	25.89
		I	66.67	I	29.73	I	25.96	I	19.05	I	
		I	.45	I	2.46	I	21.21	I	1.79	I	
-----I-----I-----I-----I-----I-----I-----I-----											
LARGE	3	I	1	I	16	I	152	I	9	I	178
		I	.56	I	8.99	I	85.39	I	5.06	I	39.73
		I	33.33	I	43.24	I	41.53	I	21.43	I	
		I	.22	I	3.57	I	33.93	I	2.01	I	
-----I-----I-----I-----I-----I-----I-----I-----											
COLUMN		3	37	366	42	448					
TOTAL		.67	8.26	81.70	9.38	100.00					

***** C R O S S T A B U L A T I O N O F *****
 OLDSIZE RECODED & COLLAPSED SIZE BY SALESUSE USE OF COMPANY SALES FORCE FOR STI

		SALESUSE					
		COUNT					
ROW PCT	COL PCT	SEVERAL	SEVERAL	SEVERAL	DOESNT	ROW	
TOT PCT	ITIMES	WK	TIMES	MO	TIMES	YR	TOTAL
1	1	2	3	7			
----- ----- ----- ----- ----- ----- ----- -----							
OLDSIZE	1	41	28	30	44		143
SMALL	1	28.67	19.58	20.98	30.77		34.46
	1	42.71	25.45	29.70	40.74		
	1	9.88	6.75	7.23	10.60		
----- ----- ----- ----- ----- ----- ----- -----							
	2	26	34	24	25		109
MEDIUM	1	23.85	31.19	22.02	22.94		26.27
	1	27.08	30.91	23.76	23.15		
	1	6.27	8.19	5.78	6.02		
----- ----- ----- ----- ----- ----- ----- -----							
	3	29	48	47	39		163
LARGE	1	17.79	29.45	28.83	23.93		39.28
	1	30.21	43.64	46.53	36.11		
	1	6.99	11.57	11.33	9.40		
----- ----- ----- ----- ----- ----- ----- -----							
COLUMN		96	110	101	108	415	
TOTAL		23.13	26.51	24.34	26.02	100.00	

***** C R O S S T A B U L A T I O N O F *****
 GLD SIZE RECODED & COLLAPSED SIZE BY SUPP USE USE OF SUPPLIERS FOR STI

		SUPP USE					
COUNT		I					
ROW PCT	COL PCT	SEVERAL TIMES	SEVERAL WK	SEVERAL MO	DOESNT TIMES YR	USE	ROW TOTAL
TOT PCT	I	1 I	2 I	3 I	7 I		
OLD SIZE		I	I	I	I	I	
	1	I	33 I	48 I	55 I	16 I	152
SMALL		I	21.71 I	31.58 I	36.18 I	10.53 I	34.86
		I	52.38 I	36.64 I	32.35 I	22.22 I	
		I	7.57 I	11.01 I	12.61 I	3.67 I	
		I	I	I	I	I	
	2	I	14 I	39 I	44 I	15 I	112
MEDIUM		I	12.50 I	34.82 I	39.29 I	13.39 I	25.69
		I	22.22 I	29.77 I	25.88 I	20.83 I	
		I	3.21 I	8.94 I	10.09 I	3.44 I	
		I	I	I	I	I	
	3	I	16 I	44 I	71 I	41 I	172
LARGE		I	9.30 I	25.58 I	41.28 I	23.84 I	39.45
		I	25.40 I	33.59 I	41.76 I	56.94 I	
		I	3.67 I	10.09 I	16.28 I	9.40 I	
		I	I	I	I	I	
	COLUMN		63	131	170	72	436
	TOTAL		14.45	30.05	38.99	16.51	100.00

***** C R O S S T A B U L A T I O N O F *****
 OLDSIZE RECODED & COLLAPSED SIZE BY CLIUSE USE OF CLIENTS-CUSTOMERS FOR STI

CLIUSE									
OLDSIZE	COUNT	1							ROW
	ROW PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT				ROW
	COL PCT	ITIMES	WK	TIMES	MO	TIMES	YR	USE	TOTAL
TOT PCT	1	1	1	2	1	3	1	7	1
-----I									

CROSS TABULATION OF

GLDSIZE RECODED & COLLAPSED SIZE

BY GOVUSE

USE OF GOVT AGENCIES FOR STI

GOVUSE

COUNT

ROW PCT I SEVERAL SEVERAL SEVERAL DOESNT ROW
COL PCT ITIMES WK TIMES MO TIMES YR USE TOTAL

TOT PCT I 1 I 2 I 3 I 7 I

GLDSIZE

1 I 6 I 37 I 84 I 27 I 154

SMALL I 3.90 I 24.03 I 54.55 I 17.53 I 35.00

I 19.35 I 33.33 I 39.62 I 31.40 I

I 1.36 I 8.41 I 19.09 I 6.14 I

I

MEDIUM 2 I 4 I 32 I 49 I 30 I 115

I 3.48 I 27.83 I 42.61 I 26.09 I 26.14

I 12.90 I 28.83 I 23.11 I 34.88 I

I .91 I 7.27 I 11.14 I 6.82 I

I

LARGE 3 I 21 I 42 I 79 I 29 I 171

I 12.28 I 24.56 I 46.20 I 16.96 I 38.86

I 67.74 I 37.84 I 37.26 I 33.72 I

I 4.77 I 9.55 I 17.95 I 6.59 I

I

COLUMN 31 111 212 86 440

TOTAL 7.05 25.23 48.13 19.55 100.00

OLDSIZE	RECODED & COLLAPSED SIZE
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

COMMUSE

***** C R O S S T A B U L A T I O N O F *****
 OLDSIZE RECODED & COLLAPSED SIZE BY RSHUSE USEOF RSRCH ORGN'S OR CONSJLTNTS FOR STI

		RSHUSE					
COUNT							
ROW	PCT	SEVERAL	SEVERAL	SEVERAL	DOESNT	ROW	
COL	PCT	ITIMES	WK	TIMES	MO	USE	TOTAL
TOT	PCT	1	1	2	3	7	
GLOSIZE		-----	-----	-----	-----	-----	
	1	1	7	10	51	76	144
		4.86	6.94	35.42	52.78		34.53
		35.00	25.00	26.15	46.91		
SMALL		1.68	2.40	12.23	18.23		
		-----	-----	-----	-----	-----	
	2	1	5	7	51	43	106
		4.72	6.60	48.11	40.57		25.42
MEDIUM		25.00	17.50	26.15	26.54		
		1.20	1.68	12.23	10.31		
		-----	-----	-----	-----	-----	
	3	1	8	23	93	43	167
LARGE		4.79	13.77	55.69	25.75		40.05
		40.00	57.50	47.69	26.54		
		1.92	5.52	22.30	10.31		
		-----	-----	-----	-----	-----	
COLUMN		20	40	195	162	417	
TOTAL		4.80	9.59	46.76	38.85	100.00	

***** C R O S S T A B U L A T I O N O F *****
 OLDSIZE RECODED & COLLAPSED SIZE BY EXPUSE EXPERTS, COLLEAGUES & ASSOCIATES FOR STI

		EXPUSE					
COUNT							
ROW	PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT	ROW	
COL	PCT	ITIMES	WK	TIMES	MO	TIMES	YR
TOT	PCT	1	2	3	7	USE	TOTAL
OLDSIZE							
1	1	61	34	36	19		150
SHALL		40.67	22.67	24.00	12.67		34.17
		27.48	33.33	44.44	55.88		
		13.90	7.74	8.20	4.33		
2	1	55	28	18	9		110
MEDIUM		50.00	25.45	16.36	8.18		25.06
		24.77	27.45	22.22	26.47		
		12.53	6.38	4.10	2.05		
3	1	106	40	27	6		179
LARGE		59.22	22.35	15.08	3.35		40.77
		47.75	39.22	33.33	17.65		
		24.15	9.11	6.15	1.37		
COLUMN		222	102	81	34		439
TOTAL		50.57	23.23	18.45	7.74		100.00

***** C R O S S T A B U L A T I O N O F *****
 CLD SIZE RECODED & COLLAPSED SIZE BY MAGUSE USE OF MAGAZINES FOR STI

		MAGUSE					
COUNT							
ROW	PCT	SEVERAL	SEVERAL	SEVERAL	DOESNT	ROW	
COL	PCT	ITIMES	WK	TIMES	MO	TIMES	YR
TOT	PCT	1	1	2	3	7	USE
OLD SIZE		1	1	2	3	7	TOTAL
SMALL	1	64	52	21	18		155
		41.29	33.55	13.55	11.61		34.75
		30.33	35.37	37.50	56.25		
		14.35	11.66	4.71	4.04		
MEDIUM	2	49	43	13	9		114
		42.98	37.72	11.40	7.89		25.56
		23.22	29.25	23.21	28.13		
		10.99	9.64	2.91	2.02		
LARGE	3	98	52	22	5		177
		55.37	29.38	12.43	2.82		39.69
		46.45	35.37	39.29	15.63		
		21.97	11.66	4.93	1.12		
COLUMN		211	147	56	32	446	
TOTAL		47.31	32.96	12.56	7.17	100.00	

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***** C R O S S T A B U L A T I O N O F *****
 OLDSIZE RECODED & COLLAPSED SIZE BY NEWSUSE NEW OF NEWSPAPERS FOR STI

		NEWSUSE					
COUNT		I					
ROW	PCT	ISEVERAL	SEVERAL	SEVERAL	DOESNT	ROW	
COL	PCT	ITIMES	WK	TIMES	MO	USE	TOTAL
TOT	PCT	I	1 I	2 I	3 I	7 I	
OLDSIZE		I	I	I	I	I	
	1	I	61 I	21 I	15 I	45 I	142
SMALL		I	42.96 I	14.79 I	10.56 I	31.69 I	35.15
		I	29.33 I	42.86 I	35.71 I	42.86 I	
		I	15.10 I	5.20 I	3.71 I	11.14 I	
		I	I	I	I	I	
	2	I	54 I	10 I	7 I	31 I	102
MEDIUM		I	52.94 I	9.80 I	6.86 I	30.39 I	25.25
		I	25.96 I	20.41 I	16.67 I	29.52 I	
		I	13.37 I	2.48 I	1.73 I	7.67 I	
		I	I	I	I	I	
	3	I	93 I	18 I	20 I	29 I	160
LARGE		I	58.13 I	11.25 I	12.50 I	18.13 I	39.60
		I	44.71 I	36.73 I	47.62 I	27.62 I	
		I	23.02 I	4.46 I	4.95 I	7.18 I	
		I	I	I	I	I	
			208	49	42	105	404
	TOTAL		51.49	12.13	10.40	25.99	100.00

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