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**The Preparedness of Canadian Business
for the Year 2000 Computer Problem:
A Reassessment**

Jamie Brunet and Christina Norris

Small Business and Special Surveys Division

September 1998

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Special Survey Reports

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ABSTRACT

With the Year 2000 fast approaching, there could be major disruptions to business activities if computer systems are not able to correctly handle the date change from December 31, 1999 to January 1, 2000. Task Force Year 2000 sponsored an initial survey in October 1997 to determine the state of preparedness of Canadian businesses for dealing with the Year 2000 computer problem. The survey revealed that while 91% of businesses were aware of the Year 2000 issue, only 45% had taken steps to address it, with 9% of all businesses having a formal action plan to do so.

In response to these results, the Task Force carried out a nation-wide communications strategy to increase awareness about the Year 2000 issue, and a follow-up survey was subsequently conducted in May of 1998. The survey found that virtually all firms were aware of the date-change issue, and 70% had taken some steps to deal with it. The percentage of businesses with a formal action plan had risen to 18%.

This report provides descriptive analysis of the results of the follow-up survey. It takes a closer look at the various steps firms have taken and reassesses the costs, in both monetary and human resources terms, of finding and fixing non-compliant systems. It also presents findings on firms' timetables for preparing for 2000. Finally, the report contains detailed charts and tables of survey results for various industrial sectors and business-size categories.

ACKNOWLEDGEMENTS

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Appreciation is also expressed to all those who contributed to the design and operation of the Year 2000 surveys, including the staff of the Operations and Integration Division, the Operations Research and Development Division (Statistics Canada) and the secretariat of Task Force Year 2000 (Industry Canada).

Most importantly, we thank the respondents of the Year 2000 surveys. Statistics Canada recognizes the constraints imposed on their time as senior business managers and appreciates the co-operation and patience shown by them during the survey interviews.

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I. HIGHLIGHTS

The most significant findings of the May 1998 follow-up Survey on the Preparedness of Canadian Business are as follows:

- As of May 1998, virtually all businesses (99%) were aware of the Year 2000 issue and 70% had taken steps to prepare their technology for the date change to 2000. These figures represent significant improvement from October 1997 when 91% of firms were aware of the problem and only 45% of firms had taken action.
- Overall, between October 1997 and May 1998, the proportion of businesses using formal action plans to address the issue doubled (from 9% to 18%). The proportion of firms taking formal action increased with size of business. In May 1998, 15% of small firms, 37% of medium firms, and 67% of large firms reported having a formal action plan.
- The proportion of large businesses taking action remained virtually unchanged, from 93% last October to 94% in May. However, a growing proportion of large businesses appeared to be tackling the problem in a more systematic manner, with 67% reporting in May that they had a formal action plan. This compared to 48% last October.
- Almost all businesses taking action said they expected to be ready by 2000. Furthermore, ninety-two percent of firms with formal action plans and 85% of firms taking informal steps were either almost completely or completely confident that their systems would successfully make the date change.
- Thirty-two percent of small firms said they were ready for the date change to 2000 as of May. This is expected to increase to 53% before July of 1999, and to 58% before the end of 1999. The survey provides no information on the preparedness of the remaining 42% of small firms, which either had not taken action as of May or had taken action but did not know when they expected to be ready.
- Some 15% of all large firms reported that they were year 2000 compliant as of May. An additional 27% expected to be ready by the end of 1998, some 34% before July of 1999, and 15% before the end of 1999. This leaves about 9% of large firms that were either not taking steps as of May or were taking steps but did not know when they would be ready.
- Businesses showed somewhat less confidence in the preparedness of their suppliers and service-providers with 62% of businesses having almost complete or complete confidence that their suppliers would be ready. Approximately 80% of firms had almost complete or complete confidence in the eventual readiness of their banks.
- Some 3% of firms were planning to hire additional human resources to address the Year 2000 problem. In total, these firms required an estimated 8,000 extra systems workers to fix non-compliant systems. Eighty-five percent of these extra workers were required by small and medium-sized firms.
- As of May 1998, close to three-quarters (72%) of all firms had not yet communicated with their customers, suppliers or service providers to determine the preparedness of their partners. However, communication with partners did increase with size of business; 27% of small, 36% of medium, and 62% of large firms had communicated with their business partners.
- Overall, the survey results vary more across business-size categories than across different industry sectors. However, some significant inter-sectoral differences can be detected. For example, firms in the finance and insurance sector tend to show higher levels of action. On the other hand, primary industries continued to have lower proportions of firms taking action.

II. INTRODUCTION

In October 1997, Statistics Canada conducted a survey of Canadian enterprises on behalf of Task Force Year 2000. The main purpose of the survey was to provide a statistical snapshot of the awareness and action levels of Canadian business regarding the Year 2000 computer problem. Statistics Canada released preliminary results of the October survey on December 8, 1997, and submitted a final report on February 3, 1998¹.

This initial survey revealed that 91% of businesses were aware of the Year 2000 issue. Some 45% of firms had taken steps to prepare their technology for the date change to 2000, with 9% having a formal action plan to do so. Just under 9 in 10 (87%) of firms that were aware of the issue had not investigated the preparedness of their business partners, and eighteen percent of respondents believed that they might be subject to litigation should their firms not be ready for 2000 on time.

Concerned about the apparent lack of action on the part of many businesses, the Task Force implemented a nation-wide communications strategy to increase awareness of the Year 2000 issue. The Task Force also issued several recommendations aimed at minimizing the effects of the Year 2000 problem to Canadians. These recommendations were a call to action to businesses and policy makers alike, with the ultimate goal of encouraging businesses to step up efforts to address the Year 2000 challenge.

One of the recommendations was that Statistics Canada conduct a follow-up survey in the spring of 1998 to reassess the state of action of Canadian business after the communications strategy had been carried out. The survey would also more closely examine the state of preparedness of businesses, especially larger firms in “mission-critical” sectors of the economy.

The follow-up survey was conducted in May 1998 using questions very similar (in most cases identical) to the ones asked in October 1997. Based on the responses, firms were divided into three broad categories: those that said they had not taken steps to prepare their technology for the date change; those who had a formal action plan, and those that had taken less formal steps.

This report profiles each of these categories across major industrial sectors and size categories. It also presents and analyzes survey findings on the monetary cost and human resources requirements of finding and fixing non-compliant systems. The report then examines additional measures that firms may have taken to deal with the Year 2000 problem, including

- approaching business partners, such as suppliers, customers and service providers (e.g. banks, distributors) to ensure that the delivery of goods, services or funds will not be interrupted due to a lack of preparedness on the part of these partners; and
- making provisions for legal action or damages that may result if business partners are disrupted should attempts to convert non-compliant systems prove inadequate.

¹ For more information on the Year 2000 computer problem and its implications, and to access the Statistics Canada Year 2000 survey reports, visit <http://strategis.ic.gc.ca/sos2000>

Finally, the report presents findings on firms' timetables for achieving preparedness and compares them across industry sectors and size categories.

The statistics in this report are compiled from Statistics Canada's Surveys on the Preparedness of Canadian Business for the Year 2000, which were conducted during October 1997 and May 1998 for Task Force Year 2000. Survey results are derived from a sample of approximately 2,000 responses in October 1997 and 2,700 responses in May 1998. The May sample was increased to 2,700 to provide greater sectoral detail for large firms. The results are representative of the population of businesses having more than 5 employees, excluding government offices, hospitals and educational institutions.²

Survey results were analysed according to business size and sector of operation, using:

I. Three business-size categories

- Small (6 to 50 employees)
- Medium (51 to 250 employees)
- Large (more than 250 employees)

2. Five industrial sectors

- Primary (agriculture, fishing, trapping, logging and forestry, and mining)
- Manufacturing
- Transportation, communication and utilities
- Finance and insurance (financial institutions, real estate and insurance firms)
- Trade and other services (wholesalers, retailers, construction companies, business services, hotels, restaurants)

In addition, the following more detailed industry groupings are analysed for large firms only:

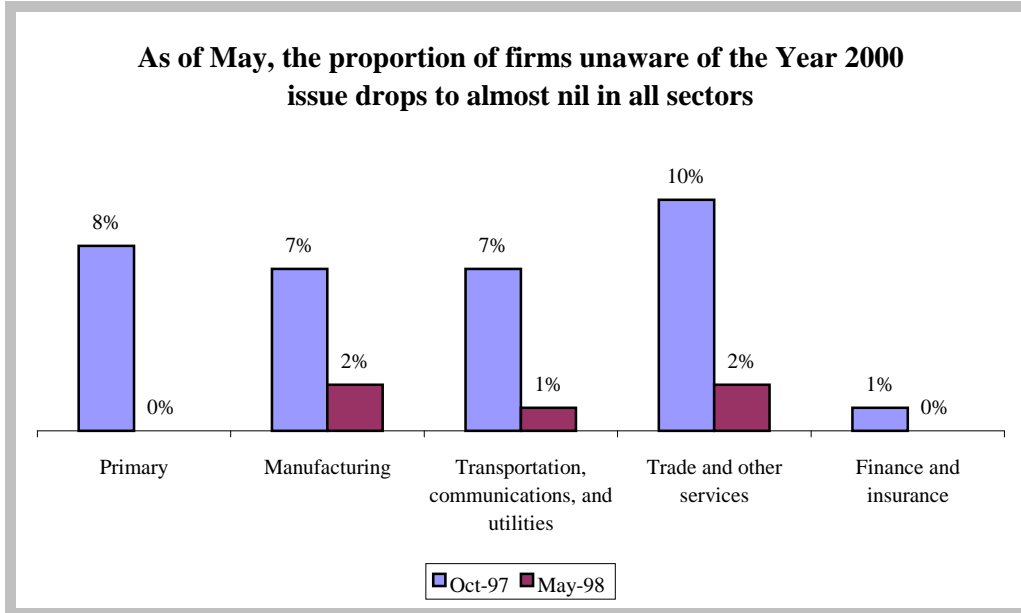
- Primary (agriculture, fishing, trapping, logging and forestry, and mining)
- Manufacturing
- Transportation
- Communication
- Utilities
- Finance and insurance (financial institutions, real estate and insurance firms)
- Wholesalers
- Retailers
- Service industries not classified elsewhere (construction companies, business services, hotels, restaurants)

This report provides quantitative information and descriptive analysis to assist policy makers and business managers in addressing the Year 2000 issue.

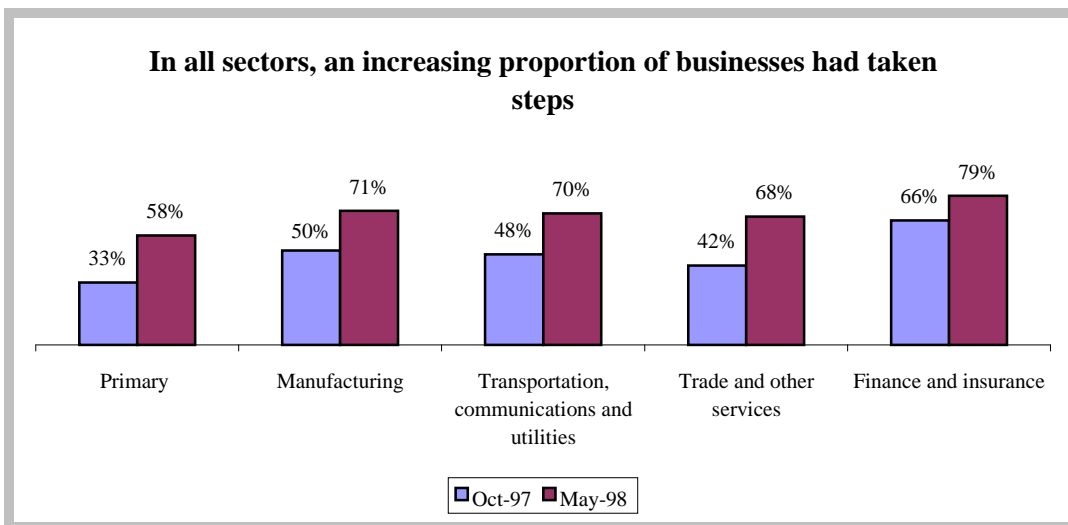
² See Appendix A for information on survey methodology.

III. PREPARING FOR THE DATE CHANGE

The May survey results show marked improvement in the progress made by businesses in preparing their technology for the date change to 2000. With only 1% of businesses indicating that they did not know about the date-change issue, lack of awareness no longer appears to be an issue.



Moreover, there has been a significant increase in the proportion of businesses taking steps to address the Year 2000 problem since the initial survey. In October 1997, only 45% of businesses reported having taken steps to prepare their technology for the Year 2000. By May 1998, this had increased to 70%. These businesses represented 89% of the survey population in terms of employment³.

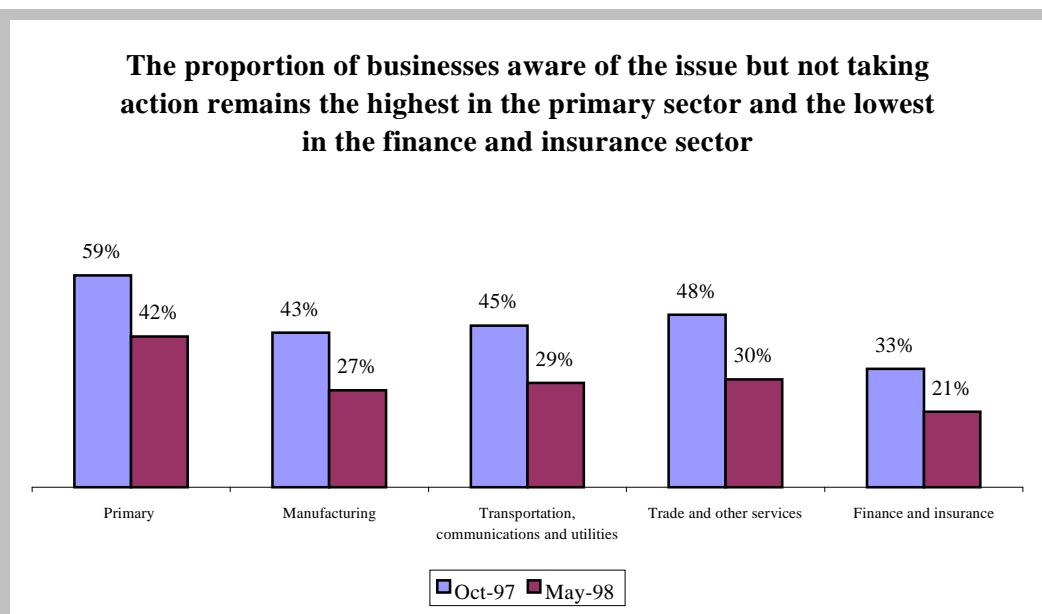
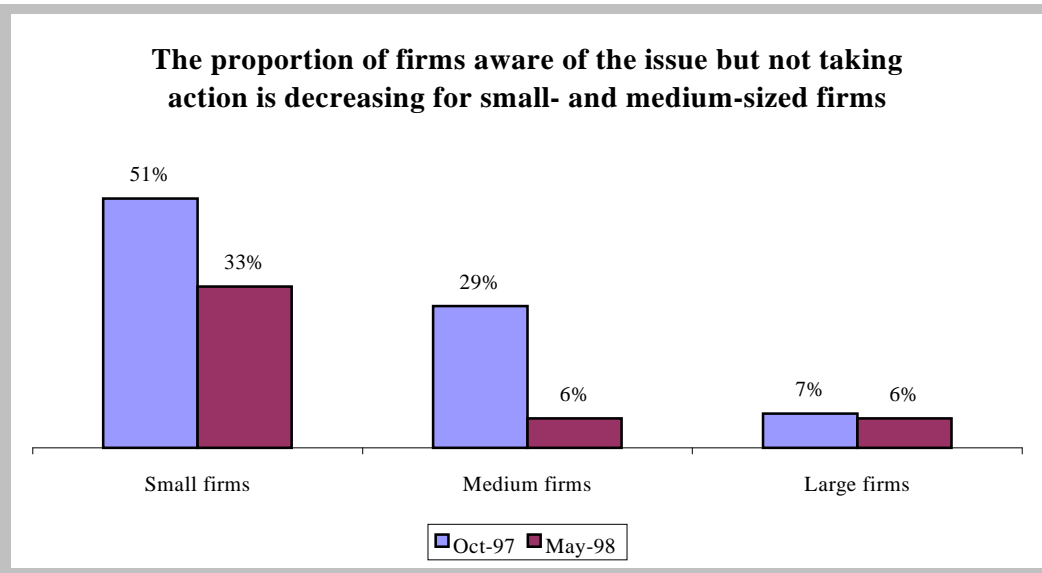


³ Employment share figures in this report are not comparable to figures released in the February 1997 report. The figures released in this report are considered to be more accurate than previous figures.

Despite the improvements, there are still areas of potential concern. Almost one-third of businesses still had not addressed the problem at all as of May, and many large businesses reported that they had not taken the type of formal action that is often recommended by Year 2000 experts.

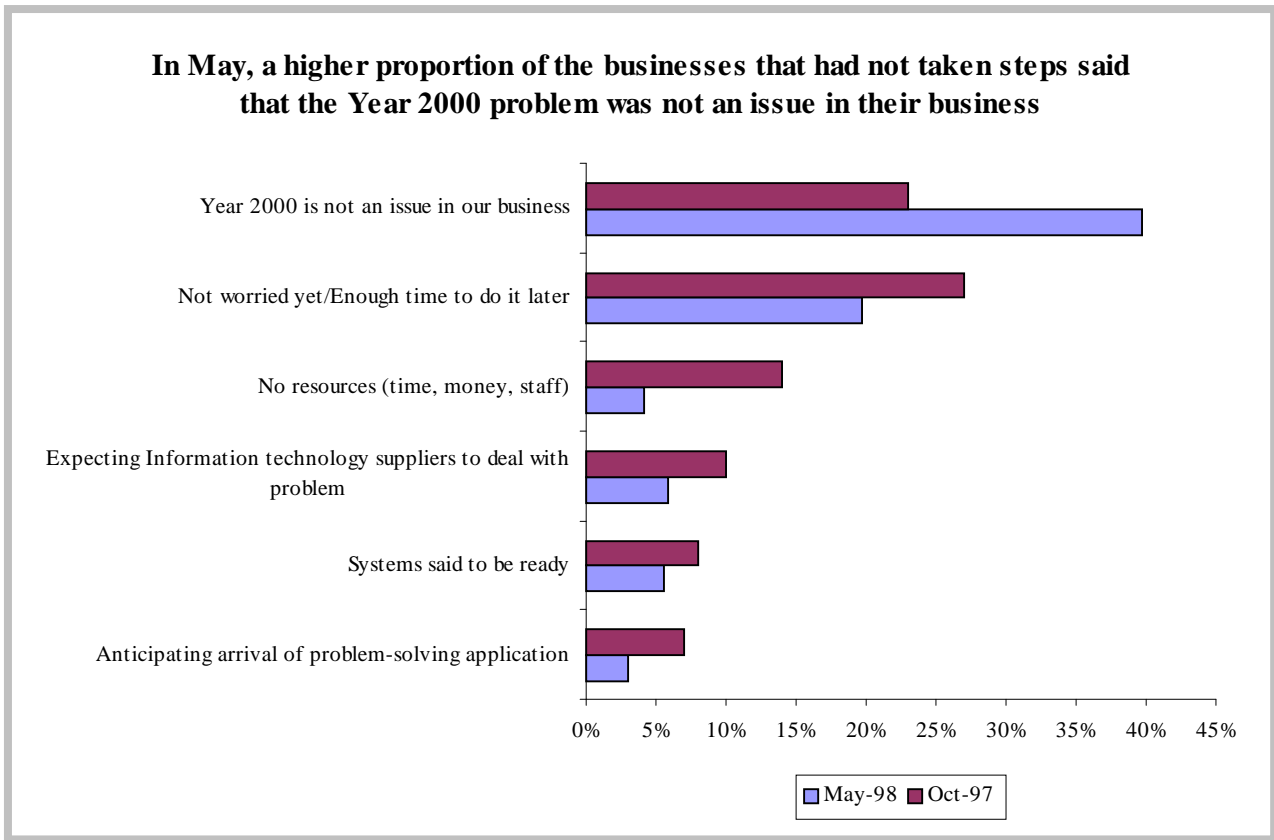
A) Firms taking no action: Who are they and what reasons do they give?

The follow-up survey revealed that some 30% of all businesses still had not taken steps to address the problem. A greater proportion of small firms (33%), compared to medium (6%) and large (6%) firms, had not taken steps to address the issue.



Businesses were asked to identify the broad categories of systems that were part of their day-to-day activities. Out of all businesses not taking action, a significant portion said that they had stand-alone computers (77%), computing systems such as mainframes, client servers, or local area networks (38%), custom-developed software (30%), and off-the-shelf software (70%).

Firms that were aware of the issue, but hadn't taken any steps to address it were asked why they had chosen not to act. Close to 40% of these firms said that they felt that the Year 2000 problem was not an issue in their business, an increase from 23% in October. As well, in the initial survey, 27% of businesses not taking action said that they weren't worried yet, or had enough time to deal with the Year 2000 problem later. This dropped to 20% in May 1998.



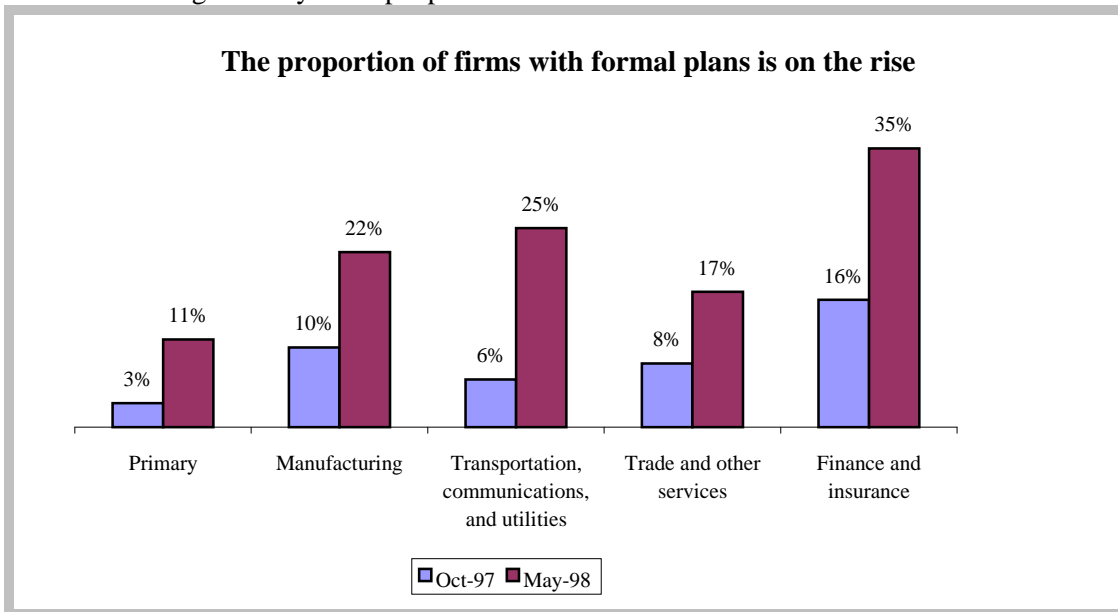
B) Firms taking action: what are they doing?

Businesses that reported taking steps to address the issue were asked to indicate which of the following best described the type of action taken:

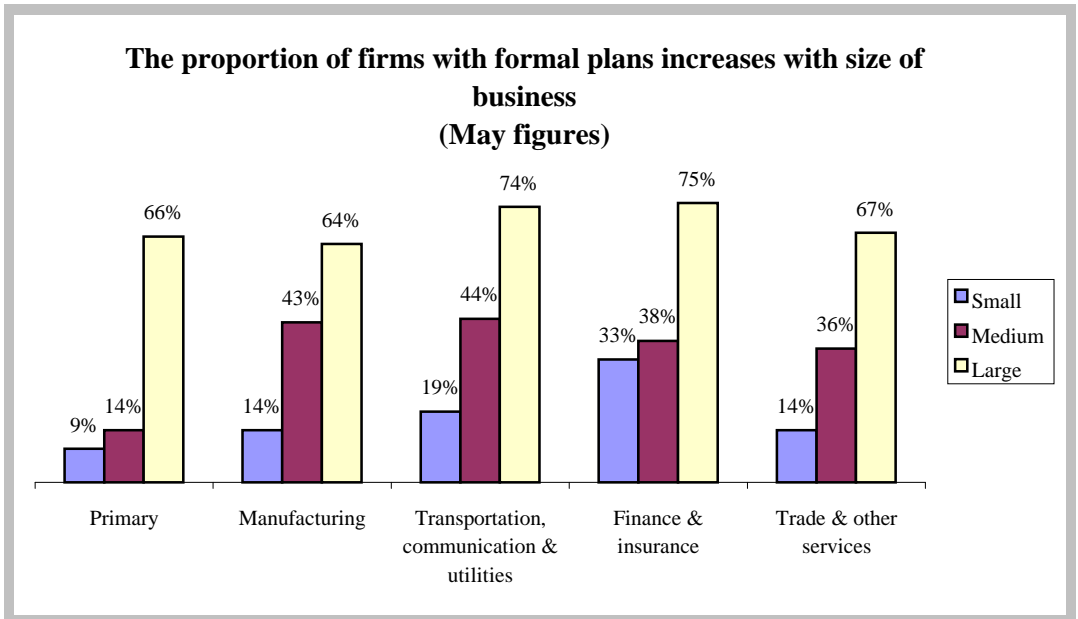
- 1) *We have a formal action plan including an assessment, conversion, and testing of all systems.*
- 2) *We have taken other less formal approaches.*

A firm was considered to have a formal action plan if it had a structured, multi-phased approach to finding and fixing non-compliant systems. For the purposes of the survey, three phases were defined. First, **assessment** typically involved taking a complete inventory to identify mission-critical computer systems and assessing their vulnerability to date-change problems. Second, **conversion** referred to the re-programming, correcting, or replacing of any non-compliant systems. Third, **testing** referred to putting converted systems through simulations of the 2000 date change.

Firms that were using a less formal approach could be implementing some, but not all, of the assessment, conversion, and testing phases required in a formal action plan. This informal approach could also include a firm contacting its information technology suppliers or having informal meetings with systems people.

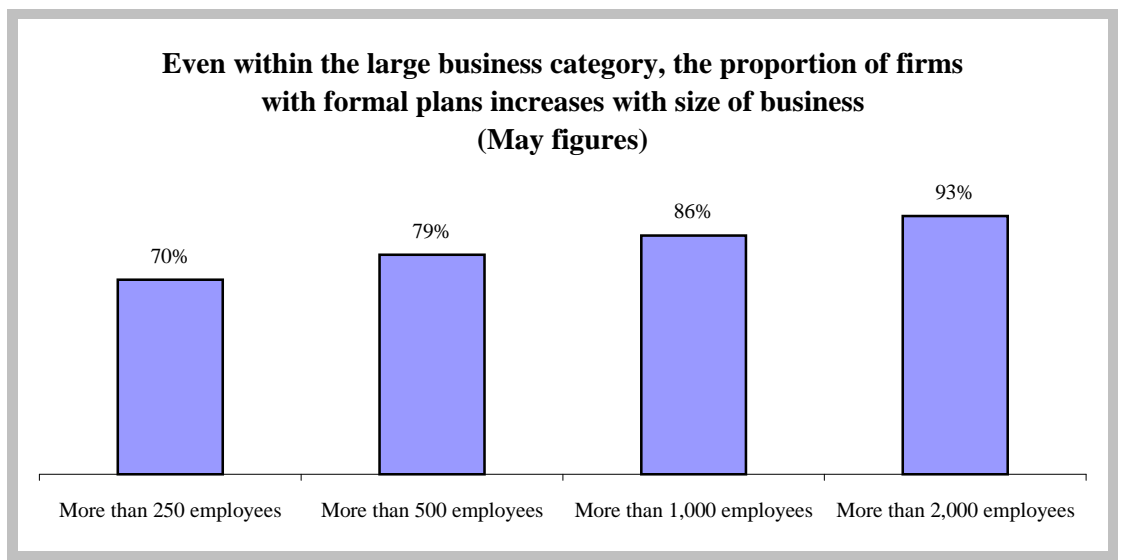


As of May, eighteen percent of all firms reported having a formal action plan and an additional 52% said they had taken informal steps. These proportions mainly reflect patterns among small firms, which account for 90% of the businesses in the survey population. Since the frequency of formal plans increases with size of business – from 15% for small, to 37% for medium and 67% for large businesses – firms with formal action plans represent a higher proportion of employment in the survey population (53%). Conversely, the proportion taking informal action is lower on an employment-share basis (36%).



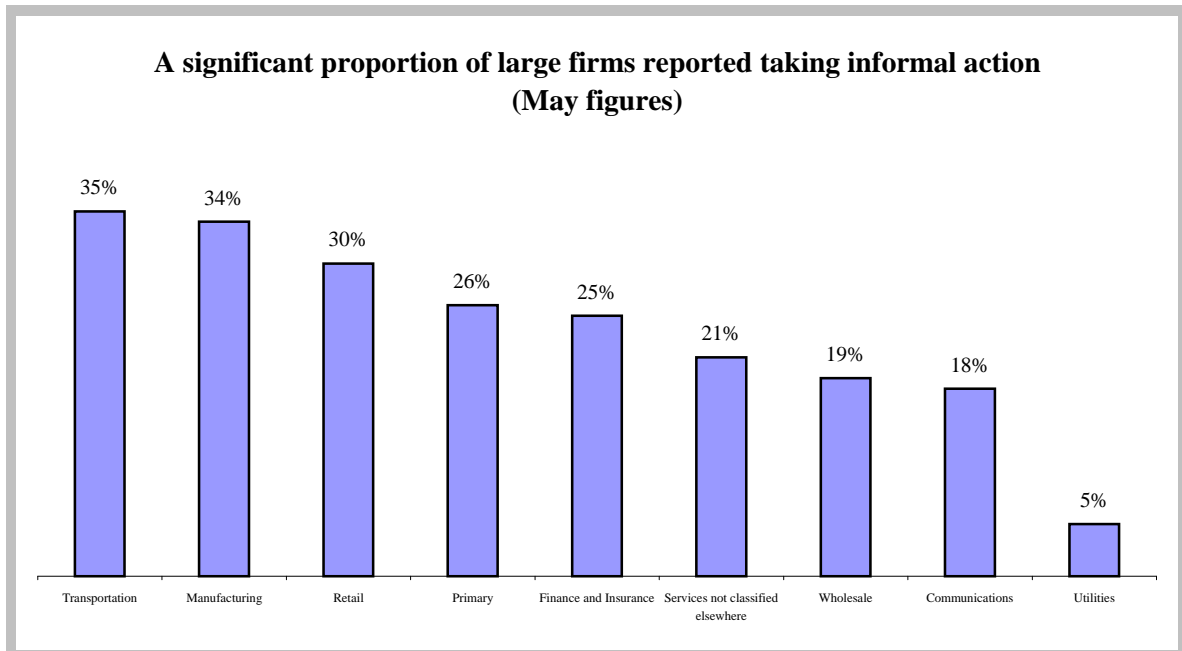
The survey found that the positive relationship between the frequency of formal action plans and business size continues above the lower bound that defines the large-business grouping. For example, the proportion of firms taking formal steps increased from 70% among firms with more than 250 employees to 79% for firms with more than 500 employees.

There is further evidence that firms taking informal action tend to be much smaller than firms with a formal action plan. On average, firms taking informal steps to address the Year 2000 problem had 33 employees. This compares to an average employment size of 134 for firms with formal action plans.



C) Are firms taking informal action doing enough?

Though the May survey shows significant improvement in the action levels of businesses, it remains an area of concern that many businesses are taking action in the absence of a formal plan. This may be especially true given that some businesses of significant size reported taking only informal action. For example, 27% of firms with more than 250 employees said they were taking only informal steps as of May. Larger firms are more likely to rely on complex computer systems and/or technology embedded in plant machinery.



In fact, significant proportions of respondents in the informal-action category said they use sophisticated technology as part of their day-to-day operations. Of all businesses taking informal steps to address the issue, about one-half (49%) of them said that they used custom-developed software on a daily basis and 62% said they used computer network systems. This compares to 77% and 77%, respectively, for firms with formal action plans.

Only 7% of all firms taking informal steps said they used process control systems embedded in plant machinery, but these firms are likely concentrated in the large firm sector, where 42% of businesses reported using process control technology.

Exactly what steps are being taken by firms taking only informal action? In May, about 6 in 10 (63%) of them said they had contacted their information suppliers to seek advice about the Year 2000 problem. Some 37% said they held meetings with systems staff, and one in five (20%) said they had hired a consultant to help them deal with Year 2000 issues.

D) Firms taking action: Is senior management sufficiently involved?

Businesses responding that they had taken either formal or informal action were asked about the extent to which their senior management was involved in making decisions about the Year 2000 computer issue. Firms categorized senior management as having: (1) *no involvement* -- the matter has been delegated entirely to lower ranks; (2) *passive involvement* -- senior management is not part of the decisions, but they are briefed regularly, or (3) *active involvement* -- senior management is regularly part of the decisions being taken.

In both the initial and follow-up surveys, nearly half of all firms described the involvement of their senior management as active. In addition, businesses with formal action plans were more likely to report active involvement by their senior managers.

		No Involvement	Passive Involvement	Active Involvement
% of businesses (May 1998)				
All businesses				
	Oct-97	15	36	49
	May-98	18	36	45
Firms taking informal steps				
	Oct-97	16	37	47
	May-98	22	38	38
Firms taking formal steps				
	Oct-97	8	30	62
	May-98	7	30	63

E) What are the costs associated with preparing for the date change?

Based on responses from the October survey, Statistics Canada estimated that businesses had so far identified \$12 billion in expenditures as a result of the Year 2000 issue. This finding was released with the caveat that these responses exhibited tremendous variability. The difficulties connected with using a sample survey to produce an accurate cost figure of this nature have been confirmed by the May survey; answers were once again highly variable. A new estimate of \$10 billion has been prepared from the May data. Due to the high variability associated with these figures, they should not be interpreted as being statistically different. No real meaning can be taken from them about any change in costs to businesses dealing with the Year 2000 issue.

These cost figures should be viewed as very rough estimates, but it can be safely concluded from the May and October surveys that it is costing Canadian businesses billions of dollars to find and fix their non-compliant systems.

F) The tight market for systems specialists: How are firms coping?

With the unemployment rate for systems analysts and programmers still hovering around 2.2%⁴, firms may experience increasing difficulty finding systems specialists to address the issue as 2000 draws near.

⁴ Labour Force Survey, July 1998

In May, the vast majority of firms (97%) reported that they did not need to hire any more programmers, testers or project managers to deal with the Year 2000 issue. The remaining 3% of firms needed roughly 8,000 systems workers to finish their Year 2000 preparations. More than four out of five (85%) of these extra workers were needed by small and medium-sized businesses.

Firms that did need to hire new employees continued to indicate that they were not having tremendous difficulty finding people. These businesses were asked to report on a scale of 1 to 5 their level of difficulty in finding new employees, with 1 representing no difficulty and 5 representing extreme difficulty.

Businesses reported only moderate levels of difficulty finding people to work on the Year 2000 issue in October 1997; in general, even lower levels of difficulty were reported in May 1998.

Level of difficulty of finding staff		
	Oct-97	May-98
	Mean level of difficulty	
Testers	2.4	1.8
Project Managers	2.8	1.6
Programmers	2.3	2.5

G) What are businesses doing to protect themselves from external Year 2000 disruptions?

Firms could be adversely affected by the Year 2000 problem even if their own systems are prepared. For example, businesses could be affected by the lack of preparedness of their partners, such as their suppliers, customers or service providers. Businesses were asked if they had communicated with these partners to determine their preparedness for dealing with the Year 2000 issue.

In May 1998, 28% of firms said they had communicated with their partners. This was up from 13% in October 1997. The proportion of businesses approaching their partners increased as the size of business increased. This trend held true for both the initial and the follow-up surveys.

% of firms approaching various types of partners		
	Oct-97	May-98
Suppliers in Canada	10	26
Foreign suppliers	3	16
Customers in Canada	4	14
Foreign customers	4	12
Banks in Canada	4	17
Foreign banks	5	10
Canadian-based intermediaries	3	15
Foreign intermediaries	2	9
Canadian distributors	6	20
Foreign distributors	4	8
Canadian government agencies/departments	5	8
Foreign government agencies/departments	2	3

% of businesses approaching suppliers, customers or service providers			
	Oct-97	May-98	Change
	% of businesses		
All Businesses	13	28	+15
Small (6-50 employees)	11	27	+16
Medium (51-250)	16	36	+20
Large (More than 250)	32	62	+30
Primary	6	11	+5
Manufacturing	6	23	+17
Transportation, communication & utilities	8	24	+16
Retail, wholesale & other services	14	29	+15
Finance & insurance	20	49	+29

As with the initial survey, Canadian suppliers were the partners who were being approached the most and foreign government agencies were being approached the least. There was a general trend for businesses to approach their Canadian partners more than their foreign partners.

The October survey found that 32% of large businesses had approached their partners. This figure improved considerably to 62% in the May 1998 survey.

By sector, the largest increase in businesses approaching their partners was in the finance and insurance sector with an increase from 20% in October 1997 to 49% in May 1998. As of May 1998, the primary sector was falling behind the other sectors in approaching their partners about their preparedness.

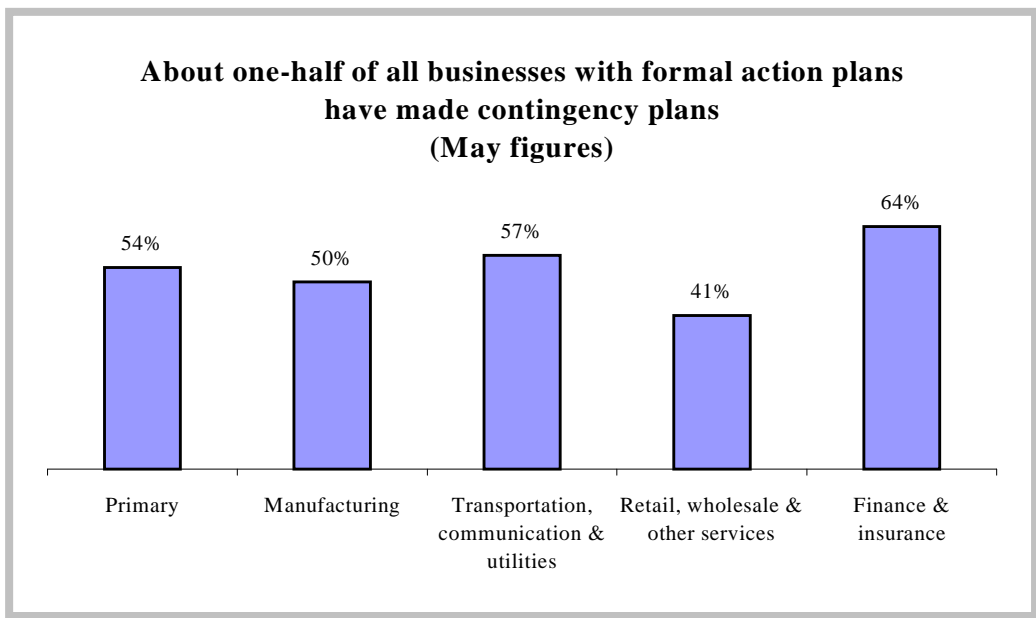
H) How are businesses preparing for disruptions caused by systems that can't be fixed on time?

Firms that adopted formal action plans were taking steps to address the Year 2000 issue including an assessment of all systems, followed by conversion and testing phases. Despite these comprehensive steps, unforeseen disruptions may occur.

According to the May survey, some 46% of businesses with formal action plans had developed contingency arrangements in the event that their efforts to address the Year 2000 problem are not successful. This included 30% of firms with formal action plans that said they were developing alternative processes in case their own systems failed. About one-quarter (26%) reported that they had contacted alternative suppliers, and 22% said they had developed communication strategies to explain any difficulties or delays with their systems to the public and/or to their employees.

% of businesses with contingency plans (as a proportion of firms with formal plans)				
	Contingency plans	Alternative suppliers	Alternative processes	Communication strategies
<i>% of businesses with formal plans</i>				
All businesses with formal plans	46	26	30	22
Small	44	24	29	18
Medium	48	28	29	29
Large	67	48	51	50

The proportion of businesses with contingency plans generally increased with size of business. Among businesses with formal action plans, 44% of small, 48% of medium and 67% of large businesses reported that contingency planning had been undertaken.



I) Are firms aware of, and preparing for, potential litigation?

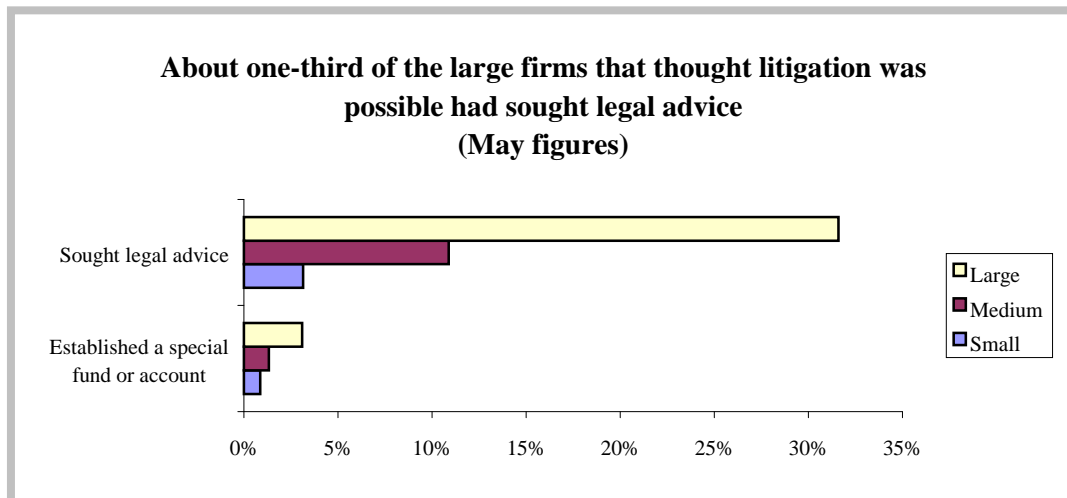
The surveys asked the responding business managers whether they saw potential for litigation in the event that their lack of preparedness should cause disruptions in the business activities of their customers, suppliers, or service providers. As was the case in October, about one in five of the responding managers felt that their business could be exposed to litigation because of the Year 2000 issue.

It would appear, however, that most managers believe that Year-2000 related litigation is a general possibility. In May, about three-quarters (74%) of the respondents who said they did not think litigation was a possibility for their own firm also said they thought that other firms could be exposed to lawsuits as a result of the Year 2000 problem.

The proportion of firms' awareness of the possibility of litigation increased as size of business increased. The May 1998 survey found that 19% of small, 37% of medium, and 51% of large businesses aware of the Year 2000 issue felt that they could be subject to litigation.

Firms that felt that there was potential for them to be exposed to lawsuits in the event that their systems are unprepared were asked if they had any specific plans to deal with litigation. Among these firms, some 33% of small firms, 35% of medium firms, and 66% of large firms said they were making preparations for potential litigation.

Firms aware of the potential for litigation were also asked how they were preparing for litigation. Many said they had sought legal advice. Some had established a special fund or account to cover the costs of potential litigation.



IV. PREPAREDNESS OF FIRMS FOR THE YEAR 2000

A) *When do businesses expect to be ready for the date change?*

The May survey included more detailed questions on firms' timetables for preparing for 2000. For the purposes of this analysis, a firm with a formal action plan is said to indicate readiness if it responded that it had completed all phases of its plan, including assessment, conversion and testing. A firm taking informal steps was categorized as ready if it responded YES when asked if all systems had been confirmed as ready to handle the date change.

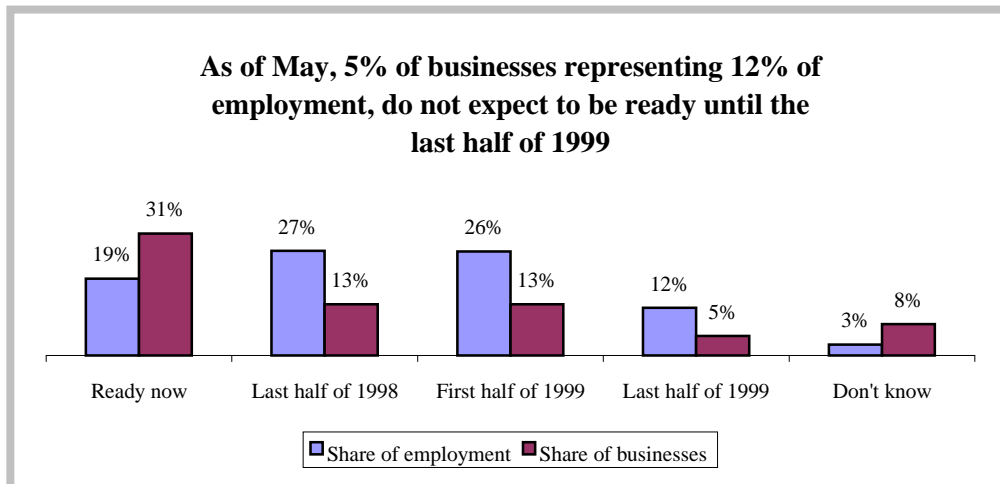
It is important to note that all survey results on the preparedness of firms are based solely on information provided by respondents. Furthermore, only firms with formal action plans or those taking less formal steps were asked questions on preparedness. The survey provides no information about the preparedness of the 30% of all firms that had not taken steps as of May 1998.

Almost one-third of businesses (31%) said that they were already prepared for the Year 2000 issue. The majority of these were small businesses with 50 employees or less. As a result, firms declaring preparedness represent only 19% of employment in the population of businesses targeted by the survey. The proportion of firms who said they were ready as of May decreases as size of business increases. Thirty-two percent of small, 19% of medium and 15% of large businesses reported they were ready for 2000 as of May.

% of businesses saying their systems are now ready (May 1998)

Small	32%
Formal	6%
Informal	26%
Medium	19%
Formal	5%
Informal	14%
Large	15%
Formal	8%
Informal	6%

Most of the remaining firms that had taken steps to prepare for 2000 said they expected to be ready before July of 1999. Nonetheless, some 5% of businesses representing 12% of survey-population employment did not expect to finish preparations until the second half of 1999. A total of 15% of large firms said that they wouldn't finish until the second half of 1999. This compares with 5% for small and 8% for medium-sized firms. A further 8% of all businesses (3% of employment) said that they did not know when they would be ready.



In general, firms' timetables for achieving preparedness did not vary tremendously across industrial sectors. In each of the five major sectors, between 27% and 32% said they were ready as of May, and only 4% to 9% reported that they would not be ready until after June of 1999.

When do firms say their systems will be ready for the Year 2000?						
	Ready now	Last half of 1998	First half of 1999	Last half of 1999	Don't know	Not taking action as of May 1998*
<i>% of businesses (May 1998)</i>						
All Industries	31	13	13	5	8***	30
Primary Manufacturing	29	11	10	4	4***	42
Transportation, communication & utilities	28	15	14	9	4	29
Retail, wholesale and other services	27	13	17	6	6	31
Finance & insurance	32	12	12	5	6	33
	30	25	18	4	1	23

* In each row, the columns should add to 100, but minor differences may exist due to rounding error
** Only firms taking formal or informal action were asked when they expected to be ready. Therefore the survey does not provide statistical information on the preparedness timetables of businesses not taking action.
*** Revised Figure

Even among large businesses, differences across industrial sectors are not, for the most part, statistically significant. However one potentially significant finding that emerges from analysis of the more detailed industry groupings available for large firms is the tendency for public utilities with more than 250 employees to report later timetables than what is typically observed for other firms in the same size category. For example, more than 4 in 5 of the large utilities that responded to the survey said they would not be ready until some time during 1999. This compares to about one-half of the large firms in all other sectors. However, it is also the case that the responding large businesses in the utilities industry showed the highest frequency of formal action plans.

When do large businesses expect to be ready?*						
	Ready now	Last half of 1998	First half of 1999	Last half of 1999	Don't know	Not taking action as of May 1998**
<i>% of large businesses (May 1998)</i>						
All Industries	15	27	34	15	3	6
Primary Manufacturing	12	17	44	18	1	8
Transportation	12	29	41	14	1	2
Communication	11	31	44	14	1	0
Utilities	15	36	28	21	0	0
Wholesalers	0	16	60	24	0	0
Retailers	14	31	41	13	1	0
Finance & insurance	9	37	42	7	3	3
Service industries not elsewhere classified	7	47	28	10	7	0
	24	17	21	19	4	15

* In each row, the columns should add to 100, but minor differences may exist due to rounding errors.
** Only firms taking formal or informal action were asked when they expected to be ready. Therefore the survey does not provide statistical information regarding the preparedness timetables of businesses not taking action.

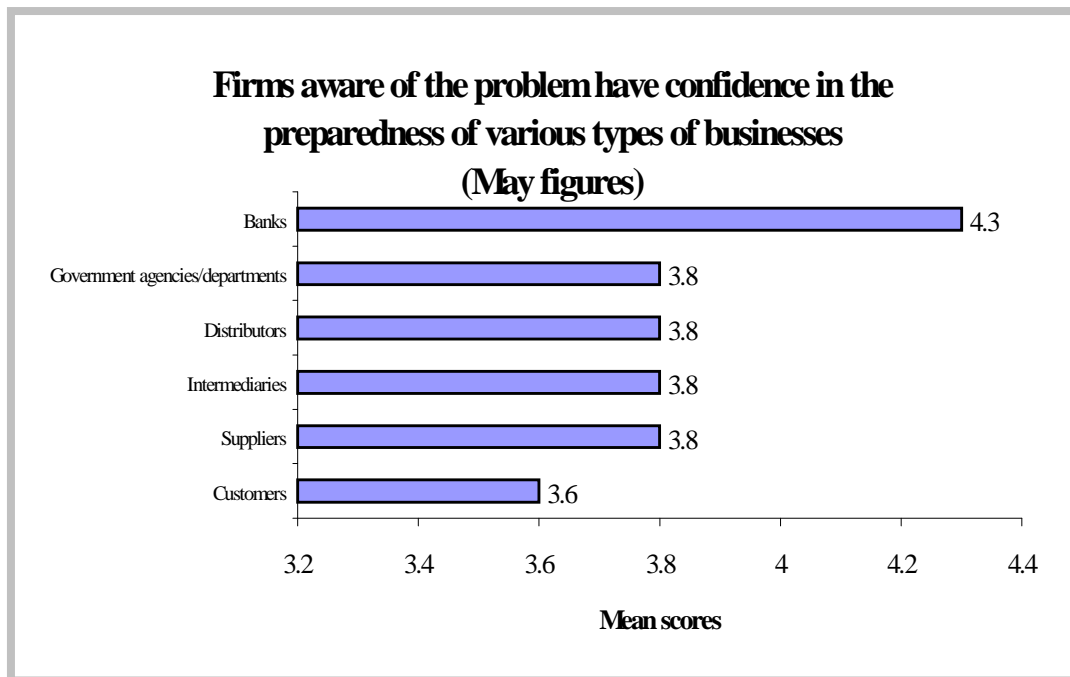
B) Are firms confident about their preparedness?

Firms were also asked to rate their level of confidence in their eventual readiness for the date change on a scale of one to five, with one being complete doubt and five being complete confidence that their systems will be ready on time for the Year 2000.

Overall, firms with formal action plans to deal with the Year 2000 computer problem had a mean level of confidence of 4.4 in May. This score varied little for firms of different sizes. Small firms with formal action plans had a mean score of 4.4, medium firms had a mean score of 4.5, and large firms had a mean score of 4.6.

The mean level of confidence for firms taking **informal steps** was 4.3, which is not statistically different than the mean for firms with formal action plans. Again, level of confidence for firms taking informal steps did not vary greatly with size of business. Small businesses had a mean score of 4.4, medium firms had a mean score of 4.0, and large firms had a mean score of 4.4.

However, firms sometimes had less confidence in the preparedness of their customers, suppliers and service providers. For example, when asked how confident they were in the eventual readiness of their suppliers, firms gave a mean score of 3.8. Overall, banks scored higher with respondents than other types of business partners.



V. SECTORAL SUMMARY

In many cases, the May and October survey results show similar patterns of action and preparedness across different industrial sectors. For example, three of the five major sectors – Transportation, communication, and utilities, Manufacturing, and Trade and other services – show very similar patterns with between 68% and 71% of firms having taken action to find and fix non-compliant systems, and between 24% and 29% of firms having communicated with business partners.

In general, action levels and preparedness seem to vary more according to size of business than according to industry sector. However, some significant inter-sectoral differences can be found from the May survey, including:

- Small and medium-sized firms in the primary sector were less likely to be addressing the Year 2000 issue than other small and medium-sized firms, with 55% of small and 80% of medium firms in the sector having taken steps to prepare their technology for the date change. Furthermore, some 9% of small and 29% of medium firms said they had communicated with their partners. Large firms in the primary sector, on the other hand, showed frequencies of action that were very similar to those of other large firms, with 92% of them having taken steps, including 66% with a formal action plan.
- Conversely, firms in the finance and insurance sector were, in general, more likely to be preparing their systems for the date change and to be assessing the preparedness of their partners. For example, just over three-quarters (76%) of the small firms surveyed in this sector said they had taken steps to prepare their technology, and about one-half (49%) had communicated with partners. Likewise, all responding large firms in the sector said they had taken steps, and 75% said they had a formal action plan.
- At 95%, the proportion of large firms in the utilities sector with formal action plans is higher than that of any other industry segment analysed. However, large utilities also appear to have later timetables for achieving preparedness, with 84% of firms reporting that they do not expect to finish preparations until some time in 1999, including 24% who will not finish until the last half of the year.
- Large firms in the communications sector fared slightly better than other large firms, with eighty-two percent reporting that they had a formal action plan. The preparedness timetables for these firms cannot, however, be said to differ significantly from those of other large firms. Fifteen percent said they were ready as of May for the date change. The other 85% expected to be ready by the end of 1999, including 21% that did not expect to be ready until the last half of the year.
- Large firms in the wholesale sector reported having formal plans more often than other large firms in the trade and other services sector. About 4 in 5 (81%) of the large wholesalers said they had a formal plan to prepare their technology for the date change. This compares to 67% for large retailers and 64% for all other large firms in the trade and other services sector.

VI. APPENDICES

A) SURVEY METHODOLOGY AND SAMPLING ERROR

Statistics Canada interviewers conducted a follow-up to 'The Survey on Preparedness of Canadian Business for the Year 2000' from May 7 to June 4, 1998. The interviewers conducted the survey by telephone using a CATI (Computer Assisted Telephone Interview) system. The questionnaire in Appendix B was administered to a senior official familiar with the computer systems of each sampled business. Statistics Canada and Task Force Year 2000 developed the questionnaire jointly. The large majority of the questions on the May 1998 survey were identical to those on the October 1997 survey. A few questions were modified slightly for clarification, and a few new questions were added to the May 1998 survey.

The target population for the survey consisted of all businesses operating in Canada with more than five employees, excluding government offices, health-care and educational institutions. To produce reliable survey estimates relating to the target population, a sample of 5,000 firms was selected from Statistics Canada's business register. The 2,000 companies that responded to the October survey were included in the May sample.⁵ The population was stratified to ensure adequate numbers of firms were selected from each of the following business-size categories and industry sectors.

Size categories

1. Small - *between 6 and 50 employees*
2. Medium - *between 51 and 250 employees*
3. Large - *more than 250 employees*

Industry sectors

1. Primary sector - *Divisions A, B, C and D of the 1980 Standard Industrial Classification⁶*
2. Manufacturing - *Division E*
3. Transportation, communication and utilities - *Divisions G and H*
4. Finance and insurance - *Divisions K and L*
5. Trade and other services - *Divisions F, I, J, M, Q and R*

Industry sectors for large firms

1. Primary - *Divisions A, B, C and D*
2. Manufacturing - *Division E*
3. Transportation - *major group 45 of Division G*
4. Communication - *major group 48 of Division H*
5. Utilities - *major group 49 of Division H*
6. Finance and insurance - *Divisions K and L*
7. Wholesalers - *Division I*
8. Retailers - *Division J*
9. Service industries not classified elsewhere (construction companies, business services, hotels, restaurants) - *Divisions F, M, Q and R*

⁵ May responses were analyzed to ensure that results were not significantly conditioned by those firms that were also in the October sample.

⁶ See *Standard Industrial Classification 1980*, Statistics Canada

Whenever population estimates are derived from a sample, sampling error is inevitable because information is obtained from only a part of the population. Measures of sampling error have been calculated for all population estimates derived from the Year 2000 surveys. In general, wherever an estimate expresses a percentage of businesses in the entire population that exhibit a certain characteristic (e.g. % answering yes, % answering no), the result should be considered accurate to within 5 percentage points 19 times out of 20. If the percentage is expressed as a proportion of only a single industry or size category, the result is accurate to within 8 percentage points 19 times out of 20. Finally, if the percentage is expressed as a proportion of the firms of a given size in a single industry, the result can be considered accurate to within 15 percentage points 19 times out of 20 and should be considered a rough figure.

It is important to note that the above rules are a generalization of the survey sampling error and apply only to estimates of a *categorical* nature. The rules do not apply to numeric estimates such as total direct costs of Year 2000 repairs, or number of employees, where sampling error is often higher. In addition, the rules are valid only for categorical estimates that apply to the entire population. For example, the percentage of firms reporting a given reason for not taking action to address the Year 2000 issue does not apply to the firms taking action. Therefore, this percentage could have greater sampling error, essentially because there is only a subset of firms in the sample from which to derive an accurate estimate.

The response rate for the survey was 70% meaning that 70 out of one hundred in-scope firms responded to the survey. The response rates varied slightly by size of firm and sector with greater proportions of medium firms and firms in the manufacturing sector responding to the survey as compared to other firms.

Type of firm	Response rate
Small	60%
Medium	83%
Large	74%

Sector of firm	Response rate
Primary	67%
Manufacturing	76%
Transportation, communication and utilities	73%
Trade and other services	65%
Finance and insurance	68%

B) SURVEY QUESTIONNAIRE



Statistics Canada

Survey on Preparedness of Canadian Business for the Year 2000 - May 1998

CONFIDENTIAL when completed.

Collected under authority of Statistics Act, Revised Statutes of Canada, 1985, Chapter S19.

Questionnaire status

- | | |
|--|--|
| <input type="radio"/> completion | <input type="radio"/> out of scope |
| <input type="radio"/> partial completion | <input type="radio"/> out of business |
| <input type="radio"/> no contact | <input type="radio"/> unable to trace |
| <input type="radio"/> refusal | <input type="radio"/> respondent not available |

Language of interview

- English French

Contact information

Name of business

Telephone

			-						
--	--	--	---	--	--	--	--	--	--

Initial Call

Hello. My name is <interviewer name> from Statistics Canada. We are conducting a voluntary survey for the Minister of Industry to find out how business managers are dealing with the Year 2000 issue.

Is this <name of business>?

Confirm name of business. If you are told that this is not the same company as above, ask if the company is any way related to the company on your list. (It could be that you have reached the company's private accountant, or that the company has merged or changed names). Find out how you can get in touch with the right company.

May I please speak with your senior manager who is directly responsible for computer systems, such as the Chief Information Officer, a Vice-President of Informatics or a Manager of Information Computer Systems?

If yes, arrange to complete the interview with the CIO.

If no, arrange to complete the interview with the senior manager, general manager, president, or owner-operator.

Survey Introduction

Hello. My name is <interviewer name> from Statistics Canada. We are conducting a voluntary survey for the Minister of Industry to find out how business managers are dealing with the Year 2000 issue.

You may be aware that some computers are not designed to handle the change of date to the year 2000.

I would like to ask a few questions about the year 2000 issue and how it relates to your business.

Confirm that you are speaking with a senior manager who could best answer questions about the Year 2000 issue.

If the respondent tells you that there is a more appropriate person to answer the survey, ask how you might arrange to speak with this person.

My records indicate that we are surveying <name of business>. The answers that you provide for this survey should relate to any consolidated Canadian operations directly managed and owned by <name of business>.

Your answers are confidential. They will be used to produce statistics that will help a federal task force monitor the progress of firms in tackling the Year 2000 issue.

My supervisor may listen in to the interview to evaluate the survey.



Statistics
Canada

Statistique
Canada

STC/SBS-524-75123

54401-6257.1



Canada

General Information

- A1 To begin, how many people are currently employed by <name of business> in Canada? Please measure part-time and contract workers in full-time equivalents.

If seasonal business, then record peak-season employment

--	--	--	--	--	--	--	--

If total number of employees is less than 6

Our survey targets businesses with 6 employees or more. Therefore, there is no need to proceed with this interview at this time. Thank you very much for your time.

- A2 Which of the following technologies are an essential part of the day-to-day operations of your firm in Canada? Do you have...

Mark all that apply

- 1 Stand-alone personal computers?
- 2 Computing systems such as mainframes, mid-range computers, client servers, local area networks?
- 3 Off-the-shelf software applications such as word processors, spreadsheets and database management software?
- 4 Custom-developed software designed specifically for your firm?
- 5 Embedded systems such as computerized thermostats, heat sensors, flow sensors?
- 6 Process control systems such as robotics and plant machinery?
- 7 Facility control systems such as security systems, elevators and building control?
- 8 Telecommunications systems such as automated voice response units, voice mail?
- 9 Miscellaneous office equipment (fax, photocopiers, pagers)?
- 10 Other types of technology? **Specify**

The Year 2000 Issue

- B1 Prior to being contacted for this interview, did YOU know about the year 2000 issue?

Mark one only

Yes

No **Skip to C1**

- B2 I would now like to ask you about how the year 2000 issue relates to YOUR firm.

Compared to six months ago, is your firm now giving the Year 2000 a higher priority?

Mark one only

Yes

No

- B3 Has your firm taken any steps to ensure that its technology will function correctly when the date changes to the year 2000?

Mark one only

Yes

No **Skip to H1**

There are different approaches firms can use to address the Year 2000 issue.

A formal approach means a structured multi-phased plan that includes an assessment of all systems followed by conversion and testing phases.

A less formal approach means that a firm may be implementing some, but not all, of the previously mentioned phases. This less formal approach can also include contacting a firm's information technology suppliers or having informal meetings with systems people.

- B4 Which of the following best describes YOUR firm's approach to the year 2000 issue?

Mark one only

You have a structured plan that includes assessment, conversion and testing of systems

You have taken other less formal approaches **Skip to E1**

The Year 2000 Issue

B5 When did your firm first implement a formal plan for dealing with the Year 2000 issue?

Don't know

_____ / _____ month/year

Skip to D1

Confirmation of Best Respondent

C1 Who in your firm might be able to answer questions about the year 2000 issue and any steps your business might be taking to address it?

Name and title of respondent

Phone number of respondent

Stream 1: Formal Approach

D1 Of the essential technologies you mentioned earlier, which ones are covered in the plan?

Mark all that apply

- 1 Stand-alone personal computers?
- 2 Computing systems such as mainframes, mid-range computers, client servers, local area networks?
- 3 Off-the-shelf software applications such as word processors, spreadsheets and database management software?
- 4 Custom-developed software designed specifically for your firm?
- 5 Embedded systems such as computerized thermostats, heat sensors, flow sensors?
- 6 Process control systems such as robotics and plant machinery?
- 7 Facility control systems such as security systems, elevators and building control?
- 8 Telecommunications systems such as automated voice response units, voice mail?
- 9 Miscellaneous office equipment (fax, photocopiers, pagers)?
- 10 Other types of technology? **Specify**

D2 Have you completed the assessment, conversion and testing of all these essential systems?

Mark one only

- Yes **Skip to D11**
- No
- Don't know

Stream 1: Formal Approach (Continued)

D3 How much of the ASSESSMENT stage is complete?

Mark one only

- All **Skip to D5**
- More than half
- Half
- Less than half
- None
- Don't know

D4 When do you expect the assessment of all systems to be completed?

Don't know

_____ / _____ month/year

D5 How much of the CONVERSION of all systems is completed, excluding testing?

Mark one only

- All **Skip to D7**
- More than half
- Half
- Less than half
- None
- Don't know

D6 When do you expect the conversion stage to be completed?

Don't know

_____ / _____ month/year

D7 How much of the TESTING of all systems has been completed?

Mark one only

- All **Skip to D9**
- More than half
- Half
- Less than half
- None
- Don't know

D8 When do you expect the testing stage to be completed?

Don't know

_____ / _____ month/year

Stream 1: Formal Approach (Continued)

D9 When do you expect to finish all phases of the plan including assessment, conversion or replacement, and testing?

Don't know

_____ / _____ month/year

D10 How confident or doubtful are you that all your essential systems will be ready on time for the year 2000? Please answer on a scale of 1 to 5 where 1 is complete doubt and 5 is complete confidence.

Leave blank if answer is DON'T KNOW

Complete doubt		Complete confidence			Does not apply
1	2	3	4	5	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

D11 Does your plan include contingency arrangements to minimize disruptions when 2000 arrives (in the event that the steps to correct your systems or the systems of your suppliers, customers, or service providers, should prove insufficient)?

Mark one only

Yes

No Skip to D13

Don't Know Skip to D13

D12 Which of the following types of contingency arrangements are being made?

Mark all that apply

Are you identifying alternative suppliers that have achieved compliance?

Are you developing alternative processes (including paper or manual processes)?

Are you developing publication or communication strategies to keep stakeholders informed of progress in dealing with the Year 2000 issue?

³¹⁶ Are you making any other contingency arrangements?

Specify

Stream 1: Formal Approach (Continued)

D13 How many millions of lines of computer code have been or must be verified to make all your systems ready for the year 2000?

Don't know

_____ millions of lines of code

D14 Please estimate the total direct dollar cost that the year 2000 issue will pose to your firm in Canada. Include the assessment, conversion and testing of all systems for which costs have or have not already been incurred.

Don't know

\$ _____ .00 ³¹³

Skip to F1

Stream 2: Informal Approach

Which of the following steps is your firm taking to deal with the Year 2000 issue?

E1 Has anyone conducted, or is anyone currently conducting, a thorough assessment of your firm's most essential computer systems to determine how the Year 2000 date change could impact on your business?

Mark one only

Yes

No

Don't Know

E2 Has anyone converted, or is anyone planning to convert, any of your business' computer systems for the date change to the Year 2000, either by replacing, reprogramming, or otherwise repairing systems that are not ready for the date change?

Mark one only

Yes

No

Don't Know

E3 Has anyone conducted, or is anyone planning to conduct, a thorough testing of systems once they have been converted to ensure the change of date to the Year 2000 will be handled properly?

Mark one only

Yes

No

Don't Know

Stream 2: Informal Approach (Cont'd)

E4 Has your firm taken any of these other steps?

Mark all that apply

Contacted information technology suppliers or software vendors to seek advice?

Replaced or will replace all non-compliant software?

Met with systems staff?

Hired a consultant or private Information Technology firm to do some of the work?

Taken any other steps? **Specify**

E5 What is your best estimate of the total cost of the year 2000 issue to your firm. Include any labour costs, consulting fees and system upgrades directly associated with the year 2000 issue.

³¹⁹ Don't know

\$ | | | | | | | | | | | | .00

E6 Of the technologies that you identified earlier as essential to your business, which ones are being - or have been - assessed for year 2000 readiness?

Mark all that apply

1 *Stand-alone personal computers?*

2 *Computing systems such as mainframes, mid-range computers, client servers, local area networks?*

3 *Off-the-shelf software applications such as word processors, spreadsheets and database management software?*

4 *Custom-developed software designed specifically for your firm?*

5 *Embedded systems such as computerized thermostats, heat sensors, flow sensors?*

6 *Process control systems such as robotics and plant machinery?*

7 *Facility control systems such as security systems, elevators and building control?*

8 *Telecommunications systems such as automated voice response units, voice mail?*

9 *Miscellaneous office equipment (fax, photocopiers, pagers)?*

10 *Other types of technology?* **Specify**

Stream 2: Informal Approach (Cont'd)

E7 Are all of these essential systems now confirmed as ready to handle the date change to the year 2000?

Mark one only

Yes **Skip to F1**

No

Don't know

E8 When do you expect all systems to be ready?

Don't know

| | / | | month/year

E9 How confident are you that all your essential systems will be ready on time for the Year 2000? Please answer on a scale of 1 to 5 where 1 is complete doubt and 5 is complete confidence.

Leave blank if answer is DON'T KNOW

Complete doubt			Complete confidence		Does not apply
1	2	3	4	5	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Human Resources

F1 I would now like to ask you some human resources questions.

Are in-house systems staff (such as analyst, programmers, testers, and project managers) dealing with the Year 2000 issue in your firm?

Mark one only

Yes

No

Don't know

F2 Have you hired any external consultants or private information technology firms to deal with the Year 2000 issue in your firm?

Mark one only

Yes

No

Don't know

F3 How many people are working on the year 2000 issue in your firm in Canada, including systems analysts, programmers, testers and project managers? Please answer in full-time equivalents the amount of time that in-house systems staff and external consultants are spending on the Year 2000 issue in your firm. (For example, a PART-TIME programmer working half of a full-time week on the Year 2000 issue counts as 0.5 of a full-time equivalent. Similarly, a FULL-TIME programmer working half of his or her time on the Year 2000 issue counts as 0.5 of a full-time equivalent.)

Nil

Don't know

| | full-time equivalents

5

Human Resources (Con't)

- F4 Does your firm need to increase the number of systems analysts, programmers, testers, or project managers working on the Year 2000?

Mark one only

Yes

No

Skip to G1

Don't know

Skip to G1

- F5 How many additional people (such as analysts, programmers, testers and project managers) will be required to make all systems ready for 2000? Please answer in full-time equivalents.

Nil

Don't know

_____ full-time equivalents

- F6 What percentage of this required additional staff will be redeployed from within the firm?

Nil

Don't know

_____ %

- F7 To what degree is your firm having difficulty finding each of the following types of workers with the qualifications to address the year 2000 issue? Please answer on a scale of 1 to 5 where 1 is extreme difficulty and 5 is no difficulty at all.

Leave blank if answer is DON'T KNOW

	Extreme difficulty		No difficulty at all			Does not apply
	1	2	3	4	5	
Project managers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Testers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Programmers and analysts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Senior Management's Involvement

- G1 Which of the following best describes the involvement of your senior management in addressing the year 2000 issue?

Mark one only

Active involvement - they are regularly part of the decisions being taken

Passive involvement - they are not part of the decisions but are briefed regularly

No involvement - the matter has been delegated entirely to lower management levels

Skip to I1

Stream 3: Firms not Taking Steps

- H1 Why has your firm chosen not to take any steps towards dealing with the Year 2000 issue?

Customers/Suppliers/Service Providers

The following questions address how your firm might be affected by the level of preparedness of its suppliers, customers and service providers.

- I1 With which of the following does your firm regularly do business? Do you deal with...

Read option below. If answer is YES, mark in column A

Once column A is complete, return to top of list and ask...

Of the categories just mentioned, which ones have been approached by your firm to determine their preparedness for 2000? Have you approached...

Read each option marked in Column A. If answer is YES, mark in Column B

	COLUMN A Firm deals regularly with	COLUMN B Have been approached by firm
Suppliers in Canada?	<input type="radio"/>	<input type="radio"/>
Suppliers in the U.S. or other countries?	<input type="radio"/>	<input type="radio"/>
Customers in Canada?	<input type="radio"/>	<input type="radio"/>
Customers in the U.S. or other countries?	<input type="radio"/>	<input type="radio"/>
Canadian banks?	<input type="radio"/>	<input type="radio"/>
Banks in the U.S. or other countries?	<input type="radio"/>	<input type="radio"/>
Canadian-based intermediaries?	<input type="radio"/>	<input type="radio"/>
Intermediaries based in other countries?	<input type="radio"/>	<input type="radio"/>
Distributors in Canada?	<input type="radio"/>	<input type="radio"/>
Distributors in other countries?	<input type="radio"/>	<input type="radio"/>
Government agencies or departments in Canada?	<input type="radio"/>	<input type="radio"/>
Government agencies or departments in other countries?	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	Mark if respondent answered NO to all items in Column A	
<input type="radio"/>	Mark if respondent answered NO to all items in Column B	

Customers/Suppliers/Service Providers

I2 How confident or doubtful are you that each of the following will be ready when 2000 arrives. Please answer on a scale of 1 to 5 where 1 is complete doubt and 5 is complete confidence. How confident are you that your <read option> will be ready?

Leave blank if answer is DON'T KNOW

	Complete doubt		Complete confidence			Does not apply
	1	2	3	4	5	
Suppliers?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customers?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Banks and other financial institutions ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intermediaries?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distributors?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the government agencies or departments that you deal with?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Litigation

J1 Does your firm believe that there is potential for litigation in the event that the unpreparedness of your systems disrupts the business activities of your customers, suppliers or service providers?

Mark one only

Yes Skip to J3

No

Don't know

J2 Do you think it is possible for ANY firms to be exposed to lawsuits in the event that their systems are unprepared for the Year 2000 issue?

Mark one only

Yes

No Skip to Conclusion

Don't know

J3 What types of provisions have been made should litigation occur? Have you...

Mark all that apply

Established a special fund or account?

Sought legal advice?

Purchased insurance?

Made any other provisions? Specify

Conclusion

The interview is now finished. Thank you very much for your participation. If you have any comments regarding this interview, I would be pleased to make a note of them now.

Additional Respondents

If there was someone else who provided any of the information other than the person identified in Question A1, please record his/her name and position title.

Name of additional respondent	Title of additional respondent
<input type="text"/>	<input type="text"/>

Comments

C) SURVEY TABULATIONS

How are businesses approaching the Year 2000 computer problem?

		Not aware of Year 2000 problem		Aware but not taking action		Taking informal steps		Having a formal action plan		
		<i>% of businesses</i>								
		Oct-97	May-98	Oct-97	May-98	Oct-97	May-98	Oct-97	May-98	
<i>by firm size</i>	All businesses	9	1	46	29	36	52	9	18	
	Small	10	1	51	33	33	51	6	15	
	Medium	1	0	29	6	50	57	20	37	
	Large	0	0	7	6	45	27	48	67	
<i>by industry sector</i>	Primary	8	0	59	42	30	47	3	11	
	Manufacturing	7	2	43	27	40	49	10	22	
	Transportation, communication & utilities	7	1	45	29	42	45	6	25	
	Finance & insurance	1	0	33	21	50	44	16	35	
	Trade & other services	10	2	48	30	34	51	8	17	
<i>by industry sector and firm size</i>	Primary	Small	8	0	64	45	26	46	2	9
		Medium	12	0	33	20	48	66	7	14
		Large	0	0	8	8	69	26	23	66
	Manufacturing	Small	10	2	50	33	36	51	4	14
		Medium	0	0	24	7	55	50	21	43
		Large	0	0	11	2	36	34	53	64
	Transportation, communication & utilities	Small	8	1	51	36	37	44	4	19
		Medium	3	0	30	2	62	54	5	44
		Large	0	0	3	0	47	26	50	74
	Finance & insurance	Small	1	0	39	24	52	43	8	33
		Medium	1	0	18	8	51	54	30	38
		Large	0	0	3	0	21	25	76	75
	Trade & other services	Small	11	2	52	32	31	52	6	14
		Medium	1	0	31	5	48	59	20	36
		Large	0	0	8	11	52	22	40	67

What types of systems are businesses using as part of their day-to-day operations?

			<i>% of businesses using class of system as of May 1998</i>							
			Stand-alone computers	Computing systems (e.g. mainframes, mid-range computers, client servers and local area networks)	Off-the-shelf software applications (e.g word processors, spreadsheets or data base management software)	Custom-developed software	Embedded systems (e.g. computerized thermostats, heat sensors, flow sensors)	Process control systems (e.g. plant machinery)	Facility control systems (e.g. security systems, elevators and building control)	Telecom systems (e.g. voice mail and automated voice response units)
<i>by firm size</i>	All businesses		82	56	83	47	15	7	43	38
	Small		81	52	81	43	13	5	40	35
	Medium		89	91	97	78	28	20	59	60
	Large		92	95	99	87	60	42	73	90
<i>by industry sector</i>	Primary		83	34	80	34	17	9	27	34
	Manufacturing		83	63	90	51	20	28	46	38
	Transportation, communication & utilities		82	55	87	51	14	5	36	36
	Finance & insurance		84	77	90	60	24	9	49	55
	Trade & other services		82	54	81	46	13	3	43	37
<i>by industry sector and firm size</i>	Primary	Small	83	29	79	30	14	5	24	31
		Medium	93	72	87	73	43	44	59	59
		Large	92	95	100	84	63	58	58	88
	Manufacturing	Small	84	54	88	43	15	21	41	29
		Medium	80	91	95	77	29	50	63	62
		Large	93	99	99	88	65	77	78	89
	Transportation, communication & utilities	Small	79	47	85	44	11	3	33	29
		Medium	98	88	97	74	16	7	43	63
		Large	95	100	100	94	61	27	66	91
	Finance & insurance	Small	85	75	88	58	21	7	47	52
		Medium	75	91	100	67	37	17	57	64
		Large	83	100	99	95	54	15	81	98
	Trade & other services	Small	81	51	80	42	12	3	41	35
		Medium	94	92	97	81	26	8	60	57
		Large	94	88	99	82	56	25	72	89
	<i>by type of action being taken</i>	Aware but not taking action		77	37	70	30	15	4	39
Taking informal steps		85	62	92	49	13	7	43	40	
Having a formal action plan		88	77	86	77	21	12	52	53	

How are senior managers involved in the steps being taken to address the Year 2000 problem?

		<i>% of businesses (as a proportion of firms taking formal or informal steps)</i>					
		Active involvement - they are regularly part of the decisions being taken		Passive involvement - they are not part of the decisions but are briefed regularly		No involvement - the matter has been delegated entirely to lower ranks	
		Oct-97	May-98	Oct-97	May-98	Oct-97	May-98
<i>by firm size</i>	All businesses	49	45	36	36	15	18
	Small	53	44	32	35	15	20
	Medium	38	48	47	37	15	9
	Large	40	53	49	42	11	6
<i>by industry sector</i>	Primary	46	48	29	39	25	13
	Manufacturing	47	54	35	38	18	7
	Transportation, communication & utilities	51	51	33	34	16	14
	Finance & insurance	55	61	32	26	13	12
	Trade & other services	49	41	37	36	14	21
<i>by type of action being taken</i>	Aware but not taking action	Does not apply to firms aware, but not taking action					
	Taking informal steps	47	38	37	38	16	22
	Having a formal action plan	62	63	30	30	8	7

What reasons are firms giving for not addressing the Year 2000 problem?

		<i>% of businesses as of May 1998 (as a proportion of firms aware of issue but taking neither formal nor informal steps)*</i>								
		No resources (time, staff, money)	Not worried yet/enough time to do it later	Do not know if it's an issue or how to approach problem	Anticipating arrival of problem-solving application on market	Expecting information technology suppliers to deal with problem	Expecting franchisor to deal with problem	Systems said to be ready	Will be upgrading all systems regardless of Year 2000 problem	Year 2000 is not an issue for our business
	All businesses	5	20	4	3	6	1	6	8	40
<i>by firm size</i>	Small	5	20	4	3	6	0	5	8	41
	Medium	8	28	1	3	0	7	13	7	23
	Large	0	71	1	0	10	0	6	6	9
<i>by industry sector</i>	Primary	12	16	8	6	8	0	15	3	31
	Manufacturing	2	19	2	1	8	0	8	8	42
	Transportation, communication & utilities	6	15	6	8	4	0	14	4	45
	Finance & insurance	12	20	11	8	8	4	16	5	23
	Trade & other services	4	21	3	3	6	0	3	9	41

* Percentages can add to more than 100% because firms could supply more than one reason for not taking action. Likewise, they may add to less than 100% due to rare number of responses not fitting into any of the above categories.

What types of informal steps are firms taking?

		<i>% of businesses (as a proportion of firms taking informal steps)*</i>					
		Hired consultant or private firm to do some of the work		Contacted Information Technology suppliers or software vendors to seek advice		Informal discussions with systems staff	
		Oct-97	May-98	Oct-97	May-98	Oct-97	May-98
<i>by firm size</i>	All businesses	21	20	58	63	24	37
	Small	21	18	57	62	25	33
	Medium	19	31	60	71	20	62
	Large	25	32	50	81	34	79
<i>by industry sector</i>	Primary	18	27	54	54	5	42
	Manufacturing	27	27	46	66	24	44
	Transportation, communication & utilities	24	28	54	72	19	45
	Finance & insurance	11	24	82	72	10	55
	Trade & other services	21	17	57	62	27	34

** Percentages may add more than 100% because respondents could supply more than one type of action. Only the most common responses are included in this table.*

What proportions of businesses are approaching their partners and addressing potential legal implications of the Year 2000 problem?

		<i>% of businesses (as a proportion of businesses aware of the Year 2000 issue)</i>					
		Approaching any partners		Believing there is potential for litigation		Making provisions for litigation	
		Oct-97	May-98	Oct-97	May-98	Oct-97	May-98
<i>by firm size</i>	All businesses	13	28	18	21	4	8
	Small	11	27	17	19	4	6
	Medium	16	36	21	37	5	13
	Large	32	62	39	51	13	35
<i>by industry sector</i>	Primary	6	11	15	16	4	6
	Manufacturing	6	23	17	18	4	8
	Transportation, communication & utilities	8	24	19	23	3	8
	Finance & insurance	20	49	25	36	8	19
	Trade & other services	14	29	18	21	4	6

When do firms say their systems will be ready for the Year 2000?*

	Ready now	Last half of 1998	First half of 1999	Last half of 1999	Don't know	Not taking action as of May 1998**
<i>% of businesses</i>						
All businesses	31	13	13	5	8 ***	30
Small	32	10	11	5	8 ***	34
Medium	19	37	21	8	8	6
Large	15	27	34	15	3	6
Primary	29	11	10	4	4 ***	42
Small	29	9	9	3	5 ***	45
Medium	25	35	14	3	3	20
Large	12	17	44	18	1	8
Manufacturing	28	15	14	9	4	29
Small	29	13	10	8	5	35
Medium	29	23	26	12	4	7
Large	12	29	41	14	1	2
Transportation, communication & utilities	27	13	17	6	6	30
Small	26	9	15	5	7	37
Medium	33	29	23	9	4 ***	2
Large	10	30	43	16	1	0
Finance and insurance	30	25	18	4	1	21
Small	30	22	17	4	3 ***	24
Medium	33	36	19	4	1	8
Large	7	47	28	10	7	0
Trade and other services	32	12	12	5	6	32
Small	34	9	11	4	8 ***	34
Medium	11	44	20	7	13	5
Large	20	22	27	17	3	11

* For each row, the sum of all columns should add to 100, but minor differences may exist due to rounding error.

** Only firms having taken formal or informal action as of May 1998 were asked when they expected to be ready. Therefore the survey does not provide statistical information regarding the expected preparedness timetables of firms not taking action.

*** Revised figure

How are large businesses dealing with the issue and when do they expect to be ready?*

	Taking action	Formal Plan	Ready now	Last half of 1998	First half of 1999	Last half of 1999	Don't know	Not taking action as of May 1998**
	<i>% of large businesses</i>		<i>% of large businesses</i>					
All Industries	94	67	15	27	34	15	3	6
Primary	92	66	12	17	44	18	1	8
Manufacturing	98	64	12	29	41	14	1	2
Transportation	100	65	11	31	44	14	1	0
Communication	100	82	15	36	28	21	0	0
Utilities	100	95	0	16	60	24	0	0
Wholesalers	100	81	14	31	41	13	1	0
Retailers	97	67	9	37	42	7	3	3
Finance & insurance	100	75	7	47	28	10	7	0
Service industries not elsewhere classified	85	64	24	17	21	19	4	15

* In each row, columns 3 through 8 should add to 100, but minor differences may exist due to rounding errors.

** Only firms taking formal or informal action were asked when they expected to be ready. Therefore the survey does not provide statistical information regarding the preparedness timetables of businesses not taking action.