The Preparedness of Canadian Business for the Year 2000 Computer Problem

Jamie Brunet

Small Business and Special Surveys Division

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ABSTRACT

The Survey on Preparedness of Canadian Business for the Year 2000 was conducted by Statistics Canada on behalf of Task Force Year 2000 to assess the business community's readiness for the Year 2000 computer problem. The survey found that more than half of Canadian businesses with more than five employees are doing nothing to address this issue. Moreover, less than 1 in 10 firms have a formal plan to assess, convert and test systems for the date change to 2000. Some 2% of firms have implemented and completed all phases of a plan, and a further 16% have taken less formal steps and say their systems are confirmed to be ready for 2000.

This report takes a closer look at the survey results to determine how businesses in different industries and size categories are preparing for potential difficulties, and it assesses the general cost and magnitude of fixing the problem.

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I. INTRODUCTION

The Year 2000 computer problem can have serious implications for businesses. Policy makers, top-level business executives and business consultants have joined technology experts in expressing to business managers the need to address the problem promptly.

The problem stems from the susceptibility of many computers to malfunction at the turn of the next century because they store and make computations on calendar dates omitting the first two digits of the calendar year. These systems were programmed such that the field "98", for example, is used to represent the Year 1998, with the century-identifying "19" prefix invariably implied by design. As such, upon arrival of 2000, year-sensitive computations will process as though the actual date is reverting to the Year 1900.

On a technical level, this could disrupt many different types of systems in a number of often-unpredictable ways. Date-sensitive functions are often built into information technology hardware (e.g. personal computers, networks and mainframes), and software applications often process data in a time dimension. Moreover, there is a myriad of computerized process and control systems functioning on date inputs, including embedded systems that operate alarm systems, facsimile machines and thermostats, as well as the computers that control plant machinery.

For businesses, the issue is more than a technical one. Many date-sensitive technologies have become an essential element of their operations, and the Year 2000 issue has potential consequences for the bottom line. Air travel cancellations, erroneous banking transactions, malfunctioning alarm systems and confused elevators are just some examples of the anticipated disruptions that could hinder or impede business operations and result in lost revenues.[1]

This report presents statistical findings on how firms are addressing the Year 2000 problem. Two broad categories of action — defined for the purposes of this report — are considered. First, corrective measures are the steps taken by individual firms to identify and correct date-sensitive systems that are part of their own operations. These measures can be part of a structured plan including formal assessment, conversion and testing of systems, or they can be less formal actions taken in consultation with in-house or external systems staff.

Second, the report defines protective measures as the steps taken by individual businesses to deal with potential problems stemming directly from business relationships, including:
- approaching business partners such as suppliers, customers and service providers (e.g. banks, distributors) to ensure 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 corrective actions prove inadequate.

The report includes findings on the corrective and protective actions taken by businesses, and on the cost implications and human resource requirements of corrective actions. Sectoral analysis and a summary of findings are also included.

The statistics are compiled from Statistics Canada's Survey on the Preparedness of Canadian Business for the Year 2000, which was conducted during the fall of 1997 for Task Force Year

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[1] **For more information on the Year 2000 computer problem and its implications, visit**
http://strategis.ic.gc.ca/sos2000

2000. Derived from a sample of approximately 2,000 responses, the results are representative of the population of businesses having more than 5 employees, excluding government offices, hospitals and publicly-funded educational institutions.[2]

Survey results are analyzed according to business size and sector of operation, with:

1.　Three business-size categories
- Small (6 to 50 employees)
- Medium (51 to 250 employees)
- Large (more than 250 employees)

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

This report provides quantitative information and descriptive analysis to assist Task Force Year 2000 in identifying areas where preparedness is most lacking and most needed.

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[2] **See Appendix A for information regarding survey methodology.**

II. ANALYSIS OF CORRECTIVE MEASURES

A) The action categories

How are businesses preparing their technology for the date change to 2000? To answer this question, four mutually exclusive and exhaustive categories of firms have been identified.

What actions are businesses taking to correct their systems?

- Addressing issue through a formal plan 9%
- Not aware of issue 9%
- Aware but taking no action 46%
- Taking informal steps 36%
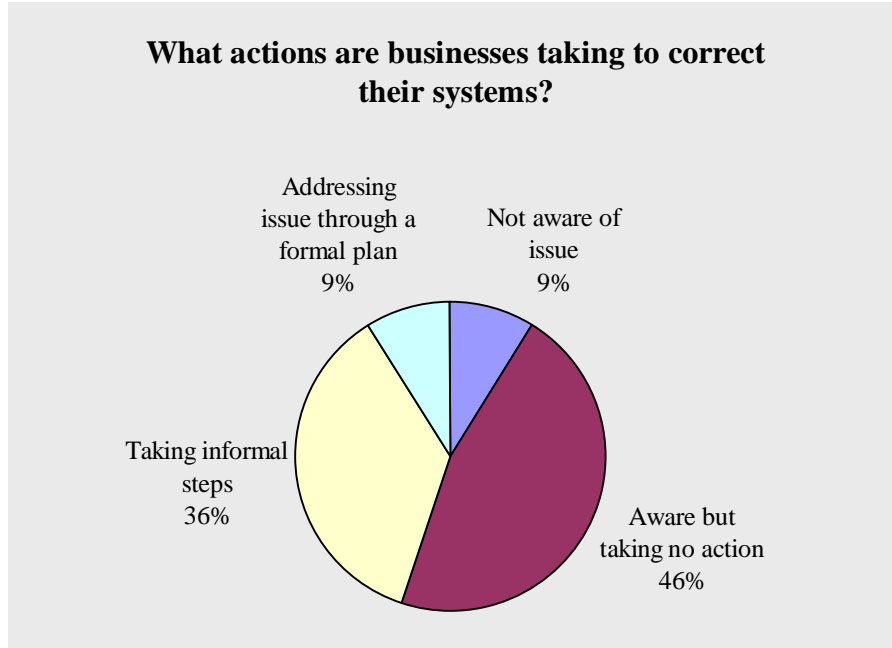
Category 1: Businesses that are unaware of the Year 2000 problem

These are businesses that gave a negative response when asked if they were aware of the existence of the problem prior to being contacted for the survey. They represent about 9% of the survey population in terms of number of businesses but only 1% in terms of employment.

They are almost exclusively small businesses (between 6 and 50 employees), employing an average of 16 people. Only 1% of medium-sized business (51-250 employees) reported being unaware. All large businesses (more than 250 employees) are aware of the Year 2000 issue.

Proportion of firms not aware of issue is small in all sectors, virtually nil in finance and insurance

Trade & other services	Primary sector	Manufacturing	Transportation, communication and utilities	Finance & insurance
10%	8%	7%	7%	1%
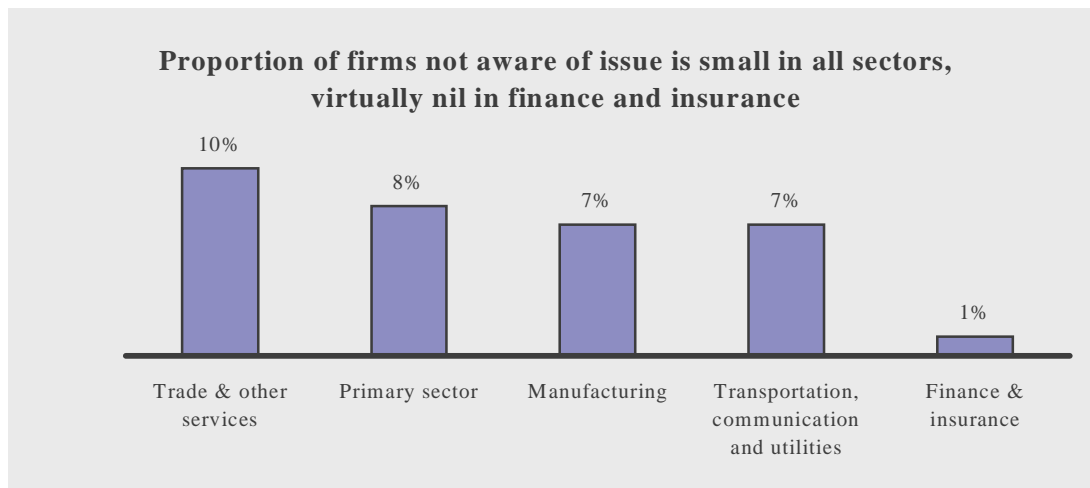
Category 2: Businesses that are aware but taking no corrective action

These are businesses taking no corrective action to address the issue, despite being aware the problem exists. They represent 46% of the target population in terms of number of businesses and only 11% in terms of employment, and are found mainly among small and medium-sized firms, representing 51% of small firms and 29% of medium-sized firms.   On average, firms aware of the issue but taking no action have 24 employees.

Proportion of firms aware of issue but not taking corrective action is substantial in all sectors

Primary sector	Trade & other services	Transportation, communication and utilities	Manufacturing	Finance & insurance
59%	48%	45%	43%	33%
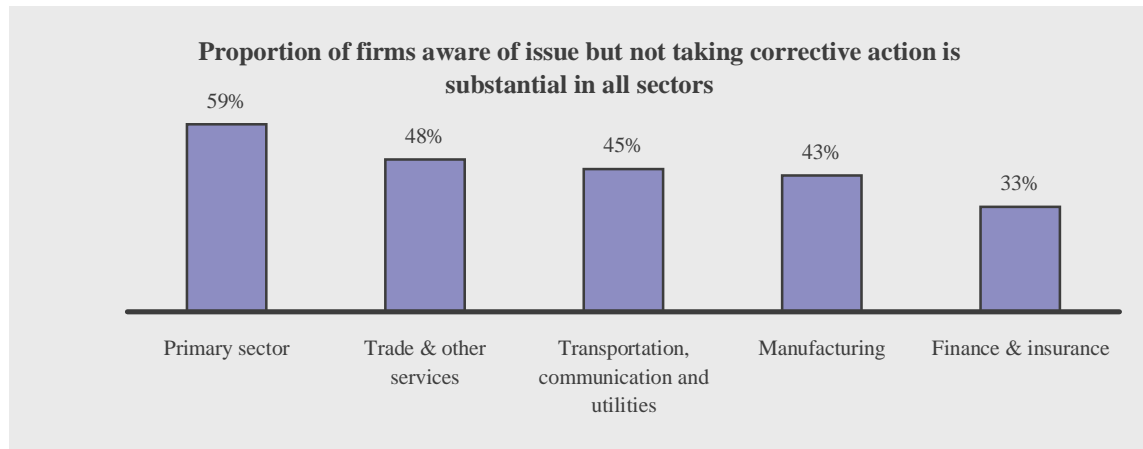
When asked why they had chosen not to take any steps to address the issue, businesses gave a range of answers. Slightly more than one-quarter (27%) of the firms in this category said that they were **not worried about the problem yet** or that they felt there would be **enough time to do it later.** Some 23% said it was **not an important issue for their company**, usually because they use computer systems only minimally. About 14% expressed a **lack of resources**, including time, money or staff to address the problem, while 10% **expected their information technology suppliers to address the problem for them[3]**.

Other reasons given by firms were as follows:
  ➢ systems said to be ready, therefore no action necessary – 8%
  ➢ anticipating arrival of problem-solving application on market – 7%
  ➢ do not know if it's an issue or how to approach problem – 4%
  ➢ will soon be upgrading all systems, regardless of the Year 2000 issue – 4%
  ➢ expecting franchiser to deal with the problem – 3%

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[3] Though respondents could provide more than one reason for not taking action, most supplied only one.

To get a general sense of the kind of technology used by businesses, the survey identified broad categories of systems and asked whether each was part of the day-to-day activities of the firm. The technologies used most often by firms aware of the issue but not taking action are: miscellaneous office equipment such as fax machines and pagers; stand-alone computers, and packaged software. Each of these categories of systems is used by at least three-quarters of the firms. About 38% reported use of custom-developed software, and 37% use computing systems such as mainframes and local area networks (LANs).

At least three-quarters of firms aware of issue but not taking action use miscellaneous office equipment, stand-alone computers and off-the-shelf software.

91%   80%   75%   38%   37%

Miscellaneous office equipment (e.g. fax machines, pagers)   Stand-alone personal computers   Off-the-shelf/packaged software   Custom-developed software   Computing systems (e.g. mainframes and LANs)
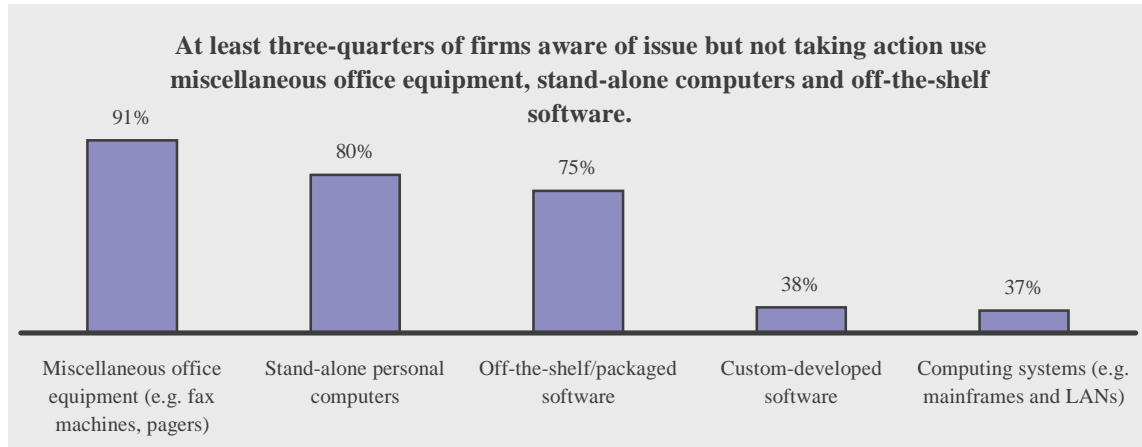
Category 3: Businesses taking informal action

This category includes businesses that are addressing the problem in some way without having implemented a formal assessment, conversion and testing of all systems. Overall, these businesses represent 36% of the survey population in terms of number of businesses and 27% in terms of employment. They appear in all industry sectors and size categories, representing 33%, 50%, and 45% of small, medium and large firms respectively. On average, businesses taking informal steps have 74 employees.

Proportion of firms taking informal action is substantial in all sectors

Finance & insurance	Transportation, communication and utilities	Manufacturing	Trade & other services	Primary sector
50%	42%	40%	34%	30%
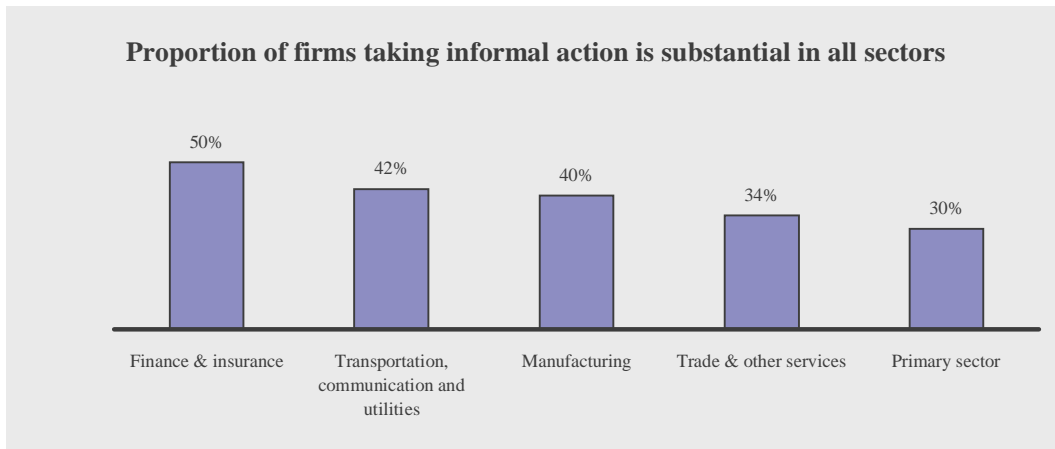
When asked what types of informal actions they had taken, more than half (58%) of the businesses in this category said they were **consulting with their information technology suppliers**, including software and hardware vendors. About one-quarter (24%) said they were engaged in **informal d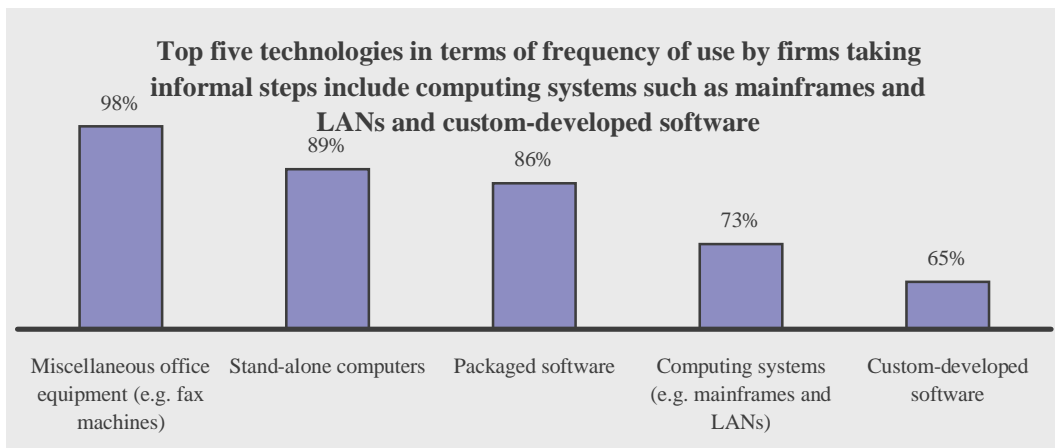iscussions with their in-house systems staff**. Some 21% had **contracted a consultant or information technology firm.** A few (8%) had begun to **reprogram systems informally**, or had bought, or were planning to buy **new systems** partly due to Year 2000 issue (7%).

The technology profile of firms taking informal steps reveals that the vast majority (at least 86%) of the firms uses miscellaneous office equipment, stand-alone computers and off-the-shelf software. Slightly lower — but nonetheless significant — percentages of firms use computing systems such as mainframes and LANs, and customized software.

Top five technologies in terms of frequency of use by firms taking informal steps include computing systems such as mainframes and LANs and custom-developed software

Miscellaneous office equipment (e.g. fax machines)	Stand-alone computers	Packaged software	Computing systems (e.g. mainframes and LANs)	Custom-developed software
98%	89%	86%	73%	65%

Businesses taking informal actions usually focus their efforts on addressing the Year 2000 readiness of their personal computers, mainframes, LANs and software applications. For example, some 91% of firms taking informal action and using computing systems such as mainframes and LANs are addressing the Year 2000 preparedness of these systems. On the other hand, only half of the businesses using process control systems (e.g. computerized plant machinery) are addressing these types of systems.

For the most part, the businesses taking informal action do not seem to think the Year 2000 issue will be a major problem. Just under half (44%) of firms taking informal action indicate their systems are already prepared for the new millennium. Eight in 10 of the remaining firms say they have either complete confidence or almost complete confidence that their systems will be ready on time. Of those firms saying their systems are not yet ready, only 15% say their systems will be ready before the middle of 1998. Some 32% say they will need at least a full year to correct all their systems, and 35% need at least 2 years. Some 18% do not know when they will be ready.

Finally, senior managers are often involved in decisions relating to the informal steps being taken by firms. About 47% of firms taking informal steps report active senior management involvement, where senior managers are a regular part of the decision-making process. Some 37% indicate passive involvement, where senior managers are briefed regularly but do not usually make decisions. The remaining 16% report no involvement from senior management at all.

Proportion of firms taking informal steps that are addressing different types of technologies used	
Computing systems (e.g. mainframes, mid-range computers, LANs)	91%
Custom-developed software	82%
Stand-alone personal computers	80%
Packaged software	66%
Embedded systems (e.g. computerized thermostats, heat censors, flow censors)	53%
Process control systems (e.g. plant machinery)	49%
Telecommunications systems (e.g. automated voice response units, voice mail)	43%
Miscellaneous office equipment (e.g. fax, photocopiers, pagers)	38%
Facility control systems (e.g. security systems, elevators and building climate)	32%

Category 4: Businesses with a formal action plan

For the purposes of the survey, businesses with formal action plans are the firms implementing a structured, three-phased approach to identifying and fixing non-compliant systems. First, a firm must do a complete *assessment* of the systems it uses. This would usually include compilation of a complete system inventory to identify and target systems most critical to business operations. Each inventoried system is then assessed for 2000-readiness. As part of the next phase — *conversion*— non-ready systems are re-programmed or corrected. Finally, the third phase entails the *testing* of all systems through simulated date changes.

Firms with formal action plans represent only 9% of the survey population in terms of number of businesses. However, this percentage reflects the preponderance of small firms in the population, of which 6% have formal plans.

Formal plans are observed with much greater frequency as firm size increases. Some 20% of medium firms and 48% of large firms have plans. With a mean employment size of 685, the average firm with a formal plan is 9 times larger than the average firm taking only informal steps, and 29 times the size of the average firm taking neither formal nor informal steps. As a result, businesses with formal plans represent some 61% of the survey population in terms of employment.

Even within the largest size category, the proportion of firms with formal plans continues to increase with employment size

48%	58%	68%	73%
More than 250 employees	More than 500 employees	More than 1000 employees	More than 2000 employees

Proportion of firms with formal plans is small in all sectors

16%	10%	8%	6%	3%
Finance & insurance	Manufacturing	Trade & other services	Transportation, communication and utilities	Primary sector

Formal planning is the highest level of action and is therefore observed often among firms relying extensively on computer technology. For example, among businesses with formal plans, about 90% indicate using computing systems such as mainframes and networks, while 74% rely on customized software and applications. However, there remain many businesses using these technologies without a formal action plan. Among all firms reporting usage of computing systems such as mainframes and networks, only 15% report having a plan. Among all firms that using customized software, about 13% have a plan.

Firms that do have formal plans usually cover the full range of affected technologies in their planning. They almost always address their personal computers, LANs, mainframes and software.

For example, some 92% of businesses with formal plans that reported using computing systems such as networks and mainframes said they were assessing those systems for Year-2000 readiness.

Other types of systems, however, may not be included in the assessments. For example, roughly one-quarter of the firms having formal plans and using process control systems indicate these systems are not being assessed under the plan.

The survey found that 1 in 5 firms with formal plans have completed all phases for all of their systems. Of the remainder, a third have completed the assessment phase. Of those with assessment in progress, 75% say they expect to complete assessment before the end of 1998.

Proportion of firms with formal plans assessing different types of technologies used	
Custom-developed software	95%
Computing systems (e.g. mainframes, mid-range computers, LANs)	92%
Packaged software	92%
Stand-alone personal computers	80%
Process control systems (e.g. plant machinery)	74%
Embedded systems (e.g. computerized thermostats, heat censors, flow censors)	67%
Facility control systems (e.g. security systems, elevators and building climate)	61%
Telecommunications systems (e.g. automated voice response units, voice mail)	61%
Miscellaneous office equipment (e.g. fax, photocopiers, pagers)	36%

Most firms with formal action plans in progress are confident that all systems will be ready by the Year 2000, with 64% expressing complete confidence that their plan will be implemented successfully and a further 31% saying they are almost completely confident.

Senior managers in businesses with formal plans are often regularly involved in decisions relating to the Year 2000 issue. Some 62% of the firms report an active role for senior management, where senior managers are a regular part of the decisions being taken. A further 30% report a passive role, where senior managers are not part of decisions but are briefed regularly. The remaining 8% report no senior management involvement, the matter having been delegated entirely to lower ranks.

B) Cost

With identification and assessment of non-compliant systems being a major part of the work firms need to do, the cost of the Year 2000 problem is difficult to quantify. The required information is available only to the extent that firms can address the issue and accurately identify the business implications and resource requirements.

The survey confirms that repairing non-compliant systems is costing Canadian business billions of dollars. The survey estimates, in very rough terms, that the business population has identified $12 billion in direct repair costs. The following caveats accompany this figure:

- *It represents only the identified costs that have been incurred, or are to be incurred, by the businesses in the survey population who have begun to address the problem and who have assessed the cost of fixing it. This represents some 25% of the population in terms of number of businesses and 55% in terms of employment.[4]*

- *Even as a minimum estimate, the rough figure has a high level of sampling error. There is tremendous variability and inconsistency in the costs reported by survey respondents, a further reflection of the uncertainty surrounding the issue. It is technically difficult to produce accurate population estimates from highly variable sample responses.*

Most of the $12 billion represents the identified costs of companies with formal plans. The population of informal action takers is estimated to have only $600 million in identified costs. Businesses taking informal steps should be expected to spend less than should firms with formal plans, given that they tend to be smaller firms with a smaller share of total business activity. The population of businesses taking informal steps represents 27% of employment among the entire population of businesses taking corrective measures, but only 5% of the repair costs.

C) Human resource requirements

The survey also confirms that fixing the problem requires thousands of skilled workers. Most firms taking corrective actions do not need any extra project managers, testers, analysts and programmers to repair systems before the turn of the millennium, but those that do have so far identified a need for an estimated 26,000 extra staff. Roughly 7,000 of these extra workers must be hired externally rather than re-deployed from internal ranks.[5] These figures exclude the unidentified requirements of the many businesses not yet taking corrective action.

Some 73% of companies taking either formal or informal steps responded that their Year 2000 team is adequately staffed. A further 14% said they were still in the process of identifying their staffing needs. The remaining 13% said they would need to assign more people (external or internal) in order to be ready on time, and the total estimated requirement of 26,000 is derived from the responses of these firms. Five percent of firms said they were looking to hire external staff, and these firms are responsible for the 7,000 new hires foreseen.

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[4] **These percentages are calculated using the firms taking either formal or informal action from which a cost figure was available.**
[5] **Like the survey estimates on costs, the estimates on human-resource requirements should be considered approximate due to high levels of sampling error for these figures. Moreover, they represent only the requirements of businesses that are taking action and have identified their labour needs.**

Scarcity of labour may pose an increasing challenge as 2000 approaches. With the Labour Force Survey reporting an unemployment rate for systems analysts and programmers running at a mere 2.3%, there are only about 6,300 available for work[6]. Some additional labour supply may come from post-secondary computer-science programmes, which produce about 8,000 graduates per year[7].

However, the Year 2000 survey suggests the labour shortage has so far not been a serious problem for employers. Businesses tended to report only moderate levels of difficulty in finding outside workers with the skills required to fix the Year 2000 problem. The 5% of businesses looking for extra staff were asked to rate the level of difficulty they had in finding Year 2000 experts on a scale of 1 to 5, with 1 being no difficulty at all and 5 being extreme difficulty. The mean scores were: 2.4 for testers; 2.8 for project managers and 2.3 for programmers and analysts.

[6] **Labour Force Survey, December 1997, Statistics Canada**
[7] **University Student Information System and the Community College Student Information System, 1995/1996 school year, Statistics Canada**

III.   ANALYSIS OF PROTECTIVE MEASURES

In addition to asking businesses about the actions taken to correct their own non-compliant technology, the survey included questions on whether firms are approaching their suppliers, service providers or customers to assess the preparedness of these business partners. To an individual firm, this is one way of anticipating internal disruptions brought on by malfunctioning systems belonging to other firms.

The survey also asked respondents if they believe there is potential for litigation in the event that non-compliance of their own systems disrupts the business activities of partners. Firms were then asked if they were making any provisions to prepare for legal issues that might arise.

A) Communication with partners

Among firms aware of the Year 2000 problem, only 13% were found to have approached any of their business partners for Year 2000 readiness. Here again, action levels increase somewhat with size of business. Slightly less than one-third of large businesses said they had approached at least some business partners.
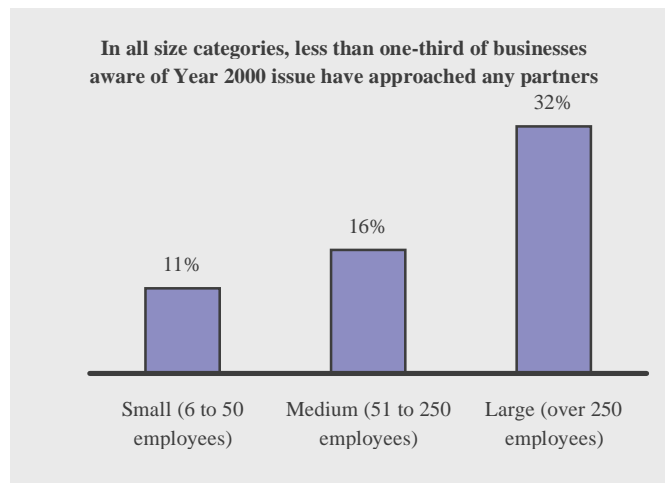
Business partners that are being approached are most often suppliers in Canada. It is rare that businesses are approaching any foreign suppliers or other customers and service providers.

In all size categories, less than one-third of businesses aware of Year 2000 issue have approached any partners

Size category	Percentage
Small (6 to 50 employees)	11%
Medium (51 to 250 employees)	16%
Large (over 250 employees)	32%

Even among businesses that have implemented formal plans to assess and convert their own technology, firms do not tend to be approaching their partners. Some 34% of firms with formal action plans are taking steps to protect themselves from disruptions caused by systems external to their own operations.

Though few businesses are approaching partners, most are confident that these business partners will be prepared. Respondents were asked to rate the confidence they have in the preparedness of their business partners on a scale of 1 to 5, where 1 is complete doubt and 5 is complete confidence in the ability of partners to address and correct the problem before 2000. In general, the mean responses hovered between 3.6 and 4.4 for all categories of partners.

% of firms approaching various types of partners	
Suppliers in Canada	10%
Foreign suppliers	3%
Customers in Canada	4%
Foreign customers	4%
Banks in Canada	4%
Foreign banks	5%
Canadian-based intermediairies	3%
Foreign intermediairies	2%
Canadian distributors	6%
Foreign distributors	4%
Canadian government agencies/departments	5%
Foreign government agencies/departments	2%

Firms aware of problem have confidence in preparedness of various types of business partners
MEAN SCORES

Category of partner	Mean Score
Banks	4.4
Government agencies/departments	4.1
Distributors	3.9
Intermediaries	3.9
Suppliers	3.9
Customers	3.6

1=Complete doubt partners will be ready   5=complete confidence

B) Providing for potential litigation

The survey found that most businesses do not believe in the potential to have litigation brought against them, and only some of those who do are preparing for potential legal issues. Overall, some 18% of businesses that know about the Year 2000 problem believe they could face legal action if their own lack of preparedness should disrupt business partners. The finding that the majority of firms do not believe in the potential for litigation is prevalent in all industry sectors and size categories.

Proportion of firms believing there is potential for litigation increases with firm size

Firm size	Percentage
Small (6 to 50 employees)	17%
Medium (51 to 250 employees)	21%
Large (over 250 employees)	39%
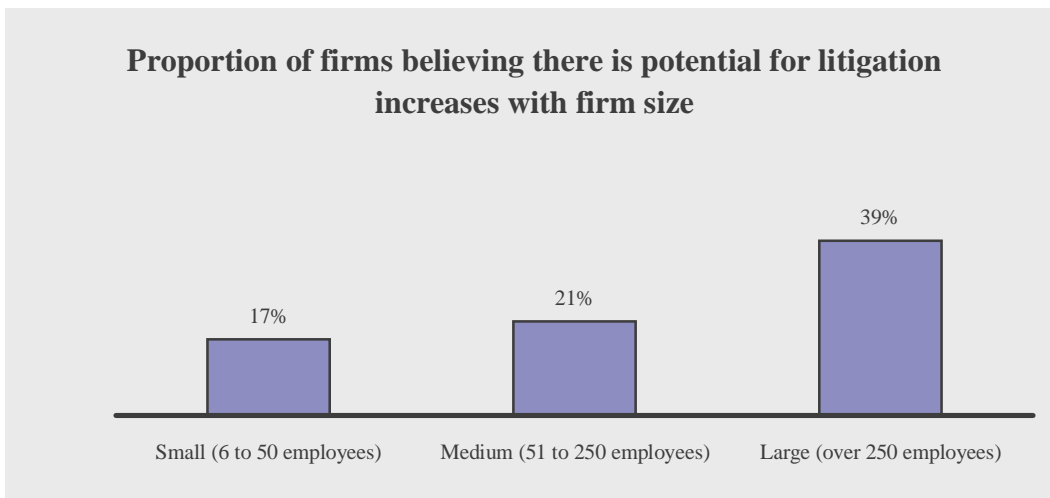
Of those businesses aware of the potential for legal action, only 23% are taking steps to prepare for it. These steps include establishment of a special fund or account to cover legal costs and damages, seeking legal advice or purchasing insurance. Once again, the proportion of firms making provisions for litigation (as a proportion of firms believing litigation is a possibility) increases with firm size, from 23% for small businesses to 34% for large businesses.

Even among businesses with a formal action plan, legal issues do not seem to be a major concern. Only 34% of them believe the Year 2000 issue could have legal implications, and only 50% of those were making provisions.

IV.   SECTORAL SUMMARY

In general, the behaviour patterns of firms concerning the Year 2000 issue do not vary widely across sectors. Within each of the five defined industry sectors, not more than 66% of firms are taking corrective action, and not more than 20% are communicating with partners.   Nonetheless, there are some findings specific to individual sectors, and these are presented as part of the following sectoral summary.

A) Primary sector

Accounting for 5% of the national Gross Domestic Product (GDP)[8], the primary sector covers farming, logging, fishing and mining operations.   As the first link in the supply chain, these industries supply approximately 50% of their output to Canadian manufacturing firms for use in production.

With only 33% of firms taking either formal or informal corrective action, the primary sector has the lowest percentage of firms getting ready for 2000. This is largely because there are many firms in the logging & forestry, and fishing & trapping sectors not taking action.

The low rate of firms taking corrective action in the primary sector is likely related to their lower use of potentially affected

Small proportions of firms in logging, forestry, fishing and trapping industries are taking formal or informal corrective action

46%	36%	17%	13%
Mining	Agriculture	Logging and forestry	Fishing and trapping

technologies. For example, only 31% of primary sector firms reported that they use computing systems such as mainframes and networks, and 39% said they have custom-developed software. In the wider survey population, some 49% of firms use computing systems and 47% use custom-developed software.

However, the segment of large businesses in the sector is as technology-intensive as large businesses in other sectors, with 97% using networks or mainframes, some 88% using custom-developed software, and 69% using process control systems. Nevertheless, the survey shows a comparatively low percentage of large firms with a formal plan in the primary sector. Whereas 48% of large firms in all sectors have a plan, only 23% of large firms in the primary sector are taking formal corrective action.

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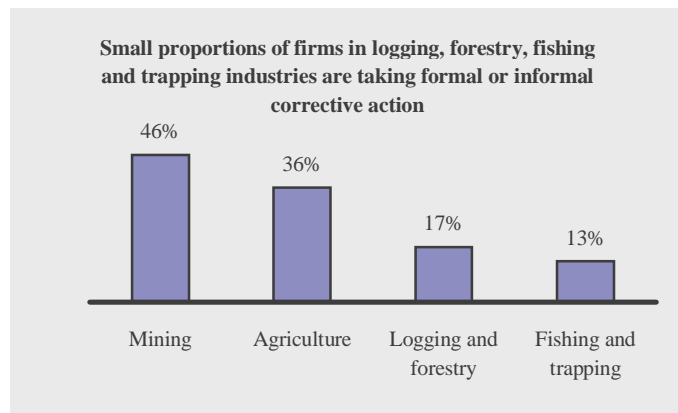
[8] **1992 Input-Output Tables, Systems of National Accounts, Statistics Canada**

B) Manufacturing

The manufacturing sector accounts for 16% of GDP and 68% of national export revenues.

With about one-half of manufacturers taking neither formal nor informal corrective steps, businesses in the sector are addressing the problem in roughly the same proportion as the entire survey population.

In addition to information technology systems such as personal computers and networks, process control systems are frequently used by manufacturers. Only 63% of firms using this technology, however, are taking any corrective action, with 12% having formal plans.

Significant percentages of manufacturers of all sizes use process control systems
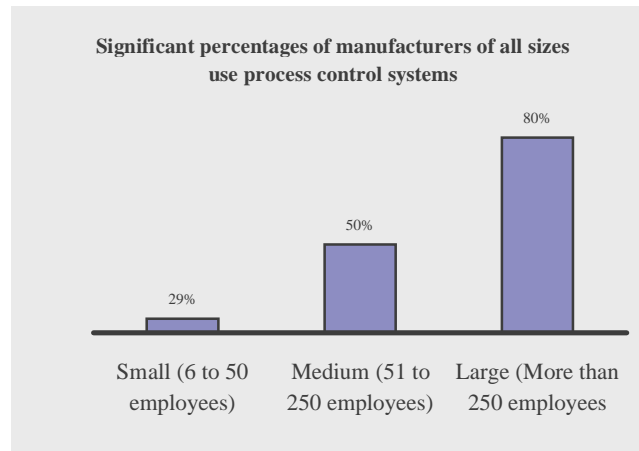
C) Transportation, communication and utilities

Providing crucial economic infrastructure to the Canadian economy, the transportation, communication and utilities sector is a major service provider to business, government and consumers. Accounting for 11% of GDP, the sector consists of two major sub-sectors, each of which has about one-half of firms taking either formal action or informal steps:

1. Transportation & storage, and
2. Communication & utilities

D) Finance and insurance

The finance and insurance sector includes firms in finance, real estate services and insurance. Accounting for 8% of GDP, it is the sector with the largest proportion of firms taking action, with 66% having a formal plan or taking informal steps. Among large firms in the sector, three-quarters of the businesses have a formal action plan.

Finance and insurance firms rely extensively on information technology. Some 75% of the firms use computing systems such as networks and mainframes, and 66% use customized software applications.

The sector includes two major components. In the first component — the Finance industries — about 65% of firms are taking either formal or informal action. In the second component — the Real estate operator and insurance industries — about 66% are taking action.

E) Trade and other services

The trade and other services sector is the largest of the five designated sectors, accounting for 28% of GDP. It covers a range of important services, including wholesalers, retailers, restaurants, hotels, business services, and miscellaneous other service providers. Firms in these individual sub-sectors are taking action in varying degrees.

Varying proportions of businesses taking formal or informal corrective measures in Trade & other services sector

Business services	Wholesale trade	Retail trade	Accomodation, food & beverage	Other services	Construction
64%	63%	47%	27%	26%	25%
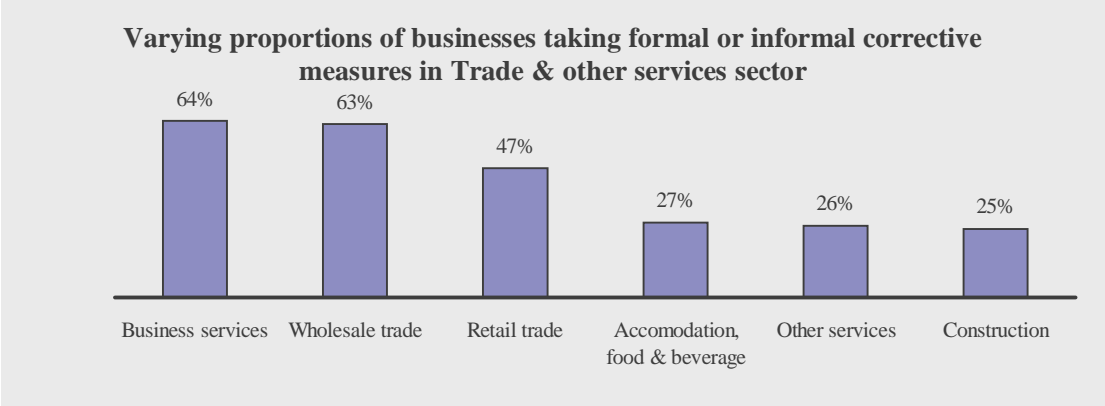
V.   SUMMARY OF FINDINGS

The most significant findings of the Statistics Canada Survey on Preparedness of Canadian Business for the Year 2000 are as follows:

- About 2% of businesses have implemented and completed formal assessment, conversion and testing of all systems.   A further 16% have taken informal steps and say they have confirmed all their systems will be ready for the Year 2000.

- Taken together, businesses taking either formal or informal steps to prepare their technology for the date change represent slightly less than one half (45%) of the survey population in terms of number of businesses, and 88% in terms of employment.

- More than 9 in 10 firms in the target population are aware there is a Year 2000 problem. The vast majority of firms that are not aware of the problem are small firms with less than 50 employees. On average, unaware firms have 16 employees.

- Businesses taking no corrective action are mainly small- and medium-sized firms employing less than 250 people. Slightly more than one-quarter of these businesses say they are not worried about the problem because there is still of time to address it. About 23% say the issue is not relevant to them because they use affected systems only minimally.

- In the overall population of businesses, some 9% of firms have a formal plan to assess, convert and test systems for 2000-readiness. This mainly reflects the low frequency of formal planning in small businesses, which account for 90% of the population. Among large businesses (more than 250 employees), slightly less than half of the companies have a formal plan.

- One in five of the firms having a formal plan has completed all plan phases and is now prepared for the date change to the Year 2000.

- Firms taking formal corrective action represent 61% of the survey population in terms of employment, but the employment share of the firms that have completed all plan phases is 3%.

- Firms taking only informal corrective actions (36% of population) are taking mainly consultative steps such as contacting their information-technology suppliers and software vendors or holding meetings with in-house systems staff.   Some 44% of the firms in this category say they are ready for 2000, with most of the remaining 56% saying they are very confident that they will be ready on time.

- Levels of corrective action do not vary widely across industry sectors. The proportion of firms with formal action plans ranges from 3% for the primary sector to 16% for finance and insurance. The percentage of firms taking informal steps ranges from 30% for the primary sector to 50% for finance and insurance. The lower percentages of firms taking either formal or informal action in the primary sector partly reflects lower percentages in the fishing, trapping, logging and forestry sub-sectors.

- Ensuring Year 2000 compliance is costing business billions of dollars and requiring thousands of systems technicians and professionals. Accurate figures are difficult to obtain

given that identifying and assessing non-compliant systems is an on-going part of the work being done by firms.   Most businesses do not have the formal approach that may be necessary to identify their requirements, and more than half of the ones that do have not yet completed the assessment phase.

- The survey roughly estimates that firms in the survey population have so far budgeted $12 billion for the Year 2000 problem.

- Firms in the survey population have so far identified a need to hire roughly 7,000 project managers, testers, systems analysts and programmers to ready their systems before 2000. With an unemployment rate of 2.3% for these types of workers, businesses may have increasing difficulty hiring workers with the capability to assess, convert and test their systems.

- Only 13% of firms aware of the Year 2000 problem are approaching business partners in the supply chain to determine the state of preparedness of these partners.

- About 18% of firms believe there is potential for litigation should a lack of preparedness on their own part disrupt business partners.

Appendix A

Survey methodology and sampling error

Statistics Canada interviewers conducted The Survey on Preparedness of Canadian Business for the Year 2000 by telephone from October 14 to November 5, 1997. To collect the information required, 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 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 3,574 firms was selected randomly from Statistics Canada's business register. 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 Classification[9]*
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*

From the original sample, 702 firms were found to be outside the scope of the target population, usually because they were found to have less than six employees. A further 929 firms either refused to participate[10], or interview appointments could not be arranged with an appropriate respondent after several attempts to do so. This left 1,943 survey responses, yielding a response rate of 68% among in-scope sampled firms.

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 survey. 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.

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[9] See *Standard Industrial Classification 1980*, **Statistics Canada**
[10] **The survey was conducted on a voluntary basis.**

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 corrective action 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.

Appendix B

Survey questionnaire

Statistics Canada

Survey on Preparedness of Canadian Business for the Year 2000

CONFIDENTIAL when completed.

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

Questionnaire status

○ 001 completion ○ 002 out of scope
○ 003 partial completion ○ 004 out of business
○ 005 no contact ○ 006 unable to trace
○ 007 refusal ○ 008 respondent not available

Language of interview

● 009 English ○ 010 French

Update contact information, if necessary

Name of business

|_____| 011

Telephone

|__|__|__|-|__|__|__|-|__|__|__|__| 012

Initial Call	**Survey Introduction**
Hello, this is <interviewer name> calling from Statistics Canada.	*Hello my name is <interviewer name> from Statistics Canada. We are presently doing a voluntary survey on behalf of the federal Minister of Industry to collect information on how businesses are preparing their technology for the year 2000.*
Is this <name of business>?	
Confirm name of business. If you are told that this is not the same company as above, ask if that 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.	*You may be aware that some systems are not pre-programmed to handle the change of date to the year 2000.*
	I would like to ask you a few questions about the year 2000 issue and how it relates to your business.
May I please speak with your senior person in charge of your computer systems. In some businesses, this person is referred to as the Chief Information Officer. Is there someone in your firm with this title?	*All of your answers are confidential to Statistics Canada. In an effort to reduce response burden, your answers may be combined with other data reported by your company on some of our other business surveys to enhance the results of this survey.*
If yes, arrange to complete the interview with the CIO.	*Is this a good time to proceed or should I call back later?*
If no, arrange to complete the interview with the senior manager or official in charge of information technology systems, or simply information systems or informatics.	**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.**

Statistics Canada Statistique Canada

Canadä

STC/SBS-524-75123 54401-6257.1

B1

General Information

A1 To begin, may I please have your name and the title of your position?

Name of respondent

[   ] 101

Title of respondent

[   ] 102

A2 How many people are currently employed by your firm in Canada? Please measure part-time and contract workers in full-time equivalents.

If seasonal business, then record peak-season employment

[| | | |] 103 *employees*

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.

End interview and classify business to out-of-scope

A3 Which of the following technologies are an essential part of the day-to-day operations of your firm in Canada? Do you have...

1 ◯ 104 *Stand-alone personal computers?*

2 ◯ 105 *Computing systems such as mainframes, mid-range computers, client servers, local area networks?*

3 ◯ 106 *Off-the-shelf software applications such as word processors, spreadsheets and database management software?*

4 ◯ 107 *Custom-developed software designed specifically for your firm?*

5 ◯ 108 *Embedded systems such as computerized thermostats, heat censors, flow censors?*

6 ◯ 109 *Process control systems such as robotics and plant machinery?*

7 ◯ 110 *Facility control systems such as security systems, elevators and building control?*

8 ◯ 111 *Telecommunications systems such as automated voice response units, voice mail?*

9 ◯ 112 *Miscellaneous office equipment (fax, photocopiers, pagers)?*

10 ◯ 113 *Other types of technology?*

[   ] 114

◯ 15 ____

The Year 2000 Issue

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

◯ 16 *Yes*

◯ 17 *No* ____

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

B2 Has your firm taken any formal or informal steps to ensure that its technology will function correctly when the date changes to the year 2000?

◯ 18 *Yes*

◯ 19 *No* ____

◯ 120 *Don't know* ____

There are different approaches firms can use to address the year 2000 issue.   For example, some firms use a structured approach that includes an assessment of all systems followed by conversion and testing phases. This approach usually includes estimates of cost and the amount of computer code that is involved.

Other firms may use less formal approaches in consultation with in-house systems specialists or information technology suppliers.

B3 Which of the following best describes YOUR firm's approach to the year 2000 issue?

◯ 121 *We have a structured plan that includes assessment, conversion and testing of systems* ____

◯ 122 *We have taken other less formal approaches* ____

Confirmation of Best Respondent

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

◯ 123 *Yes*   **Arrange to complete interview with someone who knows more about the issue**

◯ 124 *No*   **Skip to Conclusion**

1

B2

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

1 ◯ 201 *Stand-alone personal computers?*

2 ◯ 202 *Computing systems such as mainframes, mid-range computers, client servers, local area networks?*

3 ◯ 203 *Off-the-shelf software applications such as word processors, spreadsheets and database management software?*

4 ◯ 204 *Custom-developed software designed specifically for your firm?*

5 ◯ 205 *Embedded systems such as computerized thermostats, heat censors, flow censors?*

6 ◯ 206 *Process control systems such as robotics and plant machinery?*

7 ◯ 207 *Facility control systems such as security systems, elevators and building control?*

8 ◯ 208 *Telecommunications systems such as automated voice response units, voice mail?*

9 ◯ 209 *Miscellaneous office equipment (fax, photocopiers, pagers)?*

10 ◯ 210 *Other types of technology?* ——

```
                                    211



```

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

◯ 212 *Yes* ——

◯ 213 *No*

◯ 214 *Don't know*

D3 **How much of the assessment is complete?**

◯ 215 *All* ——

◯ 216 *More than half*

◯ 217 *Less than half*

◯ 218 *None*

◯ 219 *Don't know*

D4 **When do you expect to complete the assessment?**

◯ 220 *in the next 3 months*

◯ 221 *in the next 6 months*

◯ 222 *in the next year*

◯ 223 *in the next two years*

◯ 224 *Don't know*

D5 **Of the essential systems assessed as not being 2000-ready, how many have you converted to make them ready?**

◯ 225 *All* ——

◯ 226 *More than half*

◯ 227 *Less than half*

◯ 228 *None*

◯ 229 *Don't know*

D6 **When do you expect this conversion to be completed?**

◯ 230 *in the next 3 months*

◯ 231 *in the next 6 months*

◯ 232 *in the next year*

◯ 233 *in the next two years*

◯ 234 *Don't know*

D7 **How many of the converted systems have been tested?**

◯ 235 *All* ——

◯ 236 *More than half*

◯ 237 *Less than half*

◯ 238 *None*

◯ 239 *Don't know*

D8 **When do you expect to complete the testing of converted systems?**

◯ 240 *in the next 3 months*

◯ 241 *in the next 6 months*

◯ 242 *in the next year*

◯ 243 *in the next two years*

◯ 244 *Don't know*

2

B3

Stream 1: Formal Approach (Continued)

D9 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.

Complete doubt			Complete confidence		Does not apply
1	**2**	**3**	**4**	**5**	
◯ 301	◯ 302	◯ 303	◯ 304	◯ 305	◯ 306

D10 Does your plan include contingency arrangements to minimize disruptions when 2000 arrives?

◯ 307 Yes

◯ 308 No

◯ 309 Don't Know

D11 How many millions of lines of computer code have been or must be verified to make all your systems ready for the year 2000?

◯ 310 Don't know

[ ] 311 millions of lines of code

D12 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.

◯ 312 Don't know

$ [ ] 313

Stream 2: Informal Approach

E1 What steps have you taken?

◯ 314 Contracted consultant or private information technology firm

◯ 315 Consulted with IT suppliers/ software vendors

◯ 316 Ad hoc/informal meetings with systems staff

◯ 317 Other ———

[ ] 318

E2 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

$ [ ] 320

Stream 2: Informal Approach (Cont'd)

E3 Of the technologies that you identified earlier as essential to your business, which ones are being - or have been - assessed for year 2000 readiness?

1 ◯ 321 Stand-alone personal computers?

2 ◯ 322 Computing systems such as mainframes, mid-range computers, client servers, local area networks?

3 ◯ 323 Off-the-shelf software applications such as word processors, spreadsheets and database management software?

4 ◯ 324 Custom-developed software designed specifically for your firm?

5 ◯ 325 Embedded systems such as computerized thermostats, heat censors, flow censors?

6 ◯ 326 Process control systems such as robotics and plant machinery?

7 ◯ 327 Facility control systems such as security systems, elevators and building control?

8 ◯ 328 Telecommunications systems such as automated voice response units, voice mail?

9 ◯ 329 Miscellaneous office equipment (fax, photocopiers, pagers)?

10 ◯ 330 Other types of technology? ———

[ ] 331

E4 Are all of these systems now confirmed as ready to handle the date change to the year 2000?

◯ 332 Yes ———

◯ 333 No

◯ 334 Don't know

E5 When do you expect all systems to be ready?

◯ 335 in the next 3 months

◯ 336 in the next 6 months

◯ 337 in the next year

◯ 338 in the next two years

◯ 339 Don't know

E6 How confident are you that these 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.

Complete doubt			Complete confidence		Does not apply
1	**2**	**3**	**4**	**5**	
◯ 340	◯ 341	◯ 342	◯ 343	◯ 344	◯ 345

3

Human Resources

F1 How many people are working on the year 2000 issue in your firm in Canada, including analysts, programmers, testers and project managers? Please answer in full-time equivalents so that those working part-time or on a contract basis are measured accurately. For example, a part-time programmer working half of a full-time week counts as .5 of a full-time equivalent.

○ [401] *Nil*

○ [402] *Don't know*

[ ] [403] *full-time equivalents*

F2 How many additional analysts, programmers, testers and project managers will be required to make all systems ready for 2000? Please answer in full-time equivalents.

○ [404] *Nil* _____

○ [405] *Additional people will be required but don't know how many*

○ [406] *Don't know whether we need___ additional people or not*

[ ] [407] *full-time equivalents*

F3 What percentage of this required additional staff will be redeployed from within the firm?

○ [408] *Nil*

○ [409] *Don't know*

[ ] [410] *%*

F4 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 no difficulty at all and 5 is extreme difficulty.

	No difficulty at all			Extreme difficulty		Does not apply
	1	2	3	4	5	
Project managers	○ [411]	○ [412]	○ [413]	○ [414]	○ [415]	○ [416]
Testers	○ [417]	○ [418]	○ [419]	○ [420]	○ [421]	○ [422]
Programmers and analysts	○ [423]	○ [424]	○ [425]	○ [426]	○ [427]	○ [428]

Senior Management's Involvement

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

○ [429] *Active involvement* - they are regularly part of the decisions being taken

○ [430] *Passive involvement* - they are not part of the decisions but are briefed regularly

○ [431] *No involvement* - the matter has been delegated entirely to lower management levels

Stream 3: Firms not Taking Steps

H1 Why has your firm chosen not to take any steps?

[ ] [432]

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...

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

		COLUMN A	COLUMN B
		Firm deals regularly with	Have been approached by firm
1	*Suppliers in Canada?*	○ [433]	○ [445]
	Suppliers in the U.S. or other countries?	○ [434]	○ [446]
2	*Customers in Canada?*	○ [435]	○ [447]
	Customers in the U.S. or other countries?	○ [436]	○ [448]
3	*Canadian banks?*	○ [437]	○ [449]
	Banks in the U.S. or other countries?	○ [438]	○ [450]
4	*Canadian-based intermediaries?*	○ [439]	○ [451]
	Intermediaries based in other countries?	○ [440]	○ [452]
5	*Distributors in Canada?*	○ [441]	○ [453]
	Distributors in other countries?	○ [442]	○ [454]
6	*Government agencies or departments in Canada?*	○ [443]	○ [455]
	Government agencies or departments in other countries?	○ [444]	○ [456]

○ [457]

○ [458]

4

B5

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?

	Complete doubt			Complete confidence		Does not apply
	1	2	3	4	5	
1 Suppliers?	◯501	◯502	◯503	◯504	◯505	◯506
2 Customers?	◯507	◯508	◯509	◯510	◯511	◯512
3 Banks and other financial institutions?	◯513	◯514	◯515	◯516	◯517	◯518
4 Intermediaries?	◯519	◯520	◯521	◯522	◯523	◯524
5 Distributors?	◯525	◯526	◯527	◯528	◯529	◯530
6 the government agencies or departments that you deal with?	◯531	◯532	◯533	◯534	◯535	◯536

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?

◯537 *Yes*

◯538 *No*

◯539 *Don't know/can't comment*

Skip to Conclusion

J2 What types of provisions have been made should litigation occur? Have you...

◯540 *Established a special fund or account?*

◯541 *Sought legal advice?*

◯542 *Purchased insurance?*

◯543 *Made any other provisions?*

544

◯545

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

Name of additional respondent

546

Title of additional respondent

547

Comments

548

Appendix 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	Total
	All businesses	9	46	36	9	100
by firm size	Small	10	51	33	6	100
	Medium	1	29	50	20	100
	Large	0	7	45	48	100
by industry sector	Primary	8	59	30	3	100
	Manufacturing	7	43	40	10	100
	Transportation, communication & utilities	7	45	42	6	100
	Finance & insurance	1	33	50	16	100
	Trade & other services	10	48	34	8	100
by industry sector and firm size	Primary — Small	8	64	26	2	100
	Primary — Medium	12	33	48	7	100
	Primary — Large	0	8	69	23	100
	Manufacturing — Small	10	50	36	4	100
	Manufacturing — Medium	0	24	55	21	100
	Manufacturing — Large	0	11	36	53	100
	Transportation, communication & utilities — Small	8	51	37	4	100
	Transportation, communication & utilities — Medium	3	30	62	5	100
	Transportation, communication & utilities — Large	0	3	47	50	100
	Finance & insurance — Small	1	39	52	8	100
	Finance & insurance — Medium	1	18	51	30	100
	Finance & insurance — Large	0	3	21	76	100
	Trade & other services — Small	11	52	31	6	100
	Trade & other services — Medium	1	31	48	20	100
	Trade & other services — Large	0	8	52	40	100

% of businesses

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

					% of businesses using class of system				
		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 censors, flow censors)	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)	Miscellaneous office equipment (e.g fax, photocopiers, pagers)
	All businesses	79	49	76	47	12	8	36	35	90
by firm size	Small	78	44	72	41	10	6	34	31	89
	Medium	84	75	94	73	21	15	40	54	96
	Large	92	95	100	89	42	33	62	85	100
by industry sector	Primary	82	31	77	39	11	10	22	34	81
	Manufacturing	82	58	84	51	18	35	40	37	95
	Transportation, communication & utilities	83	55	86	51	10	8	26	43	96
	Finance & insurance	85	75	84	66	16	4	45	51	95
	Trade & other services	78	46	73	45	11	3	36	33	89
by industry sector and firm size	Primary Small	81	24	74	35	9	6	19	30	78
	Primary Medium	86	78	100	70	30	33	41	54	99
	Primary Large	88	97	100	88	36	69	63	77	100
	Manufacturing Small	79	46	80	41	13	29	36	27	94
	Manufacturing Medium	89	93	98	78	28	50	49	61	99
	Manufacturing Large	92	98	100	89	56	80	69	90	100
	Transportation, communication & utilities Small	80	45	82	43	3	5	23	36	94
	Transportation, communication & utilities Medium	90	84	96	69	23	13	34	61	100
	Transportation, communication & utilities Large	96	100	100	96	51	32	44	84	100
	Finance & insurance Small	84	70	79	65	10	1	40	46	94
	Finance & insurance Medium	81	91	100	66	30	12	52	60	99
	Finance & insurance Large	98	100	100	82	64	13	81	92	100
	Trade & other services Small	77	43	70	40	10	3	35	30	88
	Trade & other services Medium	83	67	91	72	16	3	37	50	95
	Trade & other services Large	90	92	100	91	28	14	55	81	99
by type of action being taken	Not aware of Year 2000 problem	70	3	59	18	13	5	30	22	87
	Aware but not taking action	80	37	75	38	8	6	33	33	91
	Taking informal steps	89	73	86	65	17	12	44	40	98
	Having a formal action plan	82	90	93	74	19	11	40	60	100

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

		% of businesses (as a proportion of firms taking formal or informal steps)			
		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	Total
	All businesses	49	36	15	100
by firm size	Small	53	32	15	100
	Medium	38	47	15	100
	Large	40	49	11	100
by industry sector	Primary	46	29	25	100
	Manufacturing	47	35	18	100
	Transportation, communication & utilities	51	33	16	100
	Finance & insurance	55	32	13	100
	Trade & other services	49	37	14	100
by type of action being taken	Not aware of Year 2000 problem	Does not apply to firms not taking action			
	Aware but not taking action				
	Taking informal steps	47	37	16	100
	Having a formal action plan	62	30	8	100

C3

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

		% of businesses (as a proportion of firms aware of issue but taking neither formal nor informal steps)*								
		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 problem is not an issue for our business
	All businesses	14	27	4	7	10	3	8	4	23
by firm size	Small	14	27	2	7	10	3	8	4	24
	Medium	14	33	22	6	7	0	5	4	12
	Large	6	49	2	1	4	0	21	4	11
by industry sector	Primary	7	35	2	4	16	2	8	4	24
	Manufacturing	10	28	1	7	5	0	12	8	34
	Transportation, communication & utilities	10	28	6	9	8	1	6	6	28
	Finance & insurance	7	22	4	9	10	15	22	3	12
	Trade & other services	15	27	4	7	10	3	7	4	22

* 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 reponses not fitting into any of the above categories.

What types of informal steps are firms taking

		% of businesses (as a proportion of firms taking informal steps)*				
		Contracted consultant or private information technology	Consulted with IT suppliers or software vendors	Informal discussions with systems staff	Will buy/have bought new systems in part because of Year 2000 problem	Informal reprogramming being done in-house
	All businesses	21	58	24	7	8
by firm size	Small	21	57	25	7	7
	Medium	19	60	20	6	12
	Large	25	50	34	9	22
by industry sector	Primary	18	54	5	14	11
	Manufacturing	27	46	24	9	9
	Transportation, communication & utilities	24	54	19	3	8
	Finance & insurance	11	82	10	11	7
	Trade & other services	21	57	27	5	8

* Percentages may to 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?

		% of businesses (as a proportion of businesses aware of the Year 2000 issue)		
		Approaching any partners	Believing there is potential for litigation	Making provisions for litigation
	All businesses	13	18	4
by firm size	Small	11	17	4
	Medium	16	21	5
	Large	32	39	13
by industry sector	Primary	6	15	4
	Manufacturing	6	17	4
	Transportation, communication & utilities	8	19	3
	Finance & insurance	20	25	8
	Trade & other services	14	18	4