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Y2K: Better late than never

But you'd better get started if you haven't already!

Scoffed at by some, feared by others to be the trigger for a second dark ages, the Year 2000 computer issue keeps getting bigger and bigger.

Most experts expect North America's private and public sectors to be largely ready. However, a recent study by the World Bank suggests third world countries will largely miss the target. More troubling is last month's speculation by the Pentagon that the command and control system of Russia's nuclear arsenal may interpret Y2K-related computer failure as evidence of a U.S. strike.

While none of our VARs has the heady task of ensuring the preven-tion of nuclear Armageddon, we do have it from Telesis Group that the newly amalgamated Toronto Hydro, supplying power to some three mil-lion households, will be almost entirely Y2K Ready by March.

We asked Telesis Group, Centaur Systems and IYB Consultants to share their experiences in getting both their own organization and their clients Year 2000 ready.

While they all emphasize the urgent need to begin now—if you haven't already begun the process—each has taken a different approach in dealing with the date issue.

Each has also found significant opportunities for developing new

Y2K?
All hype, if you ask me.

customer relationships. There's a lot of work to be done.

Will you get your share?

In This Issue ...

VAR Y2K PROFILE: CENTAUR SYSTEMS

Date Started
• about 2.5 years ago

Products Involved
• PRO/5

Method of Conversion
• Internally, Centaur uses Julian dates for robustness
• Customers' programs allow users to

continue to enter 2-digit years; numbers less than 13 will be defaulted to the 2000 series, numbers greater than 13 will be defaulted to the 1900 series
• Customers have the option of entering four-digit years, where, in unusual situa-tions, the defaults described above would produce an error
• A one-field table change allows

default centuries to be revised, as will be required over time
• The above covers all known date-related problems
• Part of conversion strategy was standardization of software, including updating of all documentation
• Used to have many different versions of custom software—changed over to a parameter-driven approach, all customers are running essentially the same software
• "If there is a problem, it will be one problem in 50 different places—not 50 fifty different problems. We can make changes immediately and propagate them to all our accounts. That's our ace."
• Has left last quarter of year unbooked as a contingency to ensure customers can be serviced if unexpected difficulties arise

Opportunities
• Has sold new software in lieu of changing existing systems
• In cooperation with other VARs has converted data and programs from older, non-BB^X systems
• Helped customers migrate from older MAI platforms to PC UNIX boxes, to efficiently support BB^X
• Smaller consulting groups have a competitive advantage over high-profile groups: in large consultancies the higher turnover means no one person knows the customer's entire system. A smaller consultancy can gain and retain an expertise that allows for seamless, cost-effective conversions
• Whoever does the customer's Y2K analysis gets to learn his business, and is well-positioned to serve beyond 2000. Make sure it's you!

Advice
• Start early; with accounting issues such as 60-day terms, your customers could be faced with date-handling problems as early as November 1, 1999. Companies with a January fiscal year-end could already be in trouble.
• The process can be very labour-intensive—allow plenty of time.
• Don't forget the opportunities—Revenue Canada is permitting up to $50,000 of Y2K expense as a tax write-off

A Glossary of Y2K Terms

BIOS: The basic input-output system in computers. When a computer is turned on, the BIOS, resident in its read-only memory (ROM), is responsible for checking various system functions. It also provides information to software applications while they are running. The BIOS collects date and time information from a PC's real-time clock, which stores only the last two digits of the year. On many older PCs, the BIOS assumes that the first two digits of the year are 1 and 9. The BIOS, in turn, relays that information including its assumption about which century we're in to some software applications.

Embedded Chip: Microchips that are implanted in the circuitry of electronic devices. The chips perform a variety of computing-related tasks, from indicating when a unit needs maintenance to regulating temperatures. The concern is that while some chips depend on dates, they don't understand the year 2000. If not remedied or replaced, machines controlled by non-Y2K compliant computers could falter; some elevators, for example, "thinking" that decades have passed since they were last serviced, could shut down.

Julian Calendar: The commonly used calendar, which every twenty-eight years, repeats itself with all dates (including leap days) falling on the same days of the week, e.g. a printed calendar for 1970 is also valid for 1998 and 2026. By using a fixed date offset of twenty-eight years, a program that formerly worked with dates from 1900 to 1999 can transparently work with dates from 1928 to 2027. Around the year 2027, the offset can be shifted again, to 56 years and later to 84. The cycle only breaks down in 2100, which violates the usual four-year rule for leap years.

Source Code: Computer software instructions originally written by a human programmer. Many computers cannot understand raw source code. Instead they compile the code into instructions the machine can understand. Those compiled instructions are saved in the computer's memory while the source code often is jettisoned. When searching for the date glitch, however, it is easier and often essential for programmers to examine the original source code. Fortunately, BB^X is not a compiled language, simplifying the date correction process.

Windowing: A technique used to solve the Y2K problem in various applications. Years are still represented by two digits instead of four. Every time a date is used in a calculation, the computer checks to determine whether it should assume the first two digits are 19 or 20. A 50-year windowing approach would work this way: If the year is from 00 to 49, the software will assume it is the next century. If it's from 50 to 99, the computer will think that a 19 goes in front.

VAR Y2K PROFILE: IYB CONSULTANTS

Date Started
• About three years ago

Products Involved
• Progression/5; ICE; VSI-FAX
• Company philosophy is to continually upgrade clients to latest versions
• Occasionally have to upgrade clients' operating system

Method of Conversion
• Using eight-digit dates—convenient from a programming point of view because dates are easily identified when looking at a data file.

• BB^X facilities used to do global search of date routines within files.
• Replacing date routines with library routines; new code is implemented into a routine.
• Some clients are using very old software installed before IYB came on board; have to analyze each individual program and every single file looking for dates
• By mid-year all client systems will have been tested on test-decks and implemented, leaving six months for final live checks
• In some instances, IYB signs legal documents stating that systems it has installed for clients are Y2K compliant. "People are asking us to put our nose on the line."

Opportunities
• In some instances, rather than fixing existing software, clients are choosing to install new software from the suite of products IYB orders through J.P. Brown. "We go in to do a conversion job and end up with a whole new contract."

Advice
• Don't wait until the last six months—the result will be totally unhappy clients. VARs are missing potential business opportunities by waiting.

"Start as soon as possible ... the later clients start, the bigger the problems are going to be."

VAR Y2K PROFILE: TELESIS GROUP

Date Started
• Did major upgrade on its software in 1994/1995, anticipated Y2K issues at this time

Products Involved
• Progression/5; ODBC Drivers

Method of Conversion
• Internally, storing as Julian date; has found the Julian date function in PRO/5 very useful
• For date inputs, changing from a two-digit year to a four-digit year
  • Scarborough (Toronto) Hydro is an example of a major conversion; the client was using an IBM RISC box running Progression/4 on AIX 3.25.
• Telesis has helped achieve the transition to the latest AIX operating system, PRO/5 and a new hardware platform.

Opportunities
• Some clients have had to upgrade hardware and operating systems as part of Y2K compliance.
• This has made it now possible for them to use some of the newer software, such as ODBC drivers. A recent example of this has been Telesis' installation of Interactive Voice Response (IVR) systems, where a Windows NT system accesses a BB^X database on a UNIX box. "J.P. Brown has been very helpful in setting this up."
• Project management role has expanded because of the pervasive nature of Y2K issues

Advice
• Start as soon as possible. "It's a very involved process—the later clients start, the bigger the problems are going to be."
• Qualified programmers are getting scarcer as time goes by; waiting much longer will mean no help will be available should you need to hire more staff

Y2K: A legal look

By Scott MacKendrick and David Takenaka

While the Y2K issue may present numerous opportunities for VARs, it certainly presents legal challenges. For example, at whose expense are Y2K software problems to be remedied? This and other legal issues must be evaluated as part of a serious business discussion on Y2K remedial work.

What follows below is a discussion of certain of the legal issues that VARs and their customers may face.

LIABILITY

It probably won't be difficult to convince your customers they need help becoming Y2K ready—where a difference of opinion may exist is in who picks up the tab.

So before embarking on remedial work, VARs should review all written agreements dealing with customers' systems to identify the legal issues and determine whether there are any obligations on any person's part to rectify the problem.

For example, it should be determined whether a specific representation concerning Y2K compliance has been provided, and the scope of any such representation. Alternatively, a customer may seek to rely on a more general representation provided in its agreement with a VAR or software vendor (e.g., that the software licensed will perform in accordance with an agreed upon set of specifications).

VARs should be sure to review any support/maintenance obligations in agreements with customers. Such documents often state that a computer system will continue to function in accordance with the accompanying documentation or in accordance with certain specifications, and will require the vendor to repair or replace any "defect" or "bug" in a computer system. It may be that a VAR's customer will argue that Y2K non-compliance issues fall within the scope of generally provided support/maintenance.

For new systems that VARs are installing for customers, be careful to stipulate that Year 2000 compliancy holds true provided only that the customer's hardware and operating system are also compliant. Ideally, before finalizing the transaction, the customer should test the computer system in its own environment to ensure Y2K compliance will not be an issue.

LEGAL REMEDIES AVAILABLE TO USERS

Once a specific obligation to repair, or a representation or warranty is uncovered upon which a business—a VAR or a VAR's customer—may rely, such a business must next determine the remedy afforded to it as a result of such breach.

Often software vendors will limit a warranty period given in respect of its products or may impose a limitation period after which actions may no longer be commenced by a licensee of its software. In addition, it is common for software vendors to include limitation of liability clauses in software agreements which limit both the scope and type of damages which may be claimed by a licensee.

If not specifically excluded from an agree-

before you leap

ment, the warranties provided to a buyer of goods under the Sale of Goods Act (Ontario) or the International Sale of Goods Act may afford a business some protection. If a customer can establish that such legislation is applicable, the implied warranties of merchantability and fitness for a particular purpose may be relevant in determining a vendor's obligations to a buyer of software.

RESOLVING Y2K PROBLEMS

Without Vendor Assistance

In most cases, it will be the software vendor with which the business will be dealing. However, for a number of reasons (e.g., the software vendor is no longer in business or the software vendor has been unable to provide an acceptable Y2K solution, etc.), a business may consider having the Y2K Problem remedied by an independent third party or by its own employees.

It is standard practice for a software vendor to state in its support/maintenance terms and conditions that the software vendor will not be responsible for supporting software which is modified by someone other than the vendor. If a business has decided to itself correct a Y2K Problem or to have an independent third party correct it and if the business still wishes to have support/maintenance provided to it, prior contact with the vendor should be made to ensure that any work undertaken by such persons will not void the maintenance/support obligations of the vendor.

Another issue which arises in relation to retaining the services of a third party to correct a Y2K Problem is the issue of confidentiality and non-disclosure. Often the agreement documenting the provision of a computer system will contain clauses which prohibit disclosure to third parties without the vendor's prior consent or may only permit disclosure where such third party has executed a non-disclosure agreement.

Access to Source Code

If a business has decided to remedy a Y2K Problem without the assistance of its vendor, the business will also want to ensure that it has access to the source code to the software in issue. If source code has not been provided, existing escrow agreements will have to be reviewed in order to determine whether the existence of a Y2K Problem constitutes an event under which the escrow agent is obligated to release to the business the source code for the software.

INTELLECTUAL PROPERTY ISSUES

In identifying the computer programs that need to be "fixed" to enable a business to make a "safe" transition into the year 2000, businesses will need to determine the source of its computer programs - that is, whether the programs were purchased "off-the-shelf", were commissioned, were developed by its employees, or any combination of the above.

For the first two instances, a review of the contracts under which the programs were licensed or purchased, or a review of the contracts under which the programs were commissioned, is necessary to determine who owns the programs and whether the business has the right to amend the programs. For the

third instance, a review of the employment contracts is necessary to determine whether the programmers were employees, and not subcontractors, and whether the employees waived their moral rights in all of the programming.

Copyright Infringement

Under the Canadian Copyright Act, the first owner of copyright in a computer program is the author of the computer program, unless the author was employed under a contract of service and the work was made in the course of his or her employment.

Accordingly, under a contract *of* service—employment—the *customer* is the first owner and under a contract *for* service—a commission—the *programmer* is the first owner. Copyright is deemed to have been infringed by any person who, without the consent of the owner, does anything the owner has the right to do—e.g., making a copy of a computer program. Although the Copyright Act provides a "fair dealing" exception for infringement, its scope is quite limited.

Moral Rights Infringement

Under the Canadian Copyright Act, an author has the moral right to the integrity of his or her work and such right may not be assigned, but may only be waived in whole or in part. The legislation expressly provides that an assignment of copyright in a work does not by that act alone constitute a waiver of moral rights.

Applying these Canadian concepts of ownership and moral rights to a computer program, a customer needs to determine:

(1) whether the business owns the copyright, as, without ownership, any amendment or "fix" to the computer program to render it Y2K

compliant would ordinarily constitute infringement;
(2) if the business is not the owner of the program but holds a licence, whether the licence allows it or any third party on its behalf to amend the software without infringement;
(3) whether there has been an express waiver of moral rights from the author(s) of the program, as any amendment of a program to render it Y2K compliant could be construed as a violation of the author's right to the integrity of the work.

Other Concerns

If a business chooses to "cure" a Y2K Problem by migrating to a new software system, the potential for copyright, moral right and trade secret infringement may be present with respect to the conversion of existing data from the old system to the new system.

EMPLOYMENT MATTERS

In light of the dearth of skilled programmers, both VARs and cus-

tomers need to be alert to obtain and retain skilled programmers.

In staffing up and then down to meet the need for Y2K compliance, a business may expose itself to employment issues - e.g., unfair dismissal claims - both arising from the hiring and subsequent dismissal of unqualified programmers and later from post Y2K terminations of programmers.

In retaining programmers, a business may wish to ensure that it either directly employs the programmers, so that the business is the first owner of the copyright in any amendments or "fixes", or should ensure that the contracts for service expressly assign ownership in the "fixes". Further, the business should ensure that either the employment agreement or the contract for service includes a waiver of moral rights, which waiver should not be limited in scope.

LITIGATION CONCERNS

Documentation

The potential for litigation crosses the range of issues outlined in the matters discussed above.

Accordingly, maintaining an appropriate "paper trail" will be imperative in initiating and, in particular, in defending Y2K Problem litigation.

The documentation which should be created and retained by every business includes documentation which sets out:
1) how the business conducted its audit to determine the scope of the Y2K Problem;
(2) what procedures were put in place to identify Y2K Problems;
(3) what mechanisms were put in

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UNIX

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- Permissions

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Tips from the ...   ...Y2K trenches!

Getting BB^X applications ready for the Year 2000 takes some time. You'll need to check every one of your programs—consider developing a utility to re-write some of your data files. Two approaches for our VARs to consider are as follows:

Option 1—Four-digit Year
• Convert all your dates to include a four-digit year—this is time consuming but you'll be sure all your aging routines will work correctly.
• Replacing occurrences of DAY with DATE(0) – DATE(0) is more robust

Option 2—Julian Date
• Store dates in your datafiles as a Julian value; e.g. January 15, 2000 would be stored as 2451559. Store this value into your file, i.e. INV_DATE=JUL(2000,1,15)
• Then when you want it printed out in a program you can use PRINT DATE(INV_DATE:"%Dl %Ml %D, %Y"), which produces Saturday January 15, 2000
• If you didn't want the date stored

as a seven-digit field you could use functions for reducing the field size when you write to the file: DEF FNDATEPCK(INV_DATE)= A-INV_DATE where the value of A=2500000, which you could retrieve from a control file.
• To restore the value you could use a function to unpack the date. DEF FNUNPCKDATE(INV_DATE) =A+INV_DATE
• These packing and unpacking routines could be placed into a CALLed routine and with the power of PRO/5 2.X or VPRO/5 2.X each routine could be CALLed from the same program; i.e. CALL "DATE_ROUTINE::DATEPAC", INV_DATE to pack the dates; and CALL"DATE_ROUTINE::DATE-UNPCK",INV_DATE to unpack the dates.

We're listening!

We all saw it coming.

Some of us, those who took the time—or made the time—got prepared early. Human nature being what it is, others have delayed.

Perhaps one of the biggest lessons that Y2K has to offer is that regardless of how sophisticated technology becomes, ultimately it is still people—fallible people—that decide the priorities. Whether it be for a company, a country, or an entire economic system.

But as important as Y2K is, we at J.P. Brown & Associates are looking beyond the Year 2000, to what your needs will be once this is all behind us. Business *will* go on.

Feel free to make any comments or suggestions to:

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(**Legal Look** ... from Page 4)

place to address the Y2K Problems; (4) what structure was put in place so that both Y2K Problems that were identified and the mechanisms that were followed are clearly and effectively reported to a person vested with responsibility; and (5) evidence that the procedures, mechanisms and reporting structures were not merely contrivances to avoid liability but were complied

Time is limited to seek Y2K legal remedies in tort law.

with on an ongoing basis.

As part of document management, a procedure should be in place to ensure that the language used to describe the Y2K Problem and the mechanism to solve the problem are appropriate - that is, would the business want all its documents discovered in subsequent litigation. Further, a business may wish to revisit its document retention policy to address whether it needs amendment with respect to the Y2K Problem - e.g., will a business want

to retain documents, such as compliance letters, which otherwise would be subject to destruction under its policy.

This is adapted with the kind permission of the authors from an article written by Scott MacKendrick, David Takenaka and other lawyers at Aird & Berlis.

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