The Year 2000 Challenge: A Real Risk to Your Locality

Dianah Neff

Year 2000 Challenge.
Millennium Bug.
New Year's Evil.

All these terms relate to the same big question: What will happen to the world of computing once the clock strikes January 1, 2000? Will massive chaos ensue when computers mistakenly interpret the year as 1900 or 1980 or some other, equally incorrect date? Or will technology experts exterminate the problem "bug" before time runs out?

The Year 2000 problem poses significant liability risks for federal, state, and local governments, besides interrupting service delivery. Risks include potential contractual exposure, constitutional litigation, and in some instances tort exposure. This means potentially spending big bucks on defending your organization against class-action suits while

Awareness of the Problem

According to a 1997 survey conducted by ICMA and Public Technology, Inc., 97 percent of cities in the United States use computers to support city operations, and 55 percent of the respondents indicated their local government computers would not be affected by the Year 2000 problem.

Because Year 2000–compliant computers have been on the market for only a few years and the majority of responding cities consider the average useful life of a computer to be more than four years, it is highly probable that many localities have noncompliant computers.

The 1997 survey was mailed to all cities with populations 2,500 and greater and to cities with populations under 2,500 that are recognized by ICMA as having a position of an appointed professional manager. Of the surveys mailed, 3,673 responses were received.

suing to recover damages from noncompliant vendors for failure to perform. All this may tend to detract from an organization's ability to deliver services!

Government agencies will not be immune from tort liability for Year 2000 claims, according to Year 2000 legal expert Vito Peraino, who spoke at the Government Technology Conference in Sacramento, California. Peraino is a partner in the Los Angeles law firm of Hancock, Rothert & Bunshoft and adviser to California's Department of Information Technology for Year 2000. Peraino said that despite current efforts to limit government liability, agencies are not likely to be fully protected from lawsuits.

Liability is predicated on negligence, intentional misconduct, or failure to follow a statutory mandate. With all the information being published on the problems of Year 2000, could a local government say that its manager wasn't aware that the date change could cause problems, so he or she didn't check to see if systems were Year 2000–compliant?

How Did This Happen?

In reality, the Year 2000 bug is not a "bug" at all but the result of purposeful decisions that made sense once upon at time. Until recently, computer memory and storage were costly and in short supply. Therefore, computer programs universally were designed to store calendar years as double digits only. Back then, programmers assumed that applications would be replaced long before the calendar change could cause a catastrophe.

Actually, this was a cost-effective business decision that saved billions of dollars over the years. However, many of those old programs, as well as antiquated hardware, still are in use today. This is one of those good news/bad news situations. Good news because we have gotten an exceptional return on our investment; bad news because those old programs and antiquated hardware must be modified or replaced. Consequently, the issue at hand is actually no one's fault, yet it is the concern of all who use computers or embedded-chip devices.

The Year 2000 issue presents another challenge: the algorithm used in some computers for calculating leap years is unable to detect that the year 2000 is a leap year (1900 was not). Therefore, sys-

Year 2000 Campaign

The Year 2000 issue is catching many organizations by surprise. Because the effects of this problem could be damaging for local governments and their communities alike, Public Technology, Inc., is leading a coordinated Year 2000 campaign, with sponsoring organizations including the International City/County Management Association, the National League of Cities, and the National Association of Counties.

The purposes of the campaign are, first, to make all appointed and elected local government officials aware of this potentially devastating problem and, second, to gather and make available resources—some managerial, some technical—to help local governments meet the challenge.

A key point is that this problem is as much a managerial issue as it is technical. As one observer puts it, "It's like changing all the light bulbs in Las Vegas by January 1, 2000. It may not be technically difficult, but I sure wouldn't want to start today!"

Use a 4x3 Matrix

When considering this problem, a useful organizational tool to use is a 4x3 matrix. Put four elements on the vertical axis: "Awareness," "Solutions," "Interfaces," and "Contingency Planning." Your entire organization must be *aware* of the year 2000 problem. Every organization must find *solutions* to eliminate this problem. No organization exists in a vacuum, but in today's world, all organizations *interface* with other entities that may or may not be fully Year 2000–compliant. Finally, organizations may not have sufficient time to eliminate the Year 2000 bug completely. Consequently, local governments must prepare by developing *contingency plans* that handle any remaining Year 2000 problems.

Along the top of this 4x3 matrix list "Programmable Systems," "Embedded Chips," and "Data." Any *programmable system* is suspect, whether it be a mainframe computer, a local area network server, or a desktop computer. If it uses software to operate, it also may be unable to understand the next century. *Embedded chips* (very small computer integrated circuits) are used in such unlikely places as security elevators and door access systems, traffic lights, chlorine dispensing systems, and so on. Because of a design flaw, there are many such systems in operation today that will not understand the 21st century. Finally, stored *data* may have only a two-digit year and must rely upon software systems to interpret the correct century. Invalid data may exist on mainframe, network, or desktop computers.

Use the matrix when considering which systems might be susceptible. Account for all nine possibilities, and your organization will be prepared for the next century.

—Michael Humphrey, business director, Information Technology and Telecommunications, Public Technology, Inc., Washington, D.C.

tems that are not Year 2000–compliant may not register the additional day, and date calculations will be incorrect.

The Year 2000 issue may manifest itself before, on, or after January 1, 2000, and its effects on operations and financial reporting may range from minor errors to catastrophic systems failure.

Why Are We Worried About the Year 2000?

When the year 2000 arrives, computer programs with two-digit years in their date fields will read the year as "00." In this case, there is no distinction between years in the 20th century and those in the 21st century. The computer will not know that a year stored as "00" means the year 2000. Consequently, date comparisons, date calculations, sortings based on dates, and leap-year determinations will not work correctly.

Date comparisons or calculations may not work correctly because 00 is less than 99. For example, if an application is calculating a person's age based on his or her birth year, it will get the wrong answer. If the person was born in 1935, then in 1997 the calculation is 97 minus 35, which equals 62. In the year 2000, however, the calculation will look like this: 00 minus 35 equals a negative 65 (which means that anyone planning to retire may have to wait a long time!).

In practical terms,

- Financial systems may not accept 00 as the year and may not print warrants to vendors. And you might not receive your paycheck. What if utility bills can't be issued or payments collected for two, three, or six months? Would your local government have enough reserves to survive?
- How would citizens react if they received notice that their property was going to auction for lack of tax payments? To the system, it will look as if taxes haven't been paid for 99 years!
- What if your local government's home detention devices released prisoners early? The release date will appear to be 1900, in which case they've overserved their sentences. What is a local government's exposure if a crime occurs when the prisoner was supposed to have been monitored?
- How effective will operations be if maintenance schedules can't be produced? Or if just-in-time deliveries don't arrive for construction projects? Or if appropriate training isn't scheduled for paramedics?
- What if traffic lights, irrigation systems, sewer control devices, etc., don't function properly or at all? January 1, 2000, is a Saturday, but January 1, 1900, was a Wednesday. What if your building security opens all your facilities, and equipment and supplies are stolen? Will you be insured?

The list could go on and on.

Do you know . . .

the Year 2000 problem will affect not only large computers and their software; it's poised to foul up personal computers and any software application programmed with a two-digit year field rather than a four-digit field. That includes computer operating systems, programs that run VCRs, time-controlled vaults, and numerous other date-dependent electronic equipment.

What Does Year 2000 Compliance Mean?

Year 2000 compliance means that applications run correctly before, during, and after the Year 2000, including February 29, 2000. Correctly means without errors relating to date data. Year 2000 compliance depends not only on the application but also on the operating environment. To be Year 2000–compliant, an application must first be century-aware. To verify or certify Year 2000 compliance, the application must be tested on a platform with a system date set to dates in the future, including February 29, 2000.

What Should Organizations Do?

As of June 1, 1998, there were only 579 days (one year and seven months) left. The Year 2000 problem is real. It is a serious issue with a rigid deadline. Following are some suggested steps to take:

- Establish organizational awareness of pitfalls and issues; the Year 2000 problem is not an information services (IS) problem, it is an organizational one. Fiduciary responsibilities are at stake.
- Audit the Year 2000 compliance of all computerized systems, including embedded-chip systems like HVAC, traffic signals, and irrigation; test for vulnerability; and recommend solutions.
- Take action. Modify computer codes, replace systems, upgrade or replace equipment, and/or archive inactive systems and data files. Contract for remediation of existing systems and equipment, if existing resources are not adequate.
- Build in Year 2000 compliance when acquiring systems, equipment, and services. Require all vendors to ensure that they can provide products and services without interruption up to and beyond January 1, 2000. Test and certify all computerized systems.
- Have your attorney review your contracts with clients and vendors and look at each piece of correspondence regarding the Year 2000 issue. Your attorney should make sure that you have taken the necessary steps to minimize liability, should you become involved in a Year 2000 lawsuit.
- Inform employees of the Year 2000 problem, and have them analyze their personal lives (for example, personal computers, home security systems, or any other device that uses

Year 2000 Programmer Retention Program

San Bernardino County, California, has followed a detailed plan approved by its board of supervisors for retention of vital COBOL programmers for the Year 2000 reprogramming effort. The elements of the plan are presented here.

- Reviewed the industry regarding techniques being implemented to retain/acquire COBOL knowledgeable staff.
- Surveyed information services department (ISD) employees to determine which issues were key to retaining their services.
- Conducted focus groups with employees to further discuss the details of the survey responses.
- Developed computer equipment (hardware and software) standards and purchased state-of-the-art desktop and laptop equipment for staff.
- Explored the software market for productivity aids to enhance the speed, reliability, and performance of the Year 2000 effort. (File Aide for testing files for Year 2000 compliance and Xpediter software for enhancing the test mode are two examples of productivity aids in use.)
- Purchased a comprehensive training program from Gartner Group to provide staff the opportunity to enhance programming skills in the latest technologies. This program is intranet and Internet-access-oriented and has over 500 courses available.
- Developed a headhunter bonus program for staff to encourage referrals for hiring/acquiring new COBOL programmer staff.
- Adopted a retention plan with these specific elements:

  Special assignment compensation up to 15 percent for those employees who demonstrate premium skills.

  A *celebration bonus program* to mark key accomplishments during the Y2K effort.

  An *end-of-period bonus plan*, a stay-with-me effort that could bank $200/month for each month a programmer remains with the county through to completion of the Y2K project. It would guarantee that the Year 2000 effort is completed successfully.

  Training opportunities (see below).

As a result of these actions, the county has lost four key programmers since the retention effort was begun in April 1997. During this same period, other counties and cities in Southern California have had to increase hourly compensation rates in order to attract employees.

In addition to the Year 2000 retention program, the county also has introduced an Information Services Incentive Training Program for COBOL programmers, in order to keep their skills current with new technology and increase their incentive to stay with the county.

ISD contracted with Gartner Group Learning for access to 571 technical courses. These courses are available in multiple media, including computer-based training, video, and CD, and some are available via the Internet.

The training program has three specific objectives:

- Give employees the opportunity to obtain in-demand skills at their convenience and at no cost to the employee.
- Encourage employees to maintain state-of-the-art technical skills regardless of their current assignment by taking advantage of the training on their own time.
- Avoid impacting the basic 40-hour work week productivity.

As a result of both programs, the county has a stable workforce of ISD employees and has saved over $500,000 in potential costs that might have been imposed by personnel turnover.

For more information, contact J. L. Freedman, information service department, County of San Bernardino, 670 E. Gilbert Street, San Bernardino, California 92415-0915; 909/388-5500; fax, 909/388-5555.

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embedded chip technology) to ensure that they can perform their duties after Jauary 1, 2000.

Above all, get going! Without advance consideration, planning, and most of all *action*, many computing systems that perform calculations based on dates will wreak havoc with governments' ability to continue to provide services and can put agencies at financial risk. Elected and appointed officials may be held personally liable for violations of fiduciary responsibility.

First, you should see that no more harm is done. Adopt and enforce a Year 2000 policy for all ongoing procurement of systems, equipment, and services; include a Year 2000 compliance statement and definition in all requests for proposals (RFPs); and assess the

An Audit of Computer Operations

Local governments can respond to the Y2K problem by establishing task forces to audit their computer operations. These computer operations can include:

- All hardware and software, including software licensed from third parties.
- Software license agreements, maintenance and support agreements, source code agreements and hardware maintenance and support agreements, source code agreements, and hardware maintenance agreements.
- Business history of vendors, focused on who has the right to change the source code.
- Coordination issues related to interfaces with vendor and contract employees, customers, and other third parties.

The audit is the basis for developing a comprehensive remediation plan, including a means to test the solution. Because there is a growing shortage of Y2K programmers, many organizations are focusing first on the most essential—often referred to as "mission critical"—components of their total systems.

If your locality, public authority, or agency isn't already well along the road to Y2K compliance, it may be difficult to achieve the technical progress necessary to ensure that its systems will function without disruption in 2000, and whatever the compliance status, unfortunately there is no guarantee that it won't be affected by failures in third parties' computer systems.

A significant additional problem that many planners could overlook is that 2000 also is a leap year. Leap years can cause computer problems even under normal circumstances, and some Y2K-compliant software also may not be leap year compliant.

Every local government can and should be prepared to defend against the likelihood of lawsuits brought by citizens who allege they have suffered injury, harm, or inconvenience if disruptions of the computerized systems and operations do occur. Here are practical steps that local governments can take well in advance of January 1, 2000, to be prepared to face this potential onslaught of litigation. Managers should realize, however, that this information is not a guarantee that litigation will not take place.

- Research and evaluate the applicability of various immunities, statutes of limitations, and other affirmative defenses.
- Evaluate the grounds that might be made for claims or actions against suppliers.
- Demonstrate a good-faith effort to achieve Y2K compliance by consistently and thoroughly documenting progress on compliance programs.
- Require written statements of Y2K (and leap year) compliance from all consultants, software vendors, and other third parties—such as telephone and building systems companies—whose system failures could negatively affect operations.
- Prepare letters to respond to inquiries from citizens and others about compliance status. These letters should be prepared with the advice of legal counsel to avoid repercussions in the event of any future problems, whether or not they are actually related to Y2K.
- Ensure that personnel who will have to deal with citizen inquiries and complaints are fully trained in appropriate procedures and responses. Consider the good will and other benefits of establishing a Year 2000 hotline or an ombudsman.

—Joel Lennen and David Tungate are members of the litigation department, Eckert Seamans Cherin & Mellott, Pittsburgh, Pennsylvania

readiness of critical business relationships, like those with banks, insurance carriers, primary vendors, and related businesses. For the next two years, all technology-related contracts that your local government enters into should include sufficient guarantees for Year 2000 compliance as to leave no ambiguity about who bears the risk of loss in the event of failure.

It is important that legal counsel collect all existing software licenses for significant systems, systems integration contracts, and support and maintenance contracts. Prepare a matrix for each contract, and list warranties that may apply; list limitations of liability and waivers of warranties that may affect remedies; identify limitation periods; and assess the viability of litigation and the cost.

Also, check your insurance policies for directors and officers; business interruption (data corruption coverage); and general liability. It is human nature to look for financially responsible parties when a company or individual suffers unanticipated financial loss or injury.

Localities need to be prepared to be sued for breach of fiduciary duty and failure to exercise reasonable care in responding to the Year 2000 challenge, causing foreseeable damage to others. They also need to be ready to go after potentially liable parties for failed sys-

tems, contractible breach of warranties, or corporate negligence for failing to be Year 2000–ready.

Armed with this guidance from your legal counsel, contact the entities with which you have critical business relationships to determine their status. If you have enough leverage from your contracts, compel contractors to comply. If they will become Year 2000–compliant, make sure that they will do so in a manner that is compatible with your conversion method. You'll need to work closely with your IS department.

If you have succeeded in getting the attention of the governing body or of senior management, and you have been given the go-ahead to contract for the assessment and assurance of your system preparedness for the Year 2000 date change, then the next challenge will be negotiating with outside vendors offering analytical and remedial services if you don't have in-house resources. At this point, localities will have little leverage in getting blanket warranties if the "fix" does not work.

In the absence of economic threats, as is often the case with low-leverage Year 2000 contracts, you need to define the contracting process carefully and to audit adherence to the intended process continually. If the contractor does not meet its procedural obligations, you need to know early in the process in order to pursue effective remedies. Contracts should provide you with some safeguards:

- First, the contract should specify that all work in process, including logs and records, is your property and will be left with you if and when the contract is terminated.
- Second, the contractor should give you a license to use any tools or techniques it was using to fix your systems.
- Third, the contract should specify a post-termination transition period during which the vendor's personnel remain on site or available for consultation.

Do you know . . .

technically, the new millennium doesn't begin until January 1, 2001. January 1, 2000, actually still is in the 20th century. But tell that to your computer.

A process-oriented contract requires the contractor to commit to performance standards and personnel requirements, rather than focusing on the end product for fear of economic consequences. If the contract closely defines the process and you adequately oversee the performance of the contract, then you will greatly enhance your changes of success and much reduce the possible adverse consequences of breach.

The Ripple Effect

Congratulations. Your organization has readied all its internal systems, and no legal problems have arisen. The IS department has tested everything, and, compared with other government entities, you feel confident that you're well ahead of the curve.

Time for celebratory champagne? Hardly. Even organizations that execute letter-perfect Year 2000 projects will be susceptible to what's being called the ripple effect. Suppliers, business partners, customers, and other third parties who don't take care of their Year 2000 problems can wreak havoc on your local government.

To avoid being hurt by the ripple effect, Year 2000 project managers are turning their gazes outside the organization to examine supply chains, customer bases, and other government entities.

A useful Web site that provides helpful Year 2000 information, recommended by Michael Sperling of the city of Phoenix, Arizona, is the Washington State Year 2000 Program Information Resource Center <http://www.wa.gov/dis/2000/y2000.htm>. The site includes information about tools, methods, and resources and links to other sites of interest.

The Information Technology Association of America's Internet site <http://www.itaa.org/y2klaw.htm>, also suggested as a resource by Sperling, outlines Year 2000 legislation at the state and federal levels, as well as Year 2000 lawsuits.

Are they going to be ready? What are their plans? Where are they in the process? Are they going to be able to do business in 2000? Your organization should dedicate significant resources to asking these questions of its key business partners, and getting businesses to respond may call for the assistance of an attorney.

Two words recur in discussions about the ripple effect: "communications" and "collaboration." Organizations must work closely with their business partners and keep a constant dialogue going to avoid being hurt by someone else's Year 2000 mistakes. The year 1999 will be the year of asking, "Who isn't going to make it, and what actions will we take?" Again, a matrix that identifies key business partners and a measurement scheme that rates them are important. What legal responsibility does the local government have for notifying the public if it will be unable to provide services if vendors, suppliers, or other agencies fail to fix their Year 2000 problems?

You need to identify all areas involving legal risks of potential third-party damage that may result from your affected data. As appropriate, suggest back-up alternatives, and discourage a blind reliance on your vulnerable applications.

As the potential for Year 2000 liability becomes more apparent, bills are being introduced into state legislatures that would modify the traditional common-law or statutory scheme of liability. In one such case, Washington State failed to move Senate Bill 6718 out of committee for the 1998 legislature. The bill would eliminate claims for indirect and consequential damages from third-party software, hardware, and suppliers.

Tip of the Iceberg

The Year 2000 problem may appear to be a technical one; however, this is only the tip of the iceberg. There are many legal issues and risks requiring attention at the highest levels of executive management. These aspects shouldn't be overlooked as you manage the technical solutions.

Here is a checklist of legal implications:

Contract auditing. What are the rights and duties of system users relative to maintenance contractors, software suppliers, and licensers?

Contract negotiating and drafting. What should you do to minimize your risk under future agreements covering hardware, software, and information services?

Insurance/indemnity. Do you have coverage under your existing insurance portfolio?

Officers' and directors' liability. What is senior management doing about Year 2000 preparedness, and what D&O coverage exists?

Protection of trade secrets and intellectual property. Year 2000 compliance may require access to informa-

Information Sources

Check ICMA's Web site <http://www.icma.org>for updates on the Year 2000 problem, as well as on the Year 2000 Campaign. At ICMA's site, look under the "Other Sites" page, which is searchable by "2000."

Access Local Government (ALG) also features a Year 2000 library. To get to ALG, click on the "Members' Corner" page on ICMA's site, then click on the logo for Access Local Government. Choose the "Library" function and scroll down to "Year 2000."

Also check out the Y2K area on the home page of Public Technology, Inc. <http://pti.nw.dc.us>.

tion that is sensitive and proprietary. How will you obtain access to what you need from other entities?

Labor and employment. What liabilities arise from the employment actions necessary to correct applications? Will the company need to modify or supplement any personnel policies as a result of Year 2000 changes?

Litigation. How will internal documentation now being generated affect your chances in court in the future? What steps need to be taken to head off litigation and at the same time to prepare for it?

What makes the specter of Year 2000 litigation so frightening is that there is no good way to estimate its potential impact. Government entities might have to sue vendors, consulting companies, and product manufacturers while facing a class-action suit by citizens for failure to defend and protect them and/or suits by other government agencies for computer code contamination. PM

Dianah Neff is chief information officer, Bellevue, Washington.