

Year 2000 bug 3506

[Technology](#), [Computer](#)



Less than one year until the year 2000, two seemingly small digits may turn January 1, 2000 from a worldwide celebration into a universal nightmare.

With

computers mistaking the year 2000 for 1900, virtually all businesses that use dates will be affected. Not only will the companies be affected, but also they are paying millions upon millions of dollars in order for computers to recognize

the difference between the years 2000 and 1900. The year 2000 computer bug is a

huge problem that our world must face. In order to explain how to solve the

" millennium bug", it is a good idea to be informed about exactly what

the year 2000 problem is. The year 2000 industry expert, Peter de Jager,

described the problem quite well. " We programmed computers to store the date in the following format: dd/mm/yy. This only allows 2 digits for the year.

January 1, 2000 would be stored as 01/01/00. But the computer will interpret

this as January 1, 1900- not 2000" (de Jager 1997). The '19' is

" hard-coded" into computer hardware and software. Since there are only

2 physical spaces for the year in this date format, after '99', the only logical

choice is to reset the number to '00'. The year 2000 problem is unlike any other

problem in modern history for several reasons. Many computer professionals point

out some of the most important ones. Time is running out- the Year 2000 is inevitable! The problem will occur simultaneously worldwide, time zones withstanding. It affects all languages and platforms, hardware & software.

The demand for solutions will exceed the supply. " It is too big and too overwhelming even for [Bill Gates and] Microsoft" (Widder 1997). Separate, any one of these points makes Y2K, a common abbreviation for the year 2000

problem, an addition to the obstacle. Combined, they form what seems more like a

hideous monster than an insignificant bug. The impact of Y2K on society is enormous, bringing the largest companies in the world to their knees, pleading

for a fix at nearly any cost. " The modern world has come to depend on information as much as it has on electricity and running water. Fixing the problem is difficult because there are [less than] two years left to correct 40

years of behavior" (de Jager 1997). " Alan Greenspan has warned that being 99 percent ready isn't enough" (Widder 1997). " Chief Economist Edward Yardeni has said that the chances for a worldwide recession to occur because of Y2K are at 40%" (Widder 1997). Senator Bob Bennett (Republican, Utah) made a good analogy about the potential of the problem. " In the 1970's, oil was the energy that ran our world economy. Today it runs on the energy of information." He later said, " To cripple the technological flow of information throughout the world is to bring it to a virtual standstill" (Widder 1997). The potential of the problem in everyday life is alarming. Imagine making a loan payment in 1999 for a bill that is due in 2000. The company's computers could interpret the '00' as 1900 and you would then be charged with 99 years of late fees (Moffitt & Sandler 1997). If the year 2000 problem isn't solved, there could be " no air traffic, traffic lights, no lights in your company, companies could not produce goods, no goods delivered to the stores, stores

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could not send you bills, you could not send bills to anyone else. Business

[could] come to a halt" (de Jager 1997). The costs of fixing Y2K are

staggering. The Gartner Group estimates that costs per line of code to be

between \$1. 50 and \$2. 00 (Conner 1). It is not uncommon for a single

company to

have 100, 000, 000 lines of code (de Jager 1997). Capers Jones, an expert

who has

studied software costs for over ten years, estimates total worldwide costs to

be

\$1, 635, 000, 000, 000 (One-trillion, 635 billion dollars) (Jones 1997). To put

this

number into perspective, if five people were to spend \$100 for every second

of

every day, 24 hours a day, 365 days a year, it would take them about 100

years

to finish the task! The year 2000 problem is not only limited to what happens

with computers between December 31, 1999 and January 1, 2000. There are

several

other important dates that are a factor. Last year was considered the last

point

where a large company could start fixing the problem with any hopes to finish

before the deadline. Also, all fixes should be done by January 1, 1999. There are two major reasons for having the fixes done a year early. The first is that there are many "special dates" during 1999 that mean special things.

For example, September 9, 1999 (09/09/99) has been commonly used as the "expiration date" for references and data that have no expiration date (Reid 1997). The computer required that a date must be entered in, and in many

cases, 9/9/99 was it. Also, it has been established that an entire year's cycle of events should be used to test all of the modifications that have been made to

a system. Also, one should be sure to test to see which day of the week is 01/01/00. January 1, 1900 was a Monday, but January 1, 2000 will be a Saturday.

Other possible failure dates: 1/10/2000 (1st 9 character date), 2/29/2000 (Leap

day- the year 2000 is a leap year), 10/10/2000 (1st 10 character date), and 12-31-2000 (Day 366 of the year 2000)(GTE 1996). With the millennium

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" bug" coming closer and closer to destroying the " crops" of the world's information every day, experts from around the globe have discovered several ways to deal with or " exterminate" this menace. Five major solutions to the problem will now be discussed. The most straightforward approach to solving Y2K is to simply change the 2-digit date fields to 4-digit ones. This is considered to be the only complete solution to the problem, giving businesses a seemingly endless range of dates for the future. This approach also can make it much easier for the company to reformat the display screens with a hard-coded format present (IBM 1998). Unfortunately, expanding the date field from 2 to 4 digits has several downsides to it. The most obvious one is that in order to convert the dates, every program and database that references to date data will have to be modified. These modifications are mostly manual labor-not

an automatic process. Also, this requires display screens to be reformatted manually, as well as increasing record lengths in databases (IBM 1997).

Another

common method for swatting the millennium bug involves what is termed "date

logic", or "windowing techniques". This procedure involves having

a separate program to determine which millennium certain dates are in. For example, the program could determine that if the year ends in numbers between 00

and 20, the date is in the second millennium. If the year ends in 21 to 99, the date is in the first millennium. This technique avoids some of the massive changes and coordination associated with the expansion approach (Martin 1997).

Date logic routines also have some downsides to them. The most important one is

that the "time window" can never be more than 100 years, and the length of the time window cannot change in the future. Also, system performance

may slow down with this extra step for each date to be processed. On top of

that, all of the assumptions and logic must be the same for all of the programs

that will use it (IBM 1998). If and only if all three of these downsides to windowing techniques can be overcome, should a business consider this solution?

Another way of getting around 2-digit dates involves a bridge program. This type

of solution is used to convert data from one record format to another. This allows a system to convert 2-digit to 4-digit dates as they are needed. This also allows a business to have very little down time for year 2000 renovations.

Instead of converting all of the data at one time, it is instead converted gradually. Also, this technique is very cost effective and fairly easy to do (Moffitt & Sandler 1997). Be aware that a bridge program has the potential to ruin a computer system. By removing the bridge before all data has been converted, 2-digit dates may become mixed with 4-digit dates, creating a larger

problem than in the beginning. Replacing the systems is probably the most

straightforward method of solving Y2K. By simply discarding old, non-compliant

systems and purchasing new systems that are year 2000 ready, a business can

eliminate the year 2000 problem altogether (Martin 1997). This avoids the hassle

of coming up with solutions to the problem, but presents the difficulties of

starting from scratch. This solution should be considered if a company's

systems are too costly to fix, or if there are not very many systems that need

to be fixed. Another idea that incorporates the replacement idea is for one

company to merge with or buy another company that has Y2K compliant systems.

Then, the old systems can be retired (Martin 1997). The last alternative that

will be discussed is to do nothing to current computer systems that a business

may use. This is not the same as ignoring the millennium bug and hoping that it

will go away. Instead, it involves analyzing exactly what will happen to a

company's computer systems and determining that the effect it will have is

either none or very little (Martin 1997). If this would be the case, and employees could work around any damages that may be caused, this selection could

work. Carrying out a solution in any business involves careful planning in order

to be successful. Each of the four steps- awareness, planning, implementation,

and testing- are crucial for a company to successfully get beyond the year 2000.

Though the shortest step, the awareness step can be considered to be the most

important step. This involves a detailed description of the problem to CEO's

and the other decision-makers for the company. Also, the management must be

informed of the impact that is likely to occur if Y2K is not solved. Without

successfully informing the company executives of the millennium bug, there is no

hope of getting funding appropriated and fixes underway (Conner 1997). The

preparation and planning phase involves finding all applications that use dates

and choosing the right combination of solutions to result in a successful endeavor. Also, a business must consider any dependencies on outside systems-

other companies, for example. In addition to this, a " priority schedule" should be created, to determine which systems are absolutely necessary to the operation of the business, and to fix them in accordance to their importance (Conner 1997). standard date interface should be agreed upon

both within the company and with all other companies, which are relied on.

Also,

the first estimate of how costly and how prolonged the fixes should be done (Conner 1997). The implementation phase is probably the most tedious phase of

year 2000 compliance. This involves taking proposed solutions and incorporating

them into a business' computer systems. Depending on which solutions are chosen, and how the solutions affect everyday business, a company's commerce

could be crippled due to the need for various systems to be down at all times

(Moffitt & Sandler 1997). Testing the solutions may be seen as an unimportant phase in the conversion process. The rewards seem few, and the costs of are high. However, testing solutions is the only way to ensure that a business will flow smoothly into the 21st century. This procedure involves making sample databases and records to verify that the fixes were made correctly, and that all systems work correctly. During this phase, a few glitches will most likely be found, and correcting these will be relatively easy. There are two common approaches to testing the solutions. The first involves making sure the systems work correctly in the 20th century, testing the computers for the 21st century, and then putting the systems back into everyday use. An advantage of this method is that all of the tests are done at the same times, allowing quicker feedback. The downside is that the amount of down time will be fairly high. The other approach is the same as the first, except switching the second and third items. The systems are first put back into

production, and then they are tested for year 2000 compliance while they are

ensuring the flow of business at the same time. The advantage of this method is

that down time is much shorter. However, getting results will take a longer time

(Pollner 1998). In conclusion, as the year 2000 comes closer and closer, companies are losing precious time in order to swat the millennium bug. The deadline is fixed. The price of survival is high and the only reward is the hope of continuing to operate in the worlds of commerce and industry. Businesses that

continue into the next millennium will enjoy the happiness of existence.

Companies that fail to act now will probably crumble under their own weight.

" The alternative to addressing the year 2000 will be going out of business" (Moffitt & Sandler 1997). Year 2000 is coming.