

What was the millenium bug



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The year 2000 problem has resulted from the common practice of using two digits to designate the calendar year instead of using four. When the year 2000 arrives, 2 digit year dates may be interpreted incorrectly causing many problems. Computer hardware and software may not recognize " 00" as an actual date and will not run properly or not at all. Credit Card systems may not recognize " 00" as a valid year for the expiration date, making transactions for those cards with " 00" as the expiration date impossible. Day of the week calculations will be off. Computers may interpret 1/1/00 as Jan. 1, 1900. 1/1/1900 was a Monday but 1/1200 is a Saturday so all day of the week calculations will be two days off. The scope of this problem is world wide. All products using the two digit technology are potentially at risk.

The " Millennium Bug" could be bring failure to everything from personal computers, home security systems, mainframes, and telecommunications equipment. The effects of the Year 2000 problem will be felt in homes, business, and government. Year 2000 conformity shall mean that neither performance nor functionality is affected by dates prior to, during, and after the year 2000." According to the British Standards Institution Committee there are four general rules for Y2K compliance:

1. No value for current dates will cause any interruption in operation.
2. Date-based functionality must behave consistently for dates prior to, during and after the year 2000.
3. In all interfaces and data storage, the century in any date must be specified either explicitly or by unambiguous algorithms or inferencing rules.

4. The year 2000 must be recognized as a leap year. Every body that deals with this problem must be ready. To avoid the Y2K problems your computer must first be checked for compliance.

Software is available that can check your computer for compliance and even make your computer Y2k compliant. Desktop computers can be checked with a simple utility but larger systems and networks may require more expertise to avoid the potential dangers. Many resources are available for checking your computer and to take the appropriate measures to correct any problems. This problem is huge. Business and government stand to lose billions of dollars if the problem is not corrected. Businesses are either already in compliance or in the process of dodging the possible disaster of the Y2k crash.

II. Examples of Business Sectors: Y2K Applied in the Mexican Public Sector

Computing systems and information technologies have become fundamental in production activities and everyday life. In order to prevent the Year 2000 effects on the information systems, the last June 3rd 1998, was installed the Year 2000 National Conversion Commission (Y2K National Commission). This Commission has the responsibility of coordinating the efforts of both the social and economic sectors to make sure of the adequate year handling, and therefore, the correct operation in information systems during the year 2000 and beyond. On July 9th 1998 it was published a presidential agreement which established the creation of the Y2K National Commission. Banco de Mexico was invited to participate in this Commission in order to coordinate the efforts of the financial sector regarding to the transition of information

systems. The purpose of this page is to offer access to different sources of information that allow users to be familiar with the Year 2000 problem, and to get on time financial sector documents issued under the coordination of this central bank with the purpose of solving the Y2K problems.

In January 1997 the " Project for Systems Compatibility Verification with the Year 2000" was established. Accordingly, the Board of Governors instructed the Systems Department to carry out the coordination and supervision of the necessary changes.

The Systems Department elaborated an initial inventory of its own systems, asking the immediate revision of the end user applications systems in the rest of the areas. In addition, the Systems Department established a bimonthly control and progress report.

In March 1998, the Board of Governors of Banco de Mexico created the Transition Year 2000 office at the Deputy Manager level, whose goal is accelerating and consolidating the progress of the global program denominated " Transition 2000".

In September 1998, the financial sector adopted a 5 phase self-evaluation methodology proposed by the National Commission for the Year 2000 Information Technology Conversion (Y2K National Commission). Banco the Mexico in his role of financial authority, took this standard of self-evaluation as a way to give a general view of the status its internal project.

In December 1998, the Institution finished the correction and internal test phases. During the

first half of 1999, the external testing will take place (Industry test), as well as the elaboration

Since early 1997 the Year 2000 Problem has become a top priority issue in PEMEX and its subsidiary firms. This is due to the fact that for several decades PEMEX has been considered one of the most important users of information technology in our country, as a means of permanently counting on timely and accurate data to support the wide range of its business transactions.

In spite of having a huge array of information systems implemented throughout the Mexican Republic, there is a strong sense of awareness in PEMEX regarding the possible implications of Y2K. Therefore, vast efforts are being carried out both in terms of information systems and automatic industrial controls in order to assess the scope of the problem and implement the necessary corrective measures, taking into consideration that the dateline is immovable.

Regarding to industrial systems PEMEX has adopted a six stage strategy:

Due to the technology reliance of PEMEX's production processes, there is also a conversion plan for industrial systems, which are critical for oil business. This plan comprises six stages, the first two stages, inventory and discrimination, are already completed and the other ones has been processing in 1999.

Because of the nature of embedded systems, PEMEX is outsourcing their Y2K conversion to manufacturers and solution integrators, and has also identified

the main vendors, which represent 70% of the inventory that have to be converted.

Conversion of industrial systems is PEMEX's top priority.

PEMEX's Board of Directors and Senior Management of Subsidiaries are totally aware of Y2k implications and therefore have undertaken a comprehensive plan to fully implement and effectively prioritize the solution concerning industrial systems and information systems. The company has assigned dedicated human resources to the Y2K project and a budget has been established.

On July 31, a successfull Y2K readiness test was conducted in the Mexican aviation sector.

The experience involved air aviation services, 6 airports and six Mexican commercial airlines.

This event was unique because of the number of airlines, airports and systems tested that were involved in this experience. It has been one of the more complex that have taken place so far in the commercial aviation sector.

The test was observed by some of the main hardware and software providers in the aviation industry in Mexico. Also present were representatives from ICAO, IATA, FAA and Transport Canada.

Equipment on board the airplanes and airport aeronautical services simulated the rollover to the Year 2000 during flight.

The experience involved the following airlines and routes:

-Aeromexico MD-88 Guadalajara-Mexico City

-Aeromexpress B-727 Mexico City-Hermosillo

-Aerolitoral M3 Leon-Mexico City

Aviacion A-320 Puerto Vallarta-Mexico City

-TAESA B-727-300 Mexico City-Mexico City

-AEROCARIBE J32 Minatitlán-Mexico City

The tests involved the following areas:

Different systems ere tested in different routes. For example, on the Guadalajara-Mexico City route, the following systems were tested:

- Data processing systems, radar and flight plan
- Digital communications processing system
- Aeronautical communications systems
- Tests of airline operational systems

The Ministry of Public Education has an informatic platform relatively modern of outfitting and application programs of Institutional use, that allows them to foresee in a general way, that the impact of the initiation of the Y2K that the Institutional information systems will be manageable and relatively easy to resolve.

The technological characteristics allows them to make such a statement are:

- Major computer equipment platform, where the actual systems run of Institutional use that consist of RISC architectural computers under UNIX operative system; which reduces the possibilities to obtain process errors caused by ancient computer architectures, that present risks when using ingoing/outgoing basic systems (BIOS) with the watch information, that do not support the Y2K impact, as it does in some platforms with other characteristics (architectural CISC Intel).
- The software for the handling of basis of Institutional data (Informix, Sybase), include dynamic date types of data, that support the Y2K impact while storing years using digital technology.

Likewise, the organization of the information in relational tables of content, facilitate the eventual modification of the information fields in contrast to more ancient mechanisms of organization of information (sequential index files).

The development tools and the methodology of analysis and design use in the construction of the most reason information systems as well as those that are in the process of development assure robustness of the systems to resist the Y2K impact.

On account of its nature, the most delicate institutional system, the Integral System for the Administration of Personnel of the Ministry of Public Education (SIAPSEP), in operation since 1994, was designed in such a manner that the date fields and the calculations that involve the same, tolerate the impact

mentioned when redesign in fields of four digits for the information stored for years.

Nevertheless, its necessary to observe that a great amount of application programs exist in several areas of the Ministry that are not of generalized Institutional use and can present process problems during the change of the century. In particular, information systems exist that store RFC type fields, in which two digits exist and additional reference exists over the birth year.

Such cases are not critical because the date does not form part of any logical or arithmetic operation, nevertheless, its necessary to have a date reference for the correct interpretation of the information for which an activities program must be integrated so as to able to detect and correct those informatic cases.

III. Mexican Company's Preparation: Y2K in Mexico's Private Sector

To achieve this, Grupo Vitro created in 1997 the Vitro Y2K Office, in charge of all matters related to the problem of the turn of the century. The main role of Vitro Y2K Office is:

1. To keep the organization focused, so that the Y2K issue is permanently included in the agendas of the entire Grupo Vitro.
2. To conclude successfully the Year 2000 Business Processes Program (Y2K).

The Office is formed by a team of professionals devoting 100% of their time to the solution of the problem of the year 2000, and a Y2K Guide Committee,

integrated by the Corporate Directors who provide services and/or define guidelines for operative areas, and are involved in any aspect of the Y2K problem, and whose main role is to provide direct support to all Y2K leaders to ensure success for the program.

The Y2K Program has a wide p, since it considers our transactions with suppliers, customers, banks, business partners and institutions. In Grupo Vitro we are aware of the magnitude and complexity of this problem, since we are just one link in the supply chain and we are conscious of the fact that no company, by itself, can guarantee success in this enormous task.

The year 2000 transition will challenge the expertise and capability of organizations to cope with complex technical problems with several levels of operative interactions. TELMEX is aware and ready to face this challenge. In January of 1999, TELMEX will be finished with solution implementation phase of its Y2K project, at which point TELMEX's systems related to the continuity and quality of service will be fully compliant and operational.

Commitments and responsibilities for TELMEX in sight of the year 2000 transition are governed by the proper terms of its commercial relationships and contracts with its customers, as a supplier of telecommunications services, to carry out its regular activities.

The Y2K project is based around a 4 phase model designed for bringing a multi-faceted and technologically complex company into compliance on time. These phases include identification, solution development, joint operations testing, and formulation of contingency plans. Both IT and Non-IT

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On the threshold of the new millennium, CEMEX is committed to undertaking every effort necessary to conduct business as usual through the year 2000 and beyond. Although the Year 2000 bug originated as a technology- related problem, we recognize that its effects extend into multiple business areas, both within and outside our company. That is why we are approaching the Year 2000 problem as a critical company-wide business issue; not just a technological one.

In January 1997 we launched CEMEX 2000, a company-wide program to become Year 2000 compliant, not only for information technology, but also for our extended business network. As part of the program, CEMEX has implemented a continuous follow-up plan to monitor the progress of the significant vendors, customers and business partners.

This program aims to overcome and even capitalize on the technology issues that the year 2000 presents. By upgrading and replacing our information technology worldwide, we are not only making efforts to ensure that we will

be doing business through the new millennium, but that we will be doing business better.

Since technology is an integral business component of CEMEX, the CEMEX 2000 Program is a global, company-wide effort. It is succeeding through the combined efforts of every business unit of the company, from top level executives to plant managers to technical, engineering and corporate support services departments.

1. Planning; In this phase the following are defined: the program's management structure, the scheduling of activities, the work team, resource and budget allocation, quality assurance strategy and the overall goals of the program.

2. Analysis; In this phase the scope of the problem is defined and the elements where CEMEX could be affected by the Year 2000 issue are identified. Dynamic business impact analyses are carried-out through an inventory of Year 2000 sensitive elements

3. Solution Design; In this phase the strategy for achieving Year 2000 compliance is defined, and a state-of-the-art testing facility named SITE 200 is created.

4. Conversion; This phase includes the correction or replacement of those elements that might affect CEMEX's business operations, giving priority to

those that represent a higher impact on operations.

5. Certification; The Year 2000 compliance process takes place on the SITE 2000, where an exhaustive integral acceptance testing procedure is conducted. The process of certification is completed once all revision points are passed.

6. Implementation; This phase includes the end user acceptance testing and implementation of the Y2K compliant system in every CEMEX business unit, office and plant around the world.

7. Quality Assurance and Follow-up; This phase includes the revision of the critical elements which represent business risk by the Year 2000, the documentation of the corresponding contingency plans and the preparation of immediate response work teams who will be monitoring the functioning of the business processes during the transition period and on critical dates.

Mexico has been working on Y2K in most of its public sectors, and is to an extent actualized and ready to face the millenium bug. We could probably attribute this to political pressures, specially coming from the United States.

In the other hand, I was only able to cover a few of the big powerful companies in Mexico, but in general most of them have a specialized department dedicated specifically to deal with the year 2000 problem. For them it's really important to work on the present problem due to the complexity and size of this companies, and also because this are global companies that can not take a chance in ruining their well developed image and systems.

The problem basically remains in the small and medium businesses, as well as in personal computers. Mexico's government has established a department to help the population update their own hardware and software, but still these people has to actively participate in updating their equipment.

Finally, I'd like to conclude saying that the technical problem is already fixed; but the real problem relays in the people's attitude towards the problem. If people feel insecure and start removing their money from bank accounts or doing things like that, then a real crisis will occur worldwide. So the only thing left to do is updating our own businesses and personal computers, and rest still trusting that what ever procedures were taken to face the millenium bug problem will work out.