The Year 2000 problem and library information systems

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The Year 2000 problem can be traced to the early days of computing when data storage was limited and expensive. In order to save storage and cost it seemed natural to store dates in a two-digit rather than four-digit form.

The Year 2000 problem occurs when two-digit dates are used for comparison or arithmetic purposes. Consider the simple calculation of your age in years.

Calculation of age (year of birth 1959)

4-digit	$2000 - 1959 = 41$
2-digit	$00 - 59 = -59$

Any system which relies on dates can be affected by the Year 2000 problem. Libraries and information systems may have problems with the following types of date-related issues:

- date calculations — for example loans and late fees;

- date manipulations;

- sorting 00 is misinterpreted as the smaller number of 1900 rather than the larger number of 2000. Reports and other date-driven information are incorrectly formatted and displayed;

- automated archival facilities where 00 (or the year 2000) would be interpreted as 1900 thus resulting in new material being automatically archived before it even reaches the shelves;

- indexing (date as part of key). An example of this is where critical information is stored using dates embedded in bar-codes.

The Year 2000 problem is a world-wide one which has the potential to make an impact on all aspects of every business. Libraries and information systems are no exception.

Libraries provide information to the public using a multitude of technology systems. No longer do libraries merely provide a book-borrowing service. They are now the information centres of the modern-day community, providing Internet access, CD-ROM research, world magazines, international newspapers, and film and sound archives.

With the automation of many library systems and the need for these systems to be linked locally, nationally and internationally their efficiency and effectiveness is paramount.

The modern-day library's dependence on computer systems has highlighted the need to address the Year 2000 issue to ensure that its daily business can continue into the Year 2000 and beyond.

The Year 2000 problem is often addressed by segmenting it into two distinctive areas: information technology and non-information technology.

Information technology

In the case of libraries and information systems these could include: borrowing systems; cataloguing systems; software, both external third-party-supplied (including operating systems), and internally developed software; hardware including CD-ROM systems, personal computers and servers; and telecommunications — routers, hubs and modems.

Non-information technology systems

Non-information technology systems are often forgotten for Year 2000 problems. Some of the areas which may be affected include:

- office equipment — including equipment that is not connected to computers, but has computer-chips embedded, such as photocopiers and faxes;

- telecommunications equipment such as PABX, mobile phones, and pagers;

- business services — including inter-organisation services, for example the production of return date stamps which have a hard-coded 19 as part of the date stamp field;

- property and security — relates to equipment used to control and monitor a building's systems;

- transportation — encompasses vehicles which are computer-chip-based;

- Other equipment, for example: microfiche.

Approaching the problem

Despite its perceived complexity, the Year 2000 problem is a relatively simple one — it is a risk mitigation exercise. A library must determine its exposure to the Year 2000 problem before risk mitigation strategies can be put in place.

The phases of a typical Year 2000 risk mitigation project might include:

1 *Awareness and communication* of the issue throughout the organisation.

2 *Inventory* — identify all components at risk in the organisation.

3 *Risk assessment* — assess each component for Year 2000 risk and then prioritise in order of importance.

4 *Strategy* — identify how each component can be remediated. There are a number of strategies which include one or more of the following:

- Repair — repair the product/component for Year 2000 compliance;

- Replace — seek an alternative vendor, product/component to remove a high-risk relationship or product;

- Retire — remove everything associated with the non-Year 2000 compliant component or product from the environment; and/or

- Risk it — do no remediation work but recognise that the component is a low-risk item which has minimal impact on the environment.

5 *Plan* — a detailed plan must be put in place to undertake the remediation work.

6 *Contingency plan* — determine which components require an alternative backup strategy, should the planned remediation work fall behind schedule.

7 *Remediate* — do the work.

8 *Testing* — perform current and future date testing to confirm that the modifications are Year 2000 compliant.

9 *Compliance management* — ensure that Year 2000 compliance is maintained.

This is an approach to address the Year 2000 problem, but it does not encompass all aspects of a Year 2000 program. ■