

PERFORMANCE AUDIT  
OF THE  
YEAR 2000 ISSUES FOR INFORMATION SYSTEMS

YEAR 2000 PROJECT OFFICE  
DEPARTMENT OF MANAGEMENT AND BUDGET

February 1998

## EXECUTIVE DIGEST

# YEAR 2000 ISSUES FOR INFORMATION SYSTEMS

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### INTRODUCTION

This report, issued in February 1998, contains the results of our performance audit\* of the Year 2000 Issues for Information Systems, Year 2000 Project Office, Department of Management and Budget. This was our initial audit of the State's efforts to address the year 2000 problem\*. We plan to periodically determine the status of the State's year 2000 issues as the State makes progress in resolving these issues.

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### AUDIT PURPOSE

This performance audit was conducted as part of the constitutional responsibility of the Office of the Auditor General. Performance audits are conducted on a priority basis related to the potential for improving effectiveness\* and efficiency\* .

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### BACKGROUND

The year 2000 problem is the result of the way dates are stored and computed in many computer systems. For the past several decades, programmers typically used two digits to represent the year to save data storage and processing costs, which were expensive at the time. However, in this format, the year 2000 is indistinguishable from the year 1900 because both are represented as "00." As a result, most computer systems that use two-digit years will not work beyond the year 1999 if corrective action is not taken. Most State agencies have computer

\* See glossary on page 17 for definition.  
07-597-97

programs that use the two-digit years; therefore, those programs will not correctly process dates beyond December 31, 1999. Effective dates for benefits, license expirations, tax payments, personnel/payroll transactions, and other transactions are all potentially affected by this problem.

In response to the year 2000 problem, the Department established the Year 2000 Project Office, which reports to the State's chief information officer. The mission\* of the Year 2000 Project Office is to oversee and facilitate agencies in achieving year 2000 operability for their critical computer applications by December 31, 1998 and for their other computer applications by December 31, 1999.

For fiscal year 1996-97, the Year 2000 Project Office was appropriated \$55.6 million. Act 114, P.A. 1997, stipulates that the unexpended portion of the appropriation is to be considered a work project appropriation and any unencumbered or unallotted funds are to be carried over into the succeeding fiscal year. The Year 2000 Project Office was in the process of completing estimates for project costs, and it expected to finalize them by January 1, 1998.

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**AUDIT OBJECTIVE  
AND CONCLUSION**

**Audit Objective:** To assess the effectiveness of the Year 2000 Project Office in implementing key processes to achieve year 2000 compliance.

**Conclusion:** Our assessment, for this initial audit of Year 2000 issues, disclosed that the Year 2000 Project Office was reasonably effective in implementing key processes to achieve year 2000 compliance. The Office has completed, or has plans to complete, all key processes within the awareness and assessment phases of the project.

\* See glossary on page 17 for definition.  
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However, we noted a reportable condition\* regarding contingency plans\* and system assessments (Finding 1).

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**AUDIT SCOPE AND  
METHODOLOGY**

Our audit scope was to examine the program and other records of the Year 2000 Project Office and of various State agencies. Our audit was conducted in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States and, accordingly, included such tests of the records and such other auditing procedures as we considered necessary in the circumstances.

To accomplish our audit objective, we utilized a framework established by the U.S. General Accounting Office (GAO). This framework presents a structured approach to follow in planning, managing, and evaluating year 2000 programs. The framework is based on the work of the federal Best Practices Subcommittee of the Interagency Year 2000 Committee and incorporates guidance and practices identified by leading organizations in the information technology industry.

Our methodology included examination of records and activities of the Year 2000 Project Office for the period October 1996 through September 1997. We collected background information about the State's plans to address year 2000 issues. We conducted interviews with Office staff and other State agency personnel regarding the awareness and assessment of the year 2000 problem. We

developed a checklist based on a framework established by the GAO to assess year 2000 issues. In addition, we evaluated and reported on the results of our data gathering and examination phase.

\* See glossary on page 17 for definition.  
07-597-97

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**AGENCY RESPONSES**

Our audit report contains 1 finding and 3 corresponding recommendations. The Department's preliminary response indicated that it agreed with the recommendations.

Ms. Janet E. Phipps, Director  
Department of Management and Budget  
Lewis Cass Building  
Lansing, Michigan

Dear Ms. Phipps:

This is our report on the performance audit of the Year 2000 Issues for Information Systems, Year 2000 Project Office, Department of Management and Budget.

This report contains our executive digest; description of project; audit objective, scope, and methodology and agency responses; comment, finding, recommendations, and agency preliminary response; the status of key processes relative to the U.S. General Accounting Office's framework to achieve year 2000 compliance, presented as supplemental information; and a glossary of acronyms and terms.

The agency preliminary response was taken from the agency's response subsequent to our audit fieldwork. The *Michigan Complied Laws* and administrative procedures require that the audited agency develop a formal response within 60 days after release of the audit report.

We appreciate the courtesy and cooperation extended to us during this audit.

AUDITOR GENERAL

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## Description of Project

The year 2000 problem is the result of the way dates are stored and computed in many computer systems. For the past several decades, programmers typically used two digits to represent the year to save data storage and processing costs, which were expensive at the time. However, in this format, the year 2000 is indistinguishable from the year 1900 because both are represented as "00." As a result, most computer systems that use the two-digit years will not work beyond the year 1999 if corrective action is not taken. Most State agencies have computer programs that use the two-digit years; therefore, those programs will not correctly process dates beyond December 31, 1999. Effective dates for benefits, license expirations, tax payments, personnel/payroll transactions, and other transactions are all potentially affected by this problem.

In response to the year 2000 problem, the Department of Management and Budget established the Year 2000 Project Office, which reports to the State's chief information officer. The mission of the Year 2000 Project Office is to oversee and facilitate agencies in achieving year 2000 operability for their critical computer applications by December 31, 1998 and for their other computer applications by December 31, 1999. The Year 2000 Project Office also identifies and promotes awareness about vulnerabilities from other potential year 2000 problems. The Office provides financial management and control for year 2000 compliance activities related to computer systems by allocating funds to State agencies as their plans are approved and progress is made on them. These funds are for remediation of software applications and for project management. In addition, State agencies must commit some of their own resources for other year 2000 related costs. These other related costs include various items, such as personal computer hardware and software. The Office also provides consulting assistance to State agencies regarding the utilization of automated tools and methods to achieve year 2000 compliance.

The U.S. General Accounting Office developed an assessment guide for the year 2000 problem. The guide identified five phases of an effective year 2000 program: awareness, assessment, renovation, validation, and implementation. Awareness of the problem includes defining the problem, familiarizing staff, and gaining executive support. Assessment includes identifying core business areas, analyzing systems supporting these areas, and prioritizing the conversion or replacement of these systems. Assessment also includes developing contingency plans and estimates for

needed resources. Renovation involves the actual conversion or replacement of computer systems. Validation is the testing and verification of converted systems in an operating environment. Implementation consists of the actual implementation of the converted systems.

As of September 30, 1997, the Year 2000 Project Office and other State agencies were in the process of completing the assessment phase, including the approval of plans and establishment of budgets. To help with the year 2000 problem, the Office contracted with a quality assurance contractor to assist with the development of year 2000 standards\* and to assist State agencies with their plans. Also, the Office planned to establish a software factory\* to help identify and correct date-sensitive coding within software applications. The software factory will also help to develop interfaces\* and data bridges\* between systems that may use different formats to address the year 2000 problem. In addition, the Office was in the process of establishing a Statewide database containing the compliance status of vendor-supplied software.

For fiscal year 1996-97, the Year 2000 Project Office was appropriated \$55.6 million. Act 114, P.A. 1997, stipulates that the unexpended portion of the appropriation is to be considered a work project appropriation and any unencumbered or unallotted funds are to be carried over into the succeeding fiscal year. The Year 2000 Project Office was in the process of completing estimates for project costs, and it expected to finalize them by January 1, 1998.

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07-597-97

## Audit Objective, Scope, and Methodology and Agency Responses

### Audit Objective

Our audit objective for the performance audit of the Year 2000 Issues for Information Systems, Year 2000 Project Office, Department of Management and Budget, was to assess the effectiveness of the Office in implementing key processes to achieve year 2000 compliance.

### Audit Scope

Our audit scope was to examine the program and other records of the Year 2000 Project Office and of various State agencies. Our audit was conducted in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States and, accordingly, included such tests of the records and such other auditing procedures as we considered necessary in the circumstances.

### Audit Methodology

To accomplish our audit objective, we utilized a framework established by the U.S. General Accounting Office (GAO). This framework presents a structured approach to follow in planning, managing, and evaluating year 2000 programs. The framework is based on the work of the federal Best Practices Subcommittee of the Interagency Year 2000 Committee and incorporates guidance and practices identified by leading organizations in the information technology industry. Our audit methodology included the following phases:

#### 1. Data Gathering and Examination Phase

Our work was performed between June and October 1997. We collected background information about the State's plans to address year 2000 issues. We examined records and activities of the Year 2000 Project Office for the period October 1996 through September 1997 and conducted interviews with Office staff and other State agency personnel regarding the awareness and assessment of the year 2000 problem. We developed a checklist based on a framework established by the GAO to assess year 2000 issues.

## 2. Evaluation and Reporting Phase

We evaluated and reported on the results of the data gathering and examination phase.

### Agency Responses

Our audit report contains 1 finding and 3 corresponding recommendations. The Department's preliminary response indicated that it agreed with the recommendations.

The agency preliminary response which follows the recommendations in our report was taken from the agency's written comments and oral discussion subsequent to our audit fieldwork. Section 18.1462 of the *Michigan Compiled Laws* and Department of Management and Budget Administrative Guide procedure 1280.02 require the Department to develop a formal response to our audit findings and recommendations within 60 days after release of the audit report.

# COMMENT, FINDING, RECOMMENDATIONS, AND AGENCY PRELIMINARY RESPONSE

## YEAR 2000 ISSUES

### COMMENT

**Audit Objective:** To assess the effectiveness of the Year 2000 Project Office in implementing key processes to achieve year 2000 compliance.

**Conclusion:** Our assessment, for this initial audit of year 2000 issues, disclosed that the Year 2000 Project Office was reasonably effective in implementing key processes to achieve year 2000 compliance. The Office has completed, or has plans to complete, all key processes within the awareness and assessment phases of the project. However, we noted a reportable condition regarding contingency plans and system assessments.

### FINDING

#### 1. Contingency Plans and System Assessments

The Year 2000 Project Office did not require the development of contingency plans for critical systems or assess which systems were most critical from a Statewide perspective. Our review of year 2000 contingency plans and system assessments disclosed:

- a. The Year 2000 Project Office had not required State agencies to initiate development of contingency plans for all their critical systems that may not function in the event of a system failure. The Office agrees with the importance of such plans and informed us that it has addressed this issue and will establish contingency plan requirements during subsequent year 2000 program phases. However, our discussions with year 2000 project coordinators from 18 State agencies disclosed that the agencies did not understand the importance of having contingency plans. None of the 18 agencies had developed contingency plans, and only 6 of the 18 agencies expected to develop contingency plans.

Contingency plans are necessary to help ensure that State agencies can continue their vital functions if their information systems fail because of

noncompliance with year 2000 standards. Such failures could range from systems not functioning at all to systems that produce inaccurate or useless information that materially affects the users relying on the information. In addition to the State's own systems, the State relies on information provided by external systems, such as those operated by the federal government. Accordingly, the State should also develop contingency plans regarding the failure of important external systems. The U.S. General Accounting Office (GAO) has stated that, at a minimum, agencies should develop contingency plans for critical systems' failures.

The GAO identified five phases of an effective year 2000 program: awareness, assessment, renovation, validation, and implementation. The GAO indicated that federal agencies should have completed the key processes for the assessment phase by July 1997. Similarly, the Institute of Internal Auditors has stated that there is a shortage of time for any organization that is not already well into the project to apply year 2000 solutions. The State had not completed all key processes identified under the assessment phase and may be behind the time schedules recommended by the GAO and the Institute of Internal Auditors. This does not mean that State agencies will not meet the year 2000 deadline; however, it does indicate that there is a risk that State agencies may be unable to correct all critical information systems on time.

The Year 2000 Project Office has initiated efforts for the awareness and assessment phases. We report on the status of the Office's key processes for these two phases in the supplemental information section.

- b. The Year 2000 Project Office did not make an assessment of which systems were most critical from a Statewide perspective rather than from an agency perspective. The Office indicated that it plans on making such an assessment based on a risk management plan in the near future. The Office will then allocate resources based on that assessment.

There is a shortage of available computer personnel because of the year 2000 problem; therefore, it may not be feasible for agencies to correct all systems that they believe are critical. Assessing the criticality of systems from

a Statewide perspective and instructing agencies to first correct the systems determined to be most critical would direct limited State resources to the highest risk systems.

### **RECOMMENDATIONS**

- (a) We recommend that the Year 2000 Project Office require State agencies to develop contingency plans for all critical systems that may not function in the event of a system failure.
  
- (b) We recommend that the Year 2000 Project Office make an assessment of which systems are most critical from a Statewide perspective rather than from an agency perspective.

We also recommend that the Year 2000 Project Office direct State agencies to correct the critical Statewide systems first.

### **AGENCY PRELIMINARY RESPONSE**

The Department of Management and Budget agrees with the recommendations but disagrees that these tasks needed to be completed by the end of September 1997.

The Department informed us that it will inform State agencies of the requirement to develop contingency plans for all mission-critical systems by February 28, 1998; will make an identification of State mission-critical systems by January 31, 1998; and will direct agencies to correct those systems first.

# SUPPLEMENTAL INFORMATION

YEAR 2000 PROJECT OFFICE  
 Status of Key Processes Relative to the U.S. General Accounting Office's Framework  
 To Achieve Year 2000 Compliance  
As of September 30, 1997

<u>Key Processes</u>	<u>Completed</u>	<u>Plans Exist to Complete</u>
Awareness Phase:		
Define the year 2000 problem and its potential impact	X	
Conduct year 2000 awareness campaign	X	
Assess the adequacy of program management capabilities	X	
Develop year 2000 strategy	X	
Obtain support from executive management	X	
Establish year 2000 executive management council	X	
Appoint year 2000 program manager and establish a year 2000 program office	X	
Identify technical and management contacts in core business areas	X	
Assessment Phase:		
Define year 2000 compliance	X	
Focus on core business areas and processes and develop a year 2000 assessment document	X	
Assess the severity of the impact of year 2000-induced failures	X	
Conduct enterprise-wide inventory of information systems for each business area	X	
Develop a comprehensive automated system portfolio	X	
Analyze system portfolio	X	
Prioritize systems and components on a Statewide basis to be converted or replaced		X
Establish year 2000 project teams for business areas and major systems	X	
Develop year 2000 program plan		X
Identify, prioritize, and mobilize needed resources		X
Develop validation strategies, testing plans, and scripts		X
Define requirements for year 2000 test facility		X
Identify and acquire year 2000 tools		X
Address implementation schedule issues		X
Address interface and data exchange issues		X
Initiate the development of contingency plans for mission-critical systems		X
Identify year 2000 vulnerable systems and processes operating outside the information resource management area		X

## Glossary of Acronyms and Terms

contingency plan	In the context of the year 2000 program, a plan for responding to the loss of a system because of a year 2000 problem. In general, a contingency plan describes the steps the organization would take, including the activation of manual or contract processes, to ensure the continuity of its core business processes in the event of a year 2000-induced system failure.
data bridge	Provides translation between the physical data stored on a file and the logical view required by a program.
effectiveness	Program success in achieving mission and goals.
efficiency	Achieving the most outputs and outcomes practical for the amount of resources applied or minimizing the amount of resources required to attain a certain level of outputs or outcomes.
GAO	U.S. General Accounting Office.
interface	A boundary across which two systems communicate. An interface can be a hardware connector used to link to other devices or it can be a convention used to allow communication between two software systems.
mission	The agency's main purpose or the reason the agency was established.

performance audit	An economy and efficiency audit or a program audit that is designed to provide an independent assessment of the performance of a governmental entity, program, activity, or function to improve public accountability and to facilitate decision making by parties responsible for overseeing or initiating corrective action.
reportable condition	A matter coming to the auditor's attention that, in his/her judgment, should be communicated because it represents either an opportunity for improvement or a significant deficiency in management's ability to operate a program in an effective and efficient manner.
software factory	The use of automated tools, standardized processes, and trained personnel for the assessment and remediation of application software.
year 2000 problem	The potential problem and its variations that might be encountered in any level of computer hardware and software from microcode to application programs, files, and databases that need to correctly interpret year-date data represented in a two-digit year format.
year 2000 standards	Standards established for information systems to ensure that they are able to accurately process date data, including, but not limited to, calculating, comparing, and sequencing from, into, and between the twentieth and twenty-first centuries, including leap year calculations.