ED 353 880   HE 026 135

AUTHOR   Walsh, John T.; And Others
TITLE   State University of New York: Further Standardization
                of Administrative Computing Systems at the Campuses
                Could Produce Substantial Savings. Report 92-S-57.
INSTITUTION   New York State Office of the Comptroller, Albany.
PUB DATE   5 Nov 92
NOTE   20p.
PUB TYPE   Reports - Evaluative/Feasibility (142)

EDRS PRICE   MF01/PC01 Plus Postage.
DESCRIPTORS   Automation; *Computer System Design; Cooperation;
                Equipment Standards; Facilities; Higher Education;
                *Institutional Administration; Leadership; Program
                Evaluation; Technological Advancement
IDENTIFIERS   *State University of New York

ABSTRACT
        This study examined the status of a State University
of New York (SUNY) plan to standardize administrative computer
systems and the success of the implementation in light of the
intention to proceed using cooperative leadership rather than an
executive order or policy mandate. The Comprehensive Computer Upgrade
Program (CCUP) aimed to modernize campus mainframe computing
facilities, establish a SUNY-wide data communications network, and
increase standardization of administrative systems. The evaluation
proceeded by interviewing SUNY management, reviewing and analyzing
planning documentation, and analyzing responses from 29 campuses to a
questionnaire dealing with campus development and maintenance of
administrative systems. The evaluation found that SUNY has made
progress in standardizing administrative systems at the campuses.
However, further standardization and cost savings are possible and to
achieve this, Central Administration must provide stronger,
executive-level direction. In particular, the policy of cooperative
leadership has been unsuccessful with four university centers where
few steps have been taken toward standardization and where centers
continue to develop and maintain unique systems. However, the
cooperative leadership has been more successful at the other SUNY
campuses. Appendixes list major contributors to the report and also
provide State Comptroller's notes and the comments of SUNY officials.
(JB)

State of New York
Office of the State Comptroller
Division of Management Audit

STATE UNIVERSITY OF NEW YORK

FURTHER STANDARDIZATION OF ADMINISTRATIVE COMPUTING SYSTEMS AT THE CAMPUSES COULD PRODUCE SUBSTANTIAL SAVINGS

REPORT 92-S-57

Edward V. Regan

Comptroller

State of New York
Office of the State Comptroller

Division of Management Audit

Report 92-S-57

The Honorable D. Bruce Johnstone
Chancellor
State University of New York
State University Plaza
Albany, NY 12246

Dear Chancellor Johnstone:

The following is our report on campus administrative computing systems for the period April 1, 1990 through March 31, 1992.

This audit was performed pursuant to the State Comptroller's authority as set forth in Section 1, Article V of the State Constitution and Section 8, Article 2 of the State Finance Law.

This report was prepared under the direction of John T. Walsh, Audit Director. Other major contributors are listed in Appendix A.

Office of the State Comptroller
Division of Management Audit

November 5, 1992

State University of New York: Further Standardization of Administrative Computing Systems at the Campuses Could Produce Substantial Savings

Scope of Audit

The State University of New York (SUNY) has 29 state-operated campuses and a Central Administration (SUNY Central), which provides executive leadership to the campuses. The state-operated campuses generally have their own mainframe computers and technical support staff to design, maintain and process academic and administrative computer systems. Academic systems support classroom instruction, research and learning. Administrative systems support student registration, accounting, billing and collections and other activities needed to operate the campus. Historically, each campus maintained unique administrative systems despite the common functions performed by the systems.

An effort to standardize administrative systems emerged in the early to mid 1980s through a series of initiatives guided by the SUNY Central Office of Information Technology (Office). For example, in 1985 SUNY embarked on the multi-year, multi-purpose Comprehensive Computer Upgrade Program (CCUP). CCUP's primary goals were to modernize campus mainframe computing facilities, establish a SUNY-wide data communications network, and increase standardization of administrative systems. The Office planned to encourage administrative systems standardization through a spirit of cooperative leadership as opposed to the issuance of an executive order or policy mandating standardization. SUNY plans to complete CCUP by March 31, 1995 at a projected cost of $43.5 million. Our audit addressed the following questions about SUNY Central's efforts to standardize campus administrative computing:

● To what extent has standardization been achieved?

● Has cooperative leadership worked?

Audit Observations and Conclusions

We found that SUNY has made progress in standardizing administrative systems at the campuses. However, further standardization and cost savings are possible. To achieve this, SUNY Central must provide stronger, executive-level direction.

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For example, the policy of cooperative leadership has been unsuccessful with the four SUNY university centers. Although past studies by SUNY have identified numerous areas where administrative systems could be standardized, few steps have been taken to achieve standardization. Instead, the centers continue to develop and maintain unique systems. If the centers were to standardize their administrative systems, we estimate that they could achieve cost savings between $886,000 and $1,477,000 annually. (see pp. 5-7)

The policy of cooperative leadership has been somewhat more successful at other SUNY campuses, but stronger leadership by SUNY Central would help ensure that standardization is achieved to the extent possible SUNY-wide. For example, SUNY Central has not issued executive level policy directives aimed at clarifying a vision for standardizing administrative systems at the campuses. Such directives should set forth the roles, responsibilities, and actions to be taken by the campuses and the Office for establishing standardized administrative systems. Under the current policy of cooperative leadership, the campuses lack the necessary guidance to effectively implement standardized systems and have too much discretion in deciding whether to pursue standardization. (see pp. 5-6)

Comments of SUNY Officials

SUNY officials question the savings that could be achieved by using common systems at the University Centers but state that our recommendation to further standardize campus administrative computing is under consideration.

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Introduction

Background

The State University of New York (SUNY) has 29 state-operated campuses and a Central Administration (SUNY Central), which provides executive leadership to the campuses. The state-operated campuses generally have their own mainframe computers and technical support staff to design, maintain and process academic and administrative computer systems. Academic processing supports classroom instruction, research and learning. Administrative systems enable the campuses to conduct business activities including student registration, accounting, billing and collections. Historically, each campus independently designed, operated and maintained administrative systems despite the common functions performed by these systems.

An effort to standardize administrative systems began in 1982 through a series of initiatives guided by the SUNY Central Office of Information Technology (Office). The Office is the SUNY Central unit responsible for developing computing and telecommunication technology to enhance SUNY's systems. The Office and the campuses formed numerous committees and task force groups to provide advice and assistance in developing a plan to provide needed computer support throughout SUNY.

In 1985, SUNY embarked on the multi-year, multi-purpose Comprehensive Computer Upgrade Program (CCUP). CCUP's primary goals were to modernize the mainframe computing facilities at the campuses, establish a SUNY-wide data communications network, and increase standardization and sharing of administrative systems and resources among the campuses. The Office planned to attain the latter objective not by issuing an executive order or policy mandating standardization, but rather by encouraging standardization through a policy of cooperative leadership.

SUNY plans to complete CCUP during the 1994-95 fiscal year at an estimated cost of $43.5 million. Actual costs as of March 31, 1991 are $28.8 million. SUNY has completed the first phase of CCUP which required SUNY Central and the four SUNY university centers to procure common mainframes. SUNY has also embarked on a second phase which brings campuses together to discuss common mainframes, data base software packages and a standardized Student Information and Campus Administrative System (SICAS) software package. This aspect of CCUP, which is in its third year, is estimated

to last a total of five years. A third and final aspect of CCUP involves the health science centers and specialized colleges. This final phase should begin during the 1992-93 fiscal year.

Audit Scope, Objectives and Methodology

We audited SUNY Central Administration's efforts to standardize administrative systems for the period April 1, 1990 through March 31, 1992. One of the objectives of this performance audit was to determine to what extent SUNY Central achieved standardization of administrative systems. Another objective was to determine whether cooperative leadership has worked. To accomplish these objectives we interviewed SUNY management, reviewed and analyzed planning documentation, and requested and analyzed responses from 29 campuses to a questionnaire dealing with campus development and maintenance of admir.:trative systems.

We conducted our audit in accordance with generally accepted government auditing standards. Such standards require that we plan and perform our audit to adequately assess those operations of SUNY that are included in our audit scope. Further, these standards require that we understand SUNY's internal control structure and its compliance with applicable rules and regulations that are relevant to SUNY operations which are included in our audit scope. An audit includes examining on a test basis, evidence supporting transactions recorded in the accounting and operating records and applying such other auditing procedures as we consider necessary in the circumstances. An audit also includes assessing the estimates, judgements, and decisions made by management. We believe that our audit provides a reasonable basis for our findings, conclusions and recommendations.

We use a risk based approach when selecting activities to be audited. This approach focuses our audit efforts on those operations that have the greatest probability for needing improvement. Consequently, by design, finite audit resources are used to identify where and how improvements can be made. Thus, little audit effort is devoted to reviewing operations that may be relatively efficient or effective. As a result, our audit reports are prepared on an "exception basis." This report, therefore, highlights those areas needing improvement and does not address activities that may be functioning properly.

Internal Control and Compliance Summary

Our consideration of the internal control structure focused on SUNY Central policy for standardizing administrative systems used by the campuses. Our audit identified material weaknesses which are described throughout this report.

Our audit identified no significant instances of noncompliance with relevant laws, rules or regulations.

Response of SUNY Officials to Audit

A draft copy of this report was provided to SUNY officials for their review and comment. Their comments have been considered in preparing this report and are included in Appendix B.

Within 90 days after the final release of this report, as required by Section 170 of the Executive Law, the Chancellor of the State University of New York shall report to the Governor, the State Comptroller, and leaders of the legislature and fiscal committees, advising what steps were taken to implement the recommendations contained herein, and where recommendations were not implemented the reasons therefor.

SUNY Central Needs To Do More To Ensure Effective Standardization of Administrative Systems

According to SUNY Central records, the cost of computing at the State-operated campuses has increased 68 percent over the last five years to a current annual total of $46 million. This trend indicates that SUNY Central should do all that it can to foster efficiency and economy of SUNY-wide computing. One area of concern is the need to standardize administrative systems to eliminate design and maintenance costs associated with operating unique systems for each campus. In fact, industry studies indicate that computer centers can achieve savings in their in-house development and maintenance of systems by procuring standard systems and pooling support resources.

To achieve standardized administrative processing throughout SUNY requires direction from the SUNY Central Office. For example, SUNY Central should have a mission statement that clearly defines the SUNY-wide position in relation to standardizing administrative systems processing. This enables the Office and all the campuses to understand the expectation for the way computing is to take place. Furthermore, SUNY should have an executive level policy and procedure setting forth the roles, responsibilities, and actions to be taken by the campuses and the Office for establishing standardized administrative systems. Such a policy and procedure, initiated from SUNY Central's top management, make it more likely that campuses will phase out the operation of unique administrative systems. In fact, one of SUNY's committees studying standardization identified this particular need early in the CCUP when it reported that the administrative operations and policies of the individual campuses had to be modified to provide for common development and support of application systems. Another necessary SUNY Central action is to develop a conceptual document outlining the proposed functions and design of standardized systems. Thus, all campuses can understand what the standardized system is to entail and can work toward that objective with a common vision.

We found that SUNY Central does not have a mission statement, policy and procedure, or conceptual documentation addressing the standardization of administrative systems. Rather, SUNY Central relies on cooperative leadership to achieve standardization. This means that the Office initiates projects aimed at standardization and encourages joint campus and Office participation to reach this

objective. While cooperative leadership has led to significant results, standardization and its resulting benefits are not being fully achieved. To do so requires stronger, executive-level SUNY Central direct on.

For example, in Phase II of the CCUP, 17 colleges agreed to discuss selection of a common mainframe and data base software package that would support a standard administrative processing system, referred to as the Student Information and Campus Administrative System (SICAS). The standardized SICAS processing was intended to help admit and register students, record student grades, bill and collect student accounts, and schedule classes. SICAS was also intended to provide an interface with general ledger, financial aid and alumni systems. Under the SICAS concept, one SUNY campus would act as a central support center to maintain SICAS and to customize it to meet the unique needs of a particular campus. As a result of this project, 11 campuses did acquire a common SICAS software product from a vendor. Thus, SUNY took a significant step towards standardization. However, in the absence of executive level directives, 6 of the 17 participating campuses chose to either design their own SICAS equivalent system or to convert existing administrative systems to be like SICAS. These unique systems will result in higher costs (e.g., design and maintenance) and will be less functional than the vendor package. Consequently, the objective and intended benefits of standardization were not fully attained.

Moreover, the policy of cooperative leadership has been unsuccessful with the four SUNY university centers. Although past studies done by campus and SUNY Central representatives indicated that efficiencies through standardization were viable for university centers, few examples of such standardization exist. For example, a Task Force identified nine applications as candidates for standardization among the university centers. However, only one common application package was actually purchased. The Task Force also recommended that the university centers address ways to standardize their student records and registration applications. Nevertheless, this never occurred.

In reality, rather than standardizing systems, the centers continue to develop and maintain unique systems in contradiction of CCUP goals. Moreover, the centers are now no longer even committed to using a common database for systems development. Pursuant to CCUP and a previous agreement among the centers, SUNY had obtained a common database package that would reduce costs and permit development of standardized systems in the future. Instead, the centers are considering buying new database software packages which will not allow for the sharing of common systems.

The officials of the centers have indicated that differing management styles preclude the standardization of systems. However, we believe that these differences ought to be overcome in order to achieve savings through standardization. We estimate that these cost savings may total between $886,000 and $1,477,000 annually for the four university centers.

Recommendation

Establish executive level policy directives aimed at standardizing administrative systems at the campuses. Support this policy with an appropriate mission statement for the Office of Information Technology and with conceptual documentation of the design of standardized systems for administrative computing.

Major Contributors to This Report

Jerry Barber, Audit Manager
Linda Miller, Audit Supervisor
Jim Brunt, Auditor in Charge
David Avery, Staff Auditor
Barbara Seeberger, Staff Auditor

Comments of SUNY Officials

SUNY officials question the savings that could be achieved by using common systems at the university centers but state that our recommendation is under consideration.

The full text of the official SUNY response to our draft is included on the following pages. Our detailed notes of clarification are referenced in the margin of the response and are included as Appendix C.

State University of New York

State University Plaza
Albany, New York 12246

Office of the Senior Vic. Chancellor
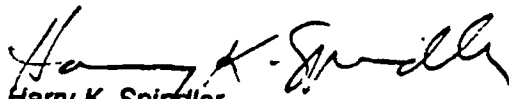Division of Administrative Affairs

October 2, 1992

Mr. John T. Walsh
Audit Director
Office of the State Comptroller
The State Office Building
Albany, New York   12236

Dear Mr. Walsh:

In accordance with Section 170 of the Executive Law, we are enclosing the comments of State University cf New York regarding the draft audit report on *Further Standardization of Administrative Computing Systems at the Campuses Could Produce Substantial Savings, State University of New York (92-S-57)*.

Sincerely,

Harry K. Spindler
Senior Vice Chancellor
Division of Administrative Affairs

Enc.

<u>State University of New York at Binghamton Comments</u>

Effective, efficient and increased use of computing technology at the SUNY University Centers has allowed the campuses to cope with increased administrative workload demands with shrinking staff resources, to maintain academic curriculums which meet educational and accrediting agency requirements, and to respond to the research computing requirements in support of the Graduate Research Initiative (GRI). The audit begins by pointing out a 68% growth in computing expenditures during the past five years (page 4); however, the statement does not break this number into its academic and administrative components. Although we do not disagree with the need to foster efficiency and economy, the computer dollars expended at the University centers have remained level, or decreased during the last three years due to SUNY-wide budget reductions.

Cost savings have been consistently achieved by taking advantage of the economy of scale in sharing a large mainframe processors and related software. Academic requirements must be the first priority for any research university campus. Choosing a computer architecture to solve academic requirements, while also secondarily being capable of administrative processing has allowed the University centers to hold overall computing costs low. For example during 1991-92 administrative computing on the IBM mainframe accounted for only 27% of overall processing . Furthermore, during the last two years usage has increased overall by 41% thus lowering the cost per unit of processing for everyone. This particular strategy adapted by the University centers has kept the total costs low for all campus constituencies.

On page 5 of the audit report it is not specific as to which nine applications the auditors are referring; however, during the past seven years the computing industry has changed dramatically and as a result influenced various software decisions. Some applications which were of high priority in 1985 were no longer required or better handled using micro computers. The strong influence of computer networks has made information on remote machines more accessible to end users with little customized applications code required. The general trend to use smaller, more distributed processors has also influenced today's computer applications. However, the single most influential factor is the rising cost of software maintenance, particularly those operating systems and application packages acquired from commercial vendors. This particular trend has made it difficult for all campuses to participate in various software purchases and has forced some campuses to drop existing software licenses to accommodate flat or declining budgets. Contractual software maintenance costs generally increase 10% to 15% annually, while SUNY's funding resources have not kept pace.

Despite the above limitations some common software does exist among the University centers. All centers run the VM and MVS operating system. CICS is used for transaction processing, TOP SECRET is used for security and common products are used to manage our tape libraries. The most critical common platform is in our SUNY-wide network (SUNYnet) using VTAM. The SUNYnet platform has allowed SUNY-Central to transmit electronically admissions application information to the campuses, saving time, improving

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accuracy, and avoiding expensive mail handling costs. Financial aid processing, of critical importance to our students, is assisted by the common package from SIGMA used at the University centers, and the SUNYnet access to HESC. SUNYnet also provides direct access to Department of Motor Vehicles which supports our law enforcement activities, and direct access to the Department of Labor's employment database which allows all members of our campus community to search employment opportunities.

The largest savings in common procurement among the University centers has been the acquisition of common library catalog, acquisitions, circulation, etc. software. The common base of MVS and CICS made this possible. In 1988 the NOTIS software was purchased for $95,000 per copy. Today individually each license would cost $209,000. A second component MIDAS, which allows access to on-line information databases, was purchased for $80,000 in 1989. Today this would cost $140,000. The contracts with NOTIS also sheltered maintenance fees for the initial three years. The current maintenance fee for NOTIS is $32,450 per year. The University centers' price is $17,000 per year. To further information access, all four University centers are linked to NYSERNet, New York State's high-speed research and education network, using a common networking protocol TCP/IP. NYSERNet has not only allowed our researchers access to facilities such as the Cornell University super computer center, but has allowed sharing of our library databases across the network as well as sharing of other library databases at Universities nationwide. The easy on-line searching of the library database by faculty has facilitated sharing of print literature and assisted in somewhat mitigating increasing costs for library acquisitions. The three NOTIS centers are currently expanding this common platform by jointly developing with NOTIS software to automate interlibrary loan procedures. Library information resources are the essence of excellent research and instructional programs. Current usage demonstrates well over 100,000 library transactions per day at the University centers. The progress in library automation would not have been possible without the underlying common hardware, operating systems and networking tools put in place during the last seven years.

On page 5 the audit report indicates that the cooperative leadership with the University centers has been unsuccessful. The successes achieved would not have been possible without the strong cooperation between the University centers.

The University centers must set their computing priorities focusing on the primary mission of their campuses: instruction and research. Administrative computing resources must support the individual curriculums, degree programs, grading policies, and course requirements at each center. It is important to note that the original transition plan of 1985 listed the various application packages as "candidates" for consideration or action. After detailed analysis, some applications went on to common development or procurement. Others were found to be not suitable. The original 1985 transition task force made recommendations, not finalized decisions. Many recommendations were based on appropriate levels of funding which were not achieved. However, considerable savings have been achieved during the last seven years. The changing nature of the

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computer industry will continue to influence both administrative and academic solutions on the University center campuses.

State University College at Buffalo Comments

During the SICAS review process, the Director of Admissions, Registrar, Bursar, Director of Financial Aid, Director of Budget and Information Services, and various members of their respective staffs attended many presentations conducted by third-party administrative system vendors. They concluded that the customized local systems self-sufficiently supported all of their automated, integrated operational systems.

State University College at Oneonta Comments

We have promoted cooperative computing during the last decade. In concert with many others within SUNY working toward the same goal, the SICAS project was implemented. The SICAS Center is presently located here and serves twelve member campuses. That Center is now in full production, and its benefits are being reaped by the campuses. In the past, when new or revised reporting requirements arose, each of these units had to ask their own programmers to make unique changes. This is no longer the case. These changes are now made at the SICAS Center and distributed to the campuses.

The SICAS Center also serves the function of updating the SCT Banner software with the necessary SUNY-wide changes. If this were not done through "cooperative computing", each campus would, again, have to implement the changes themselves. Thus, another valuable service is being provided.

The Center also makes across-the-board improvements to Banner, saving each campus programming time and labor expense. For example, when it was determined that the Banner reporting from student accounts receivable data fell short of SUNY requirements, a project was initiated under the auspices of the SICAS Center that produced the necessary reports. Those reports were then made available to all campuses.

State University of New York Comments

SUNY has adjusted its CCUP plans and there is to be no third phase targeting the health science centers and specialized colleges (though it is appropriate that some transition funding be made available to these units as they adopt the architecture for Information Technology).

The point is made that SUNY could save $886,000-$1,477,000 annually by using common systems at the University Centers. This number is questionable in that it does not include the cost for coordinating the users (Registrars, Bursars, Alumni Directors, etc.) and the campus deployment of common end-user technology (e.g., query tools, office automation programs, etc.). Most important, we generally only consider maintaining a common

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* See State Comptroller's Notes, Appendix C

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"core" of data and computer procedures across all campuses since the academic programs, hence student information systems, differ among campuses. Thus, even when we acquire a common software package (e.g., the SCT Banner System), we invest a fair amount of energy in "customizing" it for (1) SUNY and (2) for each campus.

We agree that there is merit in ensuring that the University Centers are part of all Institutional Data Systems efforts such as HRMS, Admissions. etc.

Recommendation

This recommendation is under consideration.

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State Comptroller's Notes

1. The SUNY accounting system did not distinguish between administrative and academic computer center costs. Our review of the SUNY records shows that overall computer center costs at the university centers rose from $14.3 million in the 1985-86 fiscal year to $24.2 million in the 1990-91 fiscal year; a 69 percent increase.

2. The nine applications, which we discussed with SUNY officials during the audit, included systems for room scheduling, exam scheduling, advising and degree audit, financial aid, career development, placement, library circulation, inventory control, and residential life housing. At the time of our audit many of these applications, which were candidates for standardization, were still used in a non standardized manner at the university centers. In addition to these nine applications, SUNY analyses also cited the commonality of the campus student record and registration systems which each campus independently designed, maintained and operated.

3. We agree with this observation. Moreover, we believe that through common development of systems, savings in software maintenance can be achieved. As the SUNY colleges have shown, standardized administrative systems can be maintained by a common support center to permit an overall reduction in maintenance costs.

4. With the exception of NOTIS, the referenced common software is used to control and optimize mainframe computer systems and telecommunications as opposed to processing administrative transactions. Also, the response does not address the cost savings that may be obtainable through standardization of university centers administrative software.

5. Our audit did not identify documented analyses invalidating the SUNY studies which cited administrative applications for standardization.

6. We agree that costs would be incurred to coordinate users. However, we believe that regardless of standardization, increased costs for end-user technology are going to result at each campus as users begin to exploit this technology.