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ABSTRACT

Experiences in systems-development for state information systems are summarized for eight pilot-test state agencies, as part of the State Level Information Base project. Attention is directed to the evaluation of information needs; hardware and software choices; survey administration; data organization, storage, and linkages; and staffing considerations. Separate sections for each state describe: the interface between the state agency and the data-providing institutions, the data selected by the agency, major uses of the data, the software and data organization selected by each agency, the hardware choices, and the next developmental steps anticipated in each state. The ranges of developmental costs among pilot-test state agencies are summarized, and caveats related to difficulties in obtaining reliable and informative data on costs are discussed. Appendices provide data on pilot-test state usage of the data as of May 1978. The appended charts and tables identify data used by the state agencies, including for each data category: level of aggregation, indication of whether the data are computer accessible, and type of institution. The tables also indicate the major functions or activities of the agencies, including responsibility for federal reporting, long-range planning, and involvement in budgeting. (SW)

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Postsecondary-Education Information Planning at the State Level

Five documents have been published as a result of the State-Level Information Base project under the general title of *Postsecondary-Education Information Planning at the State Level.* The specific documents are as follows.

Overview. The *Overview* briefly describes the project's purpose, history, and results.

Planning Guide. The *Guide* provides a context for understanding the major environmental and procedural factors influencing the development of state-level information systems. Specifically, it discusses assessment of the developmental environment (agency authority and role, institutional concerns), selection of a procedural approach to information-system planning, assessment of information needs generally, selection and evaluation of specific data elements, and assessment of resource requirements (staffing, computer and systems support, institutional costs).

Selection of Data to Address Planning Issues. As a companion to the *Planning Guide,* this document provides a framework for reviewing common state-level planning issues, the questions that focus analysis on those issues, and the general data requirements associated with the more common questions and analyses. The document includes a section summarizing references to applicable data sources (in either published or machine-readable format), including, when possible, descriptions or examples of these sources. The Glossary section of the document contains standard data definitions and suggested categories for collecting and presenting data.

Pilot-Test State Case Studies. The *Case Studies* describe the background and functions of each of the eight pilot-test state agencies, its approach to information systems, and its planning responsibilities (comprehensive planning, budgeting, program review). Each agency's data set is also described, and each state's information-system costs are summarized. This document also discusses attempts to develop state-level information about adult/continuing education in two pilot-test states and about educational outcomes in two others.

Systems-Related Experiences in Eight Pilot-Test States. As a companion to the *Case Studies,* this document describes pilot-test state experience with systems development, including evaluation of information needs, hardware and software choices, survey administration, staffing considerations, data organization, and data storage and linkage considerations. The ranges of developmental costs among pilot-test state agencies are summarized, and caveats related to difficulties in obtaining reliable and informative data on costs are discussed.

This report has been produced as part of a project supported by the W.K. Kellogg Foundation of Battle Creek, Michigan, with supplemental funding from the National Center for Education Statistics.

Postsecondary-Education Information Planning at the State Level

Systems-Related Experiences in Eight Pilot-Test States

Anahid Katchian

1979

National Center for Higher Education Management Systems
P.O. Drawer P Boulder, Colorado 80302
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COMMENTS FROM THE PILOT-TEST STATES

For Those Who Follow

The documents provided by the State-Level Information Base project represent the individual experiences of the eight states that have attempted to establish a common methodology for collecting, displaying, and using information with the project's issues and data framework as a guide.

In the course of implementing or upgrading our individual state-level information systems over the last three years, we have learned that inter- and intrastate data comparability, while a worthwhile objective, is occasionally an administrative quagmire. Goals that appeared to be theoretically possible and administratively reasonable often proved to be elusive when placed in a practical setting.

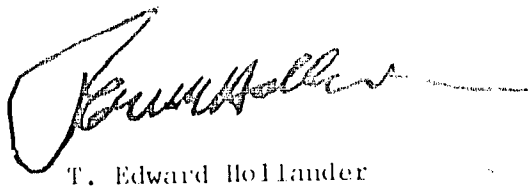
During the course of our efforts we have reported our findings to the project Task Force, the Participant States Group, and NCHEMS staff. Modifications have been made in the earlier documents to incorporate our changing thoughts. These documents accurately reflect our experiences, emphasizing the value we have found in implementing the project's concepts while providing cautions regarding the occasional pitfalls we have encountered.

It is important for the reader to understand that each of our states has derived different but important benefits from the concepts represented in the documents. Organizational, political, and economic constraints precluded "successes" in some areas in spite of the dedicated work of our institutional colleagues and our support staff. That we have achieved our results in different ways should be viewed as one of the more important outcomes of the project and as evidence of our collective feeling that no magic solutions exist in the area

of information-based state-level planning. The existence of the project documents and other services will not end all data ills but can, however, substantially aid states contemplating implementation of a statewide information system to support state level planning responsibilities.

We convey the project documents to you with the hope that you will profit from our experiences, and we trust that you will join us in sharing the insights you gain in implementing the project's concepts with those who follow.

Patrick Callan
Executive Director
California Postsecondary Education Commission



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New Jersey Department of Higher Education

Fujio Matsuda
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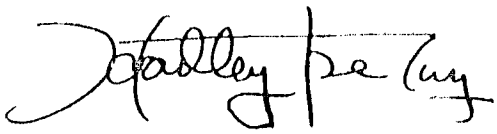

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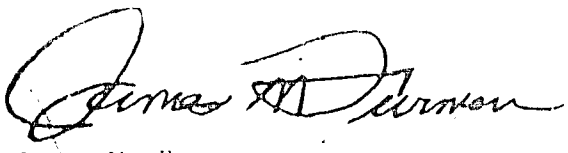
Deputy Commissioner for Higher and Professional Education
New York State Education Department



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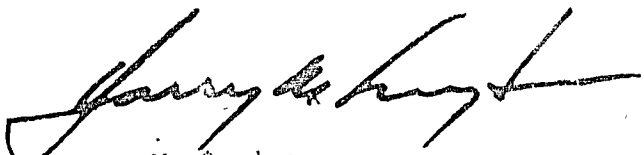

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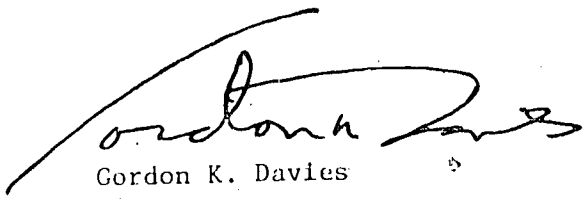

Gordon K. Davies
Director
The State Council of Higher Education for Virginia

PREFACE

The State-Level Information Base project was initiated in July 1975 with funding from the W. K. Kellogg Foundation to assist state-level planners in postsecondary education with their information needs. The project since then has developed a set of services to guide information-system planners in the development and maintenance of information systems to support postsecondary-education planning at the state level. Differences among state-level postsecondary-education agencies in their responsibilities and analytical requirements are extensive. Therefore the project documents are designed to serve as reference frameworks from which each state can develop a more tailored approach.

In order to respond to the range of responsibilities and to the data intensity of various approaches among the postsecondary-education agencies at the state level, the project has developed five published documents (described on the inside cover), a program of staff assistance, and a series of topical and general workshops.

The five documents published as a result of the State-Level Information Base project are:

1. Postsecondary-Education Information Planning at the State Level: Overview

2. Postsecondary-Education Information Planning at the State Level: Planning Guide

3. Postsecondary-Education Information Planning at the State Level: Selection of Data to Address Planning Issues

4. Postsecondary-Education Information Planning at the State Level: Pilot-Test State Case Studies

5. Postsecondary-Education Information Planning at the State Level: Systems-Related Experiences in Eight Pilot-Test States

The Overview document briefly describes the project's purpose, history, results, the other four documents, and the availability of project-supported assistance to interested state-level planning agencies. Planning Guide and Selection of Data to Address Planning Needs are companion documents that provide overall planning concepts and a supporting framework for states considering the development of a postsecondary-education information system at the state level. Pilot-Test State Case Studies and Systems-Related Experiences in Eight Pilot-Test States are companion documents that describe the specific environmental and procedural factors related to the development of information systems in the pilot-test states during the first three years of the project.

A program of staff assistance allows interested states to draw on both project staff and pilot-test state staff for direct assistance in such areas as: (1) the initial consideration of information-system requirements, (2) the development of a plan and process for implementing the system, and (3) technical assistance in the design of data-processing support and enhancements. Project-sponsored or cosponsored workshops address topics related to current postsecondary-education planning responsibilities at the state level, with an emphasis on those that are particularly data intensive. Published monographs document the proceedings of these workshops. The use of pilot-test state staff to assist new states and the sponsorship of workshops bringing state-level planners together on topics of common interest are both intended to promote a network for communication among state-level planners and information-system developers that will continue after the project is officially completed.

Developmental History

The State-Level Information Base project was initiated in 1975 under terms of agreement from the W. K. Kellogg Foundation. The high level of interest of the Foundation's program director, Dr. Peter R. Ellis, allowed the project to evolve in a way that assured maximum sensitivity to differing state-level needs. The entrance of the National Center for Education Statistics (NCES) into the project in 1976 allowed the scope and the depth of the project to be increased. A federal component of the State-Level Information Base project (the Federal Data Core project) was initiated to help NCES reevaluate federal data needs related to postsecondary education. NCES support also provided for special state-level efforts in determining data requirements dealing with educational outcomes and adult- and continuing-education planning. The depth of the project was increased through NCES support by the addition of three general pilot-test states and by further support for the direct staff-assistance portion of the dissemination effort.

The primary review group for the project was a Task Force composed of representatives of each of the eight pilot-test agencies, four representatives

of postsecondary institutions, and two representatives of other state-level agencies with an interest in postsecondary education. The Task Force was assisted in its review by a Participant States Group composed of representatives of all postsecondary-education agencies at the state level that expressed interest in the project but had not been selected as pilot-test states. One member of the Participant States Group was selected by the group to serve as a liaison to the Task Force.

The pilot-test states were selected in the first two months of the project. Each state higher-education executive officer was invited to express interest in pilot-test participation. Selection of pilot-test states from those responding was based on several factors, including size, geographic location, authority, and status of management-information-system development. The initial five pilot-test states were California (California Postsecondary Education Commission), Hawaii (University of Hawaii), Illinois (Illinois Board of Higher Education), Kentucky (Kentucky Council on Higher Education), and New Jersey (New Jersey Department of Higher Education). The three other states that were added when NCES entered the project in 1977 were New York (Office of Higher and Professional Education of the New York State Education Department), South Carolina (South Carolina Commission on Higher Education), and Virginia (The State Council of Higher Education for Virginia).

The first year of the project was spent conducting a survey of state-level planning functions and data-collection activities. From that survey, the staff proposed a preliminary data set for review by the Task Force and Participant States Group. The review resulted in some reduction in the total size of the data set and the addition of an issues framework intended to ensure that proposed data collection in any state would be justified in terms of real state-level issues and decision requirements. Also in the first year, the first edition of the State Postsecondary Education Profiles Handbook was developed and distributed in cooperation with the Education Commission of the States (ECS) and the State Higher Education Executive Officers (SHEEO). The document provided a basic set of characteristics on each state that included a description of the organizational structure of postsecondary education and the functions of the statewide coordination and/or governing agency, a summary of basic descriptive statistics, and an inventory of state-based research studies.

The second year of the project saw the addition of NCES support (initiation of the federal component of the project, three more general pilot-test states, and special data analyses in the areas of educational outcomes in two states and adult and continuing education in two other states). Also during the second year, the second edition of the State Postsecondary Education Profiles Handbook was published, and field-review editions of the State-Level Information Base project's preliminary documents, presenting the initially defined planning issues and data set, were widely circulated for review.

Twenty copies of the draft documents were sent to each pilot-test state for review by state-level personnel and institutional staff. Six hundred copies were sent to individuals on the NCHEMS general distribution mailing

list, a list comprised mainly of institutional administrative personnel. An additional 500 copies were mailed to a selected list of reviewers, including all state higher-education agencies, other state-level postsecondary-education systems, relevant national associations, state budget offices, and selected legislative staff offices. During the review period, the project staff also met directly with staff and committees of such organizations as the State Higher Education Executive Officers (SHEEO) and the National Association of College and University Business Officers (NACUBO) to promote and accomplish the review process.

The third year of the project was devoted to a synthesis of the pilot-test experience and field-review results into drafts of the final project documents. The pilot-test phase in each of the states was completed, and documents were drafted for Task Force consideration. The Federal Data Core project's field-review drafts were circulated for review, and final linkages were made between the Federal Data Core project and the State-Level Information Base project regarding data-reference aspects of the final documents.

The fourth year of the project provided for completion and distribution of project documents and for initiation of on-site staff assistance and topical workshops. The combination of project documents, direct staff assistance, and workshops helped to promote a network for communication among state postsecondary-education planners and information-system developers so that support activities and the exchange of ideas can continue beyond the end of the funded portion of the project.

Evolution of Project Activities and Services

When the project was initiated in the summer of 1975 the objectives were:

- To develop an information base designed to support state-level planning and decisionmaking, including a standardized data set and standardized support software with the capability for interstate access
- To pilot test and install this information base in selected states
- To assist states in the implementation of the information base by training staff in its maintenance and use

As the impact of diverse state-level planning needs and approaches became clear, it became necessary that the project reflect the following changes in focus:

- From one of a standardized information base and supporting software, to the development of an adaptable and flexible data-assessment framework with individual states making their own software choices based in part upon pilot-test state experience

- From states having direct computer access to the information systems in other states, to promotion of the exchange of profile information among interested states after specific issues have been identified and specialized definitions and procedures have been developed

- From generalized cost-estimating procedures regarding the development of information systems, to cost summaries drawn from pilot-test state experience

- From the definition of an all-encompassing data universe to support state-level planning, to the definition and analysis of the decisionmaking requirements associated with common postsecondary-education issues as the basis for data selection

- From a concentration on state-level planning decisions only, to a consideration of federal planning issues, to coordination of definitions and data descriptions in areas of overlap between the state and federal data-reference documents, and to an increasing emphasis on the need for institutional involvement and consideration for institutional capabilities

The pilot-test state involvement began with the concept of installing a standardized information base and testing a standardized data set and supporting software. Their involvement then shifted to include a dissemination process as well as an evaluative process by:

- Promoting the development of new ideas and the exchange of state experiences with information systems

- Encouraging the evaluation of existing data collection and the selection of only that data needed for planning and decisionmaking needs

- Emphasizing the importance of managing data in a data-base management sense by developing an awareness of the data-integration needs within an information system

- Promoting the coordination of federal/state data needs that evolved from the State-Level Information Base project and the closely related Federal Data Core project

The pilot-test states' experiences and evaluations led to:

- Modifications to the preliminary list of common issues and related data needs

- Development of summary conclusions and recommendations regarding the overall methodology for developing information systems

- Recommendations that the project's dissemination process include workshops on specific topics of interest to the participants--thus serving the dual objectives of promoting improved state-level planning and promoting the use of State-Level Information Base project results

The final documents have been through an extensive review process that has included comments received from the national field review of the preliminary documents, the project Task Force, pilot-test states, Participant States Group, and the NACUBO Financ Management Committee and internal NCHEMS staff review.

ACKNOWLEDGMENTS

The State-Level Information Base project benefited substantially from the participation of many individuals during its three years of development. Any attempt to list all who contributed would inevitably and unintentionally suffer from important omissions. The project staff hopes that those who participate, but are not mentioned here, will understand our limitations and accept our appreciation.

Project Task Force and Pilot-Test State Representatives

As mentioned in the Preface, the primary review group for the project was a Task Force composed of representatives of the pilot-test states, of other interested state-level agencies, and of public and private postsecondary-education institutions. Task Force participation was a sensitive and time consuming responsibility, and each of the members deserves special recognition for service rendered. The members were:

Thomas Braun
Deputy Executive Director
for Administration
Kentucky Council on Higher Education

Charles A. Brooks, Jr.
Coordinator of MIS Computerization
South Carolina Commission on Higher
Education

Richard Dunn
Executive Budget and Management
Officer
Wisconsin State Department of
Administration

Frederick R. Ford
Executive Vice President and
Treasurer
Purdue University

William Fuller
Executive Director
Nebraska Coordinating Commission
for Postsecondary Education

John Harrison
Associate Director for Administration
California Postsecondary Education
Commission
Horace Crandell, Higher Education Specialist at the California Postsecondary Education Commission, preceded John Harrison as the California pilot-test state representative.

Adolph Katz
Director
Office of Planning and Research
New Jersey Department of Higher
Education
J. Bruce Robertson, currently Commissioner of Higher Education for the State of Missouri, preceded Adolph Katz as the New Jersey pilot-test state representative.

Stephen W. Keto
Chief Fiscal Officer
Idaho Office of the State Board of
Education

James McGovern
Associate Director
Illinois Board of Higher Education
David Nyman, currently with Deloitte, Haskins, and Sells, and Paul Lingenfelter, Associate Director for Fiscal Affairs of the Illinois Board of Higher Education, both preceded James McGovern as the Illinois pilot-test state representative.

J. Michael Mullen
Assistant Director
The State Council of Higher Education
for Virginia

Larry H. Litten
Coordinator
Institutional Research
Carleton College

Joseph A. Malik
President
Grays Harbor College

Jane Ryland
Director
SHEEO/NCES Communication Network
Liaison representative from the
Participant States Group
Norman Fischer, Institutional Research Analyst for the Washington Council on Higher Education, preceded Jane Ryland as Participant States Group liaison representative to the Task Force.

Kenji Sumida
Director of Finance
University of Hawaii

Robert Wetnight
Vice President for Finance
Western Michigan University
Robert O. Benfield, currently Vice President for Fiscal Affairs at Texas Women's University, preceded Robert Wetnight as a Task Force member.

Richard E. Willey
Budget Analyst
Pennsylvania House Appropriations
Committee

Paul Wing
Coordinator Postsecondary Research,
Information Systems and Institutional Aid
New York State Education Department

Peter Woodberry
Postsecondary Education Specialist
Rhode Island Department of Education

Ex Officio

Curtis O. Baker
Acting Head, Systems Design and
Methodology Section
Systems Design and Analysis Branch
National Center for Education Statistics
Katherine Hallman, currently with the Office of Federal Statistical Policy and Standards, preceded Curtis O. Baker as the NCES ex officio representative to the Task Force.

Participant States Group

The second advisory group for the project, composed of representatives of state postsecondary-education agencies and other organizations interested in project developments and results, also played an important role during the developmental phase. Since the group represents a large number of potential users of the project results, members of the Participant States Group (PSG) were especially valuable in assessing the relevance and utility of alternative approaches considered by the project staff and the Task Force. The PSG met the day before each Task Force meeting and presented its advice to the Task Force through a liaison representative.

The following state-level agencies and other interested groups were represented at one or more meetings of the PSG:

ALABAMA

- Alabama Commission on Higher Education

COLORADO

- Colorado Commission on Higher Education

CONNECTICUT

- Connecticut Commission for Higher Education

FLORIDA

- State University System of Florida
- Department of Education, Division of Community Colleges

GEORGIA

- University of Georgia
- Georgia Board of Regents

IDAHO*

- Idaho Office of the State Board of Education

INDIANA

- Indiana Commission for Higher Education

IOWA

- Iowa Coordinating Council for Post High School Education
- Iowa State Board of Regents

KANSAS

- Kansas Commission for Postsecondary Education
- Kansas Board of Regents

LOUISIANA

- Louisiana Board of Regents

MARYLAND

- State Board of Higher Education

MICHIGAN

- State Department of Education

MINNESOTA

- Minnesota Higher Education Coordinating Board
- Minnesota State College Board
- State Department of Finance and Information Systems

MISSISSIPPI

- Board of Trustees of State Institutions of Higher Learning

MISSOURI

- Missouri Department of Higher Education

MONTANA

- Montana University System

NEBRASKA*

- Nebraska Coordinating Commission for Postsecondary Education

NEW MEXICO

- New Mexico Board of Educational Finance

NEW YORK*

- New York State Education Department

NORTH DAKOTA

- North Dakota State Board of Higher Education

OHIO

- Ohio Board of Regents

OKLAHOMA

- Oklahoma State Regents for Higher Education

OREGON

- Oregon Educational Coordinating Commission

* Became a pilot-test state during second year of project.

PENNSYLVANIA

- Higher Education Office of the Pennsylvania Department of Education

RHODE ISLAND*

- Rhode Island Department of Higher Education

SOUTH CAROLINA*

- South Carolina Commission on Higher Education

TENNESSEE

- Tennessee Higher Education Commission

TEXAS

- Texas College and University System

VIRGINIA*

- Virginia Community College
- State Council of Higher Education for Virginia**

WASHINGTON

- Washington Council on Higher Education

WEST VIRGINIA

- West Virginia Board of Regents

WISCONSIN

- The University of Wisconsin System

Other Interested Groups

- Education Commission of the States
- National Association of Independent Colleges and Universities
- Southern Regional Education Board
- Western Interstate Commission for Higher Education

Pilot-Test States

Eleven states were involved in the pilot-test of project results. Eight of these were considered general pilot-test states in that they worked with the overall information requirements of state-level postsecondary agencies. Five of the eight, California, Hawaii, Illinois, Kentucky, and New Jersey, were involved from the beginning of the project. Three others, New York, South Carolina, and Virginia, were added during the second year.

Three other states were considered to be focused development pilot-test states in that they were primarily concerned with the information requirements associated with particular issues. Concentrating on information related to adult- and continuing-education planning were Idaho and Nebraska. Concentrating on state-level outcomes analysis were Hawaii (which was also a general pilot-test state) and Rhode Island.

* Became a pilot-test state during second year of project.
** The State Council became the pilot-test state agency.

The states and participating agencies were:

General Pilot-Test States

CALIFORNIA

- California Postsecondary Education Commission

HAWAII

- University of Hawaii

ILLINOIS

- Illinois Board of Higher Education

KENTUCKY

- Kentucky Council on Higher Education

NEW JERSEY

- New Jersey Department of Higher Education

NEW YORK

- New York State Education Department

SOUTH CAROLINA

- South Carolina Commission on Higher Education

VIRGINIA

- The State Council of Higher Education for Virginia

Focused Development Pilot-Test States

Adult and Continuing Education

IDAHO

- Office of the State Board of Education

NEBRASKA

- Coordinating Commission for Postsecondary Education

Outcomes Analysis

HAWAII

- University of Hawaii

RHODE ISLAND

- Department of Education

The role of a pilot-test state in this project involved more than testing the work of project staff. Each state-agency representative participated fully in project design and development through direct contact with staff and through membership on the project task force. All users of project results owe a debt of gratitude to the 11 pilot-test state representatives for the time they spent and for the quality of their contributions.

The name of the lead representative from each state is included in the list of project Task Force and pilot-test state representatives. Many other pilot-test agency staff participated in the project-related work in their agencies. Notable among them were Raleigh Awaya, Director of the Management Systems

Office at the University of Hawaii; Rose Bowman, Program Administrator, and Cliff Trump, Deputy Director for Academic Planning with the Office of the State Board of Education in Idaho; Steve Sabin, Assistant Director of the University of South Carolina Computer Services Division; and John Wittstruck, Coordinator of Information Systems with the Nebraska Coordinating Commission for Postsecondary Education.

Other Contributing Organizations

One of the objectives of the State-Level Information Base project is to promote linkages and a network for communication among all national and regional organizations interested in state-level planning and information systems. A network for communication is a process that requires a mutual exchange of effort, and six organizations deserve special recognition for their support of project activities.

The SHEEO/NCES Communication Network (a project of the State Higher Education Executive Officers sponsored by the National Center for Education Statistics) through its director, Jane Ryland, not only played a major role in Task Force and Participant States Group deliberations, but also served as a regular communication channel with the state coordinating and governing boards--the primary audience for the project. The Network also presents a strong opportunity for continuing dialogue among states about planning-related information requirements after the funded portion of the project is completed.

The Education Commission of the States (ECS) has been cosponsor of the State Postsecondary Education Profiles Handbook together with NCHEMS and SHEEO. Special mention should be made of Dr. John Folger, Dr. Richard Millard, and Nancy Berve, all of ECS, for their efforts on the compilation of the Handbook. The Handbook provided a timely and thorough review of the data references suggested in the Selection of Data to Address Planning Issues document and on project descriptions of costing as a data-intensive, state-level planning activity.

The National Association for College and University Business Officers (NACUBO), through its Finance Management Committee (formerly entitled the Costing Standards Committee) and the efforts of NACUBO staff member K. Scott Hughes, provided a timely and thorough review of the data references suggested in the initial project documents and the final document entitled Selection of Data to Address Planning Issues. They also reviewed project descriptions of costing as a data-intensive, state-level planning activity.

The National Association for Independent Colleges and Universities (NAICU) is developing a statement of useful state-level planning information for independent higher education. Dr. James Olliver and Dr. Virginia Fadil, codirectors of the State-National Information Network (SNIN) project, have kept in close touch with the results of the State-Level Information Base project as those results related to independent higher education in ways similar to those offered by the SHEEO/NCES Network for state higher-education agencies.

The Southern Regional Education Board (SREB) has supported the State-Level Information Base project both by cosponsoring a workshop on enrollment planning and by advising project staff on processes and uses for interstate comparative information. SREB, through the efforts of Dr. E. F. "Tex" Schietinger, Director of Research, Dr. James R. Mingle, and Dr. David S. Spence, both Research Associates, represents the best working example of interstate exchange of postsecondary-education planning information observed by the project staff during the course of the project.

The Western Interstate Commission for Higher Education (WICHE), in addition to being the parent organization of NCHEMS at the time the project began, has cooperated with project staff in reviewing data requirements associated with state-level program review including cosponsorship of a project planning workshop on the subject. Dr. Richard Jonsen and Dr. Lilla Engdahl have worked closely with the project staff in the design and implementation of a WICHE project that surveys graduate programs and program-review practices in the western states.

NCHEMS Staff

During the four years of the State-Level Information Base project, many current and former NCHEMS staff members have been directly involved in project activities.

To Dr. Melvin Orwig and Dennis Jones goes credit for shaping the early stages of the project and for guiding the general course of all project activities during its four years. To Dr. Nancy Renkiewicz, the initial project director, goes credit for organizing the activities that first brought the proposal to life. To Marilyn McCoy goes credit for her contributions to project results through major authorship of the State-Level Information Base Field Review and Overview documents, and through her leadership of the Federal Data Core project, a federal-level activity and complementary to the State-Level Information Base project. Dr. Sidney Micek was the activity leader for the focused development work on state-level educational outcomes analysis, and Dr. Roger Sell led the staff work on adult and continuing education. To Ellen Cherin goes thanks from all project staff for her coordination of project documentation.

Other former and current NCHEMS staff members who have contributed to the development of the project are Richard Allen, Kathy Allman, Dr. Kent Caruthers, Mark Chisholm, Michael Haight, Dr. Edward Myers, Dr. James Topping, and Dr. Robert Wallhaus.

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I.

INTRODUCTION

The State-Level Information Base project, funded by the W. K. Kellogg Foundation and the National Center for Education Statistics (NCES), has had as one of its main tasks the analysis of postsecondary-education data used at the state level. The data analyzed were identified during the developmental phase of the project.[1] Eight states were selected to participate as pilot-test states (California, Hawaii, Illinois, Kentucky, New Jersey, New York, South Carolina, and Virginia). Testing encompassed each state's selection of data, based on required planning needs and modification of those data elements and definitions where necessary. The pilot-test experience demonstrated the diverse needs of the states and prompted the project task force and staff to develop a data-set selection framework instead of a standard data set. This allows each state to select the particular data most suited to its planning responsibilities. The data-selection framework uses current postsecondary-education issues at the state level as its frame of reference, a choice intended to (1) recognize that the best chance for commonality of information among states lies in recognizing the commonality of issues among states and (2) emphasize the importance of grounding year-to-year decisions regarding information system size and scope in each agency's analytical agenda.

1. These data were specified in the following field review document: Jones, Dennis P.; Katchian, Anahid; McCoy, Marilyn; and Orwig, Melvin D. State-Level Information Base. Technical Report 85. Boulder, Colo.: NCHEMS, 1977. The final data framework is included in the reference document entitled Postsecondary Education Information Systems at the State Level: Selection of Data to Address Planning Needs.

Purpose/Audience

This document presents the experience of eight state postsecondary-education-planning agencies with the systems-related side of information-systems development. It is intended as a source of experience-based guidance to those members of the information-systems planning staff most concerned with selecting hardware and software components of the system and with designing data collection and editing procedures. It also serves as a source of background information about systems considerations for all persons concerned about information-system planning generally.

The document is divided into two major parts. The first describes the systems-related dimension of the individual pilot-test experiences. The second addresses process and cost considerations drawn from the pilot-test experiences. Together, these two emphases stress the importance of thoughtfully selecting from many experiences with systems-related activities rather than directly adopting any standard solution.

II.

EXPERIENCES IN EACH PILOT-TEST STATE

General Description

Major differences among the pilot-test state agencies in developmental environment and practice are reflected in the case studies that follow. Among the more significant environmental influences are differences in (1) the degree of governance versus coordination exercised by the agency, (2) the data-intensity of the agency's approach to its analytical responsibilities, and (3) the size and scope of the state's enterprise. Examples of significant differences in practice include differences in the degree of reliance on state-specific surveys versus summaries of HEGIS data and reliance on analysis versus reporting of data.

So that different state experiences can inform the reader, each state will be summarized in the same way. Separate sections will describe (1) the interface between the state agency and the data-providing institutions, (2) the data selected by the agency, (3) major uses of the data, (4) the software and data organization selected by each agency, (5) the hardware choices, and (6) the next developmental steps anticipated in each state.

Throughout this document and each of the others through which the State-Level Information Base experience has been described, great emphasis is placed on maintaining a positive, informed climate surrounding all information-system design and development activities. Formal arrangements for user-involvement (such as advisory committees) are described, and a spirit of partnership between data provider and data user is promoted.

The state-by-state descriptions of the pilot-test experience with systems-related requirements follow.

California

The California Postsecondary Education Commission (CPEC) has a mandate from the state legislature to be a clearinghouse for information about postsecondary education. The Commission is also charged with conducting the long-range planning process for California postsecondary education and maintaining comparable data across the segments of institutions.

Postsecondary-education institutions in California are composed of five segments. The three public segments are (1) the University of California, (2) the California State University and College System, (3) the Community College System. Each of these segments is governed or coordinated, to some extent, by its own board or central office. Each segment maintains its own extensive information system to meet its own institutions' needs. The independent colleges and universities and the private (career) postsecondary institutions are represented by their respective state-level associations that collect some--but not extensive--data from member institutions.

Institutional Interface

The Commission is empowered to request specific data about institutions from the three public segments, but the independent and private segments also cooperate. The Commission maintains data from over 500 public and independent institutions. All requests for data are made via the central or association office of each segment; the Commission does not interact directly with institutions.

Technical advice on data selection and information systems proposals is provided to the Commission by the Technical Advisory Committee on the Development of Information Systems. This group consists of a representative from each of the five segments, from the Department of Education, the Department of Finance, the legislative analyst's office, and the State Student Aid Commission. This technical committee was instrumental in advising the Commission's staff on development of a dictionary for the terms used in the information-collection program.

The Data

The Commission, with the advice of the technical committee, has developed a set of data requirements that has provided the information basis to meet its planning and clearinghouse functions. In all cases, the selection of data has been based on three criteria:

- There must be a demonstrated need for the data
- The data must serve as an accurate indicator of an important activity or condition
- The data must be definable in a fashion that permits meaningful comparisons among higher-education segments

The information system maintained by the Commission includes:

- HEGIS data (Selected surveys are automated and available from 1975.)
- Academic and occupational program information--used as an inventory of offerings
- Inventory of off-campus centers and programs
- EEO-6 Survey Data
- Student enrollments (One record is maintained for each student enrolled in any public or selected independent institution. Each record contains the student's institution, major, level, sex, age, ethnicity, enrollment status (first-time/transfer/continuing/returning), full- or part-time status, credit load, residency, and degree type.)
- Student graduates (One record is maintained for each student earning a degree from a public or selected independent institution. Each record contains the student's institution, major, degree, sex, age, ethnicity, and residency.)

The Uses of the Data

From this base of data, the Commission has been able to provide the types of information required by the principal users of the information system--legislature and the executive branch--usually in the form of reports to meet special needs, including one-time requests arising out of special studies.

In addition to meeting the needs of the legislature and the executive branch for prompt information, the Commission has established a series of regular publications which are distributed widely. These include:

- The Information Digest, which summarizes many quantitative aspects of the condition of postsecondary education in California (written for the layperson)
- Directory of Colleges and Universities, which contains information about California's institutions (of particular interest to students and counselors)
- Inventory of Academic and Occupational Programs, which describes institutional programs and where and at what level they are available

- Inventory of Off-Campus Centers and Programs, which describes off-campus offerings

Software and Data Organization

Almost all data maintained by the Commission are automated. Where surveys are the collection medium, the data are automated and maintained as one file per survey, per year. Where data are collected in machine-readable form (for example, the enrollment and student graduate records), they are maintained as one file per year.

A number of proprietary data-base management systems have been available at the computer center used by the Commission. However, after evaluating the potential costs of computer processing overhead and additional maintenance staff, the decision has been to employ primarily specially written programs.

Most of the programs have been written in COBOL either to perform data entry/loading functions or to produce standard reports. The majority of information included in the Directory of Colleges and Universities, the Information Digest, and the Inventory of Academic and Occupational Programs is generated from these programs.

The Commission has been using the Table Producing Language (TPL) for much of the quick data retrieval needed for ad hoc requests. TPL is a set of table-producing data-retrieval programs available from the U.S. Bureau of Labor Statistics. The flexibility and simplicity of TPL are well-suited to the ad hoc query; COBOL is used for custom and regular reporting.

Hardware

The Commission uses the IBM 370/168 provided by the Teale Data Center. A DATA 100 Remote Job Entry (RJE) terminal has been installed at the Commission to provide batch access to the central computer. Survey data, keypunched to cards, are entered into the system using the RJE.

Next Steps

The Commission's data needs will continue to be oriented toward development of longitudinal data to address postsecondary-education policy issues at the state level. Any growth in the data set will be driven partly by its own five-year planning process and in part by other agendas in the legislative and executive branches.

The information-system staff plan to continue exploring ways of analyzing and displaying the data that will improve its responsiveness to external requests and to Commission staff demands. That is not expected to require substantial growth in either the data set or the analytical software associated with the system.

In Hawaii, a single board of regents oversees the governing of a public higher-education system that includes one university, two liberal-arts colleges, and seven community colleges. Three private institutions, with a combined enrollment of less than 4,000 students, are not included in the Regents' authority or in the system's information base.

The Hawaii system is therefore unique among the pilot-test states in that greater detail is maintained than is usually encountered in state-level agencies. This is particularly true because the information systems of the campuses and of the central office are combined. The central office of the Board of Regents also serves as the state-level agency in Hawaii.

Institutional Interface

Information processing for each campus is administered by the system's single Management Systems Office (MSO). The MSO maintains operational files for each campus on students, faculty, finances, courses, facilities, and admissions. Because of the operational nature of the data, these files are detailed with records for individual students, staff, financial transactions, courses, and physical-facility units.

Each campus receives a Management Information Folder, which contains summaries of its data--both recent and trend. In addition each campus has information on the availability of MENU, the interactive system for information retrieval, including how to use it, and what types of additional reports/requests MENU or the systems office can provide.

While the summary reports in the Management Information Folder reflect data most frequently used about an institution, there are many situations that require special reporting. MENU can be used by campuses to retrieve their own data. For example, there are many occasions when information for a campus is needed in more detail, with different aggregations, or with combined measures other than those provided in the Folder. On these occasions, the campus analyst uses MENU to directly access and organize the data in the form or level of detail desired.

The MSO staff provides training and documentation in the use of MENU for accessing the data by any campus. Within a campus, participants range from chancellors and deans to clerks. The number of staff members able to access the system is increasing in number and is expanding with regard to the types of functions served.

The Data

The Management Systems Office maintains detailed operational data for each campus. Because of the detailed nature of the system, few new data elements have been added. Those additions that have been made are primarily for external purposes (for example, federal reporting) rather than for the

operational or internal planning needs of the system. Special studies requiring data not included in the system are conducted by the interested user.

The Uses of the Data

There are five principal users of the data. The University system offices use the data for all the operational needs of the University, including payroll, student registration, and finance and accounting. The campuses use the data as presented in the Management Information Folder and as accessed through MENU as background for campus planning and management decisions and as source data for a variety of institutional research activities. The Hawaii Postsecondary Education (1202) Commission uses the information as background for the public portion of its responsibilities to conduct long-range planning for public, private, and proprietary education in the state. The state legislature requests the data on an ad hoc, issues-oriented basis, and the State Office of Budget and Finance relies on data provided indirectly from the system in preparing budget recommendations.

Software and Data Organization

MENU, from its inception, was designed and is maintained to provide fast and convenient access to the data for the nontechnical user. The widespread usage of the data with MENU can best be explained by looking at the design criteria for the data and for MENU.

- The data base and retrieval language must be flexible. The retrieval language must be able to handle ad hoc queries as well as planned queries. Ad hoc queries are usually "one-time" in nature, whereas planned queries are generally recurring. Data must be stored at a detailed level so that they can be searched and summarized in many ways.

- Step-by-step help from the system must be available to the user at the terminal when necessary. This can include assistance in what functions are available, what data are available, and how to proceed with the request. Administrators and others who do not process data are thereby encouraged to access and explore the data themselves through the use of MENU.

- The retrieved information must be displayed in a flexible format. Capabilities to rearrange and sort the retrieved information must be available.

- Retrieval of data must be timely. Since time requirements vary with each request for data, the system was built with

a 5-10 second response time from screen to screen, enabling data-query sessions to be completed within a few minutes.

- Data within the data base must cover multiple years since management queries usually involve trend analysis.

- Data files must be integrated in such a manner that personnel, student, finance, and physical facilities data can be combined.

- Data combined within the data base must be commonly defined for all campuses.

- Nontechnical users must be able to use the system with an easy-to-use, helpful language.

This system has noteworthy features built in for the convenience of the user as well as of the MSO staff. These include:

- A HELP command that the user can invoke at almost any time. HELP aids the user in determining what options are available and how to choose among them. The assistance can be general or specific, depending on the user's need.

- A SAVE command allows queries frequently made to be stored for later retrieval. This saves time and effort in not having to reformulate a request.

- Code translation allows the user to understand through text what is stored in an abbreviated code so that instead of cryptic abbreviations, the user can deal with English equivalents.

- The HISTOGRAM feature provides the capability for tabular presentation of frequencies.

- EXTRACT provides the capability for extracting a desired subset of data from a larger file so that more intensive analysis can take place outside of the system and with statistical tools.

- The LOG feature records the requestor's ID as well as the data items referenced for each query. This serves many purposes including the redesign of the data base and analysis to improve the system.

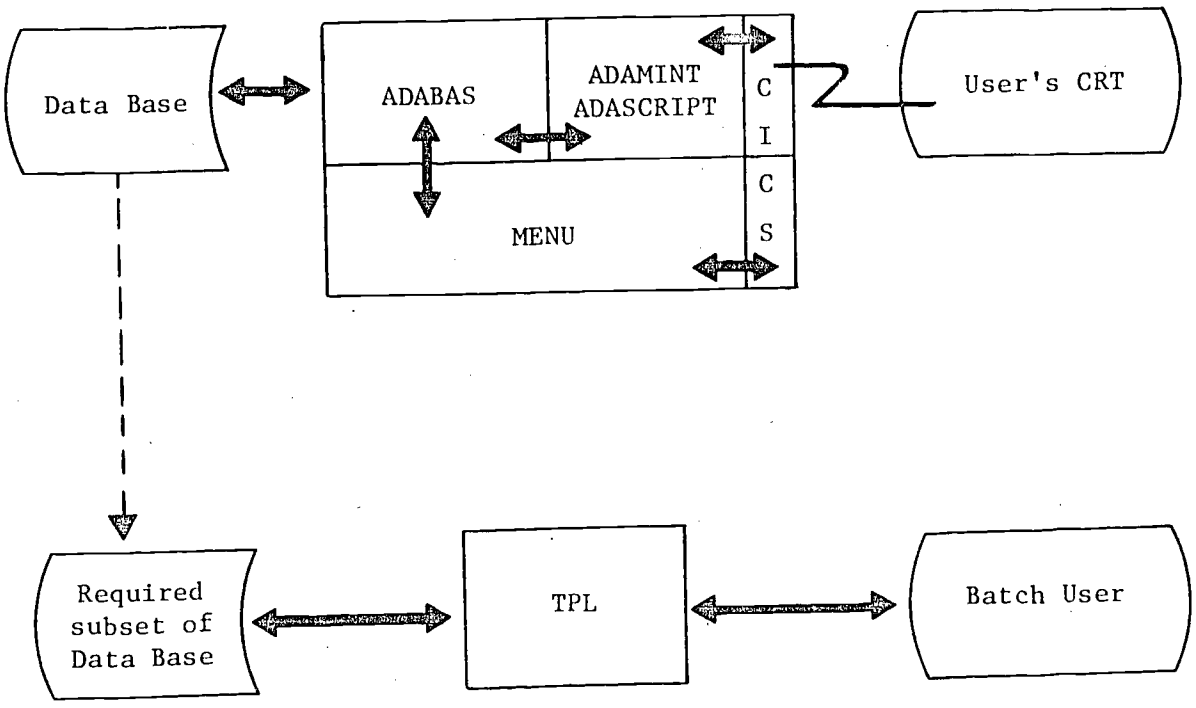
The data are organized as files--one for each type of information (students, staff, and so forth) for each campus. These files are "coupled" or linked by specific data elements that are common across files. Although a campus can access any or all of its data, it can access another campus's detailed files only with special authorization. When cross-campus requests

do occur, they are usually requested of and provided by the MSO, who are authorized access to all of the data.

The MENU system is part of a larger set of support software which the MSO staff maintains. MENU itself is the set of programs that recognizes the user's commands and produces the desired screen image on the video terminal. In addition to MENU, support software available for use with the system includes:

- A data base management system (ADABAS) for actually organizing, storing, and retrieving the physical data
- A communication language (IBM's Customer Information Control System--CICS) for teleprocessing between the user and the programs
- ADASCRIPT and ADAMINT, languages for special and specific needs not met by MENU that are part of the ADABAS system and available to the more technical user
- A Table Producing Language (TPL) used for cross-tabulation applications where summaries are often needed (TPL, a set of programs acquired from the U.S. Bureau of Labor Statistics, is now used in batch mode. Efforts are under way to develop an interactive version of TPL.)

Schematically, the software is interrelated as follows:



Hardware

The information system is located at the central computer site of the University of Hawaii on the Manoa campus. The IBM 370/158 is accessed by the MSO staff as well as by the other campuses via video terminals. Reports are produced off-line, either by a low-speed printer at the MSO office or else by high-speed printers at the central site.

Next Steps

Now that the information system contains much of the data and software to support campus and system planning and management functions, the next effort focuses on extending this utility to more types and numbers of users. With the aid of workshops, a user's manual, and reliable, convenient service, it is hoped that awareness and usage will continue to increase.

Illinois

The Illinois Board of Higher Education (BHE), in existence since 1961, has been developing an integrated management information system since 1975. When this system is completed, Illinois institutions will have a common set of definitions and procedures by which to respond to state reporting requirements; the Board will have an efficient system of collecting and summarizing information to fulfill its responsibilities; a consistent set of information will be available to satisfy special requests; and the information base and supporting software will provide the expanded capabilities for more thorough analytic studies.

Institutional Interface

An MIS advisory committee, comprised of institutional and system-level administrators and information-system managers, advised the Board on the developmental phases of its information-system project. Among the advisory committee's primary responsibilities was advising on establishment of data collection, storage, and distribution guidelines and on selection of data base software.

The data interface between the Board and public institutions is defined primarily by the Resource Allocation and Management Program (RAMP), described in the following section, and by a series of other surveys closely related to the Board's analytical responsibilities. Data are reported directly by four governing boards representing the 13 public universities and by the Illinois Community College Board for the 51 public community colleges.

The Board edits all data as each survey is received from the reporting office. A printout of the data received, with edit exceptions flagged, is provided to the reporting office with a request for corrections within a designated time period. Following corrections and sign-off by the reporting office, all standard reports are run, and (where indicated or requested) copies are provided to the reporting office.

The Data

The main part of the Illinois information system has been the Resource Allocation and Management Program (RAMP). RAMP includes surveys consisting of over 100 tables about the public universities and community colleges of Illinois. It combines financial, student, and faculty data with statements of institutional mission and scope--both historic and projected--to provide a base for budget and planning activities.

RAMP consists of two sets of tables, one for public universities, the other for the public community colleges. Consistent data are maintained for eight consecutive years: the two previous years, the present year, the budget year (that is, the next year), and projections for four subsequent years. Altogether 64 public institutions or campuses are included: 13 universities (conferring at least a master's degree) and 51 community college campuses. In the fall of 1978, institutions are submitting RAMP data on computer tapes, thus saving institutions and BHE staff coding and keypunching time.

Besides RAMP, another data base is currently under development to support the program-review function. The Board has grouped all programs into seven categories and each year one group is reviewed in detail. The Program Review Data Base will contain the necessary vareity of data to support the required analyses. The RAMP and the Program Review Data Base will be capable of being integrated for any of the seven programs for any given year by institution and by any level of detail that is available in the two data bases.

In addition to these two extensive data bases, automated data from the other Board surveys are used and stored in stand-alone files, in effect establishing one file per survey. These survey files are:

- The HEGIS surveys. Community-college HEGIS data are received in automated form from the Illinois Community College Board. The public universities report on hardcopy. Faculty, Facilities, and Earned Degrees are keypunched and edited by the Board staff while the remaining HEGIS surveys are maintained in hardcopy form. HEGIS financial data are drawn from RAMP surveys and HEGIS enrollment data come from the Illinois Fall Enrollment Survey.

- The Illinois Fall Enrollment Survey for public and private institutions, which describes student enrollment by age, by geographic origin, and by ability. Also included are data regarding transfers, residency, and applications.

- Program Inventory information collected for 1977 and 1978 showing program name, degree offered, and institutions offering the program.

- Unit Cost Study data for disciplines.

- Unit Cost data for programs.
- Faculty Load Study - student credit hour per FTE faculty.
- Facilities data - done biennially.
- Student Financial Aid data.
- EEO-6 data.
- RAMP reports.

All these surveys have computer programs that summarize the data in various ways. Besides these automated surveys, there remain some survey data that are collected and maintained only in hardcopy form. HEGIS surveys that are collected for forwarding to NCES and are therefore maintained only in hardcopy form are: Institutional Characteristics, Finances, and Libraries. The Survey of Off-Campus Programs and the Survey of Student Costs (tuition and fees) are also maintained in hardcopy.

The Uses of the Data

The audiences for these wide ranges of data vary from institutional administrators and presidents to legislators and executive office staff, state coordinators, BHE members and staff, and the public. The most widely distributed form of the data is the Data Book on Illinois Higher Education. Produced annually, it summarizes the most commonly sought data on enrollments--present and historical--degrees conferred, staff data, libraries, finances, student costs (charges), transfers, financial aid, and facilities for both public and private institutions.

A companion document, entitled the Executive Summary, provides a briefer, graphic representation of key measures from the Data Book. The Executive Summary is aimed at those persons who need a quick overview of the activities in higher education in Illinois. Additional executive summaries are planned in areas such as staff data and race/ethnicity of students and staff.

A regular schedule has been followed for producing more extenstive reports from RAMP and from the other survey data. Regular reports are produced for institutional use. The institutions are also able to request special reports, although such requests have been infrequent. Also, BHE staff analysts and administrators frequently require additional reports that involve a longer trend series or different summary organization than that used for the regular reports to the institutions.

Software and Data Organization

The Board systems staff decided to use IMS from IBM as its data-base management system. IMS was first used with the RAMP system. The Program Review data will also be installed. The remaining data that are currently stored as sequential or indexed files will be scheduled for inclusion as time and need dictate.

All RAMP data are stored, organized, and maintained as "tables." These same tables are built into the surveys used to collect the data. The tables are also the units for building the hierarchy allowed by IMS. While portion for lines and fields within a table can be individually retrieved, the basic "segment" that IMS uses is the original survey table.

The Program Review Data Base will be designed in part with the idea of conceptually providing the data to the user as if the data were in tables. But, in fact, the data are stored according to the intrinsic relationships that exist within the data. Thus for more efficient retrieval and data integration, data relations are included that are much more complex than a two-dimensional collection survey would permit.

Retrieving and reporting IMS-managed data are accomplished with the proprietary system, EASYTRIEVE. EASYTRIEVE has proved to be flexible, and usable, and to have a simple language for producing a wide variety of pre-planned and one-time requests. Users who learn the well-documented EASYTRIEVE language can refer to a dictionary of available data-base item names to formulate their requests. EASYTRIEVE then takes this concise request and produces reports of high quality. EASYTRIEVE, incidentally, provides a more natural capability for producing cross tabulations and subtotals than does MARK IV and Illinois frequently uses this feature for summarizing data. Although MARK IV is available, it is used for few applications, mainly for the Fall Enrollment Survey data.

Hardware

The Board uses an IBM 370/168 provided by the Illinois State Administrative Data System in Springfield, which includes the assistance of experienced IMS systems staff, an advantage that overcomes the considerable systems support overhead required by IMS. This has made the choice of the site and of IMS by the Board a feasible one. Currently the Board has an IBM 3772 RJE work station in its office for batch communication and has ordered a CRT (IBM 3277) for interactive use and a printer (IBM 3286) for hardcopy output.

Next Steps

As more data are automated and organized in a standard fashion, the BHE staff envisions the development of analytical capabilities that will use the data with models for projections and planning. More surveys are being submitted on tape each year, and the Board is developing plans to submit HEGIS data in the machine-readable form preferred by NCES.

Kentucky

The Kentucky Council on Higher Education has been active in developing a management-information system. Following a 1972 legislative order that expanded the Council's responsibilities for higher-education coordination, a concerted effort has been underway toward developing a useful, responsive information system.

In 1977, the Council's mandate was extended to include more planning responsibilities. Its membership was expanded to include all of postsecondary education rather than only public higher education. The mandate also created the Kentucky Center for Educational Statistics (KCES) within the Council to function as the central source for postsecondary education information within Kentucky. These expanded roles for the Council have accelerated the need for and the provision of timely and consistent information.

Institutional Interface

There are three types of institutions offering postsecondary education in Kentucky: (1) public colleges and universities; (2) independent institutions; and (3) vocational/technical institutions. The vocational/technical institutions are coordinated by the Kentucky Department of Education and therefore are not a part of the Council's responsibilities. While the Council is charged with coordinating only public higher education, it also receives cooperation and data from the independent sector whose 20 institutions are represented by the Kentucky Council of Independent Colleges and Universities.

A Task Force on Information and Data Systems, consisting of institutional representatives, has been involved in all data planning and definitional phases. All sectors are represented on the task force, with one representative from each public college and university, one for the community colleges, and one from the Council of Independent Colleges and Universities.

Institutions that submit data receive intermediate validation reports. In addition, their final data are arrayed in an extensive series of reports consisting of each institution's data adjacent to data from other institutions in its sector. The most extensive of these describes the enrollment and costs at the institutions. Since much commonality exists in the way public institutions maintain financial and student information, cooperation has been possible between the institutions and the Council in facilitating extracts from institutional files.

The Data

The information system in Kentucky is based upon three categories of data submitted by institutions: HEGIS surveys, Council surveys, and costing data based on the NCHEMS Information Exchange Procedures (IEP). As HEGIS coordinator, the Council has regularly collected and submitted the HEGIS surveys. During their participation in the State-Level Information Base project, the Council has progressed from manual, hardcopy surveys to procedures for automating the majority of the surveys.

The Council surveys have been directed primarily toward enrollment, including a wide variety of student characteristics and student-load information. In the fall of 1978, the public institutions will submit these data in the form of student-specific records. While the independent institutions may voluntarily do this, they will most probably continue to report enrollments using hardcopy surveys. In addition to enrollment data, the Council maintains:

- More detailed financial data than those required in HEGIS for quarterly reporting to the Kentucky Department of Finance

- Data to support analysis of Institutional Burden/Costs for External Reporting

- Data to support Health-Related Manpower and Planning Teacher Education Surveys

The detailed, machine-readable records the public institutions are providing consist of three files: a student file, a student-course file, and a course or class file.

- The student file contains one record for each student in the fall and includes demographic and participation information about the student such as an identifier, name, year of birth, sex, race, residency, county (if Kentucky resident), HEGIS code for major, class, credit-hour load, and full/part-time status. Additional data for first-professional students include year and day/evening participation. Also, the FICE code of previous institutions or previous state of enrollment is maintained for in-state and out-of-state transfer, respectively.

- The student-course file contains one record for each course a student is taking, student identifier, course number, section number, course level, and credit hours.

- The class file contains one record for each section of each course at an institution and includes the department, course, and section numbers, HEGIS code, minimum and maximum credit hours offered, head count of students (including auditors), duration in weeks, an identifier for the instructor, and on/off campus site (with county, if off-campus). Space utilization information is to be included in 1979.

An eight-digit institutional identifier is used in all these files. The identifier consists of the six-digit FICE code, plus a two-digit suffix to distinguish the 13 community colleges that currently have a single FICE code assigned to them as a group.

Costing information has been obtained, based upon the Information Exchange Procedures (IEP) as modified for Kentucky's purposes. It is in the automated format produced by the IEP software and basically includes direct cost and credit hours on:

- Each institution, discipline, and course level

- Each institution, program (major), and student level

Institutions receive reports containing these figures and comparing them with other institutions in their sector.

The Uses of the Data

The primary use of the data in the Council's system is to support the comprehensive set of responsibilities covered by the Council staff including program review, budget preparation and presentations, tuition and fee setting, capital resources planning and comprehensive planning. As mentioned earlier, institutions receive summaries of their own data and those of other institutions in the same sector for use in institutional planning and management. Also, the Kentucky Center for Education Statistics (KCES) relies on the data to answer inquiries about postsecondary education generally.

Software and Data Organization

Data access has evolved from hardcopy surveys to automation of the most frequently used surveys and finally to the current mode of collecting detailed records for the student and course data with the accompanying capability to summarize the data as required. MARK IV has been the main software program used for data access. For those surveys stored as single files, MARK IV has provided a language of updating and reporting the data. As these files have been progressively linked or combined, the data-management software used has been IMS by IBM. MARK IV is used for some reporting purposes in conjunction with IMS.

Special-purpose programs have also been written for report generation with COBOL as the most common programming language. Comparative costing, enrollment, and degrees-granted reports have been produced with special programs. Custom data-editing software has also been written to perform the edits MARK IV cannot perform (for example, testing for consistency as well as for reasonable magnitudes in figures within surveys).

The Council systems staff are assessing ways of graphically depicting quantitative data. They have acquired a program from the Kentucky Department of Transportation that can plot Council data by county as well as by other geographic subdivisions. For example, the proportion of enrolled students residing in a county can be compared to the total enrollment in that county. The plotting capability of the Department of Transportation program has allowed the systems staff to write a program to depict data with bar graphs for displaying institutional enrollments, degrees conferred, costs, and so forth.

While many surveys developed by the Council's systems office are still stored as single files, design efforts are underway to achieve the transition of data from separate files to a data base. Appendix C contains a segmented, hierarchical representation of the data that were used in the initial phases of the design.

Some of the student and course-specific records now being maintained will be defined for use via IMS (with retrieval done using MARK IV). This would

allow for the retrieval of only those records that are desired without having to read the entire data set. This efficiency is a major consideration for going from files to a data base.

Since the Council uses a computer facility where IMS was already installed and maintained by experienced systems staff, their primary consideration when deciding between separate files or a data base was the potential efficiency an IMS-managed data base can offer to the user. It was felt that the student records would be more efficiently accessible when managed by IMS due to the anticipated frequent and varied usage of that large set of data. The course data remain as a file for the time being but this may be reconsidered in the future when the space-utilization data are added to the class records.

Information collected through surveys, with the exception of the Institutional Characteristics and Libraries surveys, is keypunched. This has been a time-consuming task since it has been necessary to transcribe the survey data manually from surveys to coding sheets before keypunching. The systems staff at the Council could not avoid this step because their keypunching is provided as a contract service outside the Council office. Under those circumstances, keypunching directly from survey forms raises many questions for the keypuncher that cannot be addressed consistently or quickly enough. Ways of bypassing this coding step include submitting machine-readable data by the reporting institutions and arranging for keypunching to be done under closer Council staff supervision.

Keypunched data are then edited by specially written edit programs. These programs are written by the Council's systems staff or were written as part of the development of edit programs in the State-Level Information Base project. Edit reports are reviewed with institutions and final validated data are stored and/or sent to NCES.

Hardware

The Council uses the computer facility provided by the Kentucky Department of Finance with IBM 370/168 as the central processor. The IBM 3850 mass-storage device is also available and has greatly increased the feasibility of fast-access storage of data. This mass-storage device in its simplest version can effectively store 35 billion bytes. In contrast, the 3330 model II, a common disc pack, can hold 200 million bytes.

Currently, the systems staff in the Management Information Office of the Council are the primary direct accessors of the data. They use the system almost exclusively via interactive CRT terminals, with hardcopy output produced off-line or on typewriter-like terminals.

Next Steps

As survey automation proceeds, the Council systems staff are working toward a number of further developments including:

- Automated submittal of HEGIS data to NCES. Fall 1979 Opening Enrollment, for example, will be prepared and submitted by the Council, based on the student records institutions provide. Other survey data will be keypunched according to NCES formats and sent on tape.

- Continuing the integration of the separate files into single data-base design.

- Continuing to acquaint institutional and other users with the availability of data through the Kentucky Center for Education Statistics.

- Increasing the software capabilities of the system so data can be viewed and analyzed in the most useful possible ways.

New Jersey

The New Jersey Department of Higher Education has been in existence since 1967. It has been collecting HEGIS data since 1967-1968 and has been the designated HEGIS coordinating agency since that time. The Research Office of the Department was established in 1973 for data coordination and analysis. Since the budgeting and financial aid functions of the Department predated the establishment of the Research Office, there remain separate bases of information within the budget and financial aid office. Also, the community-college office within the department continues to maintain community college financial and enrollment data.

The Research Office has been the Department's primary liaison with the State-Level Information Base project. Initially, the Research Office staff began examining their data needs concurrently with the Department's master planning activities. New Jersey surveys were designed for public and independent institutions and interrelated with the federal HEGIS surveys. The resulting set of surveys, responding to both state and federal needs, is called the New Jersey HEGIS package. Of the total of 21 surveys, 7 are for federal HEGIS requirements and 14 are for state needs.

Institutional Interface

The Board is a coordinating agency with a range of responsibilities that includes budget review, program review, comprehensive planning, administration of student financial-aids program, and maintenance of a research and information clearinghouse capability.

The New Jersey HEGIS data requirements are reviewed annually with institutional representatives including the independent sector that has cooperated in arriving at compatible data definitions. The independent sector has been willing to provide the New Jersey surveys to the Department, particularly as usage of the data is demonstrated and as comparative reports are provided back to the reporting institutions.

In the fall and early winter of each year, the data-collection plan for the following year is developed. Existing surveys are reviewed for continuation, change, or deletion and proposed new data requirements, suggested by changes in responsibilities, are considered. The current project to update the master plan and the analytic studies outlined in the planning agenda presented by the new Chancellor are two potential sources for new data needs. Both efforts are described in greater detail in the companion document, Postsecondary-Education Information Systems at the State-Level: Pilot-Test State Case Studies.

After the data-collect[illegible]s been developed, the institutions are then asked to review the pr[illegible]. Workshops are conducted by the Department for each of the in[illegible]onal sectors--public senior, community, and independent colleges--to facilitate this process. Final changes are made incorporating institutional feedback, and the package of data is combined with federal HEGIS surveys and sent to the institutions.

The data are submitted by the institutions to the Research Office according to a prearranged schedule. The data undergo a preliminary edit by Research Office staff, and questions that may arise are checked with the institutions involved. The edited data then form the basis for a series of Data Briefs and Research Reports, which are produced and distributed by the Research Office to the institutions, and to Board staff, legislators, and so forth. These reports are usually designed so that an institution can compare itself with others in its sector or throughout the state.

The Data

As the HEGIS coordinator for the state, the Board administers all federal HEGIS surveys. It receives copies of all surveys. Six are mechanized: Opening Fall Enrollment, Earned Degrees, Faculty, Finance, Facilities (when included in the HEGIS schedules), and Institutional Characteristics.

The nonfederal surveys collected by New Jersey include supplemental information in the following areas:

- Institutional
  - Detailed tuition and fees information
- Students
  - Applications and admissions
  - Head counts by age and by geographic origin
  - Profiles of first-time undergraduates by ability, age, geographic origin, and race/ethnic status
  - Head count of undergraduate transfers
- Student Programs
  - Head-count enrollments by each field of study

- Faculty

  - By manpower category (for all staff) by race/ethnic status
  - By age categories

- Computers

  - Inventory of available hardware and software applications in production
  - Usage by type of user, batch/interactive, language costs
  - Staffing

Although the Department is not the coordinator for the EEO-6 survey, it still receives a copy from the institutions. These data are kept in hardcopy form at the Department.

An Inventory of Academic Programs, initially administered in the fall of 1976, is maintained and is automated. In 1978, the Board of Higher Education, in conjunction with the colleges, developed a definitive list of approved undergraduate and post-baccalaureate degree programs. Institutions will now be requested to send annually only additions, deletions, or changes to the list of approved programs.

Additional data maintained by other offices within the Department include:

- Detailed budgeting data for public senior institutions (maintained by the Budget Office). There are plans to incorporate portions of these data into the Research Office information base.

- Detailed financial data (maintained by the Financial Aid Office). Certain aggregate summaries are planned to be included in the Research Office system.

- The Community College Office of the Department maintains data for that sector of institutions.

The Research Office is developing a handbook for Department staff that contains a description of what data are maintained, the years for which they are available, and the years for which the data are automated. The handbook will also be used by potential users as a source for what information can be requested, and will provide a basis for acquainting institutional users with what they can request.

The Uses of the Data

Two major users of the data maintained at the Board of Higher Education can be identified: the institutions for internal planning and inter-institutional comparisons, and the Department staff. The institutions are currently

receiving the series of Data Briefs and Research Reports produced by the Research Office. The Data Briefs present tabulations of comparable data arraying all of the institutional values for a particular measure, while the Research Reports focus on a topic of particular interest. The Department expects that one of the next offerings to institutions will be comparative reports for each survey.

The Department of Higher Education currently uses the New Jersey HEGIS data for two major functions as outlined by the Chancellor: the development of a new statewide plan, and the observation of the status and performance of various aspects of higher education (faculty tenure and salaries, participation of minorities, profiles of entering freshmen). In developing a new statewide plan, data will be used to describe historical trends, to present the current status of programs and services, and to make enrollment projections. The plan will also seek to define the missions of the various institutions, especially the differentiation between liberal-arts and occupational programs. Resource-utilization data will be used to assess the relative costs of alternatives presented in the plan. The New Jersey HEGIS is expected to provide a base for reference and for refinement for all of the plan update activities, especially considering the number of years of data available and the consistency of measures over time.

Performance evaluation examines higher-education activities in New Jersey relative to the objectives of the earlier, 1974 master plan. Information requirements for such an evaluation will include items already available in New Jersey HEGIS, estimated values, and newly collected figures. At present, it is expected that the data requirements will include:

- Profiles of students enrolled in public senior colleges in New Jersey
- Follow-up surveys of graduates
- The academic performance of students
- Financial-aid needs of enrolled students
- The need for and availability and effectiveness of remedial education
- Persistence and graduation rates
- Effectiveness measures for affirmative-action programs
- Effectiveness measures for research programs, such as funding received and their relationship to the needs New Jersey has for research

Software and Data Organization

New Jersey has made substantial progress toward its goal of converting from a manual to an automated information system. Its choice of computer site and, as a consequence, software for maintaining data, were largely decided by the existence in New Jersey of a quasi-public organization called the New Jersey Educational Computing Network (NJECN). NJECN was established to provide hardware, software systems, communications, and programming services to public educational organizations in New Jersey. It provides computer capability via interactive or RJE stations to smaller colleges not able to afford either a computer or the related systems staff.

Two alternatives were originally available at NJECN for the data-base management system: RAMIS of Mathematica, Inc. and IMS by IBM. RAMIS was already installed and in operation with staff trained in its use. IMS was new to the installation and still in a trial mode by NJECN. RAMIS was therefore chosen by the Board staff, since rapid progress would be possible, and if IMS usage was later justified, the conversion of data files would be a relatively straightforward process.

The actual conversion to an automated information system has been achieved over a year and a half. During that time, both Board and NJECN staff have participated either part-time or full-time. A NJECN programmer was initially involved on a part-time basis but was soon changed to full-time status for the development of the file definitions, loading procedures, and editing procedures for all the surveys. The HEGIS coordinator at the Board was also involved full-time. The Director of Research devoted part of his time to the implementation and conversion effort. In addition, a systems analyst of the Board was involved part-time to maintain continuity between the Board's needs and the NJECN staff activities, as well as to provide technical and administrative support for the project.

To date, each of the New Jersey HEGIS surveys has been defined to RAMIS as a distinct file. However, there have been a number of reports requested and produced combining data from more than one survey. One example is the generation of cost-per-student figures. Using the HEGIS surveys involves the Finance-survey data for costs and Opening Fall Enrollment (OFE)-survey data for number of students. By matching the FICE codes of the institutions on each survey file, this information can be combined into the desired cost-per-student figures.

Those Board staff trained in RAMIS and working in the conversion process and those NJECN staff involved in developing and documenting the automated system are acquainted with the types of reports that are available and with the actual method of retrieving reports.

The current procedure for automating and validating a survey submitted to the Office of Research is as follows:

1. Form is received, stamped, and logged in.

2. A statistical clerk performs preliminary edit of that form to see that all pages are completed, the FICE code is correct, and the form has been signed.

3. A professional or paraprofessional staff member performs a more detailed edit of the form to check the accuracy and consistency of the data. This edit includes comparing the figures to last year's data, cross-checking the numbers with identical ones reported on other forms, and so forth. The form remains in the Research Office until all questions are resolved and all errors are corrected as a result of telephone contact with the institutions.

4. The form is picked up by a courier for the keypunching agency during one of its scheduled pick-up dates.

5. The keypunched form and cards are returned to the Research Office by the keypunching agency.

6. The keypunched cards are delivered to NJECN by a Research Office staff member; the cards are loaded into the computer file.

7. When all the forms for a particular survey have been loaded, NJECN produces a printed dump of the file and an edit report as specified by the Research Office. This edit report includes checks such as column and row total checks for each form.

8. The edit report is reviewed by a Research Office statistical clerk who contacts the institutions to resolve each error.

9. The computer file is corrected and ready to produce final reports from the data.

The nontechnical Board staff have found the RAMIS language relatively simple to learn for generating their own reports. Frequently requested reports can be stored for repeated use with new data. Except for the original file design and the preparation of updating procedures, the staff overhead requirements for RAMIS are minimal when compared to those for a data-base management system such as IMS. And, while the developmental effort places a major demand on staff time, maintenance and data retrieval should only require a part-time staff member in the future. New Jersey is approaching the operational phase when procedures will be in place and special or regular reports will be produced routinely.

Hardware

The NJECN facility is housed at the Rutgers University Hill Center in New Brunswick. It is an educational computing network that consists of an IBM 370/168 and an IBM 370/158 with several operating systems. RAMIS runs

under MVT on the 168. NJECN provides the facility not only to the Board but also, through remote communication lines, to many New Jersey community colleges for their computing needs and to the public four-year institutions for both academic and administrative usage.

The Research Office has ordered an interactive terminal for access of data at the central site. NJECN will continue to develop and produce the regular reports and the interactive terminal will be used by the Research Office staff to make special data analyses.

Next Steps

After automation procedures and programs are finalized by the NJECN consultants, the documentation and capabilities for maintaining and refining the system will be housed with staff in the Department. Data access by the Research Office and other Department staff will become easier as staff become more familiar with what is available through documentation, (for example, the Handbook), through familiarity with and/or training in the use of RAMIS, and through the availability of interactive terminals and line printers in the office. NJECN has been asked to develop plans so that the institutions will be able to directly access the information base and to retrieve their own reports.

New York

Postsecondary-education coordination in New York is under the supervision of the Board of Regents of the University of the State of New York. The Regents oversee the Department of Education, which coordinates collegiate and vocational/technical institutions and the elementary and secondary sectors as well as other institutions or organizations offering educational services. Postsecondary-education data at the state-level are maintained and analyzed within the Department's Office of Postsecondary Research, Information Systems, and Institutional Aid (OPRISIA).

Institutional Interface

OPRISIA compiles and analyzes the data for all degree and certificate-granting institutions in New York--including public, independent, and proprietary institutions. Data are received from nearly 100 percent of the independent institutions, a rate undoubtedly influenced by the Bundy Aid Program to independent institutions, which stipulates that data be provided as a condition for receiving aid.

An advisory committee of institutional representatives meets at least twice a year with Office staff. In the spring they review the data requirements for the coming year. In the fall they meet to discuss the types of reports and analyses that will be undertaken, the results of which they will receive. The committee has representatives from each institutional sector--State University of New York (SUNY), City University of New York (CUNY), independents, and proprietaries--as well as from the legislative staffs, from

the Division of the Budget, and from the Higher Education Services Corporation, which administers the state's student aid programs.

OPRISIA does not receive data directly from the institutions. The Education Department has an Information Center for Education that is the central unit for data collection from all educational institutions in New York, and it provides OPRISIA with the postsecondary-education data used in the computerized higher-education information system. While the Information Center reviews the survey data for reasonableness, the OPRISIA staff also examines the data, especially for longitudinal consistency, and sends them to institutions for validation if necessary. Institutions are familiar with the array of data available from OPRISIA and frequently request and receive special reports.

The Data

In addition to HEGIS, OPRISIA maintains:

- Intrastate residence and migration data--previously done annually, the survey will now be conducted every other year.
- Records of full-time undergraduate transfer students--type and location of former institution if from in-state; type and state if from out-of-state.
- Supplements to HEGIS Surveys
  - Finances: Finer distinctions in Revenues and Expenditures
    Revenues: State Appropriations, Auxiliary Enterprises, and Student Aid Grants
    Expenditures: Auxiliary Enterprises and Debt Service
  - Opening Fall Enrollment: Collects Master's/Doctoral student levels rather than Graduate I/Graduate II
  - Degrees Awarded: Based only on those degree programs the institution is registered (in the Program Inventory) to award
- Data from HEGIS employees in which only six data elements are used--includes total employees, total faculty, and faculty by 9- and 12-month appointment, tenured and nontenured.

The Program Inventory has become a regularly maintained source of information. After three years of work refining it, the Inventory is now updated monthly as changes in programs occur and published in limited numbers twice a year. This has eliminated one annual survey to the institutions.

OPRISIA refers to the computerized portion of its data base as the Higher Education Data System (HEDS). HEDS contains at least six years', data in its information system for each degree-granting institution, with 147 types of data for each year. This proves to be a workable selection and quantity of data for the research and analytical needs of the Department.

The Uses of the Data

The data in HEDS are used by OPRISIA to support analytical studies in the following areas, and others, for which the Department has responsibility:

- Developing financial strategies for higher education
- Determining financial status of institutions
- Conducting enrollment projections and analyzing student demand
- Developing the Statewide Plan, which presents overall strategies for postsecondary education in New York
- Employing HEDS data in studies of minimum effective size, institutional drawing power, and other topics with important policy implications

The Program Inventory is the official reference identifying the 14,000 programs offered by 250 institutions in New York. It is used as a basis for collecting detailed degrees-awarded data that institutions submit to the Information Center for Education. Although the Board of Regents has no budgetary authority over institutions, it does charter institutions and registers their programs. The Program Inventory serves as a basic reference for that function. Institutional needs for data are met by a series of reports, analyses, and planning model results. Most are prepared for audiences, but a growing number of "custom" analyses are being prepared on request.

Software and Data Organization

OPRISIA has been using the computer services of a timesharing system from General Electric. Data management and report-writing features of the DMS/2 by GE have been used to update the data, manage the storage, and provide an extensive query language. To the user, the data appear to be organized as an integrated base of data. The software, in fact, stores the data with a series of indexes so that most requests involve the retrieval of only the desired records rather than of all the data. The existing GE software has provided many of the reporting and statistical features that the staff at the Office have needed. The services from GE, which have also included consulting by GE systems staff, have been more than adequate to meet the needs. However, the annual cost (around $50,000) is significant.

Hardware

OPRISIA will soon transfer from the GE Timesharing System to a Burroughs 7700 computer, which the Department is acquiring. Although the details of software and hardware to be available have not been finalized, it is expected that interactive usage with little need for programming assistance will still be available.

Next Steps

Improvements to the information system used by the agency are foreseen not so much in what is collected from institutions but rather in the types of analyses and projections that are possible. Although OPRISIA anticipates adding a few more items of data, its primary effort will be directed toward extending an already well developed analytical capability, including an enrollment planning model and financial policy analysis model, into new areas of postsecondary education analysis.

South Carolina

The South Carolina Commission on Higher Education was established in 1967 to act as the coordinator of higher-education data in that state. Its early experience with data was derived from its role as HEGIS coordinator. Planning for the management-information system at the state level began in 1969. Today, the fully developed system includes a comprehensive set of institutional data, automated and retrievable by a variety of users.

Institutional Interface

From the earliest developmental stages, the Commission has solicited and received the cooperation of the public institutions. The establishment of the development plan was based on an agreement among institutions that the completed system would achieve statewide compatibility in data definitions (based generally on the NCHEMS Data Element Dictionary) and would lead to uniform reporting. An MIS Working Committee composed of institutional vice-presidents for academic and business affairs, as well as other key administrators, has been chaired by the Commission's Assistant Director for Financial Affairs and has assumed responsibility for development of the MIS.

Institutional involvement is also apparent in the Computer Advisory Committee comprised of the public college and university computer directors. This committee has advised on the conversion from separate incompatible computers at each campus to the present system. Now three large and compatible computers, one located at each university, provide computer services to the state colleges through on-line terminals. This network has been established cooperatively by the institutions involved.

Because of the interactive dial-up services provided by the network, the data maintained by the Commission are potentially accessible to any interested institution. Institutional staff will be trained not only in retrieving available data but also for the direct updating of data. At present, one institution--the University of South Carolina, where the Commission's information system is maintained--is using the system to prepare projections for formula funding and for updating its data.

The Data

The Commission collects and maintains HEGIS data as a function of its role as HEGIS coordinator for South Carolina. In addition, it collects from the

institutions the following surveys needed to support its own responsibilities:

- Program inventory--by program, degree type, and accreditation
- Degrees awarded by program--this survey is sent to institutions and contains space only for those programs for which the institution is approved according to the Academic Program Inventory
- Enrollment by degree programs--the survey for an institution shows only those programs for which there is approval at that institution
- Student characteristics
  - Age by sex by level
  - Race by sex by level
- Faculty and staff data
  - Percent of faculty time in instruction by discipline
  - Average salaries of teaching faculty by rank
  - Scheduled contact hours by discipline and level
  - Full-time faculty by rank by sex: numbers, tenured, total salaries, contributing services
  - Employees by manpower categories: FTE and full/part-time head count
- Discipline data
  - Scheduled meeting hours
  - Class size by course level

These surveys were developed to collect the data set established during developmental discussions with the institutions (discussed earlier). As a result, few changes have been made, and only a few types of information have been added since then, namely:

- Revenue/expenditures data, much as in HEGIS, but with expenditure categories specified in greater detail
- Space-utilization data for class and lab space
- Applications/Admissions/Enrollments
- Ability descriptors (SAT/ACT/High School Rank) of entering freshmen
- Enrollments by age and sex and student level
- Geographic origin of first-time students

These data are submitted by all public postsecondary-education institutions, including the separately coordinated technical schools. Independent institutions submit data on a voluntary basis.

Institutional data are supplemented with information that is descriptive of the state economy and population of the state as a whole. Enrollments in elementary and secondary schools, by county, are available for 10 years. State revenues and expenditures by various categories are also available for 10 years.

The Uses of the Data

The state-level information system evolved from the Commission's early examination of the data requirements required to support its planning, budget recommendation, and program review responsibilities. As a result, internal staff requirements represent the primary use of the system. There is interest in incorporating population projections, as they become available to the Commission. These latter data are significant for the freshmen-enrollment projections through 1990 that will be made for South Carolina, some of whose metropolitan areas are among the fastest growing in the nation.

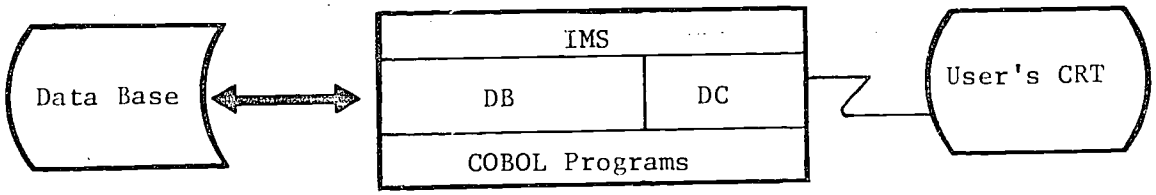
All data required to support the formula-budgeting process are included in the system, and the program inventory supports the program-review process. The program-review and enrollment-planning processes are both undergoing revision to support an expansion of the Commission's role in those two areas as mandated by the legislature. The information system is expected to be adequate to support both revised processes with minor modifications.

In addition to the Commission staff users, institutions are being encouraged to access the data for institutional analysis, particularly those related to state-level review and planning processes.

Software and Data Organization

To the user, the data are organized in the form of "screens," each of which displays a specific set of data about an institution, a county, and so forth. The available screens, or tables, are described in a handbook that is designed for the nontechnical user.

The data are stored on-line and managed by the data-base management features of IMS. The communications portion of IMS, namely IMS/DC, provides an interactive capability with the data which IMS/DB manages. A special COBOL program has been written for each screen type, providing the required commands to IMS. Schematically, the software is interrelated as follows:



The complete set of software--data management, communications, and retrieval--makes it possible to interactively access a wide variety of data.

Since a CRT is the primary method for viewing the data, the user can see a screen's worth of data at a time. A particular screen type (for example, degrees awarded by an institution in a particular program) can be requested for another institution, or another student program can be requested for the same institution. Many screens and formats are available and others will be added as new information needs are identified.

In addition to retrieving data in a particular screen, authorized users at a terminal can also add, delete, or change values in an interactive mode. All data entry is now done interactively. Each screen's program can recognize when an update is needed and enlist appropriate routines to edit the data. Specific error messages are generated for those data items that do not pass the edit. Corrections can be made on the spot or, if necessary, can be entered after checking with the people responsible for the data. Eventually all public institutions will be submitting their data by updating the Commission's system directly. The University of South Carolina already does so.

There are situations when additional software is needed. At present, further aggregations of available data are accomplished with a reporting language called DATA ANALYZER. A request can be formulated on the screen using the free-form language capability of DATA ANALYZER and then submitted as a batch (versus on-line) request. The status of the request can be monitored by the user and the output can either be scanned on the CRT, printed on a low-speed hard-copy printer or, for volume output, printed at the central site.

When a statistical or modeling application is needed, a subset of the data is generated and used with the SAS or SPSS statistical package. For enrollment-projection types of modeling, special batch programs are used. These application and statistical programs will, in time, be provided directly to the interactive user.

Hardware

The Commission's data base is located at the computer center of the University of South Carolina. Under the supervision of the Commission's Coordinator of MIS Computerization, all development, implementation, and software maintenance for the information system have been accomplished through service contracts with the University.

The University has an 8 megabyte 360/168 with MVS. All data--historical, current, and projections--are maintained on-line on an IBM 3850 mass-storage device. About 15 CRT terminals, located at the Commission offices and on several of the campuses, are currently in use.

Next Steps

Now that the information collection, installation, and retrieval procedures are operational, further development in the information system will involve:

- Providing more applications programs to the on-line, interactive user for such activities as statistical summaries, enrollment projections, financial forecasting, and planning models
- Extending the information base to include even more state demographic, economic, and financial data
- Extending the information system capabilities to interested institutional users

Virginia

The State Council for Higher Education for Virginia is the statutory coordinating agency for postsecondary education in the state. Its responsibilities range from institutional budget review and recommendation to new program review and approval and the administration of two state-funded programs of student financial aid. Because the state has a biennial legislature, a coordination plan for the system and the institutions is developed every other year and supported by the Council's information system.

Institutional Interface

Development of the Council's information system has been closely related to development of the Council's responsibilities for preparing budget guidelines for and recommendations regarding the budget requests of the state's public institutions. Statewide studies of faculty activities and costs of instruction, necessary to support the budget formulas used by the Council as the foundation of its budgetary responsibilities, preceded development of the information system. The institutional contacts developed during execution of the earlier studies have also served to keep institutions involved in information-system development activities.

The Council summarizes a basic set of institutionally descriptive data in a periodic series of Technical Reports, available to all institutions. Also, those institutions with dial-up access to the system can access and summarize data directly.

The Data

The Council's information system includes data from institutions, from other state agencies, and from national sources. As the HEGIS coordinator, the Council receives all HEGIS forms from the institutions. These forms are supplemented with the EEO-6 reports and with a series of surveys the Council administers for its own information needs. These include:

- Applications/Enrollments
- Age of Enrolled Students
- Geographic Origin of Enrolled Students
- Financial Aid Administered
- Noncredit (Community Education Offerings)
- Libraries (in greater detail than HEGIS)
- Enrollments by Class and In/Out-of-State
- Off-Campus Credit Enrollments
- Transfers from Two-Year Colleges

These surveys are automated and incorporated into the Council's information system.

Since the public institutions conduct cost studies according to the Information Exchange Procedures (IEP), student and costing data from that process are received on tape by the Council. Included is the Induced Workload Matrix (IWLM), describing credit-hour distributions across programs and disciplines, and direct cost data for disciplines and student programs.

The Council receives information on appropriations to institutions from the Virginia Budget Office. The State Personnel Department provides information on regular employees at the institutions.

State population characteristics and data on high school enrollments/graduates, the state occupational outlook, and state finances are accessed and used by the Council. Some of the data are automated; others are from published sources.

The Uses of the Data

The data maintained in the Council's information system are referenced by many agencies and institutions. Many of the staff at the Council have been trained in accessing the data directly. In addition, the staff at the Department of Planning and Budget and at the House Appropriations Committee regularly request data through the Council staff. Other departments and legislative committees and commissions also use the data. Institutions, mainly through their institutional research staff, access the data either by receiving copies of the Council's files or else by their own dial-access capability.

The Council produces a series of Technical Reports each year that summarize institutional data and include limited descriptive analyses. Most of the surveys submitted by institutions are included as subject matter for these

reports. Also, the Council processes as many requests for ad hoc reports as can be accommodated within available time.

Software and Data Organization

The Council automates all of the institution-based survey data it receives. Initially, steps were made to install all data into a single, integrated data base using the IMS data-base management system. However, the staff at the Council decided that the costs of maintaining an integrated data base are not justified by the benefits. Only about 2 out of 25 requests involve data from more than one survey, and the vast majority of requests can be satisfied with a much simpler data organization.

The Council has now turned to a data organization equivalent to one file per survey per year. These files are, for the most part, sequentially organized, fixed-length records. This allows the data to be accessed directly by report-writing software such as MARK IV. MARK IV is used extensively for reporting purposes. Users are provided with file definitions and related field names for each survey. Requests are then formulated using MARK IV. This has proved sufficient for the Council's needs.

Hardware

The Council uses the computer facility at the Virginia Polytechnic Institute (VPI) for most of its processing. VPI has twin IBM 370/158s. One computer runs with Virtual System (VS) for batch processing and the other with Virtual Machine (VM) for interactive processing. Because of the availability of VM, the user interacts with the sytem under the Conversational Monitor System (CMS).

The Council uses CRTs and a Remote Job Entry (RJE) work station to interact with the central computer. With the CRTs, the interactive capability of CMS provides a powerful interactive language for editing data and preparing and submitting requests. Requests are formulated either through the CRTs using CMS or else via the RJE using cards and the standard Job Control Language (JCL). The Regional Centers provide access to the data for those institutions or agencies that have dial-up capability and that have the data documentation necessary to access the data.

Next Steps

The Council staff plan to continue working on easier access to the system both for their staff and for others. Included are plans for increased use by nontechnical staff, facilitated by development of routines for commonly requested sets of information.

III.

THE PROCESS: CONSIDERATIONS FOR COLLECTING AND AUTOMATING DATA

Determining Information Needs

A major lesson of the State-Level Information Base project experience is the importance of an information-system planning process that relates the issues or functions addressed by the agency to the information needed to address them. Such a process should address the existing data set and any additions or other changes proposed to it.

There is no right or wrong set of data for all state agencies. Choices regarding data selection, levels of aggregation, frequency of collection, and so forth will and should reflect the economic, political, and logistical environment in a particular state. The key is a process that relates all such environmental considerations to the analytical agenda upon which the information requirements are based. The decisions to establish or change the data set can then be understood by all who provide or use the data included in the system.

In the context of the State-Level Information Base project, the emphasis has been on data collection for ongoing data needs rather than for special ad hoc studies, and for data collection where there is an established need-to-know rather than a possible curiosity.

The information system staff has a difficult and important role to play in this process. The using staff must present its needs for information according to a schedule and in a format that permits the technical staff to provide timely and thorough assessment of the alternative ways in which the need can be satisfied. Preferably, this process should follow an annual cycle in which most data-set revision and system-design changes can be made at the same time

If the alternatives considered by the technical staff are to be a feasible set, they must reflect an awareness or sensitivity of such things as changes in the degree to which the staff relies on data-intensive analysis and on data to present agency recommendations and decisions, the technical capabilities and experience in the agency of the information staff, the ability of institutions to respond to changing reporting demands, available software and hardware options, and the probable time and dollar costs of changes in the system.

Awareness of user staff comfort and reliance on data is an ongoing process that depends on the personal skills and awareness of the information-system staff. The remainder of this chapter, along with chapter IV, attempts to relate the experience of the pilot-test states to ways of helping institutions execute the reporting burden effectively, to possible hardware and software alternatives, to survey administration and data-organization considerations, and to the staffing and other resource considerations involved in developing a state-level information system.

Institutional Involvement

Institutional involvement in the design of the data to be collected (that is, the definitions to be used and the procedures for collection) has been one of the surest ways of expediting accurate, timely data acquisition. The experience of the State-Level Information Base project strongly suggests that an institutional advisory committee be organized by any state agency as an initial step in the information-system development effort.

Communication with institutions, whether through an advisory structure or directly and individually, is important at a number of steps in the process and cannot be overstated:

- Initially, during the planning for an automated data base. This step is one way to help reporting institutions understanding what data are necessary at the state level.

- During the selection and definition of data elements. This is particularly useful in conveying the purposes for particular data to be collected (for example, carrying out specific mandates of the agency or providing comparable data within the state). Some states have worked with their reporting institutions to adopt comprehensive data-element dictionaires, in effect anticipating a full range of state data needs and easing the potential later burden of changing classifications or definitions. The main point is that to the extent the reporting institutions' reporting burden can be minimized, more reliable, comparable data will result.

- Before survey data requests are administered. Training workshops for those who will be preparing the data at the institutions, perhaps conducted regionally within the state, can reduce possible questions or problems and save the time that can be consumed by incorrectly submitted data. This

should be done annually since new questions arise from new institutional staff, new survey data, or from modifications to definitions or procedures. This step is particularly relevant in the first few years of data collection by the state agency.

- Validation of data after they are received from the institutions. This can occur during and after the data-editing process. Basically, it involves a communication to insure that the institution and the state agency agree on the final data.

- Providing assistance with automated submittal of data--either state or HEGIS data. In some cases, this need be no more than standardized keying instructions. In other cases, particularly where institutions within a state maintain similar administrative-data systems, there is the possibility of software distributed to institutions for compiling and/or extracting requested data automatically.

- After most or all institutional data are edited. Preparation of reports of edited data for institutional use is one way of establishing an institutional benefit for reporting data. Possible examples include reports of the institution's own data arrayed for one or more years and reports with the same data displayed for all or some peer institutions in the state.

  Early turnaround of institutional data in the form of report generally feasible, given that most state agencies have report-writing software, which makes the specification/requesting of such reports rather straightforward.

  Eventually, it may be possible for a state to offer to compare one institution in the state with any other set that institutions might select--all others, publics, independents, senior colleges, junior colleges, technical/vocational schools, and so forth. As historical information becomes available and automated, longitudinal reports can also be provided.

- After the data collection and validating phases. Institutions can develop more of an identity with the information if their access to it is simplified, either through direct terminal access or by easy-to-specify reports produced by the agency staff upon request. The central storage of comparable data from any institutions can be a useful asset in this regard.

Hardware and Software Evaluation

The following discussion of the evaluation of various hardware and software systems has been based on the experiences and perceptions of the pilot-test states as viewed by the project staff involved with technical assistance. It should in no way be construed as any kind of official position by NCHEMS, NCES, the W. K. Kellogg Foundation, or the pilot-test state agencies.

Hardware Evaluation

Seven of the eight pilot-test states have used IBM equipment for their information processing, and therefore little basis or experience exists for comparing vendors. New York, the one non-IBM user, has used General Electric Timesharing on a service-bureau basis because the availability, turnaround, and analytic software features have been convenient. They are, however, considering changing to a Burrough system, primarily for cost reasons.

The one significant hardware feature to emerge as facilitating on-line storage and retrieval has been the mass-storage device called the 3850, made by IBM. The simplest model has a capacity of 35 billion bytes as compared with 200 million bytes for the 3330 Model II. This makes effective fast-access storage feasible for masses of data. Both Kentucky and South Carolina use facilities with mass storage capabilities.

The use of terminals--usually cathode ray tubes (CRTs)--is an asset in responding quickly to an inquiry. This is an especially valuable feature where quick response provides further motivation for using the system. This "hands-on" capability can, through training, be made available to nontechnical agency staff and to institutional staff. Hawaii and South Carolina have designed their systems to be operational for direct access by institutions via CRTs. Virginia also offers this capability--access being via batch (cards, printout) made with Remote Job Entry stations. Illinois, Kentucky, and New Jersey are in varying states of planning for data availability by direct access to institutions. California and New York provide reports as needed to those requesting them.

Software Evaluation

The selection of software suitable for processing aggregated information has been a key component of the pilot-test state activity. The pilot-test states for the most part chose from systems to which they had access: the pilot-test states have used the following software:

California	Customized programs are used for generating specific reports, although ADABAS is available. Ad hoc reports are generally produced using the Table Producing Language (TPL).
Hawaii	ADABAS was acquired primarily because of its ability to compress data for compact storage and also because of the feature which efficiently "inverts" a file (causes it to appear to the user to be in any desired sequence). In addition, a system called MENU has been developed by the University of Hawaii Management Systems Office to provide versatile and easy access to the data by nontechnical users.

Illinois	The Information Management System (IMS) is being used as the data base management system (DBMS) with EASYTRIEVE for data retrieval.
Kentucky	IMS is the Data Base Management System with MARK IV available in batch or on-line modes for data updates and retrieval.
New Jersey	RAMIS is used for data management as well as for data retrieval.
New York	GE Timesharing is used to load and access the data.
South Carolina	IMS is used as the Data Base Management System in conjunction with specially developed software for nontechnical users to access the data.
Virginia	MARK IV is used primarily for loading and retrieval.

There are diverse reasons for the selection of a data-base management system. A deliberate evaluation and acquisition strategy may be followed, as was the case in Hawaii, South Carolina, and Virginia. Or perhaps the selection of a particular service center may predetermine the software that is provided. The applicability of the service center's data-base management system to the state agency's needs may be less of a factor than such factors as proximity, availability of sufficient time, charging algorithms, personnel, and availability of sufficient support services. The selection process in Illinois provides such an example. In Kentucky and New Jersey, the service center and software were available at such a nominal cost that alternatives were not sought or considered. Finally, a data-base management system may exist at a chosen and convenient site, but the use and maintenance of the software may involve prohibitive costs. California has experienced this. ADABAS is available at the Teale Computer Center but the costs of using ADABAS there far outweigh the benefits as currently measured. Therefore California decided to use its own programming staff to install basic data files and to generate special purpose reports.

In general, three classes of software have been needed for installing and using data: (1) software to install machine-readable data--the data-storage function; (2) software to manage, alter, and summarize the data--the editing, analysis, and simulation function; and (3) software to provide data to the user--the data-retrieval function.

Among the specific tasks to be performed within these functions are the following:

Data Storage

- Organize the data into an efficient storage/retrieval form

- Store the data onto a ready-access device such as a tape or disc
- Edit the data before, during, or after storage

Editing, Analysis, and Simulation

- Provide summary capabilities to profile institutions, programs, students, staff, finances, facilities, and so forth
- Provide basic statistical tools to summarize the data--such as cross-tabulations, means, subtotals, totals, minimum or maximum values, and so forth
- Generate a subset of the original data for more extensive study
- Simulate or model possible situations so that alternatives can be anticipated and considered

Data Retrieval

- Retrieve the data with an easy-to-use language
- Provide quick response to queries
- Provide extensive reports (hardcopy or microfiche)
- Provide single-answer response (hardcopy or CRT)
- Display results in a sequence and format convenient for the user's purpose
- Provide, as an alternative to numeric displays, plotting and graphic display capabilities

Data Storage Software. Within the pilot-test-state experience, the first type of software--for organizing and storing the data--has been represented by four proprietary systems:

- The Information Management System (IMS) of IBM
- ADABAS of Software AG
- MARK IV of Informatics, Inc.
- RAMIS of Mathematica, Inc.

In general, it appears complexity and flexibility lead to added systems maintenance costs and overhead.

IMS: IMS contains features to organize basically hierarchical data and to store and retrieve data via a number of access methods. It is a complex enough system to maintain that its use has been beneficial only when the IMS-maintenance and data-base administrative functions have been assumed by staff at the site, rather than by staff at the postsecondary-education agency. In addition, IMS requires a host language such as COBOL, PL/I, MARK IV, or EASYTRIEVE. Only when one of the easier-to-use languages is used (such as MARK IV or EASYTRIEVE) is data usage easy enough from a nontechnical user's viewpoint that regular retrievals are likely. This is in contrast to the situation where a programming language (such as COBOL or PL/I) is used with IMS, requiring that a new program be written and tested for each unique data request.

ADABAS: ADABAS appears to entail less maintenance overhead than does IMS. Its overriding advantage is a feature that optimizes the storage of data and allows almost unlimited inversion of the data. Inversion is the feature in a language that allows the user to access any subset of a data file as if it were in any desired sequence. ADABAS performs better with a data base containing individual-specific information than with aggregated information. For example, a student-data base with an entire series of information about each student would be an ideal application for ADABAS. The same is true for a financial file based on a series of separate financial transactions. Hawaii's data included disaggregated records for each student, employee, financial transaction, course, and so forth, so ADABAS has been effective in generating the required aggregations.

MARK IV: Some purists may argue that MARK IV is a language for updating a file and reporting from that file, rather than a data-base management system. It has nevertheless been used to serve data-organizing purposes in a relatively simple manner. When surveys are used to collect data and each survey is au ted separately, MARK IV allows each survey (or file) to be access ither by itself or with other surveys (or files). In addition, w more than one survey has common information (FICE code, student program, student level, or all three), then these surveys can be accessed simultaneously by the user. For example, if one file contains student enrollments by program for each institution and another file consists of student completers by each program by institution, then MARK IV would allow the files to be, in effect, "coordinated" so that for a particular program at a particular institution, an enrolled/completers ratio could be calculated.

Another point regarding MARK IV is the inherent simplicity of its file structures. Unless a more sophisticated (and possibly overhead-consuming) system is justified by actual or anticipated heavy use of coordinated files, file simplicity can be a convincing advantage. Virginia has defined its files in terms of MARK IV alone, discontinuing its developmental efforts using IMS as its data-base management system.

RAMIS: RAMIS, like MARK IV, can be considered as both a data-base management system and a retrieval language. Both systems, incidentally, are independent in that they require no host languages for retrieval; that is, they both contain the language necessary to perform both DBMS and retrieval/reporting functions. RAMIS has been primarily used in New Jersey to define, organize, store, and retrieve data that are made available to the Board via surveys. With RAMIS, a record stored for an entity (such as an institution or a program) can include further subsidiary information. Although there is a practical limitation as to how much subsidiary information (repeating groups) can be included, RAMIS has been able to define and store the seven federal HEGIS surveys plus the several state-specific surveys maintained by the New Jersey Department of Higher Education.

Editing, Analysis, Simulation Software. The second class of software used in the pilot-test states includes those performing special purpose functions such as editing (establishing validity) and analyzing the data. An example of this software type is provided by the programs written by several of the pilot-test states and NCHEMS staff to edit the HEGIS surveys. Specifications for these programs were provided by the National Center for Education Statistics (NCES) and correspond to those used by NCES to edit their surveys. These programs vary from those at NCES primarily in that the state edit programs do not conduct longitudinal edits. This may be a useful modification for states to consider in the future.

Packaged statistical or tabulation software seem adequate for most data analysis anticipated by the pilot-test states. Such software as the Statistical Package for the Social Sciences (SPSS), Table Producing Language (TPL), OSIRIS from the University of Illinois, Biomedical Computer Programs (BMD), and others are often available at institutional academic computer centers, and their choice depends on need and/or availability. In using such software, the required data are extracted from the data base, producing a record for each entity being analyzed. This subset of the data is then defined to the analysis program being used and the data run through the program.

SPSS is probably the easiest to use and least error-prone of those named for joint statistical summaries. OSIRIS and BMD, for the most part, perform functions similar to SPSS but both take considerably more time and effort to learn. The documentation for OSIRIS is voluminous and can be intimidating to the uninitiated. TPL was developed and is distributed (at a nominal cost) by the Bureau of Labor Statistics. Its primary feature, unlike the other programs mentioned, is that it produces tabulated summaries and provides for the many variations and possibilities of cross-tabulation. The documentation for TPL is quite understandable, and the language is moderately easy to use.

A general-purpose plotting program is another useful addition to the methods just described. In Kentucky, the Council staff used a plotting program to graph certain variables (like enrollments, revenues) by geographical subdivisions (counties) of the state. Generalizing this program for use by other (pilot-test) states proved unfeasible. The main obstacle was the

requirement to initially describe to the program (in minute detail) the geography of the state. As intergovernmental planning efforts expand, states can be expected to have at least one agency (Transportation, Urban Development, Highways, or a state university) that has the plotting programs available with the necessary geographical boundaries defined.

Simulation and modeling may also be desirable. In this regard, the State Planning System (SPS) developed at NCHEMS is one software package that can use the type of aggregated data identified in the State-Level Information Base project. The SPS can operate with relatively few values or variables (depending on the size of the model design developed). Desired data or values are requested from the agency's data set and then manually entered into the SPS design. Enrollment forecasting and financial planning are two very common areas for simulation and the usage of models.

Data Retrieval Software. The third category of software retrieves the data, preferably in a relatively easy and error-free manner for the nontechnical user. Six software products have been used or tried in the pilot-test states: MARK IV, RAMIS, EASYTRIEVE, DATA ANALYZER, and TPL.

MARK IV: The strongest feature of MARK IV as a data-retrieval language is that, since it is not a procedural language such as FORTRAN or COBOL, the nontechnical user can learn to use it effectively and quite rapidly. In batch mode, MARK IV is used via preprinted forms. In an interactive mode, it is keyword driven; that is, rather than using a form, the desired features are named and filled in by the user. In either case, many of the repetitive and predictable functions necessary to access a file and prepare a report are assumed by MARK IV, and the user needs only to indicate which records are desired and how the final report should be sequenced and arranged. Whether attached to another DBMS, such as IMS, or used as a stand-alone system, the file definition is already available and the user has a choice of particular selection, processing, and reporting possibilities.

RAMIS: RAMIS provides a relatively easy-to-grasp basic language for the retrieval and reporting of data and is therefore quite suitable for the nontechnical user. It is not quite a procedural language. Many reports are possible with only the basic language, and more complex requests and reports can be formulated with a further knowledge of the refinements in the language.

EASYTRIEVE: Like RAMIS, the language in EASYTRIEVE is designed for easy formulation of requests. The language syntax in EASYTRIEVE can be readily understood by any user and, like the other languages described here, its capabilities can be enhanced with usage.

ADABAS: In both batch and interactive modes, ADABAS provides a relatively simple language for accessing data and for combining files. Also, because of its inversion capabilities, data can be viewed from any field upon which the data have been inverted; that is, ADABAS can make the data appear to the user as if they were stored in sequence by any field in the data record.

DATA ANALYZER: This language provides a free-form interactive way for users to prepare their request. Reports frequently involve selecting and aggregating particular measures and displaying results with headings, descriptors, and summaries. These functions are similar to those provided by MARK IV, EASYTRIEVE, and RAMIS.

TPL: The Table Producing Language (TPL) of the U.S. Bureau of Labor Statistics has been used in producing tabulated results. The language provides a compact, English-like syntax for nontechnical users to produce crosstabulated results of data. Reports can be produced with clear titles, footnotes, column and row descriptions, and totals. TPL is usually not the state agency's only data-retrieval capability. Those reports it does provide, however, are done with a significant efficiency of user time and computer resources. For example, cross-tabulations that can be produced readily by TPL are cumbersome to produce using the commercially available systems such as MARK IV, EASYTRIEVE, and so forth. TPL is designed for use at IBM 360 or 370 installations. This would include the IBM-compatible AMDAHL system. It runs in an OS environment, including VS1, VS2, MFT, or MVT. TPL is in the public domain and is available from the U.S. Bureau of Labor Statistics for a nominal cost. Contact: Peter Stevens, Chief, Division of General Systems, Office of Systems and Standards, U.S. Bureau of Labor Statistics, U.S. Department of Labor, Washington, DC 20212, (202) 523-1277.

Hawaii and South Carolina have developed their own retrieval software. MENU was developed at the University of Hawaii by the Management Systems Office. MENU has been designed primarily as a data-retrieval language that is user-oriented. At present, MENU interfaces with the Customer Information Control System (CICS) to acquire records. The staff at the University of Hawaii have expressed their willingness to share the MENU specifications as well as the programs with any interested users. Among the strongest characteristics of MENU are allowing the nontechnical user to use an interactive terminal relatively easily and prompting the user along the way with hints, further action possibilities, and aid when necessary.

South Carolina's custom retrieval software provides a linkage between the user and IMS and the data. As in Hawaii, providing convenience for the nontechnical user was the primary consideration in designing the language.

It is interesting to note that even though Hawaii and South Carolina each used a different DBMS, their basic concepts for software design and data retrieval have been similar. These concepts can be summarized as follows:

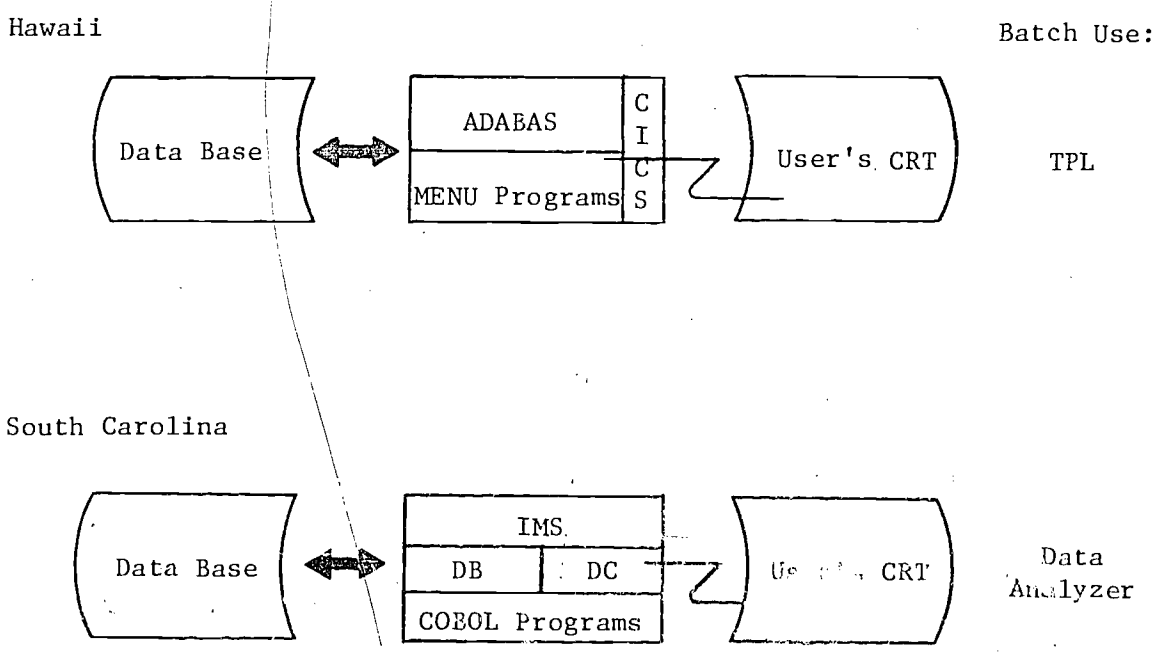
- A CRT terminal is provided for the user along with a choice of many preformatted "screens" of data. The user selects a screen for the desired institution(s), and the software presents the requested data on the screen.

- The software for both states has four functions: (1) to communicate with the user and interactive terminal; (2) to translate the request into instructions to the software for accessing the data; (3) to store and retrieve the data; and (4) when there is a need for additional types of reports such as summaries of institutions, tabulations, and statistical analyses, to accept batch programs.

- Both states have assembled these functions in virtually the same way, although different software has been employed.

Software for	Hawaii	South Carolina
Interactive Communication	CICS	IMS/DC
Request Translation	MENU	COBOL Programs
Data Base Interaction	ADABAS	IMS/DB
Batch	TPL	Data Analyzer

Schematically, the software can be related as follows:



Survey Administration

Most of the data needed by a state-level agency must be acquired from institutions. The most common mechanism for this data collection has been preprinted survey forms. HEGIS has in the past used printed forms and so have most states. Although that remains a viable method, automated data collection is also an emerging and ultimately more cost-effective method to both the provider and the maintainer of the data. NCES is actively promoting institutional submittal of HEGIS data on tape, and a number of states are encouraging those institutions that have the facilities to do so.

Administering Printed Survey Forms

Many states collecting data by surveys prepare the surveys as a package and distribute them to the institutions by late spring or early summer, on roughly the same schedule as the HEGIS. The survey forms are accompanied with definitions and directions for completion. At an earlier stage, the institutions have been appraised and hopefully involved in selecting the data items. There is generally a staggered schedule for return of completed surveys similar to that of the HEGIS.

The following checklist of points should be considered when preparing a survey:

- Each form should contain places for the institution/campus name, FICE code (pre-entered by the agency if possible), name/title of person completing form, date the form is completed, and the term encompassed by the data. On multipage surveys, the institution name or FICE code (as a minimum) should appear on each page.

- Color-coding the surveys is a convenient way of distinguishing among the following: term or semester, institutional sector (public/private, two-year/four-year/university) or type of survey (student, faculty, finances).

- A survey designed and tested with key-entering requirements in mind can expedite processing time and accuracy. Since most of the data on a survey will be keyed or keypunched, it is very important to pre-test several samples to ensure that all data and line numbers can be easily keyed. One state found the absence of this step to be the single largest factor in delaying data automation. Since the data could not easily be keypunched from the existing layout of the surveys, the survey data has to be transcribed to keypunching coding forms. This was time consuming and added another potential source of errors.

- At the agency, one or more staff members should have specific responsibilities for logging and visually checking the completed survey. These people should be familiar with the campuses so

that figures that are obviously out-of-line or missing are quickly apparent. If this step is omitted, surveys once logged-in would go straight to the key-entering process.

- Keying the data may be done in a variety of ways, such as keypunching the data to cards for future editing, key-entering to tape with limited editing, or entering the data via a terminal for simultaneous, automated editing.

- Survey forms to be keypunched should be pre-screened for legibility and completeness. This should include checking for an institutional identifier on at least the first page; resolving the meaning of any stray marks, comments, or footnotes that institutions may have added; and insuring the reasonableness of the magnitude of the data. The point to note is that some editing is better done visually (or manually) in the early stages of data entry. It is neither economical nor feasible to develop edit programs that can anticipate all errors. Many are best resolved before the survey is keyed.

Administering Automated Data Input

Many of the steps outlined above for administering printed survey forms are by-passed when data are submitted in a machine-readable form--typically on tape in card-image format. State agencies can encourage institutions to submit automated data by providing record layouts and possibly by providing programs that extract portions of the data from institutional files. This is more feasible in states where institutions maintain similar accounting, enrollment, student, or employee files.

Editing Data

Once the data are machine readable, editing can be done by one of a variety of programs, depending on the type of editing desired. Editing survey data can consist of:

- Verifying a single entry. This usually involves a numeric or range check and is possible either at the key-entering stage when programmable keying is available or at transaction-processing time when the keyed data update a masterfile. MARK IV and other file-management systems provide this capability. This verification step can also be written specifically into a program if custom programs are being used.

- Verifying data for consistency within the survey for that time period. The edit programs for the HEGIS surveys provide an example of this in their production of an exception report for values not cross-totaling or equaling totals reported, or for values falling beyond pre-set ranges. For non-HEGIS surveys, such programs, if deemed necessary, would have to be written.

- Verifying data across surveys for that time period. This pertains to both HEGIS data and state specific surveys. To accomplish this it may be a good idea, for the first year, to make a list of items that need to be consistent across surveys. These items can be manually checked before keypunching. Eventually, such an edit could be incorporated into subsequent years' edit programs. For example, a state may have several surveys that request different data on freshmen. The edits just described would check that the total number of freshmen reported is the same on each survey.

- Verifying data for a reasonable magnitude over time--longitudinal edits. NCES performs such edits on the HEGIS surveys for Finances, Employees, and Opening Fall Enrollment data. For Earned Degrees, which are reported by student programs, NCES programs check to see if new programs are designated (in the appropriate column) as being new.

The edit programs developed during the project for state-agency edit of HEGIS surveys perform single-year checks and do not edit longitudinally. The edit programs used within NCES have the longitudinal capability, and there will be an attempt to acquire and make them available to interested users.

Figure 1 is a schematic summary of the general steps just outlined for survey administration, including identification of data related to planning needs, survey design, data collection, data review and editing, file building, and report generating. Most states, in one way or another, parallel this series of steps and find that interaction with the institution is a continuing and important aspect of the process.

Staffing Considerations

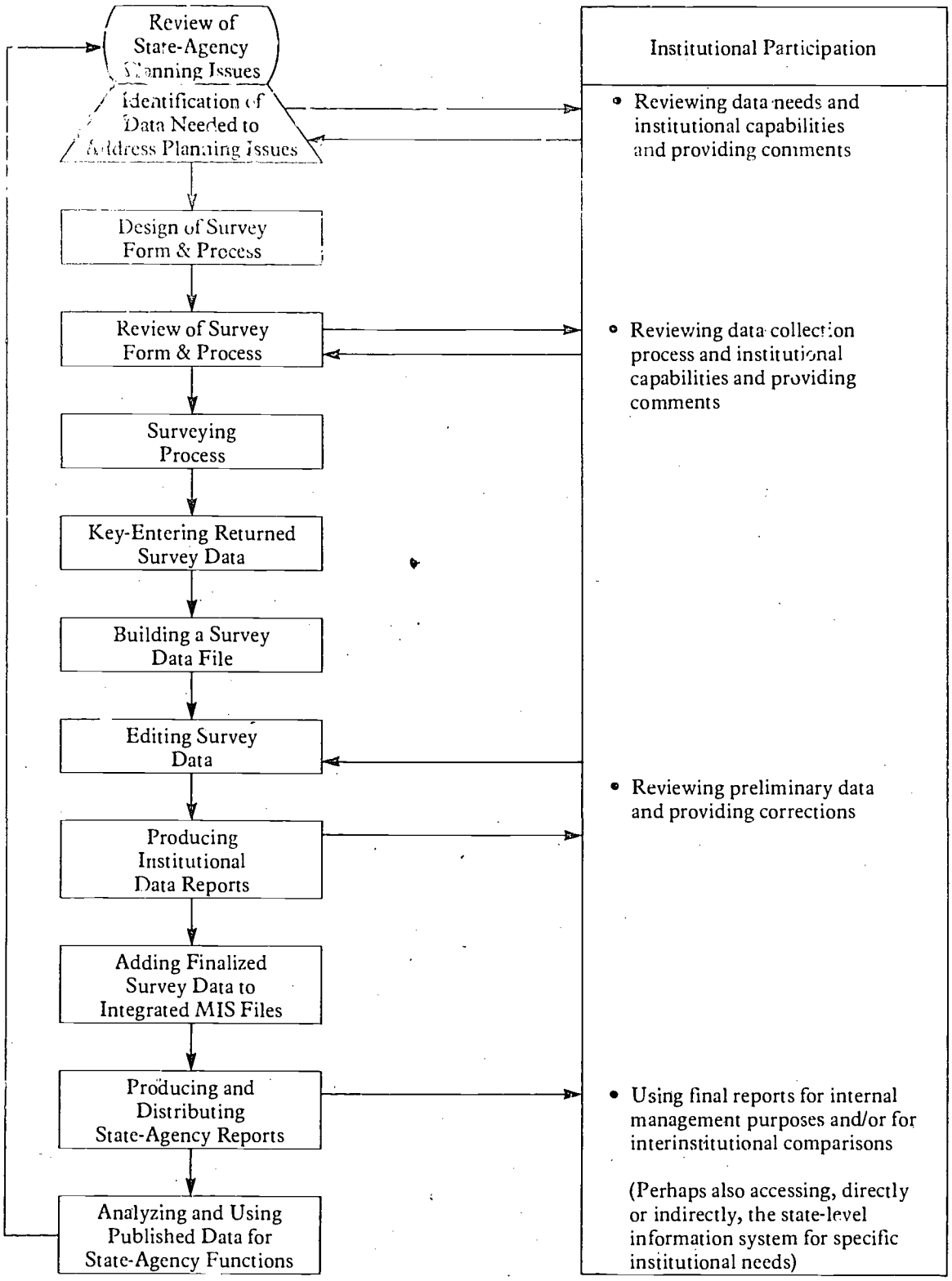
An important part of documenting the implementation experience has been noting the staffing requirements for a Management Information System (MIS). As dollar expenditures and hardware and software requirements have varied among states (see chapters III and IV), so have the types and numbers of staff required.

While the quality of staff--their knowledge of both the agency's needs and the availability of software and techniques to maximize what computer capacity is available--is a determining factor in the number of staff required, average figures can be derived within which the pilot-test state agencies have functioned.

The average staffing requirements might be characterized by the following functions and by the staff level of involvement (expressed as Full-Time Equivalents):

Figure 1

GENERAL PROCEDURAL STEPS INVOLVING
DATA DETERMINATION, COLLECTION, MAINTENANCE, AND REPORTING



Average FTE Used[2]	
.5	Overall coordinator/MIS director--ensures that the required contacts and environment for the data collection effort are maintained. This would include liaisons with institutions, agencies, and legislative/executive staff.
1.0 to 2.0 for development	Data-base administrator or systems analyst--works with the coordinator and other staff, establishes the level of MIS support requirements, establishes the technical specifications for the information system, and oversees the design and programming of those specifications.
2.0 to 3.0 for development	Programmer--writes new programs and/or installs or modifies available software to provide the best interface possible between the data and the users of the data.
1.0	Survey or data coordinator--works with the institutions to ensure that correct and complete data are submitted.
2.0--generally individuals are assigned on a part-time basis	Data entry/clerical staff--functions include keypunching, data entry, manual survey processing, mailing or transmittal, and logging functions.

Most states have performed each of these functions with their staff. It is more frequent that each person could be responsible for or participate in more than one. During the developmental stages, the systems analyst and programmer functions frequently overlap. Also, the overall coordination can overlap with the systems analyst function to a certain extent, particularly if the coordinator has systems skills.

Developmental activities are clearly of a different nature and complexity than those activities associated with an operational MIS. Nevertheless in the pilot-test states there seemed to be a minimal change in staff requirements after the initial development. Perhaps this is partially due to the fact that none of the states considers their MIS wholly operational--that refinements have been ongoing even after the installation of the data.

In considering a new implementation effort, the alternatives of hiring or contracting for systems staff may be considered. Of the eight pilot-test states, four used consultants for part or all of their systems needs. The

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2. Size and scope of both the surveys and the number of institutions included have a large impact on the number of staff involved in certain functions such as data entry.

other four had or hired their own staff. Two of the four used outside consultants for virtually the entire developmental stage. One of those states plans to continue the agreement indefinitely while the other expects to phase in their own staff once the system is more operational.

The most obvious advantage of using consultants is the ability to target specific expertise to the agency's requirements. Little training is required, and the diverse or specific background needed can be sought without a long-term commitment to the individual. The main disadvantage observed by some states is the potential lack of control over the quality of the product. The presence at the agency of someone who can regularly determine the progress and quality of what is developed seems to make the key difference in how well the consultant's services are utilized.

In the two states where consultants were used for only part of the system development, the consultants had specific tasks or assignments to complete. The overall control and decisions as to what was required resided with the agency's staff.

Data Organization Considerations

In practice, two basic ways of organizing the data have emerged in the pilot-test states--each with advantages and drawbacks.

Sequential, Survey-Oriented Organization

By far the most obvious and easy-to-implement method has been that of defining each survey as a separate file to the available software system. Often one record is created for each survey received (for example, one record per campus). The user can become familiar with the survey instruments and, once a file definition becomes available, can access the data with as much flexibility and ease as the available software system--MARK IV, COBOL, and so forth--allows.

The advantages of survey-oriented records for the user are twofold. First, a user already familiar with the survey has only to learn the field names to retrieve the desired information. There is no need to reorient one's thinking to a different scheme of organization. Second, representing the data in a sequential, one record-per-campus format is the simplest to install and maintain since the records are often of a fixed length and can be directly related to a survey. This method of organization is straightforward to implement and to learn and offers significant advantages when simplicity is important. Currently, four of the eight pilot-test states are using this method of survey-oriented organization.

The disadvantages become apparent when repetitive data occur or when data from one survey are related to data from one or more additional surveys. The storage overhead of potentially recurring data can become substantial when a field is reserved for each possible occurrence and when there are only a few recurrences of data. A good example is the Earned Degrees information, where keeping a field for each possible program/degree is expensive.

Interrelating data from more than one survey or file can be a burden on the user, the system, or on both, depending on the features of the available software system. The process of organizing and then (frequently) debugging a cross-file request discourages such an effort. If data can only be retrieved with great difficulty, they will not be used as much.

Hierarchical Organization of Segments

Another method of organizing data is to organize the data into segments by those data elements having similar keys, such as FICE codes, HEGIS codes, student level, or academic term. These segments then correspond to the entities being measured. The segments are then arranged in the order that they most frequently relate to each other. The chart of segments in appendix C is a representation of what was initially used in the state of Kentucky to install its data.

The primary advantage of a combined organization is the ability to look at the data from the viewpoint of how the information interrelates rather than from the viewpoint of the data-collection instrument. The survey is used only for data entry, and once the data are in the data base, they can be readily viewed with other related data.

Presently, the disadvantage of such an organization is primarily economic and a function of the state-of-the-art for available data-base management systems that recognize and maintain such a representation. IMS by design can maintain this organization, but the overhead of using IMS and the related systems staff support in maintaining the data base are frequently higher than can be justified by its advantages.

Hawaii, by virtue of its unique institution-based detailed data, maintains its data primarily by campus. Summaries desired for state aggregations are extracted by referring to the multiple files within each campus.

Storage and Linkage Considerations

A brief discussion follows on what data to store, where to store it, and how to interrelate data when this is required.

Storage Considerations

The volume of data collected can become quite extensive when a number of different surveys are processed for many institutions and for a number of terms and/or years. For those states where on-line storage space is at a premium, several options can be considered. Hawaii has chosen ADABAS for its ability to compress data on disc storage (as well as for other features). Other states find that backing up on-line data to tape is practical. In this way, data are kept on tape and restored to faster-access disc when a user needs them.

For frequently used files, current-year versions can be kept on-line. The 3850 mass-storage device described earlier has been a considerable aid for

those states with access to one. Maintaining HEGIS data off-line rather than on-line can effect a considerable savings in disc space. Unedited data are probably best kept on-line until both the institution and the state agency agree to an edited version.

Storing data items more than once should also be avoided. This occurs, for example, on a survey containing lines for subtotals, and perhaps a grand total (the HEGIS Earned Degrees survey is a good example). Each line value will be included with each accumulation--redundantly. After the editing stage, it should not be necessary to maintain subtotals that can be derived from the data available.

Linkage Considerations

There are occasions when data from one file need to be displayed with data from another. To serve this need, information should be organized together as a data base, rather than as separate files. An institution's FICE code is the single most useful key in accessing multiple files. Additional keys that are useful are the HEGIS program identifier code and codes for student level and degree type. Others will become apparent after experience suggests what types of data are most often used to link data from different areas of a data base or from different files.

Data items that are particularly useful can become the basis for the sequence in which files are stored. HEGIS data are most often stored by FICE code within state code. At installations where the software supports it, the capability to "invert" files based on one or many items may exist. This in effect leaves the data file in a standard sequence, but builds an index for accessing the data as if they were organized by the inverted data item.

IV.

COSTS RELATED TO POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL

This chapter summarizes the costs related to developing and implementing information systems in each of the pilot-test states. It was originally assumed that these cost summaries could be used to develop generalized cost-estimating procedures for the development of state-level information systems in other states. That has proved infeasible for the following reasons:

- Precise figures were not available from the pilot-test states. Exact figures regarding that part of the total agency budget that relates directly to the information system were not available, and estimates were the best that could be provided.

- Extreme differences in computer environments and associated staff capabilities existed among the pilot-test states. Each state's ability to support the information system (capabilities and capacity of equipment, physical location of equipment, sophistication of systems staff, and so forth) was so different from the others that the costing data can only be used with a great deal of related descriptive information. This served to emphasize the difficulty in making comparisons among even the pilot-test states.

- Differences existed in the degree of development and completion of the pilot-test states' information systems. This was the case both at the time they became pilot-test states and at the time the costing summaries were prepared. This made it virtually impossible to isolate the specific impact of the project on the development of each state system or to identify common developmental impacts of the project among the eight states. Variances

in degree of development were documented in a chronological summary of major activities related to each state's information system. Each summary gives a historical perspective to the cost estimates in such areas as maturity of the state agency data-collection process, experience and length of time the institutions had provided data to the state agency, and the status of plans/activities to computerize the agency's information systems.

- Isolating computerized information-system costs from the total cost of all data-related activities of an agency was difficult. Information systems involve both computerized and noncomputerized data, as well as some data accessed from other sources external to the agency.

- Techniques for assigning costs to some of the items and activities involved in an information system was difficult. For instance, development of a distinction between fixed and incremental costs to identify the key factors involved in planning a data-base budget would depend upon a more extensive effort than was feasible within the scope of the project.

- The institutional costs involved in reporting to a state information system could not be readily determined.

- Pilot-test state personnel involved in helping develop the cost summaries had some major concerns such as the following:

  - What is the purpose of trying to do exact cost estimates? In general, a state has to recognize that at least $100,000 in developmental costs is required to establish a computer-based information system at the state level.

  - Specific costs estimates from other states may not be relevant if a state has no choice regarding whether or not to develop an information system. In fact, in that case it may be more appropriate to ask what would be the cost of not developing an information system?

  - The pilot-test states can cite areas where money could have been saved and costs reduced if the process were repeated. This experience, if shared with other states, could result in a cost pattern different for other states developing information systems.

The information that was developed regarding cost estimates for each state and the associated chronological summaries of major activities related to the information-system development can be referred to in the companion document, Postsecondary-Education Information Planning at the State Level: Pilot-Test State Case Studies. In referring to this information, it is important that the following points be kept in mind:

- The methods used to identify costs vary from state to state
- State approaches to and uses of data vary widely (as the companion document containing the case studies points out)
- Institutional costs were not included nor were they available
- Maintenance costs, if included in operational costs for a given pilot-test state, have not been specifically identified, nor do these cost summaries address the costs of maintaining an ongoing system
- Overhead costs were not shown nor are they readily available
- Additional factors impact on costs such as the following:
  - The length of time the state agency and institutions in a state have been involved in data collection related to a state-level information system
  - Level of detail a state chooses to include in its information system
  - Form of the information provided to the state agency by institutions (that is, automated form versus manual)
  - Number and scope of institutions providing data for the information system
  - Amount of historical data maintained on automated files
  - Type of computer facilities used and sophistication of the data processing and systems analysis staff

The general conclusion from this attempt to summarize the costs involved for the eight pilot-test states was that the establishment of a state-level information base is an expensive activity and that the pilot-test state cost summaries must be referred to as a range of costs rather than individually as a statement of costs. Table 1 displays the estimated costs of developing each pilot-test state's system for time periods ranging from 1.5 years to 3 years (for an average of 2.5 years). From this table it can be seen that developmental costs ranged from approximately $75,000 to almost $270,000 with an average of $157,000. It cannot be reiterated too often, however, that recognition must be given to the vastly different situations and type and scope of systems existing in each of these pilot-test states that contributes to the wide variance in developmental costs. (The companion Case Studies document referenced earlier in this chapter describes many of these differences.)

A major point the pilot-test states wanted understood was that their involvement in the project may have led to a net negative cost effect compared

TABLE 1

DEVELOPMENTAL COSTS OF STATE-LEVEL INFORMATION SYSTEMS
SUMMARY OF PILOT-TEST STATES' ESTIMATES

AS OF MAY 1978

PILOT-TEST STATE	ESTIMATED DEVELOPMENTAL COSTS*	TIME PERIOD FOR THE DEVELOPMENT OF THE PILOT-TEST STATE'S INFORMATION SYSTEM
California	$ 114,000	2 Years (1977-78 and 1978-79)
Hawaii	75,000	1.5 Years (1975-76 and 1976-77)
Illinois	200,000	2 Years (1976-77 and 1977-78)
Kentucky	96,770	2 Years (1976-77 and 1977-78)
New Jersey	120,000	3 Years (1976-77 through 1978-79)
New York	266,000	3 Years (1975-76 through 1977-78)
South Carolina	267,400	3 Years (1976-77 through 1978-79)
Virginia	114,430	3 Years (1975-76 through 1977-78)†
TOTAL	$1,253,600	Average of 2.5 Years
High Cost	$ 267,400	
Low Cost	$ 75,000	
Average Cost	$ 156,700	

SOURCE: Detailed cost tables for each pilot-test state contained in the companion document: *Postsecondary-Education Information Planning at the State Level: Pilot-Test State Case Studies.*

NOTE: To place these cost estimates in perspective, it is necessary to know more about each state, such as the number of institutions involved, the number of students, the types of institutions reporting (public/private), whether historical files are maintained, and so forth. The source document noted above provides much of this descriptive information.

*These figures reflect estimated developmental costs for the state agency only and do not reflect institutional costs. They are cumulative costs for the time period indicated for each state.

†Virginia's MIS developmental activities will probably continue through 1980 since their files exist separately rather than as an integrated system at this time.

to the possibility of developing an information system without the kinds of guidance and assistance associated with the project. The availability of some edit specifications, computer programs, and consulting services made part of the difference. But more important was the ex ent to which project guidance helped each state's effort to be more focused and less experimental.

Of significant importance when discussing costs associated with state-level information systems, is the existence of institutional costs, including developmental costs for new data, incremental costs for currently available data, and maintenance costs for updating data. Based on the experience of a large institution in reporting to a state agency that had reporting requirements for a comprehensive information system, the following general conclusions were drawn about the institutional costs involved:

- If data required by the state agency could be provided as a by-product of the institution's operating system, it would cost the institution less to provide the data.

- If data required by the state agency were not part of the institution's operating system, then the following rule applied: it cost approximately one dollar a record for initial programming of new data and about one dollar a record to process the data, thus costing the institution about two dollars a record in total to provide data not part of the operating system. Additionally, it cost about 25 cents a record to keep the data maintained.

Appendix A

DATA MAINTAINED BY EACH PILOT-TEST STATE

The information in this appendix summarizes the data specified in the 1977 Field Review Edition (Technical Report 85) of the State-Level Information Base and captures pilot-test state usage of the data as of May 1978. The following items are included in this appendix:

- Information-Structure Overview
- Information Structure and Functional Uses of Data--Summary of All State-Level Information Base Pilot-Test States
- Information Structure and Functional Uses of Data--Detail by Pilot-Test State

The Information-Structure Overview chart provides an overall picture of the data contained in the Field Review Edition. In addition, the same sequence is used for the data that is listed in the summary and detail tables that follow the chart.

The summary table was compiled from the detailed tables of the eight pilot-test states. It contains all states using the data specified in the Field Review Edition, as well as an identification of the function for which the data were used in each state.

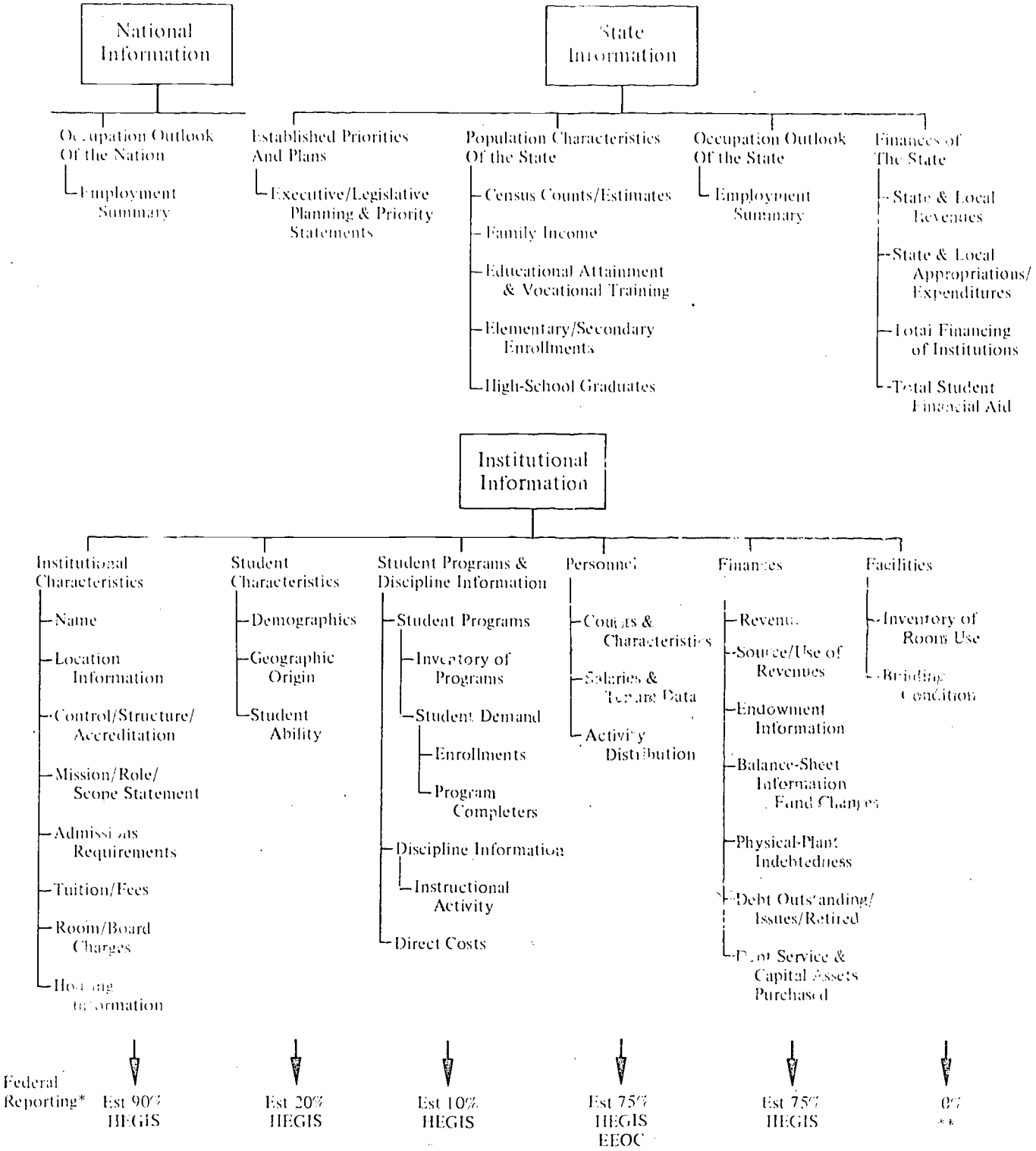
The detailed tables were completed by each pilot-test state in May 1978 and reflect the following:

- Identification of data used by the pilot-test state agency including for each data category:
  - Level of aggregation (institutional detail, institutional summary, or state summary)
  - Indication of whether the data are computer accessible (computerized, hard copy, accessible from another agency)
  - Type of institution (public, private, community colleges) for which each type of data is maintained at the agency
- Indication of the major functions (or activities) of the pilot-test state agency, including:
  - Responsibility for Federal Reporting (such as state HEGIS coordinator)
  - Long-Range Planning
  - Developing Institutional Statements of Mission, Role, and Scope
  - Involvement in Budgeting
  - New and/or Current Program Review
  - Facilities Review/Planning
  - Enrollment Projections/Forecasts
  - Financial-Aid Administration or Planning
  - Affirmative Action Review/Monitoring
  - Other Functions--Primarily Publishing of Information
- Display of how data in the pilot-test state agency's information system are used (or not used) to support the identified agency functions

Also included at the end of each of the detailed tables is a summary of additional data (both mechanized and nonmechanized) that a given state agency considers part of its information system but that are beyond those included in the table, and thus beyond those specified in the Field Review Edition. In addition, this information has been compiled in a separate page at the end of the summary table for easy reference.

The italicized data items listed in the summary and detailed tables reflect those institutional data elements specified in the Field Review Edition that are already required for federal reporting.

INFORMATION STRUCTURE OVERVIEW



* Estimated percentage of the institutional data items required for federal reporting as of 1977-78 and 1978-79.
**Reporting of some facilities data yet to be determined for the mobility-impaired will be required in HEGIS.

POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL
INFORMATION STRUCTURE AND FUNCTIONAL USES OF DATA
Summary of All Pilot-Test States

As of May 1978

INFORMATION STRUCTURE[a]	PILOT-TEST STATES ACCESSING DATA		STATE-AGENCY FUNCTIONS / USES[a]											
Major Area Data Categories/Data Items	Total	State Abbreviations[b]	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	...ing	Program Review: Current Programs	Program Review: New ...	...ilities ...eview	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
State Information													
Population Characteristics of State		[illegible]		H,I,S,V	H	H				H,K,J,Y,V		H,J	Y
- Census in total, by county, by population density	0	H,I,K,J,...		H,I,S	H		H	H		K,J	I,V	J	
- Distribution of family income										H,J,V		H,J	
- Education attainment by county for levels within elementary, secondary, college, and vocational education	4	H,J,S,V		S,V									
- Elementary/secondary enrollments by public/private by locality	6	H,K,J,Y,S,V		H,V	H		H	H		H,K,J,S,V		H,J	
- High-school graduates by sex by race by locality	6	H,(I),J,Y,S,V		(I)						H,(I),J,Y,S		J,V	
- High-school-equivalency recipients by sex for state	5	H,J,Y,S,V								H,J,S		J	
Occupancy Outlook of State													
- Employment summary by industry type and by occupational classification for state	5	H,I,J,S,V		H,I,S,V	H	H	H	H,V		H,J		H,J	
- Job applicants/openings by occupational classification for state	6	H,I,J,Y,S,V		Y,S,V			Y	Y,V				H,J	Y
Finances of State													
- State and local revenues	6	H,I,J,Y,S,V		H,S	H	H,I,J,Y,S	H	H					
- State and local appropriations/expenditures	6	H,I,J,Y,S,V		H,S	H	I,J,Y,S	H	H					
- Student financial aid available from state through state agency, including number of recipients (and their characteristics) and dollar amounts of aid	4	I,J,Y,V				I,J,Y					I,V		
National Information													
Occupation Outlook of Nation													
- Employment summary by industry type and by occupational classification for nation	3	H,I,V		H,I,V	H,J		H	H,V		H		H	
- Job applicants/openings by occupational classification for nation	3	H,I,V		I,V	I			V				H	
Finances											I		
- Student financial aid available from federal government directly to students	2	I,V				I,V							
Functions Not Applicable At:							J		C,H	C	C,H,K	C,Y,S	

[a] The data included in this table summarize the data specified in the 1977 field review edition (Technical Report 85) of the State-Level Information Base project. The use of the data by the eight pilot-test states involved in the project reflects their status as of May 1978.

(A circle around the state abbreviation indicates that the state either did not use the data item in its entirety or else s...ficantly modified the data item or definition.)

[b] Abbreviations for the pilot-test states involved in the State-Level Information Base project are as follows:

C = California
H = Hawaii
I = Illinois
K = Kentucky
J = New Jersey
Y = New York
S = South Carolina
V = Virginia

INFORMATION STRUCTURE	PILOT-TEST STATES ACCESSING DATA		STATE-AGENCY FUNCTIONS AND DATA USES											
							Program Review							
Major Area Data Categories/Data Items	Total	State Abbreviations	Federal Reporting	Long Range Planning	Mission/ Role/ Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information													
Institutional Characteristics													
HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)	All 8		All 8	H,V	V			V			V	H	C,K,J
Other data: tuition/fees separately for all levels (including lower division, upper division, and specific professional programs), housing, and commuter information	4	H,(J), S,V				S,V					(J),V		(J)
Student Characteristics													
Demographic	7	(Excluding Kentucky)		H,I,J,V	J	H,V,	H	H		H,I,J,Y,S,V		V	I,J,
- Applications, admissions, enrollments for first-time students at all levels													
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*	All 8		All 8	H,I,V	V	H,I,V	H,I	H,I	V	H,K,Y,S,V		I,K,J,V	C,I, K,J
- Other head counts by age by FT/PT by student level, including unclassified	7	(Excluding K)		(V)	J					J,Y,S,(V)			C,I,J
Geographic Origin													
- *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*	All 8		All 8	H,I,V	V	H,V				H,I,Y,(S),V			I
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: In-district by county (for all levels) In-state by county (for first-time freshmen) Out-of-state by state (for first-time freshmen) In-state versus out-of-state totals (for first-time graduates and professionals)	All 8			H,I,K,(J)		H				H,I,K,(J) (Y),S,(V)			(C),I, K,(J)
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, by out-of-state by state	6	(C),H,(I),(J),S,V		H,(I),(J)		H,(I)				H,(I),(J),S,V			(C),(J)
Student Ability													
- Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, and SAT score ranges, including institutional averages	5	H,I,J,S,V		H,J	H,J,V	H				H,J,			
Financial Aid													
- Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution	6	H,I,Y,S,V		H,V	V	H,I,Y,V					I,Y,S,V		I
Functions Not Applicable At:							J		C,H	C	C,H,K	C,Y,S	

INFORMATION STRUCTURE	PILOT-TEST STATES ACCESSING DATA		STATE-AGENCY FUNCTIONS AND DATA USES										
							Program Review						
Major Area Data Categories/Data Items	Total	State Abbreviations	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (continued)													
Student Programs and Discipline Information													
Student Programs													
Inventory of offerings by institution	All 8			H,I,V	C,H,I, K,Y,V	V	C,H,I,K, Y,S,V	All 8		V			C,I
Student Demand													
- *HEGIS required head counts by sex by FT/PT by student level (upper division, first-professional I and II, graduate I and II) for all major fields of study per HEGIS taxonomy (OE form 2300-2.9, Upper Division and Post Baccalaureate Enrollment by Degree Field, last required in 1976 has been discontinued)*	All 8		All 8	H,I,J,V	J,V	H,I,Y	H,I,Y,V	H,I,J,Y,V		I,K,Ⓥ,V			C,I,K,J
- Other head counts by FT/PT for other students (lower division and nondegree/diploma/certificate), by major field of study (including not designated)	All 8			Ⓥ,J,V	J,V	Ⓥ,Y	Ⓥ,K,Y,V	Ⓥ,K,J,Y,V		H,Ⓥ,K,V			C,Ⓥ,J
- Costs by student level within student program	5	H,Ⓘ,K,S,V		V		H,Ⓘ,K,S,V	Ⓘ	Ⓘ,S,V					
- *HEGIS required numbers of degrees/diplomas/certificates conferred by sex and race by type of degree and by major field of study for July 1-June 30 (on annual NCES forms 2300-2.1 and 2.2, Degrees and Other Formal Awards Conferred)*	All 8		All 8	H,I,J,V	J,V	I,Y	H,I,Y,S,V	H,I,J, Y,S,V				K,V	C,I,K,J
- Other information on number of students receiving a certificate/diploma for a program of less than one year by major field of study	4	H,I,S,V		V									
- Degrees conferred by age range of students summarized by type of degree	3	C,H,S										H	C
- Characteristics of program completers summarized by type of degree	2	H,S											
- Noncompleters (and exit status) by type of degree and student program	2	H,S											
Discipline Information													
- Costs by course level within discipline for:													
Degree-related instruction													
Requisite preparatory/remedial				H,Ⓥ		H,Ⓘ,K,S,Ⓥ	H,Ⓘ	H,Ⓘ,Ⓥ					
Nondegree	5	H,Ⓘ,K,S,Ⓥ		H,V	V	H,Ⓘ,K,S,V	H,Ⓘ,K,S,V	H,Ⓘ,K,S,V		V			
- Instructional activity: student-credit hours by course level within discipline	5	H,Ⓘ,K,S,V											
- Instructional activity: student-contact hours and faculty-contact hours by course level within discipline for:													
Degree-related instruction													
Requisite preparatory/remedial						Ⓥ		Ⓥ	Ⓥ				
Nondegree	3	H,S,Ⓥ											
Functions Not Applicable At:							J		C,H	C	C,H,K	C,Y,S	

INFORMATION STRUCTURE Major Area Data Categories/Data Items	PILOT-TEST STATES ACCESSING DATA		ALL AGENCY FUNCTIONS AND DATA USES										
	Total	State Abbreviations	Federal Reporting	Long Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)													
Personnel													
HEGIS required head counts by sex by FT/PT for manpower categories for all employees. (This information is reported on NCES form 2300-3 only when the form requires information on all employees instead of just full-time instructional faculty, as occurred in 1971-72, 1972-73, and 1976-77.)	All 8		All 8	H,I,J		I,V,S,V	H,I	H,I				H,J	C,I,J
EEOC required data on head counts and salary distribution by sex by race by contract period by manpower categories for all employees. (Form EEO 6 was first required in 1975 as a biennial survey and the same form was used in 1977 and 1979.)	7	(Excluding New York)	C,H,I,K,V									H,I,J,V	C
HEGIS required data on full-time instructional faculty by rank by sex by contract period, including numbers tenured and contributing services; and salary and benefit information. (As of 1977, NCES form 2300-3 incorporated information previously collected by AAUP on salaries for continuing faculty.)	All 8		All 8	H,I,J,V		I,V,S	H,I	H,I				H,I	C,I,J
Other data on instructional/research staff: Number tenured, nontenured, and total for full-time by age range Number tenured, nontenured, and total for FT/PT by discipline Service months by PCS programs	5	C,H,I,S,V		H,I,V		H,I	C,H,I	H,I,V				V	C,I
Finances *(HEGIS required data collected annually on form 2300-4, Financial Statistics of Institutions of Higher Education)*													
- *HEGIS required current fund revenues in total (unrestricted/restricted combined) by source for tuition/fees, government appropriations by level, sales and services, other sources, and independent operations*	All 8		All 8	H,I,J,V		All 8							I,K
- Other data on unrestricted current fund revenues by source for government appropriations by level, for other sources, and for independent operations	4	H,I,S,V		H,V		H,S,V	I						
- *HEGIS required unrestricted versus restricted current fund revenues by source for government grants and contracts by level; private gifts, grants and contracts; and endowment income*	All 8		All 8	H,I,V	V	C,H,I,K,Y,S,V	I	I					I,K
- Source/use matrix of current fund revenues	4	H,I,J,S	I	H,I		H,I,S	I	I					I
- *HEGIS required current fund expenditures and mandatory transfers by function*	All 8		All 8	H,I,J,V	V	C,H,I,K,Y,S,V	I	I					I
- Balance-sheet information by fund groups	3	H,S,V		H		H,S,V							I
- *HEGIS required statement of changes in fund balances*	All 8		All 8	H,I,J		C,H,I,K,Y,S,V	I	I					I
- *HEGIS required details of endowment*	All 8		All 8	H,I,J		C,H,I,K,Y,S,V	I	I					I
- *HEGIS required physical-plant indebtedness in total*	All 8		All 8	H,I,J,V		C,H,I,K,Y,S,V	I	I	V				I
- Other physical-plant indebtedness for auxiliary enterprises, hospitals, and all other	3	H,S,V		H,V		H,S,V			V				
- Retirement-fund contributions by a government source for an institution	4	H,I,S,V				H,S,V							
- *HEGIS required debt outstanding, issued, and retired amounts in total for long-term and for short-term*	All 8		All 8	H,I,V		C,H,I,K,Y,S,V	I	I					I
- Other debt outstanding, issued, and retired amounts for long-term for auxiliary enterprises, hospitals, and all other	4	H,I,S,V		H,V		H,V							I
- *HEGIS required total interest paid from all funds*	All 8		All 8	I		C,H,I,K,V	I	I					
- Debt-service amounts and purchases of capital assets by source	4	H,Y,S,V		H,V		H,Y,V			V				
Functions Not Applicable At:							J		C,H	C	C,H,K	C,Y,S	

INFORMATION STRUCTURE	PILOT-TEST STATES ACCESSING DATA		STATE AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Total	State Abbreviations	Federal Reporting	Long Range Planning	Mission/ Role/ Scope	Budgeting	Program Reviews: Current Programs	Program Reviews: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)													
Facilities *(HEGIS required assignable square feet by room use categories and by building condition (Inventory of College and University Physical Facilities, OE form 2300-7, last required this type of facilities information in September 1974. NCES form 2300-7, with the same title, will be used in 1980-81 and will be limited to institutional information about physical facilities for the mobility impaired.)*	All 8		All 8	H,V	V	P	H	H,V	I,K,J, Y,S,V	V			
Station counts for class labs and classroom facilities, weekly student hours for classroom facilities	5	H,I,J,S,V		H,I,J,		V	H	H	I,J,S,V				
Estimated replacement cost by building condition type	5	H,I,J,S,V		H,I,V		V			I,S,V				
	Functions Not Applicable						J		C,H	C	C,H,K	C,Y,S	

Following is a summary of data in each pilot-test state's information system (as of May 1978) that is beyond those data identified in this table:

STATE	DATA
I,K,J,S,V	Other financial data (to a detailed level) for budgeting purposes
J,Y,V	*Operational financial-aid data
C,Y	Off-campus centers and programs inventory
I,S	Faculty Load Study (I-annual collection, S-one-time collection)
	FTE Counts (using state-specific FTE definitions)
I,S	Students
S	Employees
S,V	Faculty
Y,V	Other student charges
S,H	Outcomes data
S,V	*Operational personnel information (through another state agency)
S,V	Other affirmative-action data (required from Adams states)
C	Academic and occupational programs inventory
C	Additional information on institutional characteristics
H	*Extensive operational data in all areas
I	Comprehensive discipline cost-study information
I	Special information on research centers
I	Information on highest degree earned by full-time faculty

STATE	DATA
K	Faculty vitae (one-time collection)
K	Health-related manpower-planning data
K	Study on institutional burden/costs of external reporting
K	Teacher-education surveys
K	Average faculty-salary data for benchmark institutions
K	*Detailed student-enrollment data (for on-site auditing)
J	Institutional computer activities
J	Institutional library information
Y	Extensive data required for state accreditation purposes
Y	Financial indicators
Y	Cohort survival report
Y	Certification of earned degrees conferred
Y	Estimates of earned degrees to be conferred
Y	Information for special aid to medical/dental schools
Y	Summer-session enrollment data
S	Data for each of the seven manpower-reporting categories
V	Other facilities data
V	Extensive program-review data

*These data items reflect individual-specific data where the other data listed are aggregated to a certain degree.

INFORMATION STRUCTURE Major Area Data Categories/Data Items	DESCRIPTION OF DATA AVAILABLE			STATE AGENCY FUNCTIONS AND DATA USES										
	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information	ID	Mech	Publics							N/A		N/A		
Institutional Characteristics - *HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*				X	X								X	
- Other data: tuition/fees separates for all levels (including lower division, upper division, and special professional programs), housing, and commuter information														
Student Characteristics														
Demographic - Applications, admissions, enrollments for first-time students at all levels					X		X	X	X		X			
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*				X	X		X	X	X		X			
- Other head counts by age by FT/PT by student level, including unclassified														
Geographic Origin - *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*				X	X		X				X			
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: In-district by county (for all levels) In-state by county (for first-time freshmen) Out-of-state by state (for first-time freshmen) In-state versus out-of-state totals (for first-time graduates and professionals)					X		X				X			
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, by out-of-state by state					X		X				X			
Student Ability - Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, and SAT score ranges, including institutional averages					X	X	X				X			
Financial Aid - Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution					X		X							

NOTE: HEGIS and EEO-6 forms are filled out from information available through Hawaii's detailed operational system.

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)	ID	Mech	Publics							N/A		N/A		
Student Programs and Discipline Information														
Student Programs														
- Inventory of offerings by institution					X	X		X	X					
- Student Demand														
- *HEGIS required head counts by sex by FT/PT by student level (upper division, first-professional I and II, graduate I and II) for all major fields of study per HEGIS taxonomy (OE form 2300-2.9, Upper Division and Post Baccalaureate Enrollment by Degree Field, last required in 1976 has been discontinued)*				X	X		X	X	X					
- Other head counts by FT/PT for other students (lower division and nondegree/diploma/certificate), by major field of study (including not designated)											X			
- Costs by student level within student program							X							
- *HEGIS required numbers of degrees/diplomas/certificates conferred by sex and race by type of degree and by major field of study for July 1-June 30 (on annual NCES forms 2300-2.1 and 2.2, Degrees and Other Formal Awards Conferred)*				X	X			X	X					
- Other information on number of students receiving a certificate/diploma for a program of less than one year by major field of study														
- Degrees conferred by age range of students summarized by type of degree													X	
- Characteristics of program completers summarized by type of degree														
- Noncompleters (and exit status) by type of degree and student program														
Discipline Information														
- Costs by course level within discipline for:														
Degree-related instruction														
Requisite preparatory/remedial					X		X	X	X					
Nondegree					X		X	X	X					
- Instructional activity: student-credit hours by course level within discipline														
- Instructional activity: student-contact hours and faculty-contact hours by course level within discipline for:														
Degree-related instruction														
Requisite preparatory/remedial														
Nondegree														

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)	ID	Mech	Publics							N/A		N/A		
Personnel														
- *HEGIS required head counts by sex by FT/PT for manpower categories for all employees (This information is reported on NCES form 2300-3 only when the form requires information on all employees instead of just full-time instructional faculty, as occurred in 1971-72, 1972-73, and 1976-77)*				X	X			X	X				X	
- *EEOC required data on head counts and salary distribution by sex by race by contract period by manpower categories for all employees (Form EEO-6 was first required in 1975 as a biennial report and the same form was used in 1977 and 1979.)*				X									X	
- *HEGIS required data on full-time instructional faculty by rank by sex by contract period, including numbers tenured and contributing services; and salary and benefit information. (As of 1977, NCES form 2300-3 incorporated information previously collected by AAUP on salaries for continuing faculty.)*				X	X			X	X				X	
- Other data on instructional/research staff. Number tenured, nontenured, and total for full-time by age range Number tenured, nontenured, and total for FT/PT by discipline Service months by PCS programs					X		X	X	X					
Finances (*HEGIS required data collected annually on form 2300-4, Financial Statistics of Institutions of Higher Education*)														
- *HEGIS required current fund revenues in total (unrestricted/restricted combined) by source for tuition/fees, government appropriations by level, sales and services, other sources, and independent operations*				X	X		X							
- Other data on unrestricted current fund revenues by source for government appropriations by level, for other sources, and for independent operations					X		X							
- *HEGIS required unrestricted versus restricted current fund revenues by source for government grants and contracts by level; private gifts, grants and contracts; and endowment income*				X	X		X							
- Source/use matrix of current fund revenues					X		X							
- *HEGIS required current fund expenditures and mandatory transfers by function*				X	X		X							
- Balance-sheet information by fund groups					X		X							
- *HEGIS required statement of changes in fund balances*				X	X		X							
- *HEGIS required details of endowment*				X	X		X							
- *HEGIS required physical-plant indebtedness in total*				X	X		X							
- Other physical-plant indebtedness for auxiliary enterprises, hospitals, and all other					X		X							
- Retirement-fund contributions by a government source for an institution							X							
- *HEGIS required debt outstanding, issued, and retired amounts in total for long-term and for short-term*				X	X		X							
- Other debt outstanding, issued, and retired amounts for long-term for auxiliary enterprises, hospitals, and all other					X		X							
- *HEGIS required total interest paid from all funds*				X			X							
- Debt-service amounts and purchases of capital assets by source	▼	▼	▼		X		X			▼		▼		

INFORMATION STRUCTURE Major Area Data Categories/Data Items	DESCRIPTION OF DATA AVAILABLE: Level of Aggregation	Mechanical Status	Institutional Scope	STATE-AGENCY FUNCTIONS AND DATA USES: Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Facilities *(HEGIS required assignable square feet by room use categories and by building [illegible] Inventory of College and University Physical Facilities, OE form 2300-2, last required this type of facilities information in September [illegible]. [illegible] form 2300-2, with the same title, will be used in 1980-81 and [illegible] to institutional information about physical facilities for [illegible] improved.)*	ID	Mech	Publics	X	X		X	X	X	N/A		N/A		
Station counts for class labs and classroom facilities; weekly student hours for classroom facilities					X			X	X					
Estimated replacement cost by building condition type					X									

NOTE: Because The University of Hawaii's mechanized information system serves the detailed operational requirements of the University, the Board of Regents has access to many data elements including individual-specific data not identified in the table.

POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL
INFORMATION STRUCTURE AND FUNCTIONAL USES OF DATA
Detail by Pilot-Test States

As of May 1978

State: Illinois
Agency: Board of Higher Education (BHE)

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE (a)			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
State Information	N/A	Aces	N/A											
Population Characteristics of State														
- Census in total, by county, by population density N/A														
- Distribution of family income					X							X		
- Education attainment by county for levels within elementary, secondary, college, and vocational education N/A														
- Elementary/secondary enrollments by public/private by locality N/A														
- High-school graduates ~~by sex by race~~ by locality					X						X			
- High-school-equivalency recipients by sex for state N/A														
Occupancy Outlook of State														
- Employment summary by industry type and by occupational classification for state (especially health srecs)					X									
- Job applicants/openings by occupational classification for state														
Finances of State														
- State and local revenues							X							
- State and local appropriations/expenditures							X							
- Student financial aid available from state through state agency, including number of recipients (and their characteristics) and dollar amounts of aid							X					X		
National Information														
Occupation Outlook of Nation														
- Employment summary by industry type and by occupational classification for nation					X	X								
- Job applicants/openings by occupational classification for nation					X	X								
Finances														
- Student financial aid available from federal government directly to students							X					X		

NOTE: N/A indicates not applicable.

(a) Description of Data Available for State Agency's Use:

Level of Aggregation within Agency
- ID: Institutional Detail (such as individual student data)
- IS: Institutional Summary (totals by institutions only)
- SS: State Summary (totals for all institutions or groups of institutions only)

Mechanized Status within Agency:
- Mech: Data are, or will be, mechanized
- No: No plans to mechanize hard copy
- Aces: Data accessible outside agency but not maintained at agency

Institutional Scope:
Data are generally available from the following types of institutions except as noted in the table:

all public institutions, all community colleges, and all private institutions

NOTE: BHE has data at an institutional summary level only. (Community College Board has institutional detailed data.)

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information	IS													
Institutional Characteristics - *HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*		Mech		X										
- Other data: tuition/fees separately for all levels (including lower division, upper division, and specific professional programs), housing, and commuter information	N/A													
Student Characteristics														
Demographic - Applications, admissions, enrollments for first-time students at all levels		Mech	Publics and Community Colleges		X						X			X
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*		Mech		X	X		X	X	X				X	X
- Other head counts by age by FT/PT by student level, including unclassified		Mech												X
Geographic Origin - *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*		Mech		X	X						X			X
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: ~~In district by county (for all levels)~~ In-state by county (for first-time freshmen) Out-of-state by state (for first-time freshmen) In-state versus out-of-state totals (for first-time graduates and professionals)		Mech			X						X			X
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, ~~by out-of-state by state~~		Mech			X		X				X			
Student Ability - Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, ~~and SAT score ranges, including institutional averages~~		No												
Financial Aid - Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution		Mech					X					X		X

NOTE: BHE is state coordinator for HEGIS and EEO reporting for all institutions.

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)	IS													
Student Programs and Discipline Information														Separate Publication
Student Programs														
Inventory of offerings by institution		Mech			X	X		X	X					
Student Demand														
HEGIS required head counts by sex by FT/PT by student level (upper division, first-professional I and II, graduate I and II) for all major fields of study per HEGIS taxonomy (OE Form 2300.29, Upper Division and Post Baccalaureate Enrollment by Degree Field, last required in 1976 has been discontinued)		Mech		X	X		X	X	X		X			X
Other head counts by FT/PT for other students (lower division and non-degree/diploma/certificate), by major field of study (including undesignated)		Mech			X		X	X	X		X			X
Costs by student level within student program		Mech	Pub. & C.C.				X	X	X					
HEGIS required numbers of degrees/diplomas/certificates conferred by sex and race by type of degree and by major field of study for July 1-June 30 (on annual NCES forms 2300.21 and 2.2, Degrees and Other Formal Awards Conferred)		Mech		X	X		X	X	X					X
Other information on number of students receiving a certificate/diploma for a program of less than one year by major field of study		Mech	Com. Coll.											
Degrees conferred by age range of students summarized by type of degree N/A														
Characteristics of program completers summarized by type of degree N/A														
Noncompleters (and exit status) by type of degree and student program N/A														
Discipline Information														
Costs by course level within discipline for:														
Degree-related instruction			Publics and Community Colleges (b)											
~~Requisite preparatory/remedial~~														
~~Nondegree~~ student		Mech					X	X	X					
Instructional activity: student-credit hours by ~~course~~ level within discipline		Mech					X	X	X					
Instructional activity: student-contact hours and faculty-contact hours by course level within discipline for:														
Degree-related instruction														
Requisite preparatory/remedial N/A														
Nondegree														

(b) Cost data by discipline for the community colleges are maintained at the four-digit HEGIS level.

INFORMATION STRUCTURE Major Area Data Categories/Data Items	DESCRIPTION OF DATA AVAILABLE			STATE AGENCY FUNCTIONS AND DATA USES										
	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information	ID	Mech	Public/Pr							N/A		N/A		
Institutional Characteristics - *HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*				X	X								X	
Other - ta tuition/fees separates for all levels (including lower division, upper division, and specific professional programs), housing, and commuter information														
Student Characteristics														
Demographic - Applications, admissions, enrollments for first-time students at all levels					X		X	X	X		X			
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*				X	X		X	X	X		X			
- Other head counts by age by FT/PT by student level, including unclassified														
Geographic Origin - *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*				X	X		X				X			
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: In-district by county (for all levels) In-state by county (for first-time freshmen) Out-of-state by state (for first-time freshmen) In-state versus out-of-state totals (for first-time graduates and professionals)					X		X				X			
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, by out-of-state by state					X		X				X			
Student Ability - Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, and SAT score ranges, including institutional averages					X	X	X				X			
Financial Aid - Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution					X		X							

NOTE: HEGIS and EEO-6 forms are filled out from information available through Hawaii's detailed operational system.

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES									
								Program Review					
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)	ID	Mech	Publics							N/A		N/A		
Student Programs and Discipline Information:														
Student Programs					X	X		X	X					
- Inventory of offerings by institution														
- Student Demand														
- *HEGIS required head counts by sex by FT/PT by student level (upper division, first-professional I and II, graduate I and II) for all major fields of study per HEGIS taxonomy (OE form 2300-2.9, Upper Division and Post Baccalaureate Enrollment by Degree Field, last required in 1976 has been discontinued)*				X	X		X	X	X					
- Other head counts by FT/PT for other students (lower division and nondegree/diploma/certificate), by major field of study (including not designated)											X			
- Costs by student level within student program							X							
- *HEGIS required numbers of degrees/diplomas/certificates conferred by sex and race by type of degree and by major field of study for July 1-June 30 (on annual NCES forms 2300-2.1 and 2.2, Degrees and Other Formal Awards Conferred)*				X	X			X	X					
- Other information on number of students receiving a certificate/diploma for a program of less than one year by major field of study														
- Degrees conferred by age range of students summarized by type of degree													X	
- Characteristics of program completers summarized by type of degree														
- Noncompleters (and exit status) by type of degree and student program														
Discipline Information														
- Costs by course level within discipline for:														
Degree-related instruction					X		X	X	X				X	
Requisite preparatory/remedial					X		X	X	X					
Nondegree														
- Instructional activity: student-credit hours by course level within discipline														
- Instructional activity: student-contact hours and faculty-contact hours by course level within discipline for:														
Degree-related instruction														
Requisite preparatory/remedial														
Nondegree														

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)	ID	Mech	Public							N/A		N/A		
Personnel														
HEGIS required head counts by sex by FT/PT for manpower categories for all employees (This information is reported on NCES form 2300-3 only when the form requires information on all employees instead of just full-time instructional faculty, as occurred in 1971-72, 1972-73, and 1976-77.)				X	X			X	X				X	
EEOC required data on head counts and salary distribution by sex by race by contract period by manpower categories for all employees (Form EEO-6 was first required in 1975 as a biennial survey and the same form was used in 1977 and 1979.)				X									X	
HEGIS required data on full-time instructional faculty by rank by sex by contract period, including numbers tenured and contributing services; and salary and benefit information. (As of 1977, NCES form 2300-3 incorporated information previously collected by AAUP on salaries for continuing faculty.)				X	X			X	X				X	
Other data on instructional/research staff.														
Number tenured, nontenured, and total for full-time by age range					X		X	X	X					
Number tenured, nontenured, and total for FT/PT by discipline														
Service months by PCS programs														
Finances (*HEGIS required data collected annually on form 2300-4, Financial Statistics of Institutions of Higher Education*)														
HEGIS required current fund revenues in total (unrestricted/restricted combined) by source for tuition/fees, government appropriations by level, sales and services, other sources, and independent operations				X	X		X							
Other data on unrestricted current fund revenues by source for government appropriations by level, for other sources, and for independent operations					X		X							
HEGIS required unrestricted versus restricted current fund revenues by source for government grants and contracts by level; private gifts, grants and contracts; and endowment income				X	X		X							
Source/use matrix of current fund revenues					X		X							
HEGIS required current fund expenditures and mandatory transfers by function				X	X		X							
Balance-sheet information by fund groups					X		X							
HEGIS required statement of changes in fund balances				X	X		X							
HEGIS required details of endowment				X	X		X							
HEGIS required physical-plant indebtedness in total				X	X		X							
Other physical-plant indebtedness for auxiliary enterprises, hospitals, and all other					X		X							
Retirement-fund contributions by a government source for an institution							X							
HEGIS required debt outstanding, issued, and retired amounts in total for long-term and for short-term				X	X		X							
Other debt outstanding, issued, and retired amounts for long-term for auxiliary enterprises, hospitals, and all other					X		X							
HEGIS required total interest paid from all funds				X			X							
Debt-service amounts and purchases of capital assets by source					X		X							

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Facilities	ID	Mech	Publics							N/A		N/A		
HEGIS required assignable square feet by room use categories and by building (... Inventory of College and University Physical Facilities, OE form 2300-? ... required this type of facilities information in September 1979. NCES form 2300-?, with the same title, will be used in 1980-81 and ... limited to institutional information about physical facilities for ... they occupied.)				X	X		X	X	X					
Stations counts for class labs and classroom facilities; weekly student hours for classroom facilities					X			X	X					
Estimated replacement cost by building condition type					X									

NOTE: Because The University of Hawaii's mechanized information system serves the detailed operational requirements of the University, the Board of Regents has access to many data elements including individual-specific data not identified in the table.

POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL
INFORMATION STRUCTURE AND FUNCTIONAL USES OF DATA
Detail by Pilot-Test States

As of May 1978

State: Illinois
Agency: Board of Higher Education (BHE)

INFORMATION STRUCTURE Major Area Data Categories/Data Items	DESCRIPTION OF DATA AVAILABLE (a)			STATE-AGENCY FUNCTIONS AND DATA USES										
	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
State Information	N/A	Aces	N/A											
Population Characteristics of State														
- Census in total, by county, by population density	N/A													
- Distribution of family income					X							X		
- Education attainment by county for levels within elementary, secondary, college, and vocational education	N/A													
- Elementary/secondary enrollments by public/private by locality	N/A													
- High-school graduates ~~by sex, by race~~ by locality					X						X			
- High-school-equivalency recipients by sex for state	N/A													
Occupancy Outlook of State														
- Employment summary by industry type and by occupational classification for state (especially health area)					X									
- Job applicants/openings by occupational classification for state														
Finances of State														
- State and local revenues							X							
- State and local appropriations/expenditures							X							
- Student financial aid available from state through state agency, including number of recipients (and their characteristics) and dollar amounts of aid							X					X		
National Information														
Occupation Outlook of Nation														
- Employment summary by industry type and by occupational classification for nation					X	X								
- Job applicants/openings by occupational classification for nation					X	X								
Finances														
- Student financial aid available from federal government directly to students							X					X		

NOTE: N/A indicates not applicable.

(a) Description of Data Available for State Agency's Use:

Level of Aggregation within Agency
- ID: Institutional Detail (such as individual student data)
- IS: Institutional Summary (totals by institutions only)
- SS: State Summary (totals for all institutions or groups of institutions only)

Mechanized Status within Agency:
- Mech: Data are, or will be, mechanized
- No: No plans to mechanize hard copy
- Aces: Data accessible outside agency but not maintained at agency

Institutional Scope:
Data are generally available from the following types of institutions except as noted in the table:

all public institutions, all community colleges, and all private institutions

NOTE: BHE has data at an institutional summary level only. (Community College Board has institutional detailed data.)

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information	IS													
Institutional Characteristics - *HEGIS required data: name, address, FICE code, county, U.S congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*		Mech		X										
- Other data: tuition/fees separately for all levels (including lower division, upper division, and specific professional programs), housing, and commuter information	N/A													
Student Characteristics			Publics and Community Colleges											
Demographic - Applications, admissions, enrollments for first-time students at all levels		Mech			X						X			X
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*		Mech		X	X		X	X	X				X	X
- Other head counts by age by FT/PT by student level, including unclassified		Mech												X
Geographic Origin - *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*		Mech		X	X						X			X
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: ~~In-district by county (for all levels)~~ In-state by county (for first-time freshmen) Out-of-state by state (for first-time freshmen) In-state versus out-of-state totals (for first-time graduates and professionals)		Mech			X						X			X
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, ~~by out-of-state by state~~		Mech			X		X				X			
Student Ability - Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, ~~and SAT score ranges, including institutional averages~~		No												
Financial Aid - Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution		Mech					X					X		X

NOTE: BHE is state coordinator for HEGIS and EEO reporting for all institutions.

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)	IS													
Student Programs and Discipline Information														Separate Publication
Student Programs														
Inventory of offerings by institution		Mech			X	X		X	X					
Student Demand														
HEGIS required head counts by sex by FT/PT by student level (upper division, first-professional I and II, graduate I and II) for all major fields of study per HEGIS taxonomy (OE Form 2300.2.9, Upper Division and Post Baccalaureate Enrollment by Degree Field, last required in 1976 has been discontinued)		Mech		X	X		X	X	X		X			X
Other head counts by FT/PT for other students (lower division and nondegree/diploma/certificate) by major field of study (including undergraduate)		Mech			X		X	X	X		X			X
Costs by student level within student program		Mech	Pub. & C.C.				X	X	X					
HEGIS required numbers of degrees/diplomas/certificates conferred by sex and race by type of degree and by major field of study for July 1-June 30 (on annual NCES forms 2300.2.1 and 2.2, Degrees and Other Formal Awards Conferred)		Mech		X	X		X	X	X					X
Other information on number of students receiving a certificate/diploma for a program of less than one year by major field of study		Mech	Com. Coll.											
Degrees conferred by age range of students summarized by type of degree N/A														
Characteristics of program completers summarized by type of degree N/A														
Noncompleters (and exit status) by type of degree and student program N/A														
Discipline Information														
Costs by course level within discipline for:														
Degree-related instruction			Publics and Community											
~~Requisite preparatory/remedial~~														
~~Nondegree~~ student		Mech	Colleges (b)				X	X	X					
Instructional activity: student-credit hours by ~~course~~ level within discipline		Mech					X	X	X					
Instructional activity: student-contact hours and faculty-contact hours by course level within discipline for:														
Degree-related instruction														
Requisite preparatory/remedial														
Nondegree N/A														

(b) Cost data by discipline for the community colleges are maintained at the four-digit HEGIS level.

POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL
INFORMATION STRUCTURE AND FUNCTIONAL USES OF DATA
Detail by Pilot-Test States
As of May 1978

State: New Jersey
Agency: Department of Higher Education (DHE)

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE (a)			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
State Information	N/A	Aces	N/A					N/A						
Population Characteristics of State														
· Census in total, by county, by population density											X		X	
· Distribution of family income											X		X	
· Education attainment by county for levels within elementary, secondary, college, and vocational education					c						X		X	
· Elementary/secondary enrollments by public/private by locality											X		X	
· High-school graduates by sex by race by locality											X		X	
· High-school-equivalency recipients by sex for state											X		X	
Occupancy Outlook of State														
· Employment summary by industry type and by occupational classification for state											X		X	
· Job applicants/openings by occupational classification for state											X		X	
Finances of State														
· State and local revenues							X							
· State and local appropriations/expenditures							X							
· Student financial aid available from state through state agency, including number of recipients (and their characteristics) and dollar amounts of aid							X							
National Information														
Occupation Outlook of Nation														
· Employment summary by industry type and by occupational classification for nation N/A														
· Job applicants/openings by occupational classification for nation N/A														
Finances														
· Student financial aid available from federal government directly to students N/A	▼	▼	▼					▼						

NOTE: N/A indicates not applicable.

(a) Description of Data Available for State Agency's Use:
Level of Aggregation within Agency
ID: Institutional Detail (such as individual student data)
IS: Institutional Summary (totals by institutions only)
SS: State Summary (totals for all institutions or groups of institutions only)

Mechanized Status within Agency:
Mech: Data are, or will be, mechanized
No: No plans to mechanize hard copy
Aces: Data accessible outside agency but not maintained at agency

Institutional Scope:
Data are generally available from the following types of institutions except as noted in the table:

all public institutions, including community colleges, and all private institutions

NOTE: Information contained herein applies to the Research Office of New Jersey's Department of Higher Education. Detailed budgeting data are maintained by the Budget Office of DHE. Detailed operational financial-aid data are maintained by the Financial Aids Office of DHE. Data other than HEGIS data for community colleges are maintained by the Community College Office of DHE.

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information	IS	Mech	Publics, Privates, and Community Colleges					N/A						
Institutional Characteristics - *HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*				X										X
- Other data: tuition/fees separately for all levels (including lower division, upper division, and specific professional programs); ~~housing, and commuter information~~												X		X
Student Characteristics														
Demographic - Applications, admissions, enrollments for first-time students at all levels					X	X					X			X
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*				X									X	X
- Other head counts by age by FT/PT by student level, including unclassified						X					X			X
Geographic Origin - *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*				X										
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: ~~In-district by county (for all levels)~~ In-state by county (for first-time freshmen) Out-of-state by state (for first-time freshmen) In-state versus out-of-state totals (for first-time graduates and professionals)					X						X			X
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, by out-of-state ~~by state~~					X						X			X
Student Ability - Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, and SAT score ranges, including institutional averages					X	X					X			
Financial Aid - Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution	N/A													

NOTE: DHE is state coordinator for HEGIS reporting.

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)	IS	Mech	Publics, Privates, and Community Colleges					N/A						
Student Programs and Discipline Information														
Student Programs														
Inventory of offerings by institution									X					
Student Demand														
HEGIS required head counts by s[illegible]t level (upper division, first-professional I and II[illegible] for all major fields of study per HEGIS taxonom[illegible] 2300-2.9, Upper Division and Post Baccalaureate Enrollment by Degree Field, last required in 1976 has been discontinued)				X	X	X			X					X
Other head counts by FT/PT for other students (lower division and nondegree/diploma/certificate), by major field of study (including not designated)					X	X			X					X
Costs by student level within student program N/A														
HEGIS required numbers of degrees/diplomas/cer[illegible]ficates conferred by sex and race by type of degree and by major field of study for July 1-June 30 (on annual NCES forms 2300-2.1 and 2.2, Degrees and Other Formal Awards Conferred)				X	X	X			X					X
Other information on number of students receiving a certificate/diploma for a program of less than one year by major field of study N/A														
Degrees conferred by age range of students summarized by type of degree N/A														
Characteristics of program completers summarized by type of degree N/A														
Noncompleters (and exit status) by type of degree and student program N/A														
Discipline Information														
Costs by course level within discipline for: Degree-related instruction; Requisite preparatory/remedial; Nondegree N/A														
Instructional activity: student-credit hours by course level within discipline N/A														
Instructional activity: student-contact hours and faculty-contact hours by course level within discipline for: N/A Degree-related instruction; Requisite preparatory/remedial; Nondegree														

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)	IS		Publics, Privates, and Community Colleges					N/A						
Personnel														
- *HEGIS required head counts by sex by FT/PT for manpower categories for all employees. (This information is reported on NCES form 2300-3 only when the form requires information on all employees instead of just full-time instructional faculty, as occurred in 1971-72, 1972-73, and 1976-77.)*		Mech		X	X								X	X
- *EEOC required data on head counts and salary distribution by sex by race by contract period by manpower categories for all employees. (Form EEO-6 was first required in 1975 as a biennial survey, and the same form was used in 1977 and 1979.)*		No	Publics and Community Colleges										X	
- *HEGIS required data on full-time instructional faculty by rank by sex by contract period, including numbers tenured and contributing services; and salary and benefit information. (As of 1977, NCES form 2300-3 incorporated information previously collected by AAUP on salaries for continuing faculty.)*		Mech	Publics, Privates, and Comm. Coll.	X	X									X
- Other data on instructional/research staff. Number tenured, nontenured, and total for full-time by age range Number tenured, nontenured, and total for FT/PT by discipline Service months by PCS programs	N/A													
Finances (*HEGIS required data collected annually on form 2300-4, Financial Statistics of Institutions of Higher Education*)														
- *HEGIS required current fund revenues in total (unrestricted/restricted combined) by source for tuition/fees, government appropriations by level, sales and services, other sources, and independent operations*		Mech		X	X		X							
- Other data on unrestricted current fund revenues by source for government appropriations by level, for other sources, and for independent operations	N/A													
- *HEGIS required unrestricted versus restricted current fund revenues by source for government grants and contracts by level; private gifts, grants and contracts; and endowment income*		Mech		X										
- Source/use matrix of current fund revenues		No												
- *HEGIS required current fund expenditures and mandatory transfers by function*		Mech		X	X									
- Balance-sheet information by fund groups	N/A													
- *HEGIS required statement of changes in fund balances*		Mech		X	X									
- *HEGIS required details of endowment*		Mech		X	X									
- *HEGIS required physical-plant indebtedness in total*		Mech		X	X									
- Other physical-plant indebtedness for auxiliary enterprises, hospitals, and all other	N/A													
- Retirement-fund contributions by a government source for an institution	N/A													
- *HEGIS required debt outstanding, issued, and retired amounts in total for long-term and for short-term*		Mech		X										
- Other debt outstanding, issued, and retired amounts for long-term for auxiliary enterprises, hospitals, and all other	N/A													
- *HEGIS required total interest paid from all funds*		Mech		X										
- Debt-service amounts and purchases of capital assets by source	N/A													

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Facilities *HEGIS required assignable square feet by room-use categories and by building condition (Inventory of College and University Physical Facilities, OE form 2300-7, last required this type of facilities information in September 1974. NCES form 2300-7, with the same title, will be used in 1980-81 and will be limited to institutional information about physical facilities for the mobility impaired.)*	IS	Mech	Publics, Privates, and Community Colleges	X				N/A		X				
Station counts for class labs and classroom facilities, weekly student hours for classroom facilities		Mech			X					X				
Estimated replacement cost by building condition type		Mech												

NOTE: The mechanized information system at New Jersey's Department of Higher Education is maintained by the Research Office, and the data identified in this table refer to that information that is mechanized by or available to this Office. In addition, the Research Office also has institutional information on computer activities and libraries, but this information is not mechanized. Information available at the Department of Higher Education in offices other than the Research Office includes the following:

- Detailed budgeting data (on public institutions only) are maintained in the Budget Office and are mechanized separately from the Research Office's management-information system.
- Detailed transactional financial-aid data (for both public and private institutions) are maintained by the Financial Aids Office and are mechanized separately from the Research Office's management-information system. (However, the Research Office eventually hopes to include aggregated financial-aid data in its system.)
- Community-college data other than that required for HEGIS reporting are maintained by the Community College Office.

POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL
INFORMATION STRUCTURE AND FUNCTIONAL USES OF DATA
Detail by Pilot-Test States

As of May 1978

State: New York
Agency: State Education Department (SED)

INFORMATION STRUCTURE		DESCRIPTION OF DATA AVAILABLE (a)			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items		Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
State Information															
Population Characteristics of State		N/A		N/A										N/A	
· Census in total, by county, by population density			Aces			X						X			X
· Distribution of family income	N/A														
· Education attainment by county for levels within elementary, secondary, college, and vocational education	N/A														
· Elementary/secondary enrollments by public/private by locality			Aces												
· High-school graduates by sex by race by locality			Aces									X			
· High-school-equivalency recipients by sex for state			Aces												
Occupancy Outlook of State															
· Employment summary by industry type and by occupational classification for state	N/A														
· Job applicants/openings by occupational classification for state			Aces			X			X	X					X
Finances of State															
· State and local revenues			Aces					X							
· State and local appropriations/expenditures			Aces					X							
· Student financial aid available from state through state agency, including number of recipients (and their characteristics) and dollar amounts of aid			Aces					X							
National Information															
Occupation Outlook of Nation															
· Employment summary by industry type and by occupational classification for nation	N/A														
· Job applicants/openings by occupational classification for nation	N/A														
Finances															
· Student financial aid available from federal government directly to students	N/A														

NOTE: N/A indicates not applicable.

(a) Description of Data Available for State Agency's Use:

Level of Aggregation within Agency
- ID: Institutional Detail (such as individual student data)
- IS: Institutional Summary (totals by institutions only)
- SS: State Summary (totals for all institutions or groups of institutions only)

Mechanized Status within Agency:
- Mech: Data are, or will be, mechanized
- No: No plans to mechanize hard copy
- Aces: Data accessible outside agency but not maintained at agency

Institutional Scope:
Data are generally available from the following types of institutions except as noted in the table:

all institutions awarding degrees

NOTE: HEGIS data are on forms at an institutional summary level. Aggregated data are mechanized and include detail by student or degree level but not by discipline.

State: New York

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information														
Institutional Characteristics			All Institutions										N/A	
- *HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*		Partly Mech		X										
- Other data: tuition/fees separately for all levels (including lower division, upper division, and specific professional programs), housing, and commuter information N/A														
Student Characteristics														
Demographic														
- Applications, admissions, enrollments for first-time students at all levels		Mech									X			
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*		Mech		X							X			
- Other head counts by age by FT/PT by student level, including unclassified		Mech									X			
Geographic Origin														
- *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*		Mech		X							X			
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: ~~In district by county (for all levels)~~ In-state by county (for first-time freshmen) ~~Out-of-state by state (for first-time freshmen)~~ In-state versus out-of-state totals (for first-time graduates and professionals)		Mech									X			
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, by out-of-state by state N/A														
Student Ability														
- Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, and SAT score ranges, including institutional averages N/A			▼										▼	
Financial Aid														
- Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution		Mech	Indep. only				X					X	▼	

NOTE: SED is state coordinator for HEGIS reporting

POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL
INFORMATION STRUCTURE AND FUNCTIONAL USES OF DATA
Detail by Pilot-Test States
As of May 1978

State: New Jersey
Agency: Department of Higher Education (DHE)

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE (a)			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
State Information	N/A	Aces	N/A					N/A						
Population Characteristics of State														
· Census in total, by county, by population density											X		X	
· Distribution of family income											X		X	
· Education attainment by county for levels within elementary, secondary, college, and vocational education											X		X	
· Elementary/secondary enrollments by public/private by locality											X		X	
· High-school graduates by sex by race by locality											X		X	
· High-school-equivalency recipients by sex for state											X		X	
Occupancy Outlook of State														
· Employment summary by industry type and by occupational classification for state											X		X	
· Job applicants/openings by occupational classification for state											X		X	
Finances of State														
· State and local revenues							X							
· State and local appropriations/expenditures							X							
· Student financial aid available from state through state agency, including number of recipients (and their characteristics) and dollar amounts of aid							X							
National Information														
Occupation Outlook of Nation														
· Employment summary by industry type and by occupational classification for nation	N/A													
· Job applicants/openings by occupational classification for nation	N/A													
Finances														
· Student financial aid available from federal government directly to students	N/A	↓	↓	↓				↓						

NOTE: N/A indicates not applicable.

(a) Description of Data Available for State Agency's Use:
Level of Aggregation within Agency
ID: Institutional Detail (such as individual student data)
IS: Institutional Summary (totals by institutions only)
SS: State Summary (totals for all institutions or groups of institutions only)

Mechanized Status within Agency:
Mech: Data are, or will be, mechanized
No: No plans to mechanize hard copy
Aces: Data accessible outside agency but not maintained at agency

Institutional Scope:
Data are generally available from the following types of institutions except as noted in the table:

all public institutions, including community colleges, and all private institutions

NOTE: Information contained herein applies to the Research Office of New Jersey's Department of Higher Education. Detailed budgeting data are maintained by the Budget Office of DHE. Detailed operational financial-aid data are maintained by the Financial Aids Office of DHE. Data other than HEGIS data for community colleges are maintained by the Community College Office of DHE.

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information	IS	Mech	Publics, Privates, and Community Colleges					N/A						
Institutional Characteristics - *HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*				X										X
- Other data: tuition/fees separately for all levels (including lower division, upper division, and specific professional programs); ~~housing, and commuter information~~												X		X
Student Characteristics														
Demographic - Applications, admissions, enrollments for first-time students at all levels					X	X					X			X
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*				X									X	X
- Other head counts by age by FT/PT by student level, including unclassified						X					X			X
Geographic Origin - *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*				X										
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: ~~In-district by county (for all levels)~~ In-state by county (for first-time freshmen) Out-of-state by state (for first-time freshmen) In-state versus out-of-state totals (for first-time graduates and professionals)					X						X			X
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, by out-of-state ~~by state~~					X						X			X
Student Ability - Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, and SAT score ranges, including institutional averages					X	X					X			
Financial Aid - Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution	N/A													

NOTE: DHE is state coordinator for HEGIS reporting.

INFORMATION STRUCTURE Major Area Data Categories/Data Items	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Student Programs and Discipline Information	IS	Mech	Publics, Privates, and Community Colleges					N/A						
Student Programs														
Inventory of offerings by institution									X					
Student Demand														
HEGIS required head counts by s[illegible]t level (upper division, first-professional I and II[illegible]) for all major fields of study per HEGIS taxonom[illegible] 2300-2.9, Upper Division and Post Baccalaureate Enrollment by Degree Field, last required in 1976 has been discontinued)				X	X	X			X					X
Other head counts by FT/PT for other students (lower division and nondegree/diploma/certificate), by major field of study (including not designated)					X	X			X					X
Costs by student level within student program N/A														
HEGIS required numbers of degrees/diplomas/certificates conferred by sex and race by type of degree and by major field of study for July 1-June 30 (on annual NCES forms 2300-2.1 and 2.2, Degrees and Other Formal Awards Conferred)				X	X	X			X					X
Other information on number of students receiving a certificate/diploma for a program of less than one year by major field of study N/A														
Degrees conferred by age range of students summarized by type of degree N/A														
Characteristics of program completers summarized by type of degree N/A														
Noncompleters (and exit status) by type of degree and student program N/A														
Discipline Information														
Costs by course level within discipline for: Degree-related instruction Requisite preparatory/remedial Nondegree N/A														
Instructional activity: student-credit hours by course level within discipline N/A														
Instructional activity: student-contact hours and faculty-contact hours by course level within discipline for: N/A Degree-related instruction Requisite preparatory/remedial Nondegree														

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES									
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)	IS		Publics, Privates, and Community Colleges					N/A						
Personnel														
- *HEGIS required head counts by sex by FT/PT for manpower categories for all employees. (This information is reported on NCES form 2300-3 only when the form requires information on all employees instead of just full-time instructional faculty, as occurred in 1971-72, 1972-73, and 1976-77.)*		Mech		X	X								X	X
- *EEOC required data on head counts and salary distribution by sex by race by contract period by manpower categories for all employees. (Form EEO-6 was first required in 1975 as a biennial survey, and the same form was used in 1977 and 1979.)*		No	Publics and Community Colleges										X	
- *HEGIS required data on full-time instructional faculty by rank by sex by contract period, including numbers tenured and contributing services; and salary and benefit information. (As of 1977, NCES form 2300-3 incorporated information previously collected by AAUP on salaries for continuing faculty.)*		Mech	Publics, Privates, and Comm. Coll.	X	X									X
- Other data on instructional/research staff. N/A Number tenured, nontenured, and total for full-time by age range Number tenured, nontenured, and total for FT/PT by discipline Service months by PCS programs														
Finances *(HEGIS required data collected annually on form 2300-4, Financial Statistics of Institutions of Higher Education)*														
- *HEGIS required current fund revenues in total (unrestricted/restricted combined) by source for tuition/fees, government appropriations by level, sales and services, other sources, and independent operations*		Mech		X	X		X							
- Other data on unrestricted current fund revenues by source for government appropriations by level, for other sources, and for independent operations N/A														
- *HEGIS required unrestricted versus restricted current fund revenues by source for government grants and contracts by level; private gifts, grants and contracts; and endowment income*		Mech		X										
- Source/use matrix of current fund revenues		No												
- *HEGIS required current fund expenditures and mandatory transfers by function*		Mech		X	X									
- Balance-sheet information by fund groups N/A														
- *HEGIS required statement of changes in fund balances*		Mech		X	X									
- *HEGIS required details of endowment*		Mech		X	X									
- *HEGIS required physical-plant indebtedness in total*		Mech		X	X									
- Other physical-plant indebtedness for auxiliary enterprises, hospitals, and all other N/A														
- Retirement-fund contributions by a government source for an institution N/A														
- *HEGIS required debt outstanding, issued, and retired amounts in total for long-term and for short-term*		Mech		X										
- Other debt outstanding, issued, and retired amounts for long-term for auxiliary enterprises, hospitals, and all other N/A														
- *HEGIS required total interest paid from all funds*		Mech		X										
- Debt-service amounts and purchases of capital assets by source N/A														

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Facilities *HEGIS required assignable square feet by room-use categories and by building condition (Inventory of College and University Physical Facilities, OE form 2300-7, last required this type of facilities information in September 1974. NCES form 2300-7, with the same title, will be used in 1980-81 and will be limited to institutional information about physical facilities for the mobility impaired.)*	IS	Mech	Publics, Privates, and Community Colleges	X				N/A		X				
Station counts for class labs and classroom facilities, weekly student hours for classroom facilities		Mech			X					X				
Estimated replacement cost by building condition type		Mech												

NOTE: The mechanized information system at New Jersey's Department of Higher Education is maintained by the Research Office, and the data identified in this table refer to that information that is mechanized by or available to this Office. In addition, the Research Office also has institutional information on computer activities and libraries, but this information is not mechanized. Information available at the Department of Higher Education in offices other than the Research Office includes the following:

- Detailed budgeting data (on public institutions only) are maintained in the Budget Office and are mechanized separately from the Research Office's management-information system.
- Detailed transactional financial-aid data (for both public and private institutions) are maintained by the Financial Aids Office and are mechanized separately from the Research Office's management-information system. (However, the Research Office eventually hopes to include aggregated financial-aid data in its system.)
- Community-college data other than that required for HEGIS reporting are maintained by the Community College Office.

POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL
INFORMATION STRUCTURE AND FUNCTIONAL USES OF DATA
Detail by Pilot-Test States

As of May 1978

State: New York
Agency: State Education Department (SED)

INFORMATION STRUCTURE Major Area Data Categories/Data Items	DESCRIPTION OF DATA AVAILABLE (a) Level of Aggregation	Mechanical Status	Institutional Scope	STATE-AGENCY FUNCTIONS AND DATA USES Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
State Information	N/A		N/A										N/A	
Population Characteristics of State														
- Census in total, by county, by population density		Aces			X						X			X
- Distribution of family income N/A														
- Education attainment by county for levels within elementary, secondary, college, and vocational education N/A														
- Elementary/secondary enrollments by public/private by locality		Aces												
- High-school graduates by sex by race by locality		Aces									X			
- High-school-equivalency recipients by sex for state		Aces												
Occupancy Outlook of State														
- Employment summary by industry type and by occupational classification for state N/A														
- Job applicants/openings by occupational classification for state		Aces			X			X	X					X
Finances of State														
- State and local revenues		Aces					X							
- State and local appropriations/expenditures		Aces					X							
- Student financial aid available from state through state agency, including number of recipients (and their characteristics) and dollar amounts of aid		Aces					X							
National Information														
Occupation Outlook of Nation														
- Employment summary by industry type and by occupational classification for nation N/A														
- Job applicants/openings by occupational classification for nation N/A														
Finances														
- Student financial aid available from federal government directly to students N/A														

NOTE: N/A indicates not applicable.

(a) Description of Data Available for State Agency's Use:

Level of Aggregation within Agency
- ID: Institutional Detail (such as individual student data)
- IS: Institutional Summary (totals by institutions only)
- SS: State Summary (totals for all institutions or groups of institutions only)

Mechanized Status within Agency:
- Mech: Data are, or will be, mechanized
- No: No plans to mechanize hard copy
- Aces: Data accessible outside agency but not maintained at agency

Institutional Scope:
Data are generally available from the following types of institutions except as noted in the table:

all institutions awarding degrees

NOTE: HEGIS data are on forms at an institutional summary level. Aggregated data are mechanized and include detail by student or degree level but not by discipline.

State: New York

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information														
Institutional Characteristics - *HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*		Partly Mech	All Institutions	X									N/A	
- Other data: tuition/fees separately for all levels (including lower division, upper division, and specific professional programs), housing, and commuter information N/A														
Student Characteristics														
Demographic - Applications, admissions, enrollments for first-time students at all levels		Mech									X			
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*		Mech		X							X			
- Other head counts by age by FT/PT by student level, including unclassified		Mech									X			
Geographic Origin - *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*		Mech		X							X			
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: ~~In-district by county (for all levels)~~ In-state by county (for first-time freshmen) ~~Out-of-state by state (for first-time freshmen)~~ In-state versus out-of-state totals (for first-time graduates and professionals)		Mech									X			
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, by out-of-state by state N/A														
Student Ability - Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, and SAT score ranges, including institutional averages N/A			▼										▼	
Financial Aid - Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution		Mech	Indep. only				X					X	▼	

NOTE: SED is state coordinator for HEGIS reporting

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Facilities	IS	Mech											N/A	
- *HEGIS required assignable square feet by room-use categories and by building condition (Inventory of College and University Physical Facilities, OE form 2300-7, last required this type of facilities information in September 1974. NCES form 2300-7, with the same title, will be used in 1980-81 and will be limited to institutional information about physical facilities for the mobility impaired.)*			Publics and Privates	X						X				
- Station counts for class labs and classroom facilities; weekly student hours for classroom facilities			Publics							X				
- Estimated replacement cost by building condition type	▽	▽	Publics							X			▽	

NOTE: In addition to the data already specified in this table, South Carolina's Commission on Higher Education has the following data:

Not Mechanized

- Detailed faculty activity analysis data collected in Fall 1977 on a one-time basis for a special study on faculty workloads

Mechanized

- Outcomes data (will be mechanized)
- More detailed current fund revenues and expenditures (but consistent with HEGIS required data)
- Data for all manpower-reporting categories
- FTE data for both students and employees (using a state-specified definition)
- Additional personnel information (from the State Department of Personnel)
- More detailed affirmative-action data on students (for reporting to the Office of Civil Rights due to South Carolina's inclusion as one of the 13 Adams States)

POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL
INFORMATION STRUCTURE AND FUNCTIONAL USES OF DATA
Detail by Pilot-Test States

As of May 1978

State: Virginia
Agency: State Council for Higher Education (SCHEV)

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE (a)			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
State Information	N/A		N/A											
Population Characteristics of State														
· Census in total, by county, by population density		Mech			X						X			
· Distribution of family income		Mech										X		
· Education attainment by county for levels within elementary, secondary, college, and vocational education		Mech			X						X			
· Elementary/secondary enrollments by public/private by locality		Mech			X						X			
· High-school graduates by sex by race by locality													X	
· High-school-equivalency recipients by sex for state														
Occupancy Outlook of State														
· Employment summary by industry type and by occupational classification for state		Aces			X				X					
· Job applicants/openings by occupational classification for state		Aces			X				X					
Finances of State		Aces												
· State and local revenues														
· State and local appropriations/expenditures		Aces												
· Student financial aid available from state through state agency, including number of recipients (and their characteristics) and dollar amounts of aid		Mech										X		
National Information														
Occupation Outlook of Nation														
· Employment summary by industry type and by occupational classification for nation		Aces			X				X					
· Job applicants/openings by occupational classification for nation		Aces			X				X					
Finances														
· Student financial aid available from federal government directly to students	▼	Aces	▼				X							

NOTE: N/A indicates not applicable.

(a) Description of Data Available for State Agency's Use:
Level of Aggregation within Agency
ID: Institutional Detail (such as individual student data)
IS: Institutional Summary (totals by institutions only)
SS: State Summary (totals for all institutions or groups of institutions only)

Mechanized Status within Agency:
Mech: Data are, or will be, mechanized
No: No plans to mechanize hard copy
Aces: Data accessible outside agency but not maintained at agency

Institutional Scope:
Data are generally available from the following types of institutions except as noted in the table:

all public and private (except where noted for public only)

INFORMATION STRUCTURE Major Area Data Categories/Data Items	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information														
Institutional Characteristics - *HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*	IS	Mech	Publics and Privates	X	X	X			X			X		
- Other data: tuition/fees separately for all levels (including lower division, upper division, and specific professional programs), housing, and commuter information	IS	Mech	Publics and Privates				X					X		
Student Characteristics Demographic - Applications, admissions, enrollments for first-time students at all levels	IS	Mech	Publics and Privates		X		X				X		X	
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*	IS	Mech	Publics and Privates	X	X	X	X			X	X		X	
- Other head counts by age by FT/PT ~~by student level, including unclassified~~	IS	Mech	Pub. & Priv.		X						X			
Geographic Origin - *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*	IS	Mech	Publics and Privates	X	X	X	X				X			
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: ~~In-district by county (for all levels)~~ In-state by county (for first-time freshmen) Out-of-state by state (for first-time freshmen) In-state versus out-of-state totals (for first-time graduates and professionals)	IS	Mech	Publics and Privates								X			
- Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, by out-of-state by state (b)	IS	Mech	Publics								X			
Student Ability - Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, and SAT score ranges, ~~including institutional averages~~	IS	No (will be)	Publics and Privates			X								
Financial Aid - Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution	IS	Mech	Publics		X	X	X					X		

NOTE: SCHEV is the state coordinator for HEGIS reporting for all institutions. Additionally, it serves as the facilitator for collecting all federally required affirmative-action data.

(b) These data are also used for articulation studies.

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Student Programs and Discipline Information														
Student Programs - Inventory of offerings by institution	IS	Mech	Publics and Privates		X	X	X	X	X		X			
Student Demand - *HEGIS required head counts by sex by FT/PT by student level (upper division, first-professional I and II, graduate I and II) for all major fields of study per HEGIS taxonomy (OE form 2300-2.9, Upper Division and Post Baccalaureate Enrollment by Degree Field, last required in 1976 has been discontinued)*	IS	Mech	Publics and Privates	X	X	X		X	X		X			
- Other head counts by FT/PT for other students (lower division and nondegree/diploma/certificate), by major field of study (including not designated)	IS	Mech	Publics and Privates		X	X		X	X		X			
- Costs by student level within student program	IS	Mech	Publics		X		X		X					
- *HEGIS required numbers of degrees/diplomas/certificates conferred by sex and race by type of degree and by major field of study for July 1-June 30 (on annual NCES forms 2300-2.1 and 2.2, Degrees and Other Formal Awards Conferred)*	IS	Mech	Publics and Privates	X	X	X		X	X				X	
- Other information on number of students receiving a certificate/diploma for a program of less than one year by major field of study	IS	Mech	Pub. & Priv.		X									
- Degrees conferred by age range of students summarized by type of degree N/A														
- Characteristics of program completers summarized by type of degree N/A														
- Noncompleters (and exit status) by type of degree and student program N/A														
Discipline Information - Costs by course level within discipline for: Degree-related instruction Requisite preparatory/remedial ~~Nondegree~~	IS	Mech	Publics		X		X		X					
- Instructional activity: student-credit hours by course level within discipline	IS	Mech	Publics		X	X	X	X	X		X			
- Instructional activity: student-contact hours and faculty ~~contact hours~~ by course level within discipline for: FTE Degree-related instruction Requisite preparatory/remedial Nondegree	IS	Mech	Publics				X		X	X				

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Personnel														
- *HEGIS required head counts by sex by FT/PT for manpower categories for all employees. (This information is reported on NCES form 2300-3 only when the form requires information on all employees instead of just full-time instructional faculty, as occurred in 1971-72, 1972-73, and 1976-77.)*	IS	Mech	Publics and Privates	X			X							
EEOC required data on head counts and salary distribution by sex by race by contract period by manpower categories for all employees. (Form EEO-6 was first required in 1975 as a biennial survey, and the same form was used in 1977 and 1979.)	IS	Mech	Publics	X									X	
HEGIS required data on full-time instructional faculty by rank by sex by contract period, including numbers tenured and contributing services, and salary and benefit information. (As of 1977, NCES form 2300-3 incorporated information previously collected by AAUP on salaries for continuing faculty.)	IS	Mech	Publics and Privates	X	X									
Other data on instructional/research staff. Number tenured, nontenured, and total for full-time by age range Number tenured, nontenured, and total for FT/PT by discipline ~~Service months by PCS programs~~ FTE by PCS programs	IS	Mech	Publics		X				X				X	
Finances *(HEGIS required data collected annually on form 2300-4, Financial Statistics of Institutions of Higher Education)*														
- *HEGIS required current fund revenues in total (unrestricted/restricted combined) by source for tuition/fees, government appropriations by level, sales and services, other sources, and independent operations*	IS	Mech	Publics and Privates	X	X		X							
- Other data on unrestricted current fund revenues by source for government appropriations by level, for other sources, and for independent operations	IS	Mech	Publics		X		X							
- *HEGIS required unrestricted versus restricted current fund revenues by source for government grants and contracts by level; private gifts, grants and contracts; and endowment income*	IS	Mech	Publics and Privates	X	X	X	X							
- Source/use matrix of current fund revenues N/A														
- *HEGIS required current fund expenditures and mandatory transfers by function*	IS	Mech	Publics and Privates	X	X	X	X							
- Balance-sheet information by fund groups	IS	Mech	Publics				X							
- *HEGIS required statement of changes in fund balances*	IS	Mech	Pub. & Priv.	X			X							
- *HEGIS required details of endowment*	IS	Mech	Pub. & Priv.	X			X							
- *HEGIS required physical-plant indebtedness in total*	IS	Mech	Pub. & Priv.	X	X		X			X				
- Other physical-plant indebtedness for auxiliary enterprises, hospitals, and all other	IS	Mech	Publics		X		X			X				
- Retirement-fund contributions by a government source for an institution	IS	Mech	Publics				X							
- *HEGIS required debt outstanding, issued, and retired amounts in total for long-term and for short-term*	IS	Mech	Publics and Privates	X	X		X							
- Other debt outstanding, issued, and retired amounts for long-term for auxiliary enterprises, hospitals, and all other	IS	Mech	Publics		X		X							
- *HEGIS required total interest paid from all funds*	IS	Mech	Pub. & Priv.	X			X							
- Debt-service amounts and purchases of capital assets by source	IS	Mech	Publics		X		X			X				

NOTE: Additional detailed personnel information is available from the State Division of Personnel and Training on mechanized tapes (for public institutions only).

Additional detailed financial data are available from the State Department of Accounts (for public institutions only).

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area Data Category Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Facilities														
- *HEGIS required assignable square feet by room-use categories and by building condition (Inventory of College and University Physical Facilities, OE form 2300-7, last required this type of facilities information in September 1974. NCES form 2300-7, with the same title, will be used in 1980-81 and will be limited to institutional information about physical facilities for the mobility impaired.)*	IS	Mech	Publics and Privates	X	X	X	X		X	X	X			
- Station counts for classlabs and classroom facilities weekly student hours for classroom facilities	IS	Mech	Publics		X		X			X				
- Estimated replacement cost by building condition type	IS	Mech	Pub. & Priv.		X		X			X				

NOTE: In addition to the data already specified in this table, Virginia's State Council for Higher Education has the following data:

Not Mechanized

- Extensive information used in program review

Mechanized

- Detailed financial-aid data
- Additional student-fee data
- Additional facilities data
- FTE faculty data
- Additional detailed financial data. (These data are sent to the State Department of Accounts by public institutions and are available to the Council.)
- Additional personnel information. (Virginia's State Division of Personnel and Training collects detailed data on each employee in the public institutions, and the Council has access to mechanized summary data from this source as well as detailed information as needed. Personnel reports required for federal reporting may be generated from this source.)
- More detailed affirmative-action data on students (for reporting to the Office of Civil Rights due to Virginia's inclusion as one of the 13 Adams States).

Appendix B

PILOT-TEST-STATE REPRESENTATIVES AND TECHNICAL LIAISONS

California	John Harrison California Postsecondary Education Commission
Hawaii	Kenji Sumida Raleigh Awaya University of Hawaii
Illinois	James McGovern Illinois Board of Higher Education
Kentucky	Thomas Braun Gary Henson Kentucky Council on Public Higher Education
New Jersey	Al Katz New Jersey Department of Higher Education
New York	Paul Wing New York State Education Department

South Carolina	Charles Brooks, Jr. Steve Sabin South Carolina Commission for Higher Education
Virginia	J. Michael Mullen Virginia State Council for Higher Education

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Facilities	IS	Mech											N/A	
- *HEGIS required assignable square feet by room-use categories and by building condition (Inventory of College and University Physical Facilities, OE form 2300-7, last required this type of facilities information in September 1974. NCES form 2300-7, with the same title, will be used in 1980-81 and will be limited to institutional information about physical facilities for the mobility impaired.)*			Publics and Privates	X						X				
- Station counts for class labs and classroom facilities; weekly student hours for classroom facilities			Publics							X				
- Estimated replacement cost by building condition type	▽	▽	Publics							X			▽	

NOTE: In addition to the data already specified in this table, South Carolina's Commission on Higher Education has the following data:

Not Mechanized

- Detailed faculty activity analysis data collected in Fall 1977 on a one-time basis for a special study on faculty workloads

Mechanized

- Outcomes data (will be mechanized)
- More detailed current fund revenues and expenditures (but consistent with HEGIS required data)
- Data for all manpower-reporting categories
- FTE data for both students and employees (using a state-specified definition)
- Additional personnel information (from the State Department of Personnel)
- More detailed affirmative-action data on students (for reporting to the Office of Civil Rights due to South Carolina's inclusion as one of the 13 Adams States)

POSTSECONDARY-EDUCATION INFORMATION SYSTEMS AT THE STATE LEVEL
INFORMATION STRUCTURE AND FUNCTIONAL USES OF DATA
Detail by Pilot-Test States
As of May 1978

State: Virginia
Agency: State Council for Higher Education (SCHEV)

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE (a)			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
State Information	N/A		N/A											
Population Characteristics of State														
· Census in total, by county, by population density		Mech			X						X			
· Distribution of family income		Mech										X		
· Education attainment by county for levels within elementary, secondary, college, and vocational education		Mech			X						X			
· Elementary/secondary enrollments by public/private by locality		Mech			X						X			
· High-school graduates by sex by race by locality													X	
· High-school-equivalency recipients by sex for state														
Occupancy Outlook of State														
· Employment summary by industry type and by occupational classification for state		Aces			X				X					
· Job applicants/openings by occupational classification for state		Aces			X				X					
Finances of State														
· State and local revenues		Aces												
· State and local appropriations/expenditures		Aces												
· Student financial aid available from state through state agency, including number of recipients (and their characteristics) and dollar amounts of aid		Mech										X		
National Information														
Occupation Outlook of Nation														
· Employment summary by industry type and by occupational classification for nation		Aces			X				X					
· Job applicants/openings by occupational classification for nation		Aces			X				X					
Finances	▼		▼											
· Student financial aid available from federal government directly to students		Aces					X							

NOTE: N/A indicates not applicable.

(a) Description of Data Available for State Agency's Use:

Level of Aggregation within Agency
- ID: Institutional Detail (such as individual student data)
- IS: Institutional Summary (totals by institutions only)
- SS: State Summary (totals for all institutions or groups of institutions only)

Mechanized Status within Agency:
- Mech: Data are, or will be, mechanized
- No: No plans to mechanize hard copy
- Aces: Data accessible outside agency but not maintained at agency

Institutional Scope:
Data are generally available from the following types of institutions except as noted in the table:

all public and private (except where noted for public only)

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information														
Institutional Characteristics - *HEGIS required data: name, address, FICE code, county, U.S. congressional district, control, structure, accreditation, admissions requirements, undergraduate and graduate tuition/fees, room and board charges, and so forth (on annual NCES form 2300-1, Institutional Characteristics of Colleges and Universities)*	IS	Mech	Publics and Privates	X	X	X			X			X		
- Other data: tuition/fees separately for all levels (including lower division, upper division, and specific professional programs), housing, and commuter information	IS	Mech	Publics and Privates				X					X		
Student Characteristics														
Demographic - Applications, admissions, enrollments for first-time students at all levels	IS	Mech	Publics and Privates		X		X				X		X	
- *HEGIS required head counts by sex, race, FT/PT, and student level, including unclassified (on annual NCES form 2300-2.3, Fall Enrollment in Institutions of Higher Education)*	IS	Mech	Publics and Privates	X	X	X	X			X	X		X	
- Other head counts by age by FT/PT ~~by student level, including unclassified~~	IS	Mech	Pub. & Priv.		X						X			
Geographic Origin - *HEGIS required head counts by state (or foreign total) for all students by sex, by program level (bachelor's-degree credit, vocational technical, first professional, graduate, unclassified, and total), and for first-time freshmen and new transfer undergraduates (on NCES form 2300-2.8, Residence and Migration of College Students)*	IS	Mech	Publics and Privates	X	X	X	X				X			
- Other data on head counts by FT/PT split for first-time entering students at freshman, graduate, and first-professional levels by: ~~- in-district by county (for all levels)~~ In-state by county (for first-time freshmen) Out-of-state by state (for first-time freshmen) In-state versus out-of-state totals (for first-time graduates and professionals)	IS	Mech	Publics and Privates								X			
Other data on head counts by FT/PT split for new undergraduate transfers by in-state by institution, by out-of-state by state (b)	IS	Mech	Publics								X			
Student Ability - Head counts of first-time entering undergraduates by high-school rank percentiles, ACT score ranges, and SAT score ranges, ~~including institutional averages~~	IS	No (will be)	Publics and Privates			X								
Financial Aid - Number of recipients (and their characteristics) and dollar amounts of aid available from institution and administered by institution	IS	Mech	Publics		X	X	X					X		

NOTE: SCHEV is the state coordinator for HEGIS reporting for all institutions. Additionally, it serves as the facilitator for collecting all federally required affirmative-action data.

(b) These data are also used for articulation studies.

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
Major Area / Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Student Programs and Discipline Information														
Student Programs														
- Inventory of offerings by institution	IS	Mech	Publics and Privates		X	X	X	X	X		X			
Student Demand														
- *HEGIS required head counts by sex by FT/PT by student level (upper division, first-professional I and II, graduate I and II) for all major fields of study per HEGIS taxonomy (OE form 2300-2.9, Upper Division and Post Baccalaureate Enrollment by Degree Field, last required in 1976 has been discontinued)*	IS	Mech	Publics and Privates	X	X	X		X	X		X			
- Other head counts by FT/PT for other students (lower division and nondegree/diploma/certificate), by major field of study (including not designated)	IS	Mech	Publics and Privates		X	X		X	X		X			
- Costs by student level within student program	IS	Mech	Publics		X		X		X					
- *HEGIS required numbers of degrees/diplomas/certificates conferred by sex and race by type of degree and by major field of study for July 1-June 30 (on annual NCES forms 2300-2.1 and 2.2, Degrees and Other Formal Awards Conferred)*	IS	Mech	Publics and Privates	X	X	X		X	X				X	
- Other information on number of students receiving a certificate/diploma for a program of less than one year by major field of study	IS	Mech	Pub. & Priv.		X									
- Degrees conferred by age range of students summarized by type of degree N/A														
- Characteristics of program completers summarized by type of degree N/A														
- Noncompleters (and exit status) by type of degree and student program N/A														
Discipline Information														
- Costs by course level within discipline for: Degree-related instruction; Requisite preparatory/remedial; ~~Nondegree~~	IS	Mech	Publics		X		X		X					
- Instructional activity: student-credit hours by course level within discipline	IS	Mech	Publics		X	X	X	X	X		X			
- Instructional activity: student-contact hours and faculty ~~contact hours~~ by course level within discipline for: FTE Degree-related instruction; Requisite preparatory/remedial; Nondegree	IS	Mech	Publics				X		X	X				

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE AGENCY FUNCTIONS AND DATA USES										
Major Area Data Categories/Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/Role/Scope	Budgeting	Program Review: Current Programs	Program Review: New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Personnel														
HEGIS required head counts by sex by FT/PT for manpower categories for all employees. (This information is reported on NCES form 2300-3 only when the form requires information on all employees instead of just full-time instructional faculty, as occurred in 1971-72, 1972-73, and 1976-77.)	IS	Mech	Publics and Privates	X			X							
EEOC required data on head counts and salary distribution by sex by race by contract period by manpower categories for all employees. (Form EEO-6 was first required in 1975 as a biennial survey, and the same form was used in 1977 and 1979.)	IS	Mech	Publics	X									X	
HEGIS required data on full-time instructional faculty by rank by sex by contract period, including numbers tenured and contributing services; and salary and benefit information. (As of 1977, NCES form 2300-3 incorporated information previously collected by AAUP on salaries for continuing faculty.)	IS	Mech	Publics and Privates	X	X									
Other data on instructional/research staff. Number tenured, nontenured, and total for full-time by age range Number tenured, nontenured, and total for FT/PT by discipline ~~Service months by PCS programs~~ FTE by PCS programs	IS	Mech	Publics		X				X				X	
Finances *(HEGIS required data collected annually on form 2300-4, Financial Statistics of Institutions of Higher Education)*														
HEGIS required current fund revenues in total (unrestricted/restricted combined) by source for tuition/fees, government appropriations by level, sales and services, other sources, and independent operations	IS	Mech	Publics and Privates	X	X		X							
Other data on unrestricted current fund revenues by source for government appropriations by level, for other sources, and for independent operations	IS	Mech	Publics		X		X							
HEGIS required unrestricted versus restricted current fund revenues by source for government grants and contracts by level; private gifts, grants and contracts; and endowment income	IS	Mech	Publics and Privates	X	X	X	X							
Source/use matrix of current fund revenues N/A														
HEGIS required current fund expenditures and mandatory transfers by function	IS	Mech	Publics and Privates	X	X	X	X							
Balance-sheet information by fund groups	IS	Mech	Publics				X							
HEGIS required statement of changes in fund balances	IS	Mech	Pub. & Priv.	X			X							
HEGIS required details of endowment	IS	Mech	Pub. & Priv.	X			X							
HEGIS required physical-plant indebtedness in total	IS	Mech	Pub. & Priv.	X	X		X			X				
Other physical-plant indebtedness for auxiliary enterprises, hospitals, and all other	IS	Mech	Publics		X		X			X				
Retirement-fund contributions by a government source for an institution	IS	Mech	Publics				X							
HEGIS required debt outstanding, issued, and retired amounts in total for long-term and for short-term	IS	Mech	Publics and Privates	X	X		X							
Other debt outstanding, issued, and retired amounts for long-term for auxiliary enterprises, hospitals, and all other	IS	Mech	Publics		X		X							
HEGIS required total interest paid from all funds	IS	Mech	Pub. & Priv.	X			X							
Debt-service amounts and purchases of capital assets by source	IS	Mech	Publics		X		X			X				

NOTE: Additional detailed personnel information is available from the State Division of Personnel and Training on mechanized tapes (for public institutions only).

Additional detailed financial data are available from the State Department of Accounts (for public institutions only).

INFORMATION STRUCTURE	DESCRIPTION OF DATA AVAILABLE			STATE-AGENCY FUNCTIONS AND DATA USES										
								Program Review						
Major Area Data Categories - Data Items	Level of Aggregation	Mechanical Status	Institutional Scope	Federal Reporting	Long-Range Planning	Mission/ Role/ Scope	Budgeting	Current Programs	New Programs	Facilities Review	Enrollment Projections	Financial Aid	Affirmative Action	Published Information
Institutional Information (Continued)														
Facilities - *HEGIS required assignable square feet by room-use categories and by building condition (Inventory of College and University Physical Facilities, OE form 2300-7, last required this type of facilities information in September 1974. NCES form 2300-7, with the same title, will be used in 1980-81 and will be limited to institutional information about physical facilities for the mobility impaired.)*	IS	Mech	Publics and Privates	X	X	X	X		X	X	X			
- Station counts for classlabs and classroom facilities - weekly student hours for classroom facilities	IS	Mech	Publics		X		X			X				
- Estimated replacement cost by building condition type	IS	Mech	Pub. & Priv.		X		X			X				

NOTE: In addition to the data already specified in this table, Virginia's State Council for Higher Education has the following data:

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- Detailed financial-aid data
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