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EXECUTIVE SUMMARY

EVALUATION OF ADMINISTRATIVE MANAGEMENT INFORMATION SYSTEMS FOR ELEMENTARY AND SECONDARY SCHOOL DISTRICTS AND STATE DEPARTMENT OF EDUCATION

JANUARY 31, 1980

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MANAGEMENT INFORMATION SYSTEMS
FOR ELEMENTARY AND SECONDARY
SCHOOL DISTRICTS AND
STATE DEPARTMENT OF EDUCATION

January 31, 1980



Peat, Marwick, Mitchell & Co.

Certified Public Accountants

1700 IDS Center
Minneapolis, Minnesota 55402

January 31, 1980

Mr. Robert G. Renner
Governor's Office
130 State Capital
St. Paul, Minnesota 55101

Dear Mr. Renner:

Peat, Marwick, Mitchell & Co. (PMM&Co.) is pleased to present this Executive Summary of our final report in connection with our evaluation of the administrative management information system (ESV-IS) developed by MECC for elementary, secondary, and vocational (ESV) schools in Minnesota. Although not required by terms of our contract, we believe the second report, based on the same analyses as the January 14, 1980 report of responses to the RFP questions, provides a comprehensive topical summary of our findings, observations, and recommendations for the ESV administrative data processing system. The contents of this report have been organized into six chapters:

1. Organization and Staffing;
2. Data Center Reviews;
3. Data Base Systems;
4. Analysis of Cost;
5. User Survey Results; and
6. Background and Requirements Analysis.

Because of the legislative concern for controlling the proliferation of computers in education, MECC was created in 1973. In response to the legislature's mandate for timely and accurate financial information, UFARS was enacted and ESV-FIN was developed to provide an automated system compatible with UFARS. These events have provided the impetus and foundation for the development of the ESV-IS and SDE-IS systems.

PMM&Co. believes that these systems are necessary to provide the information desired by SDE and the Legislature. While many successes have been realized during the last six years, we believe many critical issues exist which should be addressed in the near-term future. The second report, dated January 31, 1980, as well as the January 14, 1980 report, identifies these issues and opportunities for improvement along with recommendations for solving the critical issues and making the necessary modifications and adjustments for improvements.

* * * * *



We enjoyed the opportunity to assist the State of Minnesota in this project. We appreciate the assistance and cooperation of everyone involved in the project, especially the Project Review Committee.

Very truly yours,

Peat, Marwick, Mitchell & Co.

EXECUTIVE SUMMARY

I - INTRODUCTION

BACKGROUND

The Minnesota Educational Computing Consortium (MECC) was officially established in July 1973. In signing a joint powers agreement, the University of Minnesota, the State University System, the Community College System, the Department of Education, and the Department of Administration completed an extensive planning effort involving state government officials, educators, and private citizens in creating the Consortium.

MECC is governed by a 16-member Board of Directors, who meet monthly to establish policy and to review the operation of the Consortium. Membership on the Board of Directors is from the member organizations in the system including six directors appointed by the Department of Education; two directors each from the University of Minnesota, the State University System, and the Community College System; one director appointed by the Commissioner of Administration; and three directors appointed by the Governor. MECC draws upon the resources of member systems and a professional staff in providing the overall review of computing plans and budgets, a state-wide instructional computing network, development of regionally-based management information systems, and support to a variety of special projects utilizing computers.

The primary purpose of MECC is to assist member systems in the coordination and utilization of computer resources through a cooperative planning and decision-making structure. The two major goals related to this primary purpose are:

- to coordinate and assist in planning and educational computing activities of the member systems through the maintenance of a long-range master plan for educational computing, the development of short-term biennial plans, and the ongoing review of proposals for specific facilities and services; and
- to serve the member systems by meeting their needs in the areas of the management and operation of computer facilities, system design and development, fiscal management or "broker-ing" of specific computer services from provider to user, consultation and training, and the conduct of special projects involving the application of the computer in education.

PMM&Co. Study Effort

The study effort, conducted by PMM&Co. from September 1979 through January 1980, emanated from the Governor's Office as the result of legislation enacted by the 1979 session of the Minnesota Legislature, which directed the Governor, "to employ consultants...to evaluate the development of the Minnesota Educational Computing Consortium (MECC) Regional Management Information System."

We understood this action was triggered in part by many happenings, including the following activities and events:

- Questions by the larger school systems in Minnesota (Minneapolis, Rochester, and St. Cloud) about the ESV administrative management information system's:
 - cost-effectiveness;
 - quality of software;
 - hardware purchase decisions;
 - technological obsolescence; and
 - sensitivity and responsiveness to local user requirements and needs.
- A successful lawsuit initiated by the Minnesota Department of Education to prevent the Minneapolis School District from purchasing new hardware (Honeywell) and withdrawing from METRO II;
- Enactment of laws requiring the adoption of uniform financial accounting and reporting for school districts effective after June 30, 1980, with support services provided by the regional ESV processing centers;
- Interest of the Minnesota Senate and House of Representatives in educational computing opportunities, more timely and comparable financial reporting by school districts, and effective use of computer hardware and software. Committees handling education and appropriation legislation, and special computer subcommittees, in both houses, have been most directly involved in this area; and
- Increases in state funding of public education requiring more and improved accountability of school district officials, along with more timely and accurate financial reporting to the Legislature, Department of Education, and the general public.

PMM&Co. was selected to perform the evaluation and to answer the 57 questions, specified in the Request for Proposal (RFP), which were categorized in seven task areas:

- A1 - Comparison of centralized vs. decentralized systems;
- A2 - State level funding and organization;
- B1 - Formation, function, and structure of regional centers;
- B2 - Assignment of districts to regions;
- C1 - Procurement of hardware;
- D1 - Development and maintenance of software; and
- D2 - Implementation of software.

To obtain information and data needed in developing our responses, the PMM&Co. engagement team employed four collection methods:

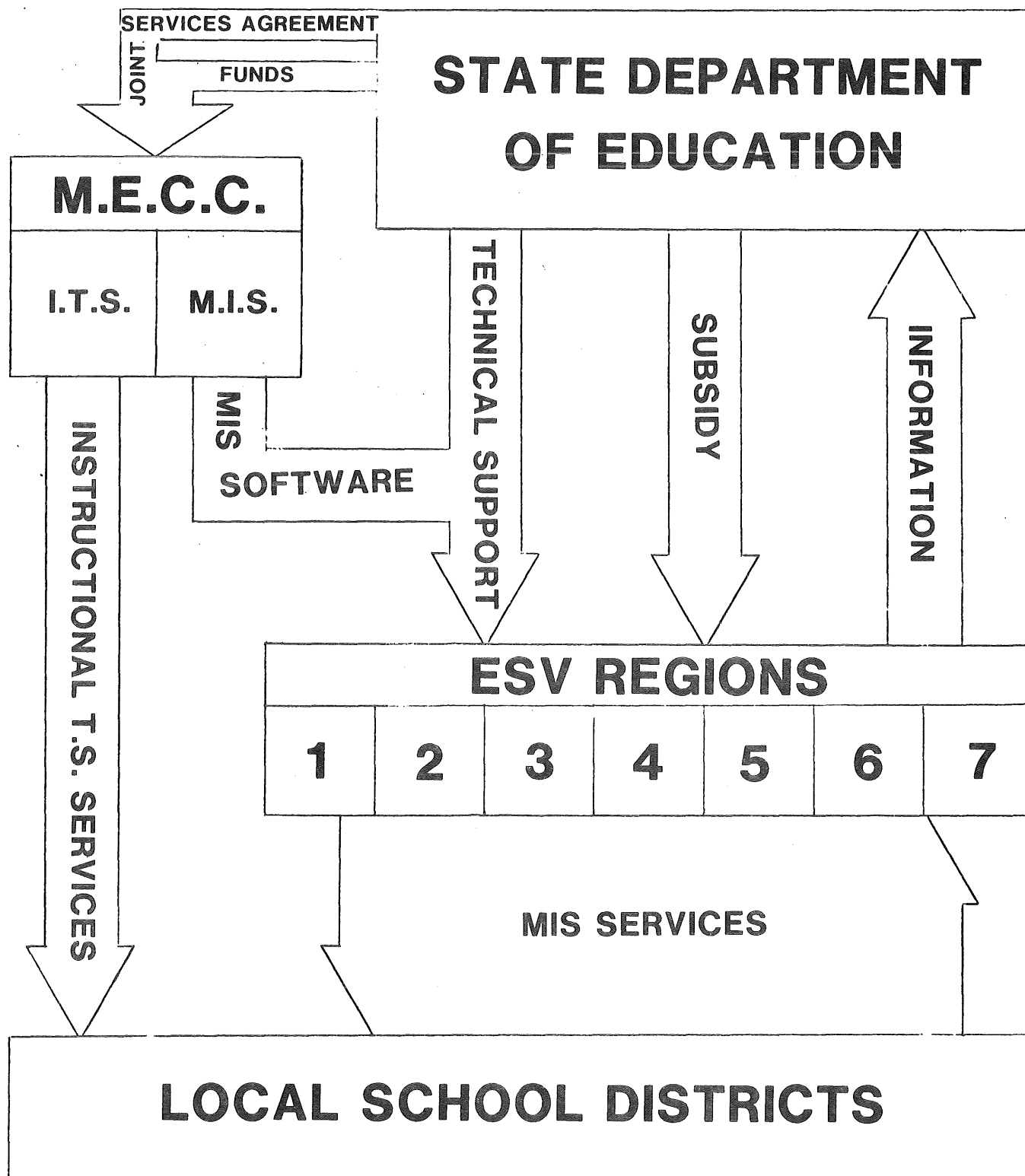
- reviewed data center operations, at ESV Regions III, V, METRO II, and TIES, and MECC-MIS, and reported our findings to the center management.

- developed and sent a survey questionnaire to potential and present school district users of ESV administrative data processing services to determine their understanding and to obtain their perceptions of these services. Eighty-five school districts responded to the survey distributed to 103 school districts with other districts volunteering additional comments;
- conducted personal and group interviews, as part of or in addition to the data center reviews and survey follow-up, with over 300 persons representing the State Department of Education, Legislature, MECC, ESV regional centers and boards, and local public school districts; and
- utilized a project review committee, organized by the Governor's office to work with the PMM&Co. engagement team and composed of individuals having varying understandings of MECC, its mission, and its practices. The individuals represented the proposal review committee which recommended PMM&Co. to the Governor, SDE, ESV regions, and local school districts.

The results of this evaluation are contained in a report entitled "Evaluation of ESV-IS and SDE-IS," dated January 14, 1980. While that report was responsive to the RFP questions, PMM&Co. believes the results of our study effort are better presented with an additional report which includes our specific observations and recommendations to improve the efficiency and effectiveness of the ESV data processing system. This additional report is entitled "PMM&Co.'s Evaluation of Administrative Management Information Systems for Elementary and Secondary School Districts and the State Department of Education" and dated January 31, 1980. The purpose of this executive summary is to concisely outline our findings and to suggest the next series of actions which could be taken.

We have been treated with courtesy and candor by all participants throughout the course of this study. They have viewed our efforts in the spirit in which they were intended -- as a constructive effort to assist the educational and management goals of the state and local districts. We particularly wish to thank the members of the Project Review Committee whose comments and review of our work were of enormous help throughout the project.

SDE and the ESV REGIONS



II - THE ORGANIZATION AND SCOPE OF EFFORT

The current organization is composed of many groups operating independently and requiring a high degree of interaction and coordination. Figure 1, on the facing page, depicts this organization. The main flow of activity is from the Legislature to the State Department of Education to the seven ESV (Elementary, Secondary and Vocational) regions and, finally, to the 437 local school districts. Many of these organizations have some degree of independence because of having their own governing boards. MECC-MIS is separately governed and seeks to provide standard software to the regions, who in turn provide computing services to the local school districts. However, although independent governance may exist in these organizations, each organization is dependent on each other to provide quality and effective data processing services. The principal roles of each organization are summarized in Figure 2.

There are two major systems which interact and form the main framework for ESV administrative data processing activity. These systems, known as the State Department of Education Information System (SDE-IS) and the Elementary, Secondary and Vocational Information System (ESV-IS), were the subject of our study. (See Figure 3.)

SDE-IS

The overall purpose of the SDE-IS data base is to receive, store, and provide detailed data reflecting at least five years of operation of all public school districts in the State. The resulting collection of data bases is a state-level repository for appropriate levels of summarized operational data from all public school districts in the State. The concept is to have a set of MIS-type, large, interrelated data bases supported by a flexible system of generalized software and application programs which will provide users with direct access to their data. The primary users of the SDE-IS data base are the State Legislature and the State Department of Education.

ESV-IS

The ESV-IS system is the administrative data processing and management information system designed for elementary, secondary, and vocational schools in Minnesota. Information from ESV-IS is expected to provide most of the input to the SDE-IS system.

The ESV-IS is composed of four subsystems:

- Finance (ESV-FIN);
- Payroll/Personnel (ESV-PPS);
- Student (ESV-SSS); and
- Instructional Management (ESV-IMS).

Finance (ESV-FIN)

The ESV-FIN system has been developed to provide financial accounting capability to local school districts. The finance system has many capabilities, including transaction processing, subsystems for accounts payable

Figure 2

PRINCIPAL ROLES OF ORGANIZATIONS

STATE DEPARTMENT OF EDUCATION

- Budgetary Control of the State effort in education;
- Control over expenditures by local school districts for data processing;
- Planning and budgeting requiring the use of State resources for elementary and secondary education;
- Design, development, and enforcement of uniform financial reporting standards.

ESV REGIONS

- Responsibility for Administrative data processing and instructional timesharing;
- Planning and budgetary linkage between local school districts and State Department of Education;
- Operate data centers and, depending on joint powers, may design and develop systems.

MECC-MIS

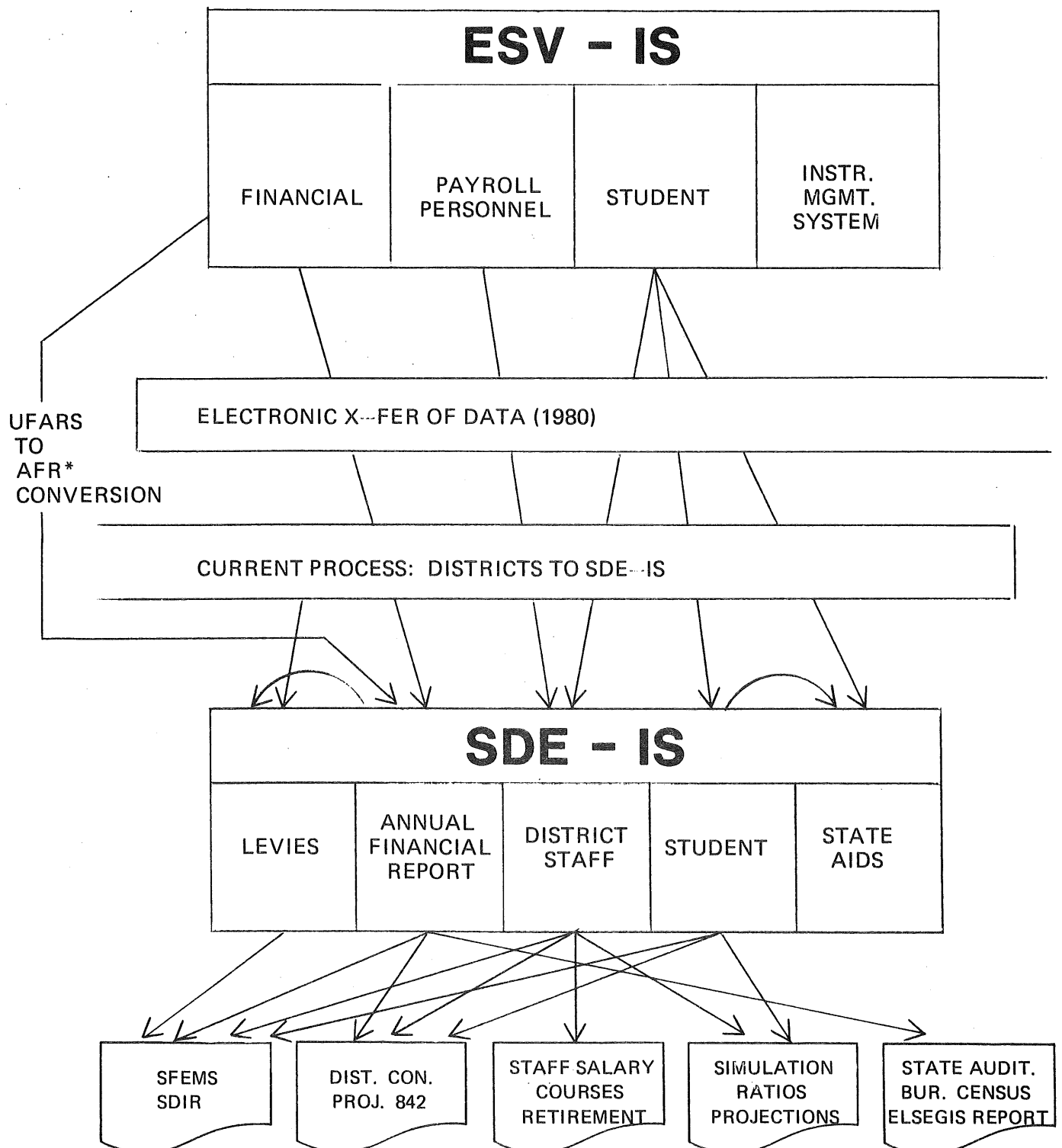
- Provides data services to State Department of Education;
- Designs, develops, and maintains state-wide ESV-IS systems;
- Provide training in operation of ESV-IS systems.

LOCAL SCHOOL DISTRICTS

- Deliver educational services at the local government level
- Authorized to tax locally to support education;
- Prepare an annual financial report consistent with UFARS standards.

FIGURE 3

ESV - IS SDE - IS DATA FLOW



* ANNUAL FINANCIAL REPORT

and inventory, and financial report production. SDE contracted with MECC-MIS to develop ESV-FIN as an automated accounting system alternative for school districts using manual methods or other automated systems. ESV-FIN was developed to be compatible with the UFARS standards.

Before ESV-FIN was developed, the Legislature enacted a law requiring each school district to comply with a set of uniform accounting and reporting standards. These standards, the Uniform Accounting and Reporting Standards (UFARS), were to be followed by all school districts commencing with the school year 1976/1977. School districts were required annually to submit a financial report, pursuant to UFARS standards, to the State Department of Education. ESV-FIN was developed by MECC-MIS to support the UFARS financial accounting and reporting requirement.

It is important to distinguish between ESV-FIN and UFARS. The UFARS law and administrative rules include the policies and standards for the accounting and financial reporting. ESV-FIN is the application software developed, consistent with UFARS, as the processing system for accounting and reporting. ESV-FIN is a system, while UFARS specifies the accounting standards to be applied by school districts. The UFARS requirement exists whether a school district maintains a manual system or an automated accounting system such as ESV-FIN.

Payroll/Personnel (ESV-PPS).

The Payroll/Personnel System was designed to enable school districts to automate a personnel function for maintaining employee personnel records and a payroll function to make payroll transactions. School districts may voluntarily decide to implement ESV-PPS, and 74 school districts had implemented or were scheduled to implement ESV-PPS on October 1, 1979.

The Payroll/Personnel System is divided into four major sections:

- Regional tables which contain information required by each district, such as tax tables;
- District information which contains information required, such as district name, address, and phone number;
- Personnel information which contains data on employee name, address, employment information, insurance record, certification information, and leave status;
- Payroll information which includes all information needed to pay the employee, such as pay amount, labor distribution, statutory and voluntary deductions, and period-to-date totals.

Student Support (ESV-SSS)

The Student Support System was developed for use by school districts in the following functional areas:

- student accounting;
- resident/family accounting;
- attendance/enrollment;

- student scheduling;
- mark reporting; and
- history.

Seven school districts had implemented ESV-SSS and were using some, but not all, of the functions. This system has not been fully developed, as the six functions are not complete at this time.

Instructional Management System (IMS)

The Instructional Management System assists educators by keeping records, scoring and processing tests, summarizing data to provide decision-making information, and facilitating instructional planning and evaluation. The Instructional Management System seeks to integrate the following:

- Objectives - are a statement of anticipated outcomes of the instructional process. This may be a general, or a specific, behaviorally stated objective.
- Activity - provides a description of the curriculum, course of study, unit of instruction, or other organization of instructional material.
- Group - comprises three definitions: (a) an organization of students into school, classes, units or teams; (b) a test group of students based on criteria for processing specifications for testing; or (c) an achievement group which is based on some criteria of excellence.

LINKAGES BETWEEN SYSTEMS

The ESV-IS system provides data which is required for statewide reporting by districts. For the finance system (ESV-FIN), the electronic transfer of data is scheduled to be implemented in 1980. That means that districts who are operating on the ESV-FIN system will be able to submit their annual financial report using the automated support of the regional processing center. If the district is not collecting its detailed transactions and processing these transactions on the ESV-FIN system, it will still be possible for the regional center to report using automated systems to the State Department if the annual financial report which has been manually prepared by the district is submitted to the regional processing center.

The Payroll/Personnel System (ESV-PPS) is expected to provide the SDE-IS with information on staffing, salaries, courses, and retirement information. The Student Support System (ESV-SSS) is expected to provide the SDE-IS with information on student population for use in state aids formulas. At present there are no scheduled linkages between these two systems and the SDE-IS.

III - FINDINGS

There have been a number of positive results since the ESV administrative data processing was formally initiated in 1973, including the following:

- The State has negotiated substantial discounts in its contract for computer equipment with Burroughs Corporation;
- Four regional processing centers (one additional in January 1980) have been funded and staffed, are operational, and are an effective way of delivering services;
- A Financial System (ESV-FIN) is operational and is effective in supporting multidimensional, modified accrual accounting;
- A Payroll/Personnel System (ESV-PPS) has been designed and is being implemented, despite the problems identified;
- A Student System (ESV-SSS) is completing pilot in some functions, and these functions are being used by four districts, despite the problems identified; and
- An Instructional Management System (ESV-IMS) has been completed and is being used by four school districts.

However, our evaluation developed a number of significant problems which must be addressed if the ESV administrative data processing system is to continue to be viable. These problem areas revolve around five major issues:

1. The need for improved planning and monitoring efforts;
2. The need for an efficient and more effective organizational structure;
3. The need to improve the technical quality of the systems design for standard statewide software;
4. The need to apply uniform standards for systems development and operations; and
5. The need to improve the operational efficiencies of the data centers and the systems developed in the process.

Each of these issues is addressed more fully below.

1. PLANNING AND MONITORING

One of the original objectives of the MECC consortium was to develop and maintain a long-range plan for computing on a statewide basis. Such a plan has not been developed and, consequently, the systems development projects and technical operations of the regional centers have diverged in a variety of ways. The resulting confusion has created significant difficulties in the development and operation of truly standardized systems, and

will continue to plague further development and maintenance of automated systems. A long-range plan should be developed now to include the following:

- An overall system architecture linking the individual ESV-IS systems with each other and with the SDE-IS system;
- An overall technical plan for the operation of the regional data centers including hardware, operating systems, software aids, and other systems;
- Criteria should be developed for measuring the performance of the data centers; and
- An implementation plan and methodology for monitoring the execution of the plan should be developed.
- A financial control mechanism to capture actual expenditures versus specifically defined programmatic objectives.

The first step in developing a plan for administrative computing is to define the strategy to be used for the delivery of computer services to districts and for the reporting of district information to the State Department of Education.

Such a strategy should consider, in our opinion, the following options:

- single, monolithic system in which one computer-based system would meet all needs for districts and SDE;
- common, nonmonolithic system in which two separate systems are maintained, one for SDE and one for ESV;
- common systems specifications in which data element standards, reporting standards, and transaction processing are defined; a number of hardware and software solutions may exist; and
- output reporting requirements in which reporting frequencies and some elements of information are defined, but no single standard for reporting or data elements exists.

PMM&Co. believes the following advantages, as the result of selecting the option of common system specifications, would be beneficial to the State:

- flexibility to permit district needs to be more effectively met by other computer systems or approaches which meet State standards;
- commitment of districts to supporting and maintaining the concept and execution of statewide reporting;
- cost reduction over less flexible approaches of monolithic or common, nonmonolithic systems; and
- future orientation to take advantage of new technology and software techniques by not "locking in" the State to a single hardware and software solution.

OPTIONS

ISSUE	SINGLE MONOLITHIC SYSTEM	COMMON, NON-MONOLITHIC SYSTEM	COMMON SYSTEM SPECIFICATION	OUTPUT REPORTING REQUIREMENTS
STATE	<p>ADVANTAGES</p> <ul style="list-style-type: none"> One development cost Single operating strategy Single maintenance project Single training program <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Difficult design task High cost (hardware/software) 	<p>ADVANTAGES</p> <ul style="list-style-type: none"> SDE/ESV-IS systems break software into convenient systems Not require common communications net Not demand instant access to data <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Single ESV not meet all needs 	<p>ADVANTAGES</p> <ul style="list-style-type: none"> Common data element definition Common process for transaction creation Multiple solutions, creativity discouraged <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Difficult to ensure "cost/benefit" of new solution has preceded development More complicated to guide and structure multiple software developments 	<p>ADVANTAGES</p> <ul style="list-style-type: none"> No regulation No impact on district affairs <p>DISADVANTAGES</p> <ul style="list-style-type: none"> No common standards No meaningful cross-district comparison
DISTRICT	<p>ADVANTAGES</p> <ul style="list-style-type: none"> Common training State support <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Not meet small/large district needs 	<p>ADVANTAGES</p> <ul style="list-style-type: none"> Common training State support <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Not meet small/large district needs 	<p>ADVANTAGES</p> <ul style="list-style-type: none"> Flexibility and innovation allowed Encourages commitment to supporting state requirements <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Must take action to analyze cost/benefit and present district solution to ESV Planning and Control 	<p>ADVANTAGES</p> <ul style="list-style-type: none"> No State interference Business as usual <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Responsibility for administrative computing is completely on district
TECHNICAL CONTROL	<p>ADVANTAGES</p> <ul style="list-style-type: none"> Single control point <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Difficult design task 	<p>ADVANTAGES</p> <ul style="list-style-type: none"> Simpler communications net design task Not demand "instant" access to data <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Linkages between ESV and SDE 	<p>ADVANTAGES</p> <ul style="list-style-type: none"> Not demand large scale software solution Simple to "stage" development; No "final solution" <p>DISADVANTAGES</p> <ul style="list-style-type: none"> Definition of specification will require effort to define transaction processing, data element definition, and reporting requirements Requires coordination with a number of system development teams 	<p>ADVANTAGES</p> <ul style="list-style-type: none"> Define reports, frequency of reports only <p>DISADVANTAGES</p> <ul style="list-style-type: none"> No coordination of data element definition No common transaction processing approach No commonality or cross-comparison of "numbers"
COST	<p>Very high cost for:</p> <ul style="list-style-type: none"> Network Hardware 	<p>Reduced cost vs. single monolithic for:</p> <ul style="list-style-type: none"> Network Hardware 	<p>Reduced cost vs. non-monolithic for:</p> <ul style="list-style-type: none"> Network Hardware 	<p>Unknown</p>

In Figure 4, on the facing page, we present a table identifying each of the options with advantages and disadvantages listed for:

- state;
- district;
- technical control; and
- cost.

Please refer to the Appendix for a detailed discussion of these processing options.

2. ORGANIZATION

The current organization structure is hindered by a large number of participants with no mechanism to resolve conflict and to establish a plan which can be executed. Figure 1 showed this current structure, while Figure 5 shows the actual communication channels and some of the links which we determined are in operation. Districts do not, in the present organization, have a means to effectively communicate their needs and do not have an organization which is empowered to act directly on those needs. If there is conflict, the only arbitration mechanism is the State Department of Education.

There is a need to develop a more streamlined organization which will:

- Maintain coordination and control;
- Enlist district participation in the process;
- Ensure that a method for resolving conflict is provided in the organizational mechanism; and
- Ensure that systems exhibit common characteristics to users.

Figure 6 suggests such an organization. In the proposed structure, the State Department would take a stronger position in enforcing the process by which decisions are made (i.e., not permitting the process to stall from conflicting viewpoints) and in reviewing overall plans and budgets. The Department would be supported by two units:

- ESV Planning and Control group responsible for the development and monitoring of the long-range plan; and
- MECC ESV-MIS responsible for common systems development.

The ESV Planning and Control group would be supported on an as-needed basis by the following three groups:

- Facilities review group to examine proposals for new hardware acquisitions;
- Advisory committee to prioritize ESV system enhancements and modifications; and

Figure 5

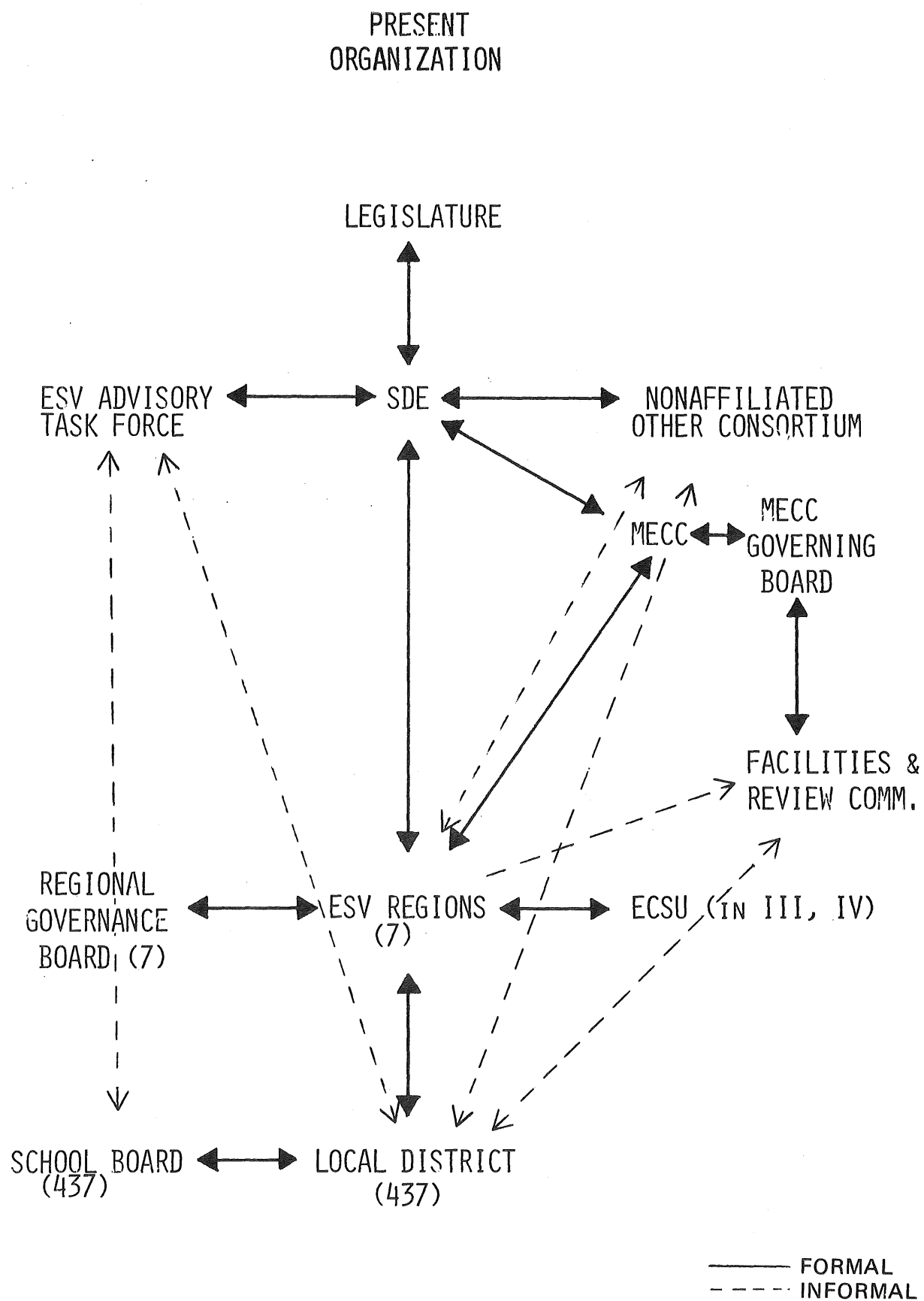
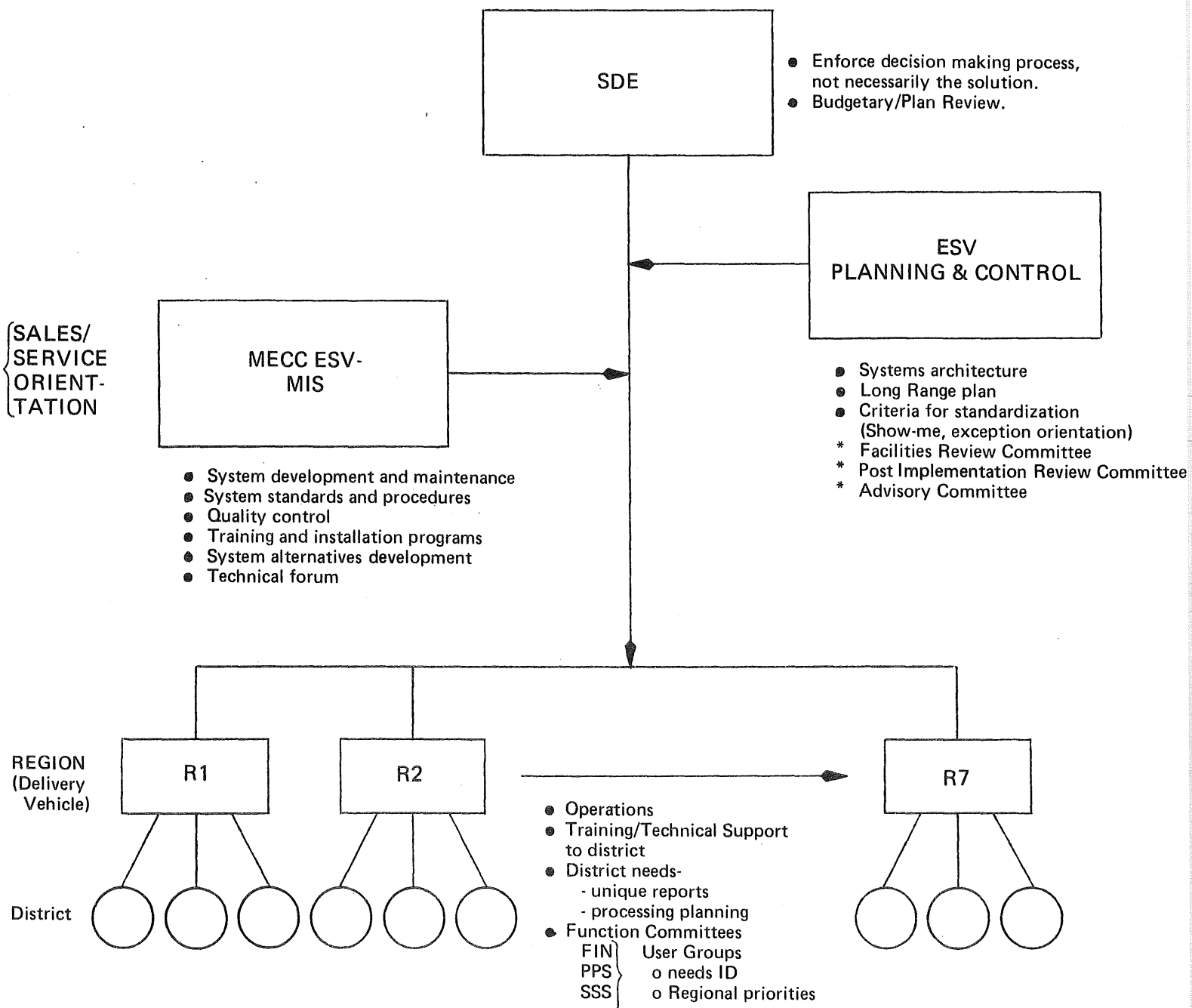


Figure 6

PROPOSED ORGANIZATION

**MECC ESV-MIS**

Technical Expertise Group - Recommend to larger managerial concil.

- Frame issues
- Provide technical forum for Regional and MECC-MIS personnel.

ESV PLANNING & CONTROL

Working Committee - acts on technical recommendations of MIS.

* Chaired by SDE

- Post-implementation review group to examine ESV systems after pilot, after statewide installation, and prior to major enhancement.

Please refer to Section I, Organization and Staffing, of the January 31, 1980 report for further details.

3. SYSTEMS DESIGN

The systems designed for ESV-IS are not uniform and do not present a single processing methodology to the user. A single processing approach has the advantage of (a) reducing training time for the district; (b) reducing support requirements from the region to the district; and (c) ensuring that tested, common design and processing modules are used system-to-system. In addition, the quality of the designs differs markedly from system to system. Each ESV-IS system will be discussed in the following paragraphs. See Section III, Data Base Systems, of the January 31, 1980 report for further details.

- ESV-FIN

The ESV-FIN system is, in PMM&Co.'s opinion, an efficiently designed system. There are good input edit controls, and the data base structure and organization is efficient. Our examination of the ESV-FIN user manual shows this to be a well-documented system. This user manual is somewhat technical for the average small district user; however, the information which districts would need to process with the ESV-FIN system is available in this manual. Regions II and III have developed useful ESV-FIN manuals for small districts. These manuals should be examined by MECC for future ESV-FIN user documentation.

- ESV-PPS

The ESV-PPS system is not designed for efficient operation. The editing process for ESV-PPS consists of three levels. Users do not receive the final level of edit until a payroll is actually run. Such an editing process is wasteful and confusing to the district. Current pay information is not maintained within the ESV-PPS data base. This pay information is kept in a series of payroll work files. The linkage to retrieve and record information on current pay creates an extra step in processing and is an inefficient design.

In interviews with districts, and in responses received on the PMM&Co. survey, we have received a picture of the ESV-PPS system which is not promising. This system consumes an extensive amount of district time in clerical staff support. The input process, although relatively simple for the creation of records, is extremely difficult when a final payroll is a goal. Therefore, the system does not operate in a manner which effectively supports school district needs.

We are informed that a number of processing improvements, documentation changes, and edit modifications have been completed since our examination of the system in October 1979.

Although a number of these changes could be significant, we believe it prudent to re-assess the present state of the ESV-PPS system. The examination should consider improvement alternatives for processing efficiencies and editing. We recommend further development on ESV-PPS be stopped and the ESV-PPS system design be re-evaluated by an independent third party to determine future alternatives available for this product. Regional centers should be involved in this development of alternatives and in the development of cost estimates. MECC-MIS would continue to support the present district users on ESV-PPS during this re-evaluation period of ESV-PPS.

- ESV-SSS

ESV-SSS has had substantial change since the original specifications were written. At present, there are no MECC-MIS personnel who are directly responsible as functional managers for the Student Support System (SSS). Employees at METRO II are assisting a contractor who has been hired to complete the implementation of ESV-SSS. Based on information received in the survey conducted by PMM&Co., there is little knowledge of this student system in the school districts. These districts do not believe that they have been consulted on the design of the ESV-SSS system, and user districts are not satisfied with documentation that has been supplied for the system operation.

ESV-SSS is now in operation at seven school districts in the State. At the time of our review, October 1979, documentation was not available. It is our understanding that MECC-MIS has now completed a draft manual for ESV-SSS.

The ESV-SSS system uses a different method for the creation of transactions. This method, GEMCOS, is a Burroughs system product. It is designed to be a transaction processor and includes data security. The other two MECC-developed ESV-IS systems utilized CANDE. CANDE is a Burroughs system product which provides generalized file preparation and updating. PMM&Co. notes that these are not consistent processing methodologies. Therefore, MECC-developed systems do not exhibit the same characteristics to users which centrally developed software should exhibit.

PMM&Co. recommends that further development or modification of this system should be postponed until the State has re-assessed the original requirement and compared this requirement to the actual features developed and operating on ESV-SSS. After these differences have been defined, specific work plans and cost estimates can be developed to upgrade ESV-SSS to the necessary level to support user needs.

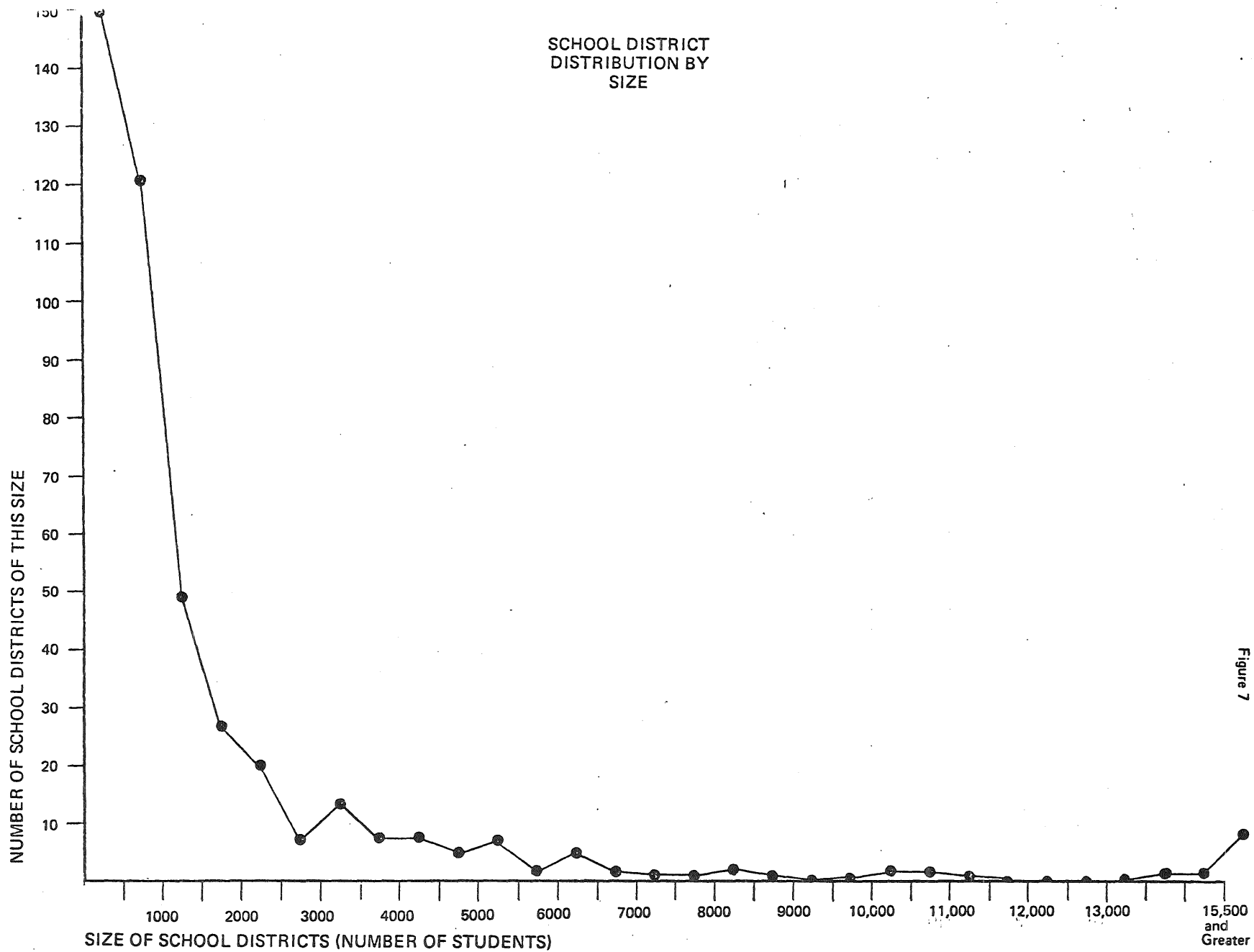


Figure 7

An independent review of these requirements should be conducted. Such a review would use data processing expertise with ESV-SSS at METRO II and Region III as an evaluation resource. During this re-assessment period, present districts using ESV-SSS should continue to be supported by MECC-MIS.

- ESV-IMS

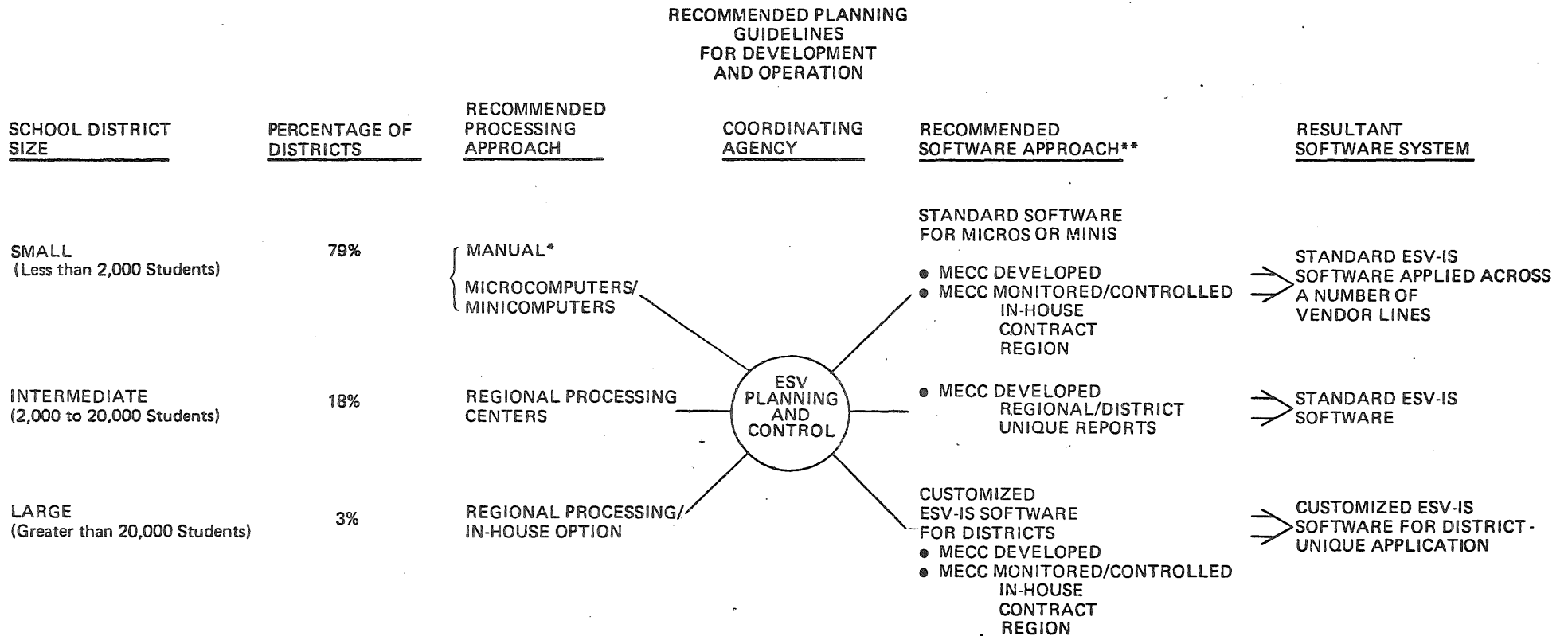
ESV-IMS has been developed from State specifications by METRO II. It is our understanding that METRO II districts are the only users of the system. We have reviewed the documentation for ESV-IMS. It is well organized, logical, and should be easily understood by district users. We believe the documentation techniques for ESV-IMS could be used as a model for other ESV systems.

Based on our analysis of the user survey responses and the complexity of the applications software, we believe the systems currently developed for ESV-IS have been designed for intermediate-sized school districts. However, Minnesota's school districts are divided into a large number of small districts (79%), a few large districts (3%), and a small number of intermediate-sized districts (18%). (See Figure 7, on the facing page.) Current designs generally provide more features and capabilities, and at a higher cost, than small districts require or desire, and provide inadequate versatility and number of capabilities to the large districts.

To solve this situation, PMM&Co. recommends different stratification levels for the development and operation of ESV-IS systems. Figure 8 shows the suggested three levels of district size, using school enrollment as a reference:

- Small districts - typically less than 2,000 students;
- Intermediate districts - typically 2,000 to 20,000 students; and
- Large districts - typically greater than 20,000 students.

At the small district level, PMM&Co. believes that a manual reporting option should be available, especially for the very small districts. However, there are small districts presently using the ESV-FIN system which prefer ESV-FIN to a manual system. These districts may be near the regional processing center and/or may have a sufficiently complicated chart of accounts, or an extensive file of vendors supplying services to the district which would necessitate their operation on a more sophisticated financial system. There are, however, a number of these small districts which do not desire this level of sophistication. For these districts, PMM&Co. believes that microcomputer or minicomputer systems, such as that developed at Ortonville, can provide a useful method for reducing processing burdens at the regional center and providing districts with less complicated operational procedures. The proposed ESV Planning and Control group would be responsible for defining a number of software solutions that would meet the needs of these users. The software developed for the microcomputers or minicomputers could be purchased from an outside vendor, developed by a regional center, developed by the district, or developed by



THERE IS NO SIMULTANEOUS EQUATION TO SOLVE THE TOTAL SYSTEM!

REGIONAL CENTERS SHOULD WORK WITH SCHOOL DISTRICTS TO DETERMINE BEST SOLUTION

* A manual reporting option should exist for these school districts. The manually prepared report should be delivered to the regional center for data entry in the regional ESV-FIN.

** MECC = MECC ESV-MIS

MECC ESV-MIS. Whatever the option, MECC ESV-MIS would ensure that the software system was developed in accordance with statewide standards and provided with helpful user documentation.

For the intermediate district, we believe the regional processing center should be responsible for delivering the approved versions of ESV-IS software. We have learned of needs for district-unique capabilities. We believe that many of these capabilities can be created and maintained by the regional center for the requesting district. We further believe that any unique district reports should be shared with MECC ESV-MIS, to be considered for future releases on the ESV systems. Using regional expertise would help alleviate some demands for development work at MECC ESV-MIS. This option has the added advantage of allowing regions to respond directly to member district requests.

For the large districts, we believe three options for processing should be considered:

- Processing at the regional center; or
- Processing at the district (in-house); or
- A combination of regional and district processing.

For these large districts, there may be the need for customized versions of the ESV-IS software. It is the district's responsibility to present their business plan for software, or for processing on district hardware, to the ESV Planning and Control group. The district proposal should consider several options: (a) MECC ESV-MIS development of the specific changes and customized version of ESV-IS for the district; (b) district development of the customized ESV-IS system; and (c) contract development with an outside vendor. We believe that MECC ESV-MIS should monitor in-house or contract development to ensure statewide standards and documentation requirements are maintained.

We believe it is important to keep the following information in perspective:

- Regional centers should work with school districts to determine the best solution, be it manual, micro- or minicomputer, the regional processing center, or an in-house option; and
- Districts desiring to have unique processing or hardware operations must make business proposals first to the regional center and then to the ESV Planning and Control group.

The ESV Planning and Control group can also act as a court of appeals. In the instance where a district was unable to receive the service or support desired from a regional processing system, that district should have the option of presenting its business plan to the ESV Planning and Control group. The district's business plan should include alternatives analysis, costing analysis, and staffing requirements. In evaluating the business proposal from the district, the ESV Planning and Control group should consider utilizing the expertise of MECC ESV-MIS, regional centers, and outside business personnel or data processing practitioners.

4. UNIFORM STANDARDS FOR SYSTEM DEVELOPMENT AND OPERATIONS

Our review of systems development and regional data center operations revealed a number of areas in which we believe uniform standards would be beneficial:

- data center operations do not have performance standards defined, or measured in a comparable manner;
- enhancement, modification, and system development requests are not handled on a standard basis, or prioritized using standard procedures;
- training plans, procedures, and documentation are not shared among regional centers; and
- data elements are not defined consistently among the systems.

We believe considerable advantage can be gained by the State if changes are made to adopt more uniform standards for the ESV process. We believe the major areas for uniform standards are:

- Operations, to include: (a) data center performance objectives; (b) computer operations standards and procedures; (c) data center resources utilization and cost charge-back; and (d) computer operations trouble reporting.
- Change management, to include; (a) surfacing of requests for change through the regional functions committee; (b) stratification of change requests to include modification, enhancement, or work request; (c) bidding by MECC-MIS Regional Centers, or outside vendors for cost of change to include manpower, computer resource costs, and overhead; (d) prioritization of request for change by the PMM&Co. proposed Planning and Control Advisory Committee; and (e) post-implementation reviews of systems which have major enhancement, or modification by the ESV Planning and Control Post-Implementation Review group.
- Training and installation plans, to include (a) operation manuals for the ESV system, (b) installation guides for computer operations personnel, (c) ESV-IS user manuals which show systems flow and detail processing procedures; and (d) ESV-IS reference manuals which define in detail transaction processors, update modules, and reporting modules.
- Data element standardization, which would link (a) internal SDE department use; (b) ESV systems to support/report this data element; (c) manual options for reporting the data element; (d) frequency of reporting; and (e) record retention policies for the data element.

Please refer to Section II, Data Center Review of the January 31, 1980 report for further information.

5. OPERATIONAL EFFICIENCIES

PMM&Co. recommends a number of changes to improve operations at the regional processing centers:

- Consider using multidistrict processing;
- Adopt an option of multidistrict tape backup for each ESV system;
- Measure resource consumption by district and by application;
- Compute computer performance based on standards;
- Adopt the Burroughs incident reporting form and the collection of these incident reports at MECC ESV-MIS;
- Adopt a systems and programming standard beyond PRIDE Phase I and II;
- Adopt a formal project management methodology for MECC ESV-MIS;
- Adopt a communications long-range plan to link future expansion plans of each regional center into a cost-effective statewide system; and
- Adopt formal disaster plans between regional processing centers.

As a method of continuing to improve operating efficiencies at the regional data center, we believe a Technical Forum, chaired by MECC ESV-MIS, should provide a method for sharing:

- Data center management experience;
- Data center security and backup provisions;
- Communication net management provisions;
- Burroughs computer efficiencies; and
- Vendor service experience.

PMM&Co.'s proposed Technical Forum provides a means of sharing experience from regional data centers and for providing a means for the exchange of technical information. Please refer to Section II, Data Center Reviews, of the January 31, 1980 report for further elaboration of these recommendations.

IV - CONCLUSION

PMM&Co. believes that the ESV administrative data processing system can become a very valuable asset to the State of Minnesota. The system is at a critical juncture. If the organizational issues and technical issues are not addressed in a forthright manner, we believe the system will have many difficulties and may cease to exist.

The State has a substantial opportunity to take advantage of the many successes achieved and to build upon that base for the future. We believe that a system development effort is an evolutionary process and, therefore, the recommendations in this report represent first steps in that evolution rather than ultimate answers.

The successes which have occurred in this system have been systems development efforts where standards were set by Legislature and/or by the State Department of Education. We believe that pattern should be used in the future. It is more effective for the Legislature to examine the performance of the ESV administrative data processing system in terms of defined objectives and standards than to define technical solutions to resolve conflict. In our opinion, the best method to ensure efficient and effective operations is for the Legislature and the State Department of Education to define standards of operation and, from these standards, to measure performance.

The next portion of the Executive Summary presents action plans to be completed by SDE, the ESV Planning and Control group, MECC ESV-MIS, and the regional processing centers.

These action plans bring together our recommendations based on examination of the Consortium's organization, the ESV-IS software, data center operations, and financial control.

Finally, present law, rules, and interpretations of those laws and rules seem to require that every district must use the same software and the same hardware. We do not believe that degree of uniformity is necessary to meet the State's needs for financial information. We believe that other software and hardware options can produce needed information, but that each option proposed must meet the system standards and be examined carefully, to ensure that the information produced will be comparable. We believe that some districts will be tempted to pursue other options, and they should be allowed to do so. However, the districts must know that options which will produce information which meets standards are likely to be more difficult and expensive to amend or develop. Districts should not assume that other systems they are presently using will produce this information without major changes.

V. SUMMARY OF RECOMMENDED ACTIONS

PMM&Co. believes that these recommendations can provide a means for improvement of consortium performance. Such improvements are imperative if this consortium is to be effective.

Our recommendations address the following major areas:

- Planning and coordination;
- Organization;
- System efficiencies; and
- Options for delivery of information to the State.

We provide in the next pages a list of actions we believe are necessary for the following:

- State Legislature;
- State Department of Education;
- PMM&Co. proposed ESV Planning and Control;
- PMM&Co. proposed MECC-ESV-MIS; and
- Data Centers.

RECOMMENDED ACTIONS

LEGISLATURE

The Minnesota Legislature should take the following actions, which may require enacting legislation, to:

1. Create or direct the State Department of Education to create the ESV Planning and Control, which should be responsible for:
 - Long-Range Plan for ESV;
 - Facilities Review (Hardware);
 - Post-implementation Reviews; and
 - Advisory Committee (Software and Priorities for MECC ESV-MIS).
2. Require the State Department of Education to prepare comprehensive implementation plans with timelines for the recommended organization changes and systems modifications.
3. Require the biennial budget for ESV data processing prepared by the State Department of Education (SDE) include program budgets prepared by the ESV Regions, by MECC ESV-MIS, and related divisions of SDE.
4. Undertake a needs analysis with the State Department of Education to determine the information required and/or desired from the three administrative systems, the timing of this information, and the reporting requirement.

NOTE:

PMM&Co. recommends the Legislature maintain an orientation of setting standards and goals when enacting legislation, and not establish systems specific solutions (technological change will outmode the systems specific solution) for the following application systems:

- Finance;
- Payroll/Personnel;
- Student Support.

RECOMMENDED ACTIONS

STATE DEPARTMENT OF EDUCATION

The State Department of Education should:

1. Renegotiate the present services agreement with the proposed MECC ESV-MIS. In this new service agreement, MECC ESV-MIS should be responsible for sales/service of ESV systems, operations expertise, quality control, standards and procedures, training/installation programs, technical forum, and technical advice to the proposed ESV Planning and Control.
2. Ensure that Regional Data Centers understand their responsibilities, as (a) the delivery vehicle for ESV-IS, (b) an operations, training/technical support arm, (c) providing functional committees for ESV-FIN, ESV-PPS, ESV-SSS, and (d) support unique district needs and provide advice on processing strategies.
3. Prepare generalized budget and control guidelines for MECC ESV-MIS efforts at maintenance/enhancement.
4. Exercise financial control of the administrative computing and monitor plans/budget submitted to and reviewed by the proposed ESV Planning and Control.
5. Define reporting requirements to support legislated data collection mandates for financial, payroll/personnel, and student data. These reporting requirements should be keyed to the SDE department using or which will use the information.
6. Define data dictionary requirements for the entire system and select the data dictionary system which will be adopted statewide.
7. Contract with MECC ESV-MIS to document the present SDE-IS.
8. Implement systems development methodology for SDE-IS and include time lines and effort estimates for future SDE-IS development.
9. Analyze the alternative of providing summarized and synthesized SDE-IS data back to the regions for use by the districts in their own planning efforts.
10. Enforce labor distribution reporting throughout ESV system for MECC ESV-MIS efforts at maintenance/enhancement.
11. Contract with the State Auditor or an independent third party for an EDP audit of the ESV-FIN system.

RECOMMENDED ACTIONS

PROPOSED ESV PLANNING AND CONTROL

After the proposed ESV Planning and Control group is formed, it should proceed to:

1. Adopt an overall strategy for system architecture:

- single monolithic system;
- common, non-monolithic system;
- common system specifications; or
- output reporting requirement.

In responding to business proposals for deviation of development of software not currently supported by the State, the burden of proof must be on the requesting district. The State should abandon the idea of having to prove to the district that the State system is "better than" the district's system. There must be substantial benefit to the district to not use the present, or future, versions of the ESV system.

(See Appendix for definitions of these options.)

2. Analyze priority requirements for ESV-FIN, examine PMM&Co. recommendations for improvements to reports, and prioritize these suggestions for MECC ESV-MIS action. Consider application of TIES ESV-FIN for use by outstate regions with large numbers of districts.
3. Review PMM&Co. recommendations for change to ESV-PPS for (a) edit modifications, (b) storage of current pay, (c) data structure, (d) adjustments to pay, (e) processing cycle, and (f) user manual. Obtain bids from MECC ESV-MIS for these changes. Consider alternatives of Regional or contractor bids for this work, or application of TIES payroll/personnel system.
4. Stop all modification efforts on ESV-SSS. Contract with (a) MECC ESV-MIS, (b) a regional center, or (c) an independent third party to examine original requirements documentation, verify original needs definition, and reprioritize user requirements. Contract with MECC ESV-MIS, a regional center, or an independent third party to complete an alternatives analysis. The results should be reviewed and subsequently prioritize future activity for ESV-SSS system.
5. Prepare generalized budget and control guidelines for regional centers.

RECOMMENDED ACTIONS

PROPOSED MECC ESV-MIS

The proposed MECC ESV-MIS, after being established, or MECC-MIS given a new "charge", should:

1. Create a Technical Forum to exchange technical information.
 - A. Define computer operations performance criteria, using regional experience at TIES and METRO II to help define standards of performance for the regional centers. The results of performance should be coordinated and communicated as a single voice to Burroughs.
 - B. Define business growth strategy for upgrades of hardware and share this strategy with the regional centers to help avoid premature upgrade of hardware at the regional center.
 - C. Define cost accounting methodologies for each ESV application system, using the Technical Forum to share these methodologies and to help regional centers to establish cost accounting systems.
 - D. Define archiving standards for record retention on the ESV-FIN, ESV-PPS, and ESV-SSS systems which are consistent with SDE data requirements.
 - E. Develop installation guides for each ESV system, or new release.
 - F. Provide output capability in ESV-FIN, ESV-PPS, and ESV-SSS for multidistrict tape of annual reporting and capability for backup to reduce number of tapes created.
 - G. Coordinate and publish computer operations procedures developed at regions for each ESV system.
 - H. Provide standard operating instructions for ESV-FIN, ESV-PPS, and ESV-SSS systems, using CANDE to store this set of operating instructions and to speed the implementation of changed procedures.
 - I. Coordinate disaster plans of regional centers and provide a model for regions based on TIES updated disaster plan.
 - J. Coordinate the application of a single tape management system for the regional centers.
 - K. Coordinate application and utilization of Burroughs B80/90 in regional processing plans.

RECOMMENDED ACTIONS

PROPOSED MECC ESV-MIS (Continued)

2. Coordinate training plans to reduce training costs across all regions.
3. Define role of Data Base Administrator to include responsibility for: (a) data dictionary; (b) DBMS software (applying updates and ensuring system efficiencies); (c) quality reviews of ESV systems; and (d) consulting on data base design.
 - A. Institute an automated project control system to monitor personnel workloads and system development/maintenance milestones. The TIES system should be reviewed for possible application at MECC. Workload accounting for each ESV system should be reported to SDE.
 - B. Adopt a categorization scheme for incidents/enhancements/modifications to ESV systems, and measure effort against each of these categories by application system.
 - C. Ensure renewed emphasis is placed on the following:
 - System Development Life Cycle Milestones;
 - System Feasibility;
 - Alternative Analysis;
 - System Test; and
 - Post-implementation Review.
 - D. Include the following System Test procedures:
 - stratification of software testing (unit, subsystem, and full system);
 - standards for test data creation (boundary values); and documentation procedures for test results.
 - E. Ensure that ESV systems to users exhibit the following common characteristics:
 - common naming conventions for data elements;
 - common data element definitions across application systems; and
 - a common transaction processing methodology.
 - F. Report support costs on an annual basis for each ESV system, including information on manpower, processing resource, and overhead.

RECOMMENDED ACTIONS

PROPOSED MECC ESV-MIS (Continued)

- G. Specify deliverables and time lines when letting contracts for software support.
4. Coordinate regional center plans for the development and enhancement of communication networks.
- A. Develop strategies for communication net growth to include use of leased circuits and purchased modems.
 - B. Implement Communications Long-range Plan Action List developed by PMM&Co. (See Section II, Data Center Review, Appendix A, of January 31, 1980 report.)
 - C. Provide communications operating procedures, systems testing procedures, and trouble reporting forms for regional use.
 - D. Develop communications network performance criteria and assist regions in establishing monitoring systems for communications performance.
 - E. Coordinate communications error reports to provide a comprehensive solution to regional communication system failures.

RECOMMENDED ACTIONS

DATA CENTERS

The Data Centers should adopt the following general recommendations/actions:

1. Link contingency and disaster plans together using the MECC-MIS Technical Forum as the vehicle to coordinate this effort.
2. Institute processing resource measurements and use performance criteria defined by MECC as the standard for system performance.
3. Utilize Burroughs data center performance audits at least annually, while more frequent audits should be considered if the data center processing load is increasing.
4. Review TIES-REGION V trouble and error reporting procedures for application in other centers.
5. Review Region III and V position descriptions (PD's) for possible incorporation in revised PD's for regional centers.

We recommend the following actions for the designated Data Center.

REGION III

1. Investigate alternatives for additional work space to reduce congestion and traffic flow problems in the present center.
2. Develop a contingency and backup recovery plan in coordination with MECC ESV-MIS.
3. Revise computer operations procedure manual including standard operating procedures developed by MECC ESV-MIS for ESV systems.
4. Install a computer resource measurement system to report system utilization by ESV system and by district.
5. Define computer service level performance criteria to include: (a) accuracy standards; (b) reliability standards; and (c) timeliness standards.
6. Review and revise backup/retention policy on ESV system records and coordinate the retention period with MECC ESV-MIS policy for archiving records.
7. Install electromechanical security devices to protect access to the computer operations area.
8. Develop a skills inventory, including education and training history, to serve as the basis for planning future training needs.

RECOMMENDED ACTIONS

DATA CENTERS, Continued

REGION V

1. Relocate center to a more suitable physical facility.
2. Establish a computer resource utilization measurement program to compare performance and to highlight operational problems.
3. Define computer service level performance criteria to include: (a) accuracy standards; (b) reliability standards; and (c) timeliness standards.
4. Control privileged user codes under CANDE.
5. Coordinate with MECC ESV-MIS in reporting Burroughs equipment malfunctions.
6. Develop an employee skills inventory and use the inventory in planning for future training needs.

METRO II

1. Examine present computer performance objectives to define response time goals in terms of specific application being processed, or the specific transaction to be processed.
2. Link disaster and contingency plans to TIES and MECC ESV-MIS.
3. Provide MECC ESV-MIS with operator instructions for each ESV-IS system.
4. Expand present manual workload system to include an automated project control system to monitor personnel workloads and system development/maintenance/enhancement milestones.
5. Redesign personnel performance appraisal form to include more objectives-based appraisal. Reference TIES approach, and include specific review cycle for appraisals.
6. Establish a skills inventory of METRO II personnel to aid in planning for future training needs.

TIES

1. Coordinate disaster recovery plan with MECC ESV-MIS and METRO II.
2. Install a computer resource measurement system to track application system usage by district.
3. Institute a formal training program which is coordinated with other regions and MECC ESV-MIS.

RECOMMENDED ACTIONS

DATA CENTERS, Continued

MECC ESV-MIS (Data Center Only)

1. Install processing resource measurements and review system performance according to standard.
2. Install a computer resource measurement system to measure resource consumption by application and by district.
3. Coordinate disaster recovery plan with METRO II and TIES.
4. Revise computer operations procedure manual and include standardized operating procedures for ESV-IS system.
5. Adopt Burroughs incident reporting form, as used by TIES and Region V, as a standard method for reporting trouble on the Burroughs system.
6. Install electromechanical security devices to improve security over data center operations area.
7. Use "bottom-up" budgeting to ensure that functional managers are aware of costs in their areas, and track actual spending against budget by functional manager.
8. Define position descriptions with specific skill sets.

PROCESSING OPTIONS
ESV SYSTEMS

OPTIONS

1. Single Monolithic System:

Link: SDE-IS (Legislature) to ESV-IS (School District)

Methodology: Single processing strategy
One data base (however distributed)
Communication network

Result: Analysis of data from central network of school district information for:

- more up-to-date information
- more detailed information

Net: One system,
One solution

Example: Payroll/personnel would be a single system in which the Legislature and SDE would have access to detailed records of district operations.

Advantages: One development cost
One operating strategy
One maintenance project
One training program
Common core procedures

Disadvantages: Difficult to do all things for all people.

Difficult design task.

Improbable that system will meet all needs.

High network cost to get increasingly less valuable information from operating school district.

Large data base

Large hardware

Expanded hardware needs could be greater than that which is available.

2. Common, Non-monolithic System

Link: Information passed between ESV-IS and SDE-IS. No direct link.

Methodology: Single hardware/software system for district processing (ESV-IS).

Multiple district data bases that can report, as needed, to SDE-IS.

Result: System implemented throughout State (mandatory for ESV-FIN, optional for ESV-PPS and ESV-SSS).

Data access not instantaneous for Legislative inquiry.

Net: Statewide ESV-FIN on single vendor hardware and using common software.

Attractive solution to State.

Example: Payroll/personnel system in district would pass summary level data to the SDE-IS.

Advantages: Does not demand common communication link throughout State, can use regional service centers. (Save communication costs.)

Does not demand instant access to data. (Save cost of on-line access.)

Compatible software and hardware.

Addresses legislative need for information but is not "instantly" responsive.

Disadvantages: Does not address different needs, levels of expertise in districts.

Single system unlikely to solve all information and support requirements.

3. Common System Specification

Link: Common Reporting Standards

Methodology: Common data element definition.

Minimum data requirements and reporting standards.

Common main-line process for:

- capturing transactions
- manipulating transaction to complete update to data base.

Guided, structured development standards.

- Result:** Multiple "solutions" to the reporting standard
(See Figure 4 in report)
- Microcomputer or minicomputer ESV-IS applications that are a companion to and functionally identical to ESV-FIN, but are not operationally identical to current ESV-FIN.
 - A processing methodology, such as at TIES, that is not compatible with current MECC processing approaches.
 - In-house district hardware capable of reporting using State-defined data elements and State-defined transaction processing approach.
 - Nonsubstantial reporting change encouraged, as long as statewide reporting standard was upheld.
- Net:** Common reporting standard to SDE to facilitate financial analysis.
- Attractive to user community. Encourages innovation, involvement, and flexibility.
- More difficult for the proposed ESV Planning and Control group to control to ensure cost-effective solutions for the entire system.
- Example:** Payroll/personnel reporting would be defined by data element, processing method for the transaction and frequency of capture.
- Advantages:** Does not demand common software or hardware.
- Encourages flexibility and innovation in local districts with new technology and approaches.
- Encourages commitment, as "solution" to common reporting standard can be locally derived.
- Meets legislative need for standard, common data.
- Disadvantages:** More difficult to assure a cost/benefit calculation has preceded development of a "solution."
- More difficult to guide and structure multiple developments of system solutions to the reporting standard because of the increased number of development teams.

4. Output Reporting Requirement

Link: None. Separate, unrelated systems.

Methodology: Any processing strategy.

Multiple definitions of data elements.

Multiple computations of transactions at input/output.

Net: Define reports, frequency of reports.

No coordination of data element definition.

No common transaction processing approach.

Example: Payroll/personnel data would be reported at specified intervals.

Advantages: Less regulation.

Less interference in district affairs.

Disadvantages: No common data element or system standards.

Not possible to make meaningful cross-district comparisons.

Unknown cost to State.

RECOMMENDATION

PMM&Co. recommends:

a) The State not adopt a Monolithic system because:

- There is no demonstrated need for "instant" information to the Legislature. (Note: Legislature must be adamantly in favor of this option, if it is to be considered.)
- It is too costly to establish the communication networks to support data bases distributed throughout the State and centrally accessible to SDE.
- It may stifle creativity with enforced uniformity and create an unwilling user community.
- It will eliminate the need for central, direct access to the district data base, with reporting periods of less than "immediate."
- A lack of full commitment by user community will result in (a) poor execution at the operational level, and (b) failure and disintegration of the monolith over time due to loss of shared purpose and objectives.

b) The State adopt common system specifications, which would permit limited, controlled variance:

- Small districts be permitted to consider and investigate microcomputer or minicomputer systems, such as operating at Ortonville. If those "pilot" systems prove a viable option, then MECC-MIS could complete development of the best microcomputer system and release this new system in the same fashion as present ESV systems. This micro version of ESV-FIN would be functionally similar to the present ESV-FIN but would have more "tutorial" and "menu" responses for the data processing user in the smaller districts.
- Large districts be permitted to develop internally, or contract for the development of ESV-FIN systems versions which comply with MECC standards in data base structures and data element definitions. These large districts must demonstrate that deviation from the standard ESV system will cause them to experience severe cost or technical penalties.

We do not encourage proliferation of ESV-IS subsystems beyond a reasonable number, five or six versions, we believe. Some creativity and innovation should be encouraged, and this limitation will permit it. To force variation to zero is not defensible. The hurdles for obtaining

approval of the modification or construction of another ESV must be difficult, but not impossible. The State should move away from viewing deviation by Minneapolis as destroying the concept of uniform reporting standards and as contributing to the destruction of the consortium.

The greatest level of standardization must occur in the financial area. For payroll/personnel and student systems, we do not see the need for rigid hardware and software solutions, although linkage to the financial system should be maintained and strengthened. The State should encourage alternate solutions. These solutions may be locally developed, purchased from vendors, or contract developed by MECC ESV-MIS. Whatever the alternative, these systems should be documented and released by MECC. Support for this newly released system would be through MECC ESV-MIS. If it were a vendor product, MECC ESV-MIS would deal directly with the vendor for enhancement and support.

This recommendation will require that the following occur:

- the availability of a central decision-making capacity to evaluate district proposals for deviation (see PMM&Co. proposed organization - Figure 6);
- the State have an overall systems architecture plan;
- the State have an implementation plan for this systems architecture; and
- the State broker reasonable arrangements as the State works its way to implement the systems architecture plan.

We do not believe there can be instant implementation of the systems architecture. Therefore, there must be the understanding that a number of processing arrangements not compatible with ESV-FIN will remain. Districts which have this deviation must be working with their region to establish milestone dates for conversion to the ESV-FIN system.

The State must not lock itself into a "final solution" to the objective of timely uniform financial reporting. Innovation and technical change should be encouraged with the objective of delivering cost-effective solutions to the State need for financial information.