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THE DEVELOPMENT OF ALGORITHMIC PROFILE DATA
FOR COMPREHENSIVE PLANNING IN EDUCATION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Calvin Edwin Leader, B.S., M.E.

The Ohio State University
1974

Reading Committee:
Dr. Marion J. Conrad
Dr. Hugh Laughlin
Dr. Dwayne Gardner

Approved By

Adviser
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ACKNOWLEDGEMENTS

A dissertation is the responsibility of an individual. However, no individual operates within a vacuum. Many friends and acquaintances give assistance. Without the encouragement of many people, this dissertation could not have been completed. Their assistance is recognized and appreciation is expressed.

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Miss Bonita Williams typed the draft copy and the manuscript. Her long hours of labor and her willingness to help me meet deadlines is appreciated.
Greater thanks than can be expressed in writing is due my family. The encouragement and understanding of our daughter Carole and son Steven continually provided motivation. The great and constant understanding of my wife provided not only the impetus but also the opportunity to accomplish the total program. Without her love and devotion, this educational goal could not have been attained.
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A School Building Needs Study for the Westerville City Public Schools, Westerville, Ohio, 1962.


General Educational Specifications for Fayette County High Schools, Fayetteville, West Virginia, 1974.

FIELDS OF STUDY

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Minor Fields: Elementary and Secondary Education
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CHAPTER I

INTRODUCTION

The subject of this investigation is the development of a useful array of data relationships. These data relationships are portrayed as algorithmic profile data statements. Each statement is designed to be useful to the tactical planner in comprehensive educational planning. This planning is designed to serve the local school district at the central office level of planning; i.e., tactical planning.

In any planning function, specific parameters must be established to provide understanding of the attempted tasks. In this investigation, three planning levels are recognized. These are the strategic, the tactical, and the operational levels. The strategic level is that planning function in which the state department of education has major responsibility. The tactical level of comprehensive educational planning is that planning function in which the local educational agency has major responsibility. The local educational agency is defined as a separate governmental entity, usually with a superintendent as the head executive officer. The operational level of comprehensive educational planning is that level at which the principal of a school has major responsibility. This usually encompasses an attendance district within a local educational agency.

While it is true that everyone can point to facets of planning in nearly any endeavor, comprehensive planning has only recently been indicated as desirable and necessary. The English were recognized as using
systematic planning in World War II. It was 1965 when the late President
Johnson issued a directive intending to implement a planning, programming,
budgeting system at the federal government level. While recent uses of
comprehensive planning have increased in intensity; Ceasar, Napoleon,
the Builders of the Great Wall of China and others could be studied to
determine their emphasis on planning.

While previous activity occurred which could be identified as com-
prehensive planning, such activity was not as complex as it is today.
The knowledge explosion has increased the information available for con-
sideration at exponential rates. Added to this rapid increase in infor-
mation are the additional constraints and opportunities today. There
are more alternative solutions to problems because there are more facts
available and greater knowledge about the issues. However, there are
more constraints because more people are involved. Each additional person
is a constraint in the sense that his needs must be accommodated. Like-
wise, as more people desire more of the "good life," these increases in
people-activities must be accommodated within the total matrix of society.
Regardless of the basis for additional constraints or additional oppor-
tunities, both dimensions must fit within the total fabric of comprehen-
sive planning.

The educational administrator has both greater opportunities and
greater limitations in comprehensive planning. Increases in information
can always be seen in these two dimensions. Limitations can be seen as
factors which are created by knowledge of what should not be done or that
which is not effective enough. Limitations to the planner are often
stated as policy requirements and become the parameters of his "work-
space." The greater opportunities occur when advances in knowledge are
recognized. These can include techniques, strategies and large organizational models of planning.

The organizational management theory most heavily relied upon in comprehensive planning in education is that identified as the systems approach. To this writer, this indicates a recognition of the inter-relationships of all recognized factors which have relationships to any planning situation. This systems approach has become much more prevalent in recent years. Historically, the management stance had been one of segmented functional specialties. Specialists had been trained and educated for task areas of planning, organizing, coordinating, budgeting, etc. Carried to an extreme, too often specialists acted without regard to the related functions of other specialists. To avoid unnecessary conflict and also duplication of effort, it became necessary to recognize the relationship of each element of the total structure of organizations.

Another development occurred which aided the systems approach to organizational functioning. This was the invention of and the implementation of the high speed computer. The use of this machine made possible the consideration of more data and subsequently, many more alternative plans. The systemic approach became truly possible because many more relationships of data and facets of organizational functioning could be considered rapidly.

In looking at the process of comprehensive planning in education more discretely, this writer has chosen to use the model developed by Marion Conrad. He explicated this model at the August, 1973 meeting of the National Council of Professors of Educational Administration.

He stipulates the following seven steps in the model.

1. Establishing goals for the system
2. Developing the data information system
3. Sub-optimizing the means of goal achievement
4. Synthesizing plan alternatives
5. Implementation and possible plan adjustment
6. Goal reassessment and possible complete replanning
7. Developing the planning strategy

Figure 1 is presented to add to the understanding of this model.

The Comprehensive Educational Planning Model uses rectangles to designate processes, and circles to indicate products of the processes. The total model is presented in cyclic form to indicate the continuity of the total planning process. Each part has an effect upon each succeeding part and the result of a planning endeavor has an effect upon the next planning endeavor.

Comprehensive planning is defined as "a continuous process of:

1. Establishing goals;
2. Gathering data;
3. Forming and assessing alternative means of goal achievement; and
4. Making decisions about these alternatives."

This is the definition of comprehensive educational planning used in this investigation.

Previous work has resulted in the development of procedures for the establishment of goals. Additionally, previous work has accomplished the development of a part of the data information system. This investigation furthers the development of the data information system.

\[\text{Ibid., p. 1.}\]
Figure 1

SOURCE: Higgins, K. Ronald and Conrad, Marion J. A Data System for Comprehensive Planning In Education, p. 3.
Figure 2 is presented as a conceptual portrayal of the base data system. This model is found in *A Data System for Comprehensive Educational Planning in Education*.\(^1\)

This multi-dimensional model displays four levels of data. (The levels here should not be confused with the three levels of planning and the reader is reminded that this planning information model is designed to serve the tactical planner in comprehensive educational planning). These four levels are identified as data level one, raw profile data; data level two, algorithmic profile data; data level three, policy environmental conditions: present and alternative futures; and data level four, projected alternative states. It is data level two, algorithmic profile data, that is developed in this study.

One vertical dimension of this model explicates data categories into 14 trees. Each tree is a family of related data. These categories are grouped into ten trees of educational data and four trees of community data. These categories are identified as curriculum and instruction, instructional services, student personnel, staff personnel, facilities, finance, transportation, food service, business management, organizational management, population, physical, activities and services, and governance data trees.

Another vertical dimension depicts two major parts in each of the trees. These are data elements and data keys. The data elements are the sub-categories into which data are collected at data level one, raw profile data. Data keys are sub-categories into which data is accrued by summation and other data manipulative means. Additionally, the data keys

---

\(^1\)K. Ronald Higgins and M. J. Conrad, *A Data System for Comprehensive Planning in Education* (A Paper developed as a part of Project Simu-School, Council of Educational Facility Planners, The Ohio State University, Columbus, Ohio), p. 8.
BASE DATA SYSTEM for COMPREHENSIVE EDUCATIONAL PLANNING

DATA TREES
- Educational Data
- Community Data

DATA LEVEL 1
- Raw Profile Data

DATA LEVEL 2
- Algorithmic Profile Data

DATA LEVEL 3
- Policy Environmental Conditions: Present and Alternative Futures

DATA LEVEL 4
- Projected Alternative States

FIGURE 2

are major linking elements from one tree to another.

Data level one, raw profile data, has been developed and field tested prior to this study. The existing product of that development determines some of the parameters of this study. The nomenclature and the raw profile level categories are used as context information. It is assumed that the total production of data elements is a valid description of the raw profile, level one planning data needed at the tactical level.

This data system is designed as an open system in that data elements can be added as needed. Also, it is possible to utilize the system without using all elements in each of the trees. In fact, it is possible to use the system without using all the trees.

To complete the portrayal of the Total Data System for Comprehensive Educational Planning, it is necessary to add one more concept. This is presented in pictorial form by Figure 3.\footnote{Ibid., p. 13.} This shows the relationship of the base data system and coordinate systems. Data and reports will be extracted from other agencies and entered into the base data system as they are needed. It could be very expensive and time-consuming to store all data in the base data system. By using data from coordinate systems, as the data are needed, the base data system will be less cumbersome and of more manageable size.

The use of the terms data, data information systems and management information systems is prevalent today. The concern in this investigation is with a data information system to serve the tactical planner in comprehensive planning for education. In this system, data elements are classifications of descriptors of an organization. The total of all
Some of the data from the reports of other systems and related agencies will be extracted and entered into the base data system.

Figure 3

the data elements, in their proper relationships, describe the total organization. This is a system or a sub-system. When a description of an organization is desired, data elements must be given values. The differences in these values and the relationships of data elements provide the discrimination necessary to identify different organizations. (For example, a data value indicating 1000 pupils in a school is a descriptor of that school. Another school with 500 pupils has 500 in the data category indicating numbers of pupils. The differences indicated by this one descriptor, 1000 pupils as compared with 500 pupils, provides one discriminating feature.)

Data information systems are classifications of data elements with values into categories which can be used in describing an organization. The data information system includes a bank of data, means of data input and output and prescribed relationships of data elements.

Data is not necessarily information and very often is not useful in and of itself. Data elements must be ascribed values to be information. However, valued data elements are not necessarily information unless they are of sufficient magnitude to be descriptive and have relationships with other valued data elements and/or the total system.

To the degree that a data information system is established to aid in planning, relationships of data must be determined. The most useful information will be generated when appropriate relationships of data are constructed.

**Statement of the Problem**

In order for a planning information system to be most useful, the relationship of raw profile data elements must be discovered, stated and
arranged. This investigation discovers, states and arranges those data relationships which are perceived as most useful to the tactical planner engaged in comprehensive educational planning for the local school system.

Design of the Study

This developmental project was consumated in three major stages. First, this writer, drew on fifteen years experience as chief executive officer of local school systems; searched the literature for examples, ideas and concepts, and worked with two other research associates to develop the initial listings of algorithms perceived to be useful for the tactical planner in comprehensive educational planning. Second, the preliminary listings were submitted to a jury of three professors and three research associates. Third, after refinement of the listings following the assessment by the jury, the revised listings were submitted to school district personnel who worked at the tactical level of planning. The final product is the listing as it now appears after being revised following the field assessments.

Limitations

The purpose of this study was to develop an array of algorithmic profile data which would be useful to the tactical planner in comprehensive educational planning. The study used initial development from a planning model. The algorithms will have specific utility for planners using this particular model. There may be applicability for other models but such use was not studied and, therefore, the findings relate only to the model used.

The listings have been assessed by a very limited size audience and the refinement of the initial listings reflect these assessments. Because this is an open system, additions and revisions to the listings can always be made.
Definition of Terms

1. Algorithm - a rule for manipulating data.
2. Algorithmic profile data - data produced by the application of a rule.
3. Data element - the smallest unit of categorization of data within the planning information system.
4. Valued data element - the quantitative dimension of a category of data.
5. Key data elements - those particular data elements which are used most often as categories for aggregation of valued data elements and are used for linking of large categorizations of data.
6. Level one data - raw profile data and the smallest unit of disaggregation used for tactical planning.
7. Level two data - profile data generated from level one by application of an algorithm either in the base data systems or from coordinate systems.
8. Planning information system - a data information system used for the planning function.

The above terms are used extensively in this study. Other terms will be defined as they are used if an explanatory definition is warranted.

The Significance of This Study

There are times when decision makers must act without all the facts. In these instances they make the best decision within the limitations that exist. Better decisions can be made when more of the facts are known. Also better decisions can be made when more of the correct kinds of data are available. Decision makers cannot always be in the position of having the optimum quantity and quality of data.

Algorithmic profile data, as defined in this paper, are data which, at times are indicators of conditions, generalized portrayals of a
situation, and/or descriptors of a concept. At some times they are all that is necessary or economical to make the kind of decision needed.

Of course, danger exists with such use of data. The danger is that decision makers will make all their decisions with less data than they should have. However, this danger exists now and will continue with inferior decision makers. The use of algorithmic profile data, as developed herein, can be an aid to the conscientious, dedicated decision maker. It can lead him to better decisions than he has had the opportunity to make without such data.

This study advances the process of planning. Specifically, it furthers the development of a comprehensive planning model for education. To augment this development it was necessary to advance the development of the data system. With the development of the data system the planning process can be implemented. With this development of a procedure for data handling, more appropriate information can be generated for the decision maker.

This study has specific applicability for the educational planning at the local educational agency level of planning. It provides the planner with information generation capabilities. These are designed to be effective and efficient means of obtaining information.

This study provides the base upon which additional development may occur. This additional development will be necessary for the greatest utility of the comprehensive planning model. Additional studies should involve the development of policy environmental conditions and alternative states for the planning information system.

Additionally, in the comprehensive planning model, strategies and techniques will need be developed for the development of alternatives,
for the synthesis of alternatives and for the assessment of selected alternatives. However, none of these phases of the comprehensive planning model could have been augmented to the fullest degree without the successful completion of the development of algorithmic profile data.

Any increase in either the amounts of data which can be utilized effectively or additional procedures for better utilization of data available will enhance the opportunity for better decisions in education. To the extent that data has been manipulated to produce information useful to decision makers in education, this developmental project is highly significant.

Organization of the Study

This study is organized into five chapters. The first chapter is introductory in nature. The setting for the study is described; the design of the study is stated; the statement of the problem is written; the significance of the study is stated; the organization of the study is explicated; and definitions are stated. In Chapter Two selected literature is reviewed on the topics of comprehensive planning and planning information systems. Chapter Three details the design of the study. This includes initial development of algorithmic profile data by the project team; plans for the assessment of this development by selected university staff; plans for the assessment of this development by administrators in the field; and reiterations of the algorithmic profile data listing at necessary intervals. Chapter Four will cite the findings from the work of the project team; the university personnel and the local educational agencies personnel. Chapter Five will list conclusions, observations, and recommendations and a final statement of the developed array of useful algorithmic profile data.
CHAPTER II

REVIEW OF THE RELATED LITERATURE

Comprehensive Planning Literature

The literature concerning comprehensive planning in education has not been profuse. Until recently, much more was written about specific task areas in education. These task areas were defined and planning within these areas was explicated by different authorities. Different specialties in educational administration were developed. The curriculum specialist was one result. The facilities specialist was another result. The list could continue citing many, many specialists. With such fragmentation of the fulfillment of the educational function, little growth could occur in the study of comprehensive planning in education. Activity was greater in the area of coordination of the diverse and sometimes, opposing specialty functions in education.

However, with the development of systems theory and the resultant greater emphasis on systems organization, there has been a greater emphasis on comprehensiveness in educational planning. The relatedness of the different segments or subsystems in all organizational behavior has had greater acceptance and study. Getzels and Guba classified organizational behavior on a continuum from the nomothetic dimension to the idiographic dimension. Campbell and others spoke to the transactional dimension between these two. This added to the understanding of the relatedness of the dimensions of organizational behavior.
Another development adding impetus to the development of systems theory and the resultant consideration of the comprehensiveness of organizations has been the development of data processing machines and techniques of data handling. With the increases in knowledge, data, organizations, people, aspirations, alternatives and many, many other factors, a method of handling large amounts of diffuse but related data was necessary. The high speed computer is a partial answer to this need of data handling. The development of storage capability for large quantities of data has added to the usefulness of data processing equipment. Some techniques for such data handling have been developed. These need constant refinement as additional factors are added and revision when new procedures are developed.

Some of the most pertinent literature on the subject of comprehensive planning comes from sources other than education. A very elementary treatment is found in a pamphlet published by The Community Planning Division of Sears, Roebuck and Company. Within this writing, planning is seen as a science, an art and an activity.\(^1\) Planning is presented as being future-oriented in that it is implemented:

"1. to meet events we expect to happen
2. to accomplish things we want to happen
3. To avoid or prevent things we don't want to happen."\(^2\)

These authors also cite six functions of planning as:

"1. a means of preparing for the future
2. helps to get at the roots of problems

\(^1\)"ABC's of Community Planning," The Community Planning Division of Sears, Roebuck and Co., Harry N. Osgood, Director, 1972, p. 11.

\(^2\)Ibid., p. 5.
3. helps do first things first
4. helps set sound policies for development
5. is a technique for coordinating
6. a means of correlating, educating and inspiring.\textsuperscript{1}

The same authors have stated the following five elements of a comprehensive plan:

"1. basic policies
2. standards
3. general plans
4. specific plans
5. programs.\textsuperscript{2}

The above reference to planning was written from the perspective of comprehensive community planning. However, it could be adapted for comprehensive planning in general and specifically for comprehensive planning in education.

In J. H. McGrath's book, Planning Systems for School Executives,\textsuperscript{3} two models are developed. The first, Organizational Systems Network explicates the planning structure into five subsystems. These are entitled environments, technologies, actors, structures and tasks. Each of these subsystems is related to the other. Each subsystem is further delineated into additional subsystems. The environment subsystem has internal and external dimensions. The technologies subsystem has systemic programs and support/transport dimensions. The actors subsystem has members, machines and

\textsuperscript{1}Ibid.

\textsuperscript{2}Ibid.

clients as its elements. The structures subsystem has roles and positions, communication networks and work flow as its parts. The tasks subsystem has organization, member, client and society as its dimensions. The total model then "includes five components, fourteen subsystems and an infinite number of variables."\(^1\)

The second model is that of the Problem-based/Problem-solving System. It is presented as "an application of the method of scientific inquiry."\(^2\) It is conceived as having four milestones and three functional steps. Sequentially these occur as follows:

1. anticipation/awareness/recognition - of a trouble.
   functional step - searching/learning/decisioning

2. a working hypothesis toward a problem statement.
   functional step - pool of strategies

3. the test hypothesis
   functional step - program or treatment designed to test the hypothesis

4. problem solution and/or evaluation.\(^2\)

These two models of McGrath's planning process are explained in great detail in his book. This represents one way to accomplish comprehensive planning in education.

Another planning process is described by Thiemann and Borkosky in a paper entitled "Designing and Testing Ariole, A Planning Guide."\(^3\) A portrayal of this system follows in summary form.

\(^1\)Ibid., p. 40.
\(^2\)Ibid., p. 195.
First, these authors identify a typology of seven categories. These are designed to include all areas of concern. The discreteness of the categories is not seen as absolute because it is intended that the parameters of categories be general and overlapping. The seven areas of concern and a brief editorial definition of each follows and are taken from pages, 7, 8, and 9 of "Ariole, A Planning Guide."

1. Almanac - concerns in this category are those which can be clarified by access to historical facts.

2. Almanac Analysis - problems regarding the interrelationship of two or more almanac facts fall into this category.

3. Scientific Projection - this category covers those concerns beyond descriptive knowledge and interrelationship of facts and requires simple calculations of known facts with an element of probability.

4. Historical Projection - recognizing that any collection or analysis of data requires interpretation, the distinction made in Historical Projection over other kinds of factual knowledge is the inputing of motives as a means of explanation.

5. Normative Projection - this category differs from Historical Projection in that opinions form the basis of the data gathered, and, unlike the other categories described above, Normative Projection deals with opinions that are not usually dependent upon remote historical events.

6. Speculative Projection - concerns in this area are clarified and defined by using the entire range of knowledge and information obtained in all the above categories.
7. Free Futures - in this category concerns are described as those requiring the projection of thought into an undefined future independent of the constraints of rigorous procedure, explanation, and even mediate premises.

Following the identification of the area of concern, a design for effectively generating alternative solutions was necessary. Here the process calls for use of charrette or brainstorming or both as the leading techniques. However, other feasible options can be included too. The emphasis is on the use of small groups as opposed to individuals as solution generators. It is documented that research shows small groups as better than individuals for this task.

The next step is that of generating strategies. It was felt that the same group which produced solutions could be most effective in generating strategies. However, for this task, the group must be restrained within narrower parameters of operation. A process similar to Kriegsspiel is recommended. This emphasized decisive action and attention to the task at hand. It confined players to a time limit during which strategies were plotted according to feasibility, practicality, and possibility.

For the greatest utility of Ariole, suggestions are included concerning the size and kind of respondent groups for each area of concern. These range in size from one to more than sixty and in kind from the highest skilled person to those willing to express an opinion about any area of concern.

Data analysis is to be accomplished by a wide range of analytic methods from the highly sophisticated to the less complex methods. Imposing sense and order to the world of data is not accomplished by
using only one correct approach, rather choosing and employing the most appropriate method is the task.

The above abbreviated description of Ariole indicates another planning process. Its authors emphasize user-determination and situation specificity.

An in-depth treatment of the development of literature about planning can be found in Chapter II of a dissertation by Kenneth Brooks. Brooks was searching specifically for sources of planning data and information. He found little literature available relating specifically to sources of planning data. However, he contributed greatly to the field of planning literature by providing a more inclusive look at planning and citing the sources found. Brooks concludes, in part, "The planning process is actually an application of the more generalized process known by a variety of designators including: the scientific method, the inductive approach, or the discovery method."2

Other planning procedures including Educational Planning3 by Brieve, Johnston and Young and School Planning, Evaluation and Communication System4 by Eidell and Nagle were examined to varying degrees but are not detailed herein. The model developed by Conrad and used by Higgins and Conrad was explicated in Chapter I.


2Ibid., p. 82.


Data Informations System Literature

Every effective planning system must have a data information system. The data must provide information useful to the planner. This information must satisfy qualitative and quantitative criteria. It must interrelate data to provide the most meaningful information.

As can be inferred from the above paragraph, data is not necessarily useful information. Before data can be classified as useful information, it must be manipulated to provide meaning to the planner. Efficiency in providing meaning involves providing the correct amounts of the right kinds of data in meaningful relationships. Blumenthal has said that "information is data recorded, classified, organized, related or interpreted within context to convey meaning."¹

Coleman and Karweit have stated that "(l) Data on each variable must be maintained at levels of disaggregation far below the level to which aggregation is desired, often at the level of the individual student, whose performance and educational environment are recorded; and
(2) aggregation must be carried out by joint use of more than one variable."² The most minute part of any data information system can be referred to as a data element. Data elements can have different forms in different data systems.

Coleman and Karweit continue by stating "Each aggregation and presentation of information should be designed for specific purposes, rather


than as a general purpose datum." The data aggregation for planning will not necessarily be the same as that for managing.

Manipulation of data can vary according to the information needs of the user. "Numerous techniques, such as regression analysis, factor analysis, analysis of variance, item analysis, discriminant analysis, and other statistical methods comprise the techniques by which large amounts of data are reduced and brought to bear on particular kinds of decision questions."2

Simon speaks to the question of the construction of a data information system when he says "The secret of problem solving is that there is no secret. It is accomplished through complex structures of familiar simple elements. The proof is that we can simulate it, using no more than those simple elements as the building blocks of our programs."3 Also Simon has endorsed automation by saying "In solving problems, human thinking is governed by programs that organize myriads of simple information processes--or symbol manipulating processes if you like--into orderly, complex sequences that are responsive to and adaptive to the task environments as the sequences unfold. Since programs of the same kind can be written for computers, these programs can be used to describe and simulate human thinking."4

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1Ibid., p. 52.
2Ibid., p. 53.
4Ibid., p. 81
A further endorsement of the use of data processing equipment for the implementation of a data information system is found in an article in TIP. There the authors state in part, "the technique of storing data along with the algorithms for manipulating that data is proving to be increasingly useful as increasing amounts of data, as well as ever increasing numbers of different computational techniques, are becoming available." In the same issue of TIP is found a listing of the following thirteen processes to which information can be subjected. These are comparison, evaluation, pattern recognition, correlation, validation, separation, compilation, transformation, extrapolation, condensation, measurement, contemplation, and generalization.

Banghart has substantiated the need for the use of data processing by stating, "as school systems increase in size and complexity, the administration becomes further removed from the source of information. Fortunately, the use of computers as total information systems is beginning to solve this problem. The use of computers also allows the present day administrator to solve many of his problems by simulation and building models."

In the construction of a data information system some cautions must be observed. In part these are spoken to by Blumenthal when he says "We can conclude that programmed decisions, (referring to Herbert Chaffee, et. al., "Cross-Section of Information Activities," Theory Into Practice, Vol. XII, No. 3, June (1973) (College of Education, The Ohio State University, Columbus, Ohio), p. 152.

Ibid., p. 150.

Simon's discussion of programmed and non-programmed decisions) no matter how complex they seem, can be automated, while non-programmed decisions, except perhaps at a very primitive level cannot."\textsuperscript{1}

Blumenthal further indicates our low level of understanding of management control systems when he states, "This segment of our configurational concept is least well understood, in terms of implementing its more advanced and generalized manifestations in hardware and software. In its simpler, less flexible forms, however, it is a fairly rigid structural information-retrieval system. The data base would, in this case, be partitioned into a number of separate but related structures containing various previously agreed upon summary files and indexes. These structures may correspond to certain "natural" divisions of responsibility in the business, such as those between marketing, production, distribution and financial functions."\textsuperscript{2}

Another caution to be observed is indicated by Ackoff when he states, "Managers usually suffer from a lack of relevant information but they suffer more from an overabundance of irrelevant information."\textsuperscript{3} He continues by advising that "...condensation as well as filtration, performed either mechanically or by hand, should be an essential part of a management information system, and that such a system should be capable of

\begin{flushright}
\textsuperscript{1}Ibid., p. 26.
\textsuperscript{2}Ibid., p. 193.
\end{flushright}
handling the unsolicited as well as solicited information that a manager receives.¹

A specific data information system was not described from the literature. Inasmuch as each data information system must be constructed to service a particular function, specific data systems from literature sources would not necessarily be applicable or adaptable to the project which follows.

However, gleanings of data systems parameters from the literature assist in providing a general framework. This framework can be helpful in constructing a specific data system for a specific planning process. It can be ascertained that the selected literature has included references from corporate planning, management systems, educational planning and others. Such wide consideration of data systems for different functions is necessary because more work has been done outside the field of education. Even though differences exist between these various planning functions, similarities occur also.

The greatest relationships which can be anticipated are general principles which can be followed in comprehensive educational planning at the local district level. In a dissertation written on the subject of comprehensive planning at the local district level Fisher has formulated four general principles. This writer has taken the liberty of rephrasing these to better meet the needs of this project but the meanings have not been changed.

1. An information system must contain the correct amount of the correct kinds of data.

¹Ibid., p. 115.
2. Data must be organized to enhance rapid and accurate means of classification, storage and retrieval of the data.

3. Data shall possess the possibility of being shared at different levels within and outside the system.

4. The data system shall permit periodic and continuous updating of data.

These general principles and other concepts from the selected literature sources were used in selecting, adapting and constructing a data information system for this investigation. The model of the specific data system used was explicated in Chapter 1.

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CHAPTER III

DESIGN OF THE STUDY

Ten discrete but related phases were followed sequentially in the development of the listings of algorithmic profile data. These are:

1. A search of the literature to find concepts related to comprehensive educational planning and the development of data information systems;

2. The use of raw profile data as base data from which algorithmic profile data are generated;

3. The application of selected algorithms to raw profile data;

4. The determination of algorithmic profile data to be included from coordinate systems;

5. The generation of an array of algorithmic profile data and the display of these data in paradigm form;

6. Assessment of the array of algorithmic profile data by selected university staff members;

7. Revision of the data array as needed following the assessment and restatement of the revised array;

8. Assessment of the revised data array in selected school districts;

9. Revision of the array of algorithmic profile data as needed;

10. Final statement of the listings of the array of algorithmic profile data.
PHASE 1. A Search of the Literature to Find Concepts Related to Comprehensive Educational Planning and the Development of Data Information Systems

Literature concerning comprehensive planning both within and outside the field of education was surveyed. In addition to the Conrad model, "A Comprehensive Educational Planning Model," two other models for comprehensive planning in education were studied in depth. These were S. H. McGrath's, Planning Systems for School Executives, and "Ariole, A Planning Guide" by Thiemann and Borkosky.

The literature concerning data information systems was surveyed. In addition to the model developed by Higgins and Conrad, the literature concerning general principles of data handling was studied.

PHASE 2. The Use of Raw Profile Data as Base Data From Which Algorithmic Profile Data Are Generated

This phase entailed the explication of each of the data trees of level one data. This consisted of a listing of each of the 14 trees with the data keys and the data elements for each tree. This listing can be found in A Data System for Comprehensive Planning in Education by Higgins and Conrad.

PHASE 3. The Application of Selected Algorithms to Raw Profile Data

This phase was the most time-consuming and tedious. It consisted of selecting one or more algorithms to apply to one or more data elements in relationship to one or more data keys within a tree. Following the intratree algorithmic profile data generation, it was necessary to consider possible intertree relationships.

The actual generation of initial algorithmic profile data was accomplished in collaboration with two other research associates. This
team, working under the auspices of The Ohio State University Component of Simu-School, refined and extended previous theoretical development in this planning component. Following this initial involvement with the Simu-School Component, this investigator proceeded as sole developer.

The first step followed in this phase was the creation of as many algorithmic profile data statements as possible in each tree. Emphasis was placed on obtaining all statements which promised possible utility for the tactical planner.

Following the voluminous generation of these algorithmic profile data statements, the two research associates and the investigator each assessed the statements with the criterion of usefulness to the tactical planner. At appropriate times, these listings were assessed by Dr. M. J. Conrad. In these assessments a simple three-point scale was used for rating the potential utility of each statement. The ratings were: (1) very useful, (2) possible utility, and (3) of no use. Only those statements garnering a majority of (1)'s were kept as viable algorithmic profile data.

The next procedure was the generation of the intertree listings. This entailed the consideration of each data element in each tree and its possible relationship to the data keys in that tree and each other data element in each other tree with its relationship to the data keys in its tree. After generation, these algorithmic statements were assessed in the same manner as those in the preceding paragraph. Only those with a majority of (1) ratings were kept.

To keep the size of the listings in manageable form mathematical symbolism was used in the above development.
PHASE 4. The Determination of Algorithmic Profile Data
to be Included from Coordinate Systems

In ascertaining the algorithmic profile data to be included from coordinate systems, it was deemed necessary to first determine the potential number and classifications of coordinate systems. This was accomplished through literature search and by drawing on previous experiences.

An illustrative listing of potential coordinate systems was created. This was seen as an open system with the potential of additional agencies being added. Additionally, it was assumed that only those providing the types and kinds of data needed would be used.

From this illustrative listing, three coordinate agencies were chosen as examples. With these three agencies, illustrative algorithmic profile data statements were listed. This listing was not designed to be comprehensive.

PHASE 5. The Generation of an Array of Algorithmic Profile Data
and the Display of These Data in Paradigm Form

This phase relied heavily upon the production from phase 3 and to a lesser extent phase 4. The algorithmic profile data listings were translated into prose form from the mathematical symbolism used previously. The statements were written in a form presumed to be understandable by anyone engaged in the process of planning.

The algorithmic profile listings were arranged into the 14 categories, one for each tree. The intertree algorithmic profile data statements were placed at the end of one of the trees to which they were related. Many of the statements were grouped in listings when the same relationship of data elements with data keys was desired.
The finished product of this phase became the initial array of algorithmic profile data perceived to be useful to the tactical planner in comprehensive planning for education. Several iterations of these statements were necessary before a satisfactory initial listing was accomplished.

PHASE 6. Assessment of the Array of Algorithmic Profile Data by Selected University Staff Members

Three university professors and three research associates were selected to assess the initial listings of algorithmic profile data. Each assessor had some experience in planning.

The assessors were requested to judge the potential utility of each algorithmic profile listing. In addition to a concise written explanation of the task, each assessor was provided a verbal explanation by this investigator. The verbal explanation was directed toward providing an understanding of the process of comprehensive educational planning at the tactical level of the school hierarchy.

The instrument to be assessed was quite lengthy, 38 pages in addition to the three pages of instructions and two illustrative figures. The assessors were asked to rate each statement by encircling the rating code provided adjacent to the listing. The rating code allowed four choices: (SA) strongly agree, (A) agree, (D) disagree, and (SD) strongly disagree. The assessor's ratings were designed to indicate their perception of the potential usefulness of the concept presented in each statement.

Following the ratings of all of the algorithmic profile listings, intertree, intratree, and illustrations from coordinate systems, the assessors were requested to respond to general statements about the total
system of algorithmic profile data presented to them. Additionally, they were provided an opportunity to add to the system if they discerned omissions in any of the categories.

**PHASE 7. Revision of the Data Array as Needed Following the Assessment and Restatement of the Revised Array**

The assessment ratings were listed and totalled for each of the 179 intratree algorithmic profile data listings; each of the 18 intertree listings; each of the 23 coordinate systems illustrative statements and the general statements concerning the process. Additionally, the responses to the requests for additional suggestions were listed.

These listings were studied by individual scores for each algorithmic profile data statement and by total responses to all of the listings. This process was used to determine the necessity of revising or eliminating any listing. The assessments of the general statements concerning the total process were studied to determine the necessity of any changes in total process. Further, the additional suggestions were studied to determine the necessity for additions or modifications to the total array of algorithmic profile data statements.

Finally, the array of algorithmic profile data was restated. This revision incorporated the suggestions deemed to be consistent with the total process. Deletions or revision of statements receiving less than majority endorsement was made.

**PHASE 8. Assessment of the Revised Data Array in Selected School Districts**

This investigator selected superintendents or central office personnel in school districts in central Ohio and two administrators from Centerville, Ohio. The major criterion for selection of participants
from a school district required that each participant be in a position requiring planning at the central office level of district operation. A secondary criterion required that each participant have the time to accomplish the assessment.

This investigator personally went to each school district and met with each participant. This meeting was held to explain the total process of comprehensive planning in education and to explain the requested task of assessment. Each of these meetings required approximately 30 minutes of time. Each assessor was informed that this investigator would return to get the instrument when they had finished except for the respondents at Centerville, Ohio. They were requested to return the instruments by mail.

PHASE 9. Revision of the Array of Algorithmic Profile Data as Needed

The process followed in phase 7 was followed in this phase with data from the field.

PHASE 10. Final Statement of the Array of Algorithmic Profile Data

The comments, ratings and suggestions of all respondents were considered. All pertinent data were used to improve the initial array. The final array is a synthesis of these new data and the original array. This final array can be found in Chapter V.
CHAPTER IV

DEVELOPMENT OF THE ARRAY OF ALGORITHMIC PROFILE DATA

The nature of this investigation does not lend itself to large amounts of useable information from related literature. Those sources having a relationship to this project were reported in Chapter II. The most assistance from the related literature was in the form of general principles.

The two planning models studied in depth demonstrated the necessity of a system and sub-systems. After explicating the models, each author cited strategies to be used in the operationalization of the system. These studies and other references about comprehensive planning helped in developing a generalized understanding about the total concept of comprehensive planning.

The literature search included study of data information systems, planning information systems, and management informations systems. No other models, per se, were found of information systems which had direct relationship to this investigation. These studies also provided general principles of data systems and data handling. Those cited from Fisher were helpful in this study.

Initial Development of Algorithmic Profile Data Statements for Comprehensive Planning in Education

This investigation sought to discover and state the algorithmic profile data statements which are useful to the tactical planner in
comprehensive educational planning. To accomplish this it was necessary to examine all potential data relationships which were available. The beginning point of this development was taken as the finished product of raw profile data development. An example of this development can be found in Table 1. This table shows all 11 keys and 49 of the 180 data elements in the Curriculum and Instruction Tree.

Each of the data trees varied in size. This variation can be seen in Table 2 where the number of data keys and the number of data elements are listed for each tree.

The initial consideration of algorithmic profile data development consisted of assessing the contents of each data element and its relationship to the data keys. Here the summation algorithm was used most often. One question then was, "will the tactical planner find any of the summations of any of the elements in any of the trees in any of the data key categories useful?" It was then necessary to construct algorithmic profile data statements for each combination of data key and data element where potential utility for the planner existed.

An example of this development can serve to further explain this portion of the initial process. In Table 1 you can find element one, "section identification." If the entries to element one are collected and identified as they relate to each data key, the information system could provide the number of sections by Instructional Mode, data key 11, Course or Activity Title; by data key 10 and by each of the other data keys. Summations for each of these data keys of element one will not necessarily be used by the tactical planner. The total number of sections in the total district would probably be of little value to the planner.
### TABLE 1

Simu-School - LEA Comprehensive Educational Planning Project  
Data System - Raw Profile Data Level 1  
CURRICULUM AND INSTRUCTION TREE

<table>
<thead>
<tr>
<th>I. Curriculum and Instruction Keys</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Agency</strong>: LEA, Joint vocational school district, Parochial school district, YMCA, Parks and recreation, etc.</td>
</tr>
<tr>
<td>2. <strong>Agency Component</strong>: Decentralized unit or Planning area</td>
</tr>
<tr>
<td>3. <strong>School</strong>: Madison High School, Montgomery County Tech., Jefferson Elementary</td>
</tr>
<tr>
<td>4. <strong>Building</strong>: Academy, North building, East Annex, etc.</td>
</tr>
<tr>
<td>5. <strong>Program</strong>: Direct instruction, Indirect instructional support, Student support, Institutional support, Independent operations</td>
</tr>
<tr>
<td>6. <strong>Program Component-Age or Grade Level</strong>: Nursery, Kindergarten, Grades 1-14 or Age group, Adult education</td>
</tr>
<tr>
<td>7. <strong>Program Component-Curricular Organization</strong>: General, College prep, Honors, Career education, Special education, etc.</td>
</tr>
<tr>
<td>8. <strong>Program Component-Instructional Organization</strong>: Departmentalized, Team teaching, Non-graded, Multi-age grouping, etc.</td>
</tr>
<tr>
<td>9. <strong>Program Component-Curricular Area</strong>: Mathematics, Science, Automobiles, Orthopedics, Slow learners, etc.</td>
</tr>
<tr>
<td>10. <strong>Course or Activity Title</strong>: Art I, Geometry, French club, Debate, Stock market, Flower arrangements, etc.</td>
</tr>
<tr>
<td>11. <strong>Instructional Mode</strong>: Action (laboratory), Interaction (seminar), Reaction (lecture-demonstration), Multi-modal, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. Raw Data Collected on each Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Section identification</strong></td>
</tr>
<tr>
<td>2. <strong>Number of minutes per class session</strong></td>
</tr>
<tr>
<td>3. <strong>Number of meetings per schedule cycle</strong></td>
</tr>
<tr>
<td>4. <strong>Duration of this course in weeks</strong>: (36, 18, 12, 9, 8, 6, 4, 3, 2, 1)</td>
</tr>
<tr>
<td>5. <strong>Enrollment (number)</strong></td>
</tr>
<tr>
<td>6. <strong>Room assignment for class section</strong> (room identification number)</td>
</tr>
<tr>
<td>7. <strong>Course taught by</strong> (single teacher, discipline team, inter-discipline team)</td>
</tr>
<tr>
<td>8. <strong>Identification of personnel assigned to this section</strong></td>
</tr>
</tbody>
</table>

The entries for the following data items will be chosen using the following scale: (1) extensive (greater than 75%); (2) considerable (50% to 75%); (3) frequent (25% to 50%); (4) some (5% to 25%); (5) limited (1% to 5%); (6) less than 1% or none

**Extent to which course content is derived from**

<p>| 9. <strong>Adopted course text(s)</strong> |
| 10. <strong>Other text(s)</strong> |
| 11. <strong>Variety of supplementary materials</strong> |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>Teacher and pupil cooperatively created substance</td>
</tr>
<tr>
<td>13.</td>
<td>Teacher created substance</td>
</tr>
<tr>
<td>14.</td>
<td>Pupil created substance</td>
</tr>
<tr>
<td>15.</td>
<td>Other sources</td>
</tr>
</tbody>
</table>

**Extent to which the course includes**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16.</td>
<td>Career education content</td>
</tr>
<tr>
<td>17.</td>
<td>Sex education content</td>
</tr>
<tr>
<td>18.</td>
<td>Environmental education</td>
</tr>
<tr>
<td>19.</td>
<td>Drug abuse education</td>
</tr>
<tr>
<td>20.</td>
<td>Alcohol abuse education</td>
</tr>
<tr>
<td>21.</td>
<td>Safety education</td>
</tr>
<tr>
<td>22.</td>
<td>Consumer education</td>
</tr>
<tr>
<td>23.</td>
<td>Library science</td>
</tr>
<tr>
<td>24.</td>
<td>Patriotism</td>
</tr>
<tr>
<td>25.</td>
<td>Minority studies</td>
</tr>
<tr>
<td>26.</td>
<td>Other State required content</td>
</tr>
</tbody>
</table>

**Extent to which course content is organized around the following**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>27.</td>
<td>A discrete subject matter discipline</td>
</tr>
<tr>
<td>28.</td>
<td>The interrelationships of two or more discrete subject matter disciplines</td>
</tr>
<tr>
<td>29.</td>
<td>Pre-determined instructional objectives for this course</td>
</tr>
<tr>
<td>30.</td>
<td>Pupil-teacher developed instructional objectives</td>
</tr>
</tbody>
</table>

**Extent to which the course is directed toward the following types of objectives**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>31.</td>
<td>Psychomotor</td>
</tr>
<tr>
<td>32.</td>
<td>Cognitive</td>
</tr>
<tr>
<td>33.</td>
<td>Affective</td>
</tr>
</tbody>
</table>

**Extent to which the following participate in decision-making regarding the content and organization for this course**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>34.</td>
<td>Central office staff</td>
</tr>
<tr>
<td>35.</td>
<td>Building administrators</td>
</tr>
<tr>
<td>36.</td>
<td>Department head</td>
</tr>
<tr>
<td>37.</td>
<td>Team of teachers</td>
</tr>
<tr>
<td>38.</td>
<td>Teacher</td>
</tr>
<tr>
<td>39.</td>
<td>Pupil</td>
</tr>
<tr>
<td>40.</td>
<td>Parents</td>
</tr>
<tr>
<td>41.</td>
<td>Craft and/or other specialists committee</td>
</tr>
<tr>
<td>42.</td>
<td>Other citizens</td>
</tr>
</tbody>
</table>

**Extent to which the following participate in decisions regarding the selection of curriculum materials**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>43.</td>
<td>Central office staff</td>
</tr>
<tr>
<td>44.</td>
<td>Building administrators</td>
</tr>
<tr>
<td>45.</td>
<td>Department head</td>
</tr>
<tr>
<td>46.</td>
<td>Team of teachers</td>
</tr>
<tr>
<td>47.</td>
<td>Teachers</td>
</tr>
<tr>
<td>48.</td>
<td>Pupils</td>
</tr>
<tr>
<td>49.</td>
<td>Parents</td>
</tr>
</tbody>
</table>
TABLE 2
SELECTED ATTRIBUTES OF DATA TREES

<table>
<thead>
<tr>
<th>Data Trees</th>
<th>Number of Data Keys</th>
<th>Number of Data Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Curriculum and Instruction</td>
<td>11</td>
<td>180</td>
</tr>
<tr>
<td>2. Instructional Services</td>
<td>8</td>
<td>84</td>
</tr>
<tr>
<td>3. Student Personnel</td>
<td>7</td>
<td>34</td>
</tr>
<tr>
<td>4. Staff Personnel</td>
<td>8</td>
<td>58</td>
</tr>
<tr>
<td>5. Facilities</td>
<td>9</td>
<td>141</td>
</tr>
<tr>
<td>6. Financial Resources</td>
<td>3</td>
<td>46</td>
</tr>
<tr>
<td>7. Transportation</td>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>8. Food Service</td>
<td>6</td>
<td>25</td>
</tr>
<tr>
<td>9. Business Management</td>
<td>5</td>
<td>51</td>
</tr>
<tr>
<td>10. Organizational Management</td>
<td>5</td>
<td>43</td>
</tr>
<tr>
<td>11. Population</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>12. Physical</td>
<td>6</td>
<td>42</td>
</tr>
<tr>
<td>13. Activities and Services</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>14. Governance</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>Totals</td>
<td>91</td>
<td>795</td>
</tr>
</tbody>
</table>

This total could be found by summing element one by key one, Agency. However, the tactical planner might use the results of summing element one by data key 9, Program Component-Curricular Area if the totals were reported for each School, data key 3. Much greater consideration was given to the relationship of data contained in element one with the individual data keys and the combinations of data keys but further description is not deemed necessary.
When the size of the Curriculum and Instruction tree is examined and visualized, a beginning indication of the magnitude of the task can be seen. If each of the 180 elements is related to each of the data keys and each possible combination of data keys and data elements, the number of possibilities is enormous. However, one of the limiting factors is the potential utility of each algorithmic statement created. Because many of the elements contain data of little value to the tactical planner, they need no further consideration in this study. Element six, "Room assignment for course section (room identification number)," would have little utility for the tactical planner.

The examples above have been using the summation algorithm only. All possible data relationships need be considered for each element in each tree. To assist in the listing of this large number of statements, a language of mathematical symbolism was used. This codification was helpful because less time and space was required in the writing of each statement. An example of this product is furnished as Table 3.

This example uses the Curriculum and Instruction Tree also. The numbers to the left of the period identified the element in the tree. The word "by" was a signal for summation and the number(s) following "by" identified the data key to be used for summary categories.

Using the above symbolism, statements were generated for each of the 14 trees and for each data relationship within each tree which promised some utility for the tactical planner in comprehensive planning in education. During this development, quantitative records were not kept because changes in the numbers and forms of listings occurred frequently. This process provided many statements; some with high potential utility and some with little or no potential utility for the tactical planner.
<table>
<thead>
<tr>
<th>Item</th>
<th>By 9, 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5 + 1 by 9, 3, 1 Displaying totals by 9 by 3 By 11, 10, 9, 7, 6, 3, 1 for past 5 years Graph over past 5 years by 11, 10, 9, 7, 6, 3</td>
</tr>
<tr>
<td>9-15</td>
<td>By 9, 6, 3 Graph over past 5 years by 9, 6, 3</td>
</tr>
<tr>
<td>16-26</td>
<td>By 10, 6, 3 Graph over past 5 years by 10, 6, 3</td>
</tr>
<tr>
<td>27-30</td>
<td>By 10, 6, 3 Graph over past 5 years by 10, 6, 3</td>
</tr>
<tr>
<td>31-33</td>
<td>By 10, 6, 3 Graph over past 5 years by 10, 6, 3</td>
</tr>
<tr>
<td>34-42</td>
<td>By 3 Graph over past 5 years by 3</td>
</tr>
<tr>
<td>43-51</td>
<td>By 3 Graph over past 5 years by 3</td>
</tr>
<tr>
<td>52-67</td>
<td>By 10, 9, 3 Graph over past 5 years by 10, 9, 3</td>
</tr>
<tr>
<td>68-79</td>
<td>By 9, 6, 3 Graph over past 5 years by 9, 6, 3</td>
</tr>
<tr>
<td>80-86</td>
<td>By 9, 3 Graph over past 5 years by 9, 3</td>
</tr>
<tr>
<td>87-90</td>
<td>By 3, 9 Graph over past 5 years by 3, 9</td>
</tr>
<tr>
<td>91-95</td>
<td>By 3, 9 Graph over past 5 years by 3</td>
</tr>
<tr>
<td>96-115</td>
<td>By 10, 3, 9 Graph over past 5 years by 10, 3</td>
</tr>
<tr>
<td>116-121</td>
<td>By 3, 9 Graph over past 5 years by 3, 9</td>
</tr>
</tbody>
</table>
After generation of the intratree algorithms, a similar process was followed to generate intertree algorithms. This required consideration of each data element in each tree with its potential information generation if related to each data element and/or data key in each other tree.

All of these algorithmic profile data statements were then assessed individually by this investigator and two other research associates as a part of the larger Simu-School project. Only those statements which received majority approval were saved for further development. This resulted in a listing of more manageable size but still of considerable magnitude. To reduce further the number of separate listings, this investigator grouped sequential data elements within data trees where the same data handling was to occur.

The next development involved the translation from the symbolism referred to above to prose designed to be understandable to planners and others in educational administration. Several additional iterations were necessary before each statement was resolved in a form to be assessed by others. This first listing of the algorithmic profile data statement array consisted of 179 intratree algorithms and 18 intertree algorithms.

The third category of algorithmic profile data needed to service the Total Data System for Comprehensive Educational Planning is derived from coordinate systems. Development in this phase required this investigator to determine the potential number of coordinate systems which could be useful to the tactical planner. Research of the literature led to the listing in Table 4.

This listing of coordinate systems is designed to be empirically useful. It is an open system where additional coordinate systems may
### TABLE 4

**LISTING OF COORDINATE INFORMATION SYSTEMS HAVING POTENTIALLY USEFUL INFORMATION FOR THE TACTICAL PLANNER IN COMPREHENSIVE EDUCATIONAL PLANNING**

1. Federal Census
2. Other planning agencies
   a. City planning agency
   b. Regional planning agency
3. Metropolitan Church Board
4. City Chamber of Commerce
5. Regional Chamber of Commerce
6. Community Improvement Corporation
7. Athletic league (local, regional and state)
8. Community recreation program
9. Higher education agencies
10. Other local governmental agencies
    a. Local building authority
    b. Department of Health
    c. Fire department
    d. Police department
11. Public library
12. PTA (local, council and state)
13. Model cities program
14. Affirmative action program
15. School boosters organizations
    a. Athletic boosters
    b. Music boosters
    c. Other boosters
16. Art league
17. League of women voters
18. Service Clubs
    a. Lions
    b. Kiwanis
    c. Rotary
    d. Sertoma
    e. Others
19. Veterans organizations
    a. Veterans of Foreign Wars
    b. American Legions
20. Welfare department
21. Civil Service Commission
22. Labor organizations
    a. AFL
    b. CIO
    c. Local professional organization
    d. Non-professional organization (local)
23. County budget commission
24. County prosecuting attorney or city solicitor
TABLE 4 (continued)

25. State agencies
   a. Department of Education
   b. Department of Buildings
   c. State auditor's office
   d. Legislative Services Commission
   e. State Highway Patrol

be added if needed. Prior to the determination to use this listing, coordinate systems taxonomies were studied. One of the latest taxonomies developed in the literature was accomplished by Kenneth Brooks in his dissertation written in 1972. He based his taxonomy on hierarchical levels and listed 35 such coordinate systems. However, the coordinate systems, ranked in hierarchical order, are not of the same order from one organization to another. Because of this, data, from a coordinate system high in the hierarchical order of one organization, may be useful at a lower hierarchical level in another organization. This study of these taxonomies was helpful in arriving at the listing produced.

Because each listed coordinate system is anticipated to have at least some measure of utility in providing useful data, a listing of each useful algorithmic profile data quantity would be very voluminous and beyond the scope of this investigation. For this reason, only selected illustrative examples have been provided. These are not exhaustive even in the examples chosen. They are indicative only of some of the listings which can be generated.

Three coordinate systems are chosen which are used for illustration. The first one cited is the "Federal Census System," number 1 in Table 4. This system was chosen because known data exist which usually are used by
a tactical planner. Some of these data are unavailable at the raw profile data level because confidentiality is promised individuals in their answers. When this situation exists, it is necessary to use algorithmic profile data from this system as the lowest order data available.

The listings of the ten illustrative algorithmic profile data statements is present in Table 5.

<table>
<thead>
<tr>
<th>TABLE 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEDERAL CENSUS SYSTEM</td>
</tr>
<tr>
<td>ILLUSTRATIVE ALGORITHMIC PROFILE DATA STATEMENTS</td>
</tr>
<tr>
<td>1. The sum of the numbers of residents by age group by blocks</td>
</tr>
<tr>
<td>2. The sum of the number of families in different income ranges by blocks</td>
</tr>
<tr>
<td>3. The sum of ADC categorized youth by age by block</td>
</tr>
<tr>
<td>4. The sum of welfare recipients by numbers of children by age range by block</td>
</tr>
<tr>
<td>5. The sum of the numbers of residents by housing type by block</td>
</tr>
<tr>
<td>6. The sum of the numbers of residents by ethnic characteristic code by block</td>
</tr>
<tr>
<td>7. The sum of the numbers of residents whose native language is not English by language code by block divided by total number of residents in the block</td>
</tr>
<tr>
<td>8. The sum of the numbers of households when only one parent resides by block divided by total number of households in the block</td>
</tr>
<tr>
<td>9. The sum of the number of residents who have resided one, two, three, four, five years in present location by block divided by total number of residents by block</td>
</tr>
<tr>
<td>10. The sum of the cost of single family dwelling units by price code by block by number of children by age code</td>
</tr>
</tbody>
</table>
The second and third coordinate systems to be illustrated are picked at random. The two chosen are the "Regional Planning Agency, number 2.b. in Table 4 and the Labor Unions or Teachers Associations which have school district teachers as members. The algorithmic profile data statements developed for illustrative purposes for these two coordinate systems are shown in Tables 6 and 7.

TABLE 6

COORDINATE SYSTEM--REGIONAL PLANNING AGENCY

1. The sum of the projection of population by age group by year in the school district
2. The sum of the potential numbers of home sites by zoning code in the school district
3. The sum of the acres available for industrial development in the school district
4. The sum of the number of miles of improved highways in the school district
5. The sum of the acres available at recreational sites by activity code in the school district
6. The sum of the number of acres of water available by recreational code in the school district
7. The sum of the number of acres of farmland in the school district divided by the total number of acres in the school district

It is not intended that each tactical planner in comprehensive educational planning use all coordinate systems cited. The planner would use data from those systems which provide data needed, available and within his resources.
TABLE 7

COORDINATE SYSTEM—LABOR UNIONS OR TEACHERS ASSOCIATIONS WHICH HAVE SCHOOL DISTRICT TEACHERS AS MEMBERS

1. The sum of the numbers of teachers who are members of each organization in the school district

2. The sum of the numbers of teachers who have been members in each organization in the school district for each of the past ten years

3. The sum of the benefits awarded to teachers in negotiations, summed by labor organizations or associations in the school district for each of the past ten years

4. The sum of the number of days of work stoppage by majority organization for each of the past ten years in the school district

5. The sum of the dues paid to each labor organization in the school district for each of the past ten years

6. The sum of the number of inservice teacher-days provided and financed by the labor organization for each of the past ten years

The final result of the above work became the initial listing of algorithmic profile data statements and included the listings from inter-tree, intratree and illustrative coordinate data relationships. This initial listing was compiled into an assessment instrument to be used with selected university staff members. Five general statements were added to the instrument to determine an assessment of the total process. Additionally, respondents were provided space to add to or suggest modifications of the listings. This document can be found in Appendix A.

Assessment of the Algorithmic Profile Data Listings by University Staff Members and Central Office Personnel

On the instrument, the assessors were requested to rate the potential utility of each statement. The rating scale provided four choices; i.e. (SA) strongly agree, (A) agree, (D) disagree, (SD) strongly disagree.
Each of the six selected university staff members responded to most of the items. Each of the nine selected central office personnel responded to each item. In addition to the instructions on the assessment instrument, each participant had an explanation of comprehensive educational planning, planning information systems and the models of the Base Data System and the Total Data System for Comprehensive Educational Planning, figures 2 and 3. Each explanation consumed approximately 30 minutes.

It is emphasized that these two groups participated at different time periods and used similar but different instruments. The university staff members assessed their instruments first and used the instrument found as Appendix A. With input from this assessment, the revision in the instrument consisted of eliminating 15 statements prior to the central office staff assessment.

The following tables explicate the initial listings of algorithmic profile data statements. A separate tabular listing is presented for each tree and contains the intratree algorithms perceived to be useful for the tactical planner in comprehensive educational planning. The intertree algorithms are located within the table of a tree to which they are related. These intertree algorithms are not repeated in the tables of other trees to which they are related. The algorithmic profile data statements are found in the even-numbered tables 8 through 34.

Following each table of listings of algorithmic profile data statements is a table of responses from the university staff members and the central office staff members. Because 15 statements were omitted from the assessment instrument used by the central office staff members, the tables depicting responses will show dashes (---) in the response columns
for these items assessed by university respondents but not by the central office respondents. These tables are odd-numbered, 9 through 35.

Additional tables, 36 through 38, are presented to show the responses of each of the two groups to the illustrative coordinate systems listings of algorithmic profile data statements. Table 39 explicates the general statements which were assessed by each group. Table 40 indicates the responses of each group to the general statements in Table 39.

The tallies of responses were converted to per cents. These tallies are the per cent of the total number of respondents who responded to each item.

Prior to each tabular listing will be found explanatory comments. Where appropriate, comments concerning the differences in the two assessments will be made.

Curriculum and Instruction Algorithmic Profile Data Listings

The listing in Table 8 explicates 14 intratree statements. Twelve of these statements combine elements within the listing where the same data relationships are desired. For example, item 9-15 depicts each of the elements 9 through 15 being valued and the values summed in each element to provide the opportunity for a comparative analysis, for each Curricular Area within Schools, and between Schools. Other examples can be seen throughout the table.

After the intratree listings, two intertree listings are provided in this table. These two each provide data relationships from elements of the Curriculum and Instruction Tree and the Staff Personnel Tree by the indicated data keys.
<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Determine the number of sections in each Curricular Area by totalling the entries in data element, &quot;section identification,&quot; for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School.</td>
</tr>
<tr>
<td>5</td>
<td>Determine average section size in each Curricular Area by totalling the values in data element, &quot;Enrollment (number),&quot; for each Curricular Area, i.e. mathematics, science, automotives, etc. in each School and dividing each Curricular Area total by the number of sections in each Curricular Area in each School.</td>
</tr>
<tr>
<td>9-15</td>
<td>The entries for data elements, 9 through 174, contain a rating scale of 1 to 6 with each scale indicating: (1) extensive (greater than 75%); (2) considerable (50% to 75%); (3) frequent (25% to 50%); (4) some (5% to 25%); (5) limited (1% to 5%); (6) less than 1% or none. Determine one dimension of curriculum analysis by obtaining the totals in each of the following data elements which have been valued to indicate the extent to which course content is derived from: element 9, &quot;Adopted course text(s)&quot; element 10, &quot;Other texts&quot; element 11, &quot;Variety of supplementary materials&quot; element 12, &quot;Teacher and pupil cooperatively created substance&quot; element 13, &quot;Teacher created substance&quot; element 14, &quot;Pupil created substance&quot; element 15, &quot;Other sources&quot; for each Curricular Area; i.e. mathematics, science, automotive, etc. in each School.</td>
</tr>
<tr>
<td>16-26</td>
<td>Determine another dimension of curriculum analysis by obtaining the totals in each of the following data elements which have been valued to indicate the extent to which the course includes: element 16, &quot;Career education content&quot; element 17, &quot;Sex education content&quot; element 18, &quot;Environment education&quot; element 19, &quot;Drug abuse education&quot; element 20, &quot;Alcohol abuse education&quot; element 21, &quot;Safety education&quot; element 22, &quot;Consumer education&quot; element 23, &quot;Library science&quot;</td>
</tr>
</tbody>
</table>
TABLE 8 (continued)

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>element 24, &quot;Patriotism&quot;</td>
</tr>
<tr>
<td>element 25, &quot;Minority studies&quot;</td>
</tr>
<tr>
<td>element 26, &quot;Other State required content&quot;</td>
</tr>
</tbody>
</table>

for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School.

34-42 Obtain information about the process of decision making in curriculum content and organization determination by totalling the values indicating the extent to which the following participate in decision making regarding the content and organization for each course:

- element 34, "Central office staff" 
- element 35, "Building administrators" 
- element 36, "Department head" 
- element 37, "Team of teachers" 
- element 38, "Teacher" 
- element 39, "Pupil" 
- element 40, "Parents" 
- element 41, "Craft and/or other specialists committees" 
- element 42, "Other citizens" 

by Curricular Area, i.e. mathematics, science, automotives, etc. in each School.

43-51 Provide information about the extent of participation in the selection of curriculum materials by each of the following groups by totalling the values in each of the following data elements:

- element 43, "Central office staff" 
- element 44, "Building administrators" 
- element 45, "Department head" 
- element 46, "Team of teachers" 
- element 47, "Teachers" 
- element 48, "Pupils" 
- element 49, "Parents" 
- element 50, "Craft and/or other specialists committee" 
- element 51, "Other citizens" 

for each Curricular Area; i.e. mathematics, science, automotives, etc. for each School.

52-67 Obtain information about the frequency of use of the following 16 categories of instructional materials by totalling the values in each of the following elements:

- element 52, "Adopted texts" 
- element 53, "Other texts" 
- element 54, "Other printed materials: hard bound" 
- element 55, "Other printed materials: soft bound" 
- element 56, "Filmstrips"
TABLE 8 (continued)

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>element 57, &quot;Records&quot;</td>
</tr>
<tr>
<td>element 58, &quot;Tape recordings&quot;</td>
</tr>
<tr>
<td>element 59, &quot;Films&quot;</td>
</tr>
<tr>
<td>element 60, &quot;Video-recordings&quot;</td>
</tr>
<tr>
<td>element 61, &quot;Learning kits&quot;</td>
</tr>
<tr>
<td>element 62, &quot;Learning games&quot;</td>
</tr>
<tr>
<td>element 63, &quot;Maps&quot;</td>
</tr>
<tr>
<td>element 64, &quot;Charts&quot;</td>
</tr>
<tr>
<td>element 65, &quot;Globes&quot;</td>
</tr>
<tr>
<td>element 66, &quot;Other learning materials&quot;</td>
</tr>
<tr>
<td>element 67, &quot;Other community resources&quot;</td>
</tr>
</tbody>
</table>

for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School.

68-79 Obtain information about the frequency of use of the following 12 instructional strategies by totalling the values in each of the following elements:

- element 68, "Reaction (group and/or lecture-demonstration)"
- element 69, "Interaction (small group discussion)"
- element 70, "Action (Learning by doing, independent work, etc.)"
- element 71, "Discovery method"
- element 72, "Simulation"
- element 73, "Video-recordings"
- element 74, "Computer assisted instruction"
- element 75, "Field trips"
- element 76, "Outside resource persons (speakers, etc.)"
- element 77, "Building media center with materials used in class"
- element 78, "Building media center with students sent to the center to work"
- element 79, "Variation of strategies to accommodate pupil differences"

for each Curricular Area, i.e. mathematics, science, automotives, etc. in each School.

80-86 Obtain information about the frequency of use of the following seven instructional strategies by totalling the values in each of the following elements:

- element 80, "Programmed instruction"
- element 81, "Teacher prepared instructional packages"
- element 82, "Contract fulfillment"
- element 83, "Criterion-referenced objectives fulfillment"
- element 84, "Outdoor education"
- element 85, "Montessori"
- element 86, "British informal education"

for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School and for age Age or Grade Level; i.e. Nursery, Kindergarten, Grades, 1-14, or Age group, Adult education, etc., in each School.
TABLE 8 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Obtain information about the extent to which the following pupil evaluation and/or grading methods are used in each course by totalling the values in each of the following elements:</th>
</tr>
</thead>
</table>
| 116-121 | element 116, "Letter or percentage grade"  
element 117, "Pass-fail"  
element 118, "Written narrative given to pupil"  
element 119, "Written narrative given to parent"  
element 120, "Check list rating scales"  
element 121, "A system indicating effort applied" for each Curricular Area; i.e. mathematics, science, auto-motives, etc. in each School and for each Age or Grade Level in each School. |
| 122-131 | Obtain information about the frequency of use of 10 evaluation techniques by totalling the values in each of the following elements:  
element 122, "Pupil-teacher evaluation conferences"  
element 123, "Teacher-parent evaluation conferences"  
element 124, "Pupil-teacher-parent evaluation conferences"  
element 125, "Teacher does home visitation for pupil evaluation purposes"  
element 126, "Pupil-peer evaluation provided for by teacher"  
element 127, "Pupil self-evaluation provided for by teacher"  
element 128, "Pupil evaluated by more than one teacher"  
element 129, "Conferences scheduled between teachers to evaluate pupils"  
element 130, "Conferences scheduled between teacher and counselor to effect pupil evaluation"  
element 131, "Conferences scheduled between teacher and psychologist to effect pupil evaluation" for each Curricular Area; i.e. mathematics, science, auto-motives, etc. in each School and for each Age or Grade Level in each School. |
| 132-143 | Obtain information concerning the extent to which pupil evaluation is based on the following 12 elements by totalling the values in each of the elements:  
element 132, "Academic achievement"  
element 133, "Ability to function independently"  
element 134, "Ability to plan and use time efficiently"  
element 135, "Effort expended toward course objectives"  
element 136, "Attainment of course objectives"  
element 137, "Behavior (conduct)"  
element 138, "Peer-relations" |
TABLE 8 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>element 139</td>
<td>&quot;Teacher-pupil relations&quot;</td>
</tr>
<tr>
<td>element 140</td>
<td>&quot;Learning style&quot;</td>
</tr>
<tr>
<td>element 141</td>
<td>&quot;Use of personal resources&quot;</td>
</tr>
<tr>
<td>element 142</td>
<td>&quot;Use of material resources&quot;</td>
</tr>
<tr>
<td>element 143</td>
<td>&quot;Ascertained pupil attitude toward class&quot;</td>
</tr>
</tbody>
</table>

for each Curricular Area; i.e., mathematics, science, automotives, etc. for each School and for each Age or Grade Level in each School.

144-153 Determine the extent to which the following 10 categories of school system actors participate in program evaluation by totalling the values in each of the 10 elements:

- element 144, "Central office staff"
- element 145, "Building administrators"
- element 146, "Department head"
- element 147, "Course teachers"
- element 148, "Other teachers"
- element 149, "Pupils"
- element 150, "Parents"
- element 151, "Craft and/or other specialist committees"
- element 152, "Other citizens"
- element 153, "Specialists from outside LEA"

for each Curricular Area; i.e., mathematics, science, automotives, etc. in each School and for each Age or Grade Level in each School.

154-174 Determine the extent to which the following 21 items are a part of program evaluation by totalling the values in each of the following 21 elements for each course:

- element 154, "Degree of individualization of content"
- element 155, "Degree of individualization of instructional methods"
- element 156, "Grade level appropriateness"
- element 157, "Appropriateness of materials"
- element 158, "Appropriate construction of objectives"
- element 159, "Pupil evaluation procedures"
- element 160, "Organization of content"
- element 161, "Sequential order of content"
- element 162, "Appropriateness of instructional strategies"
- element 163, "Pupils' attitudes toward program"
- element 164, "Parents' attitudes toward program"
- element 165, "Teachers' attitudes toward program"
- element 166, "Administrators' attitudes toward program"
- element 167, "Overall pupil achievement"
- element 168, "Relative cost of program"
- element 169, "To the extent pupils are meeting the course objectives"
TABLE 8 (continued)

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>element 170, &quot;The extent to which the objectives of the course are fulfilling the needs of pupils&quot;</td>
</tr>
<tr>
<td>element 171, &quot;The extent to which teachers are actualizing their potential&quot;</td>
</tr>
<tr>
<td>element 172, &quot;The extent to which administrators are actualizing their potential&quot;</td>
</tr>
<tr>
<td>element 173, &quot;The extent to which other staff members are actualizing their potential&quot;</td>
</tr>
<tr>
<td>element 174, &quot;The extent to which the community is actualizing its potential&quot;</td>
</tr>
</tbody>
</table>

for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School and for each Age and Grade Level in each School.

Intertree Algorithms

1. Determine the pupil-teacher ratio in each Curricular Area; i.e. mathematics, science, automotives, etc. in each School by totalling the number of pupils enrolled in each Curricular Area and totalling the number of teachers assigned to each Curricular Area and by dividing each former total by each corresponding latter total for each School.

2. Determine the pupil-teacher ratio in each Age or Grade Level; i.e. Nursery, Kindergarten, Grades 1-14, or Age Group, Adult education, etc. in each School by totalling the number of pupils enrolled in each Age or Grade Level and by totalling the number of teachers assigned to each Age or Grade Level and by dividing each former total by each corresponding latter total.

Assessments of the Listings in the Curriculum and Instruction Tree

Thirteen of the listings in Table 8 are shown as receiving majority agreement responses from university staff respondents. One item, 116-121 did not receive majority agreement. Upon restudy of this item, it was decided that it could be classified as providing data more appropriate for the operational planner than for the tactical planner. Because of these two reasons, this item was removed from the data array prior to the iteration for the central office staff assessment. In the central
office staff assessment each of the listings received responses indicating majority agreement. The two intertree listings received responses indicating majority agreement in each assessment.

### TABLE 9
ASSESSMENTS OF LISTINGS IN CURRICULUM AND INSTRUCTION TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA A D SD</td>
<td>SA A D SD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intratree</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>33 67 0 0</td>
<td>78 22 0 0</td>
</tr>
<tr>
<td>5</td>
<td>33 67 0 0</td>
<td>78 22 0 0</td>
</tr>
<tr>
<td>9-15</td>
<td>17 50 33 0</td>
<td>44 56 0 0</td>
</tr>
<tr>
<td>16-26</td>
<td>33 33 33 0</td>
<td>33 44 22 0</td>
</tr>
<tr>
<td>34-42</td>
<td>0 83 17 0</td>
<td>44 33 22 0</td>
</tr>
<tr>
<td>43-51</td>
<td>17 50 17 0</td>
<td>22 33 33 11</td>
</tr>
<tr>
<td>52-67</td>
<td>33 50 17 0</td>
<td>22 78 0 0</td>
</tr>
<tr>
<td>68-79</td>
<td>33 67 0 0</td>
<td>33 56 11 0</td>
</tr>
<tr>
<td>80-86</td>
<td>33 50 17 0</td>
<td>33 44 22 0</td>
</tr>
<tr>
<td>116-121</td>
<td>0 33 67 0</td>
<td>- - - -</td>
</tr>
<tr>
<td>122-131</td>
<td>33 50 17 0</td>
<td>44 33 11 11</td>
</tr>
<tr>
<td>132-143</td>
<td>33 33 33 0</td>
<td>33 56 11 0</td>
</tr>
<tr>
<td>144-153</td>
<td>17 83 0 0</td>
<td>33 67 0 0</td>
</tr>
<tr>
<td>154-174</td>
<td>33 67 0 0</td>
<td>67 22 11 0</td>
</tr>
<tr>
<td><strong>Intertree</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>50 50 0 0</td>
<td>89 11 0 0</td>
</tr>
<tr>
<td>-</td>
<td>50 50 0 0</td>
<td>89 11 0 0</td>
</tr>
</tbody>
</table>
Instructional Services Algorithmic Profile Data Listings

Table 10 explicates seven intratree statements. One listing, item 4-31, depict elements within it which receive the same data treatment. After these seven intratree listings, one intertree listing is stated.

TABLE 10
INSTRUCTIONAL SERVICES TREE
ALGORITHMIC PROFILE DATA STATEMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree Algorithms</th>
</tr>
</thead>
</table>
| 4-31 | Each of the 28 categories of instructional and learning materials which are stored and are available for use have been given an adequacy rating from 1-4. This rating is a combined qualitative and quantitative expression of adequacy. Determine information indicating adequacy of each of these 28 categories by totalling the values in each element and by dividing by the number of entries in each of the following elements:  
  - element 4, "Texts: issued to students"
  - element 5, "Texts: multiple or supplemental"
  - element 6, "Printed materials: hard bound"
  - element 7, "Printed materials: soft bound"
  - element 8, "Filmstrips"
  - element 9, "Records"
  - element 10, "Tape recordings"
  - element 11, "Films"
  - element 12, "Video-recordings"
  - element 13, "Learning kits"
  - element 14, "Learning games"
  - element 15, "Maps"
  - element 16, "Charts"
  - element 17, "Globes"
  - element 18, "Calculators"
  - element 19, "Models"
  - element 20, "Other learning materials"
  - element 21, "Filmstrip projectors"
  - element 22, "Record players"
  - element 23, "Tape recorders"
  - element 24, "Language masters"
  - element 25, "Film projectors"
  - element 26, "Video-tape recorders"
  - element 27, "T.V. sets"
  - element 28, "Opaque projectors"
TABLE 10 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>element 29</td>
<td>&quot;Over-head projectors&quot;</td>
</tr>
<tr>
<td>element 30</td>
<td>&quot;Computer terminals&quot;</td>
</tr>
<tr>
<td>element 31</td>
<td>&quot;Other audio-visual equipment&quot;</td>
</tr>
</tbody>
</table>
for each Curricular Area; i.e. mathematics, science, automobiles, etc. in each School.

40-42 | Ascertain a dimension of the quantitative aspects of guidance services by totalling the values in element 40, "Average number of referrals received from teaching and/or administrative staff per week," the values in element 41; "Average number of students initiating contact per week;" the values in element 42, "Average number of students contacted through guidance counselors initiative per week" for each School.

46 | Obtain information about the number of pupils served in speech and hearing therapy by adding the values in element 46, "Number of students served (in speech and hearing therapy)," in each School.

54 | Obtain information about the extent of psychological services provided to students by totalling the values in element 54, "Average number of student contacts made per week," in each School.

61,63,64 | Obtain information about the amount time expended in tutorial services for each type of tutorial service by identifying the types of tutorial service from element 61, "Type of tutorial service code (neurological, home instruction, remedial reading, musical, etc.)." and by finding the product of element 63, "Average number of contacts per week," and element 64, "Average length of meeting," for each identified tutorial service in each Agency Component, i.e. decentralized unit of the school district or designated planning area.

69,71,72,73 | From element 69, "Type of special event code (assembly program, career days, field days, etc)" identify each special event and for each special event provide information in numerical magnitude by ascertaining the product of element 71, "Number of meeting times or events per year," element 72, "Average length of meeting or event in hours," and element 73, "Average number of student participants per meeting or event," for each School.

75-84 | Obtain information indicating the cost per student hour of each extracurricular activity by dividing element 84, "Annual expenditure for activity," for each activity by the product of element 77, "Number of meeting times per week," element 78, "Average length of meeting (in hours)," element 79, "Duration of activity in weeks," element 80, "Average number of student participants" for each activity in each School.
TABLE 10 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Intertree Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compare the perceived adequacy of instructional and learning materials ratings with the achievement tests results in each School and in each Agency Component.</td>
</tr>
</tbody>
</table>

Assessments of the Listings in the Instructional Services Tree

The university staff responses in Table 11 indicate majority agreement on five of the seven listings. Two items, labeled 69, 71, 72, 73 and 75-84 failed to receive a majority in the agreement columns. These statements were designed to provide specific, detailed information about the number of pupil-hours entailed in each special event and cost per student hour of extra curricular activities. Each of these listings could be determined to be more appropriate for operational planning than for tactical planning. After restudy of these two items and with the assessed ratings it was decided to omit these in the next iteration of algorithmic profile data statements.

Each of the items included in the assessment by the central office staff members received majority agreement responses. The one intertree statement received majority agreement responses from each of the assessment groups.
### TABLE 11

**ASSESSMENTS OF LISTINGS IN INSTRUCTIONAL SERVICES TREE**

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree</th>
<th></th>
<th>Central Office Staff</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>University Staff</td>
<td>Central Office Staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA A D SD</td>
<td>SA A D SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-31</td>
<td>40 60 0 0</td>
<td>56 44 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-42</td>
<td>40 40 20 0</td>
<td>33 67 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>33 67 0 0</td>
<td>33 67 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>33 67 0 0</td>
<td>44 56 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61,63,64</td>
<td>33 67 0 0</td>
<td>44 56 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>69,71,72,73</td>
<td>17 33 50 0</td>
<td>- - - -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75-84</td>
<td>17 33 50 0</td>
<td>- - - -</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Intertree**

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>University Staff</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA A D SD</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>17 67 17 0</td>
<td>56 22 22 0</td>
</tr>
</tbody>
</table>

---

**Student Personnel Algorithmic Profile Data Listings**

Table 12 explicates a listing of 13 intratree algorithmic profile data statements. Item 1, 6 creates data relationships with two elements, 1 and 6, with two data keys, Grade Level and School. Another difference in this listing from the previous two shows two statements to be assessed after element 9. Each of these statements utilizes data from element 9 but in a different manner. Each of these statements is assessed separately.

Two intertree listings are found at the end of the table.
TABLE 12
STUDENT PERSONNEL TREE
ALGORITHMIC PROFILE DATA LISTINGS

Item

Intratree Algorithms

1, 6 Obtain information about the total number of students at each age group in each grade in each School by totalling the number of entries in element 2, "Name," having the same year of birth as ascertained from element 6, "Date of birth" for each Grade Level; i.e., Nursery, Kindergarten, Grades 1-14, in each School.

7 Obtain information about the numbers of students in each School from different categories of birth places by totalling the entries in element 7, "Place of birth code;" i.e. suburban, urban, rural, small city, etc. for each category of birth place in each School.

8 Obtain information about the numbers of boys and numbers of girls by totalling the entries in each sex category in element 8, "Sex" in each School.

9 Obtain information about the ethnic stratification of the student body by totalling the number of entries in element 9, "Ethnic characteristic code" for each School. Obtain information about the Curricular Organization; i.e. General, College prep, Honors, Career education, Special education, etc. enrollments for each ethnic characteristic group by totalling the numbers of students from each ethnic characteristic group enrolled in each Curricular Organization in each School.

10 Obtain information about the assessment of student performance by totalling the numbers of students receiving each category of grade in element 10, "Academic record (schedule, credits, grades)," in each School.

11 Obtain information indicating the numbers of students attaining intelligence test score levels by totalling the entries in element 11, "Intelligence test(s) (name, date, score)" for each desired score level in each School.

12 Ascertain information indicating the aptitude levels of students by totalling the entries in element 12, "Aptitude tests (name, date, score)" for desired score levels of students in each School and each category of aptitude desired.
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Ascertain information indicating the achievement levels of students by totalling the entries in element 13, &quot;Achievement test(s) (name, date, total score, sub-scores)&quot; for the desired levels in the desired achievement categories and/or sub-categories for each School.</td>
</tr>
<tr>
<td>14</td>
<td>Ascertain information indicating the interests of students by totalling the entries in each interest category from element 14, &quot;General interest inventory(ies) (name, date, score)&quot; for each School.</td>
</tr>
<tr>
<td>15</td>
<td>Ascertain information indicating the occupational interests of students by totalling the entries for each designated occupation in element 15, &quot;Occupational interest inventory(ies), (name, date, score)&quot; in each School.</td>
</tr>
<tr>
<td>22-23</td>
<td>Obtain information about the discrepancy existing between learning difficulties existing and instructional services received by totalling the number of entries in element 22, &quot;Learning difficulties code,&quot; and comparing these totals with the totals in element 23, &quot;Instructional services received code (tutoring for neurologically handicapped, home instruction, etc.)&quot; for each School.</td>
</tr>
<tr>
<td>8, 25</td>
<td>Ascertain the comparative numerical magnitude of girls and boys participation in extracurricular activities by totalling the number of boys and the number of girls cited as entries in element 25, &quot;Extracurricular activities code&quot; in each School.</td>
</tr>
</tbody>
</table>

**Intertree Algorithms**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Obtain information about the relative percentage composition of the student body and the School staff in ethnic characteristics by comparing the per cent of students in each ethnic characteristic code with the per cent of staff in each ethnic characteristic code in each School.</td>
</tr>
<tr>
<td>2</td>
<td>Determine if there is a positive relationship between students' achievement test score levels and the perceived competency ratings of staff in individual Schools by comparing the student achievement test score levels with the perceived competency ratings of staff in each School.</td>
</tr>
</tbody>
</table>
Assessment of Listings in the Student Personnel Tree

Table 13 depicts the responses of the university staff and the central office staffs members. It shows that each of the 13 intratree algorithmic profile statements received majority agreement responses by each of the groups on the separate assessments. Additionally, each of the two intertree statements received majority agreement responses.

**TABLE 13**

ASSESSMENTS OF LISTINGS IN THE STUDENT PERSONNEL TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
</tr>
<tr>
<td>Intratree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,6</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
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<tr>
<td>8</td>
<td>17</td>
<td>50</td>
</tr>
<tr>
<td>9</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>-</td>
<td>17</td>
<td>67</td>
</tr>
<tr>
<td>10</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>11</td>
<td>33</td>
<td>50</td>
</tr>
<tr>
<td>12</td>
<td>17</td>
<td>67</td>
</tr>
<tr>
<td>13</td>
<td>50</td>
<td>33</td>
</tr>
<tr>
<td>14</td>
<td>33</td>
<td>50</td>
</tr>
<tr>
<td>15</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>22-23</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>8, 25</td>
<td>17</td>
<td>67</td>
</tr>
<tr>
<td>Intertree</td>
<td></td>
<td></td>
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<tr>
<td>1</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>50</td>
</tr>
</tbody>
</table>
Staff Personnel Algorithmic Profile Data Listings

Table 14 explicates 12 intratree algorithmic statements and one intertree statement. The data relationships provide information generation potential concerning staff personnel.

TABLE 14

STAFF PERSONNEL TREE
ALGORITHMIC PROFILE DATA STATEMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Obtain the total number of staff members in each Occupational Category; i.e. teacher, nurse, bus driver, secretary, etc. in each School and in each Agency Component; i.e. decentralized unit or planning area, by totalling the entries in element 1, &quot;Name,&quot; by Occupational Category for each School and each Agency Component.</td>
</tr>
<tr>
<td>4</td>
<td>Ascertain information indicating the number of staff members &quot;on leave&quot; for each Occupational Category in each Agency Component by totalling the entries in the &quot;on leave&quot; category of element 4, &quot;Present status (assigned, on leave, released, terminated)&quot; by Occupational Category for each Agency Component.</td>
</tr>
<tr>
<td>8</td>
<td>Ascertain the stratification of ethnic characteristics of staff by Occupational Category, School and Agency Component by totalling the entries in each ethnic characteristic code from element 8, &quot;Ethnic characteristic code,&quot; for each Occupational Category, each School and each Agency Component.</td>
</tr>
<tr>
<td>11</td>
<td>Obtain information about a dimension of the tenure status of staff by totalling the entries in element 11, &quot;Present contract code (one year, one year probationary, etc.)&quot; for each contract code by Occupational Category in each School and in each Agency Contract.</td>
</tr>
<tr>
<td>14</td>
<td>Ascertain the total revenue needed for salaries of all employees in each Occupational Category and the total revenue needed in the Agency by totalling the values in element 14, &quot;Present total contracted salary,&quot; for each Occupational Category and for the Agency.</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>20</td>
<td>Ascertain the annual absentee rate by Occupational Category in each Agency Component by totalling the values in element 20, &quot;Days absent per year,&quot; for each Occupational Category in each Agency Component and by dividing each total by the number of entries in each Occupational Category in each Agency Component.</td>
</tr>
<tr>
<td>22</td>
<td>Obtain a generalized concept of the staff performance in each School by totalling the entries in element 22, &quot;Position performance appraisal&quot; for each category of performance appraisal for each category of performance appraisal for each Occupation Category in each School.</td>
</tr>
<tr>
<td>31</td>
<td>Ascertain information about staff members who terminate their employment by totalling element 31, &quot;Reason for termination code&quot; for each code for each Occupational Category for each School.</td>
</tr>
<tr>
<td>35</td>
<td>Obtain a composite picture of the educational attainment level of the staff by totalling the entries in each code of element 35, &quot;Highest degree or certificate received code,&quot; for each Occupational Category in each School and in the Agency.</td>
</tr>
<tr>
<td>46</td>
<td>Ascertain one of the dimensions of the pre-employment history of staff members by totalling each category of element 46, &quot;All previous experience code (teacher, secretary, painter, bus driver, etc.)&quot; by each Occupational Category in each School.</td>
</tr>
<tr>
<td>49</td>
<td>Ascertain information about the location of pre-employment experience by totalling each code from element 49, &quot;Experience by LEA location code (central city urban, non-central city urban, suburban, rural)&quot; for each Occupation Category in each School and in the Agency.</td>
</tr>
<tr>
<td>55</td>
<td>Obtain the number of teachers with bilingual competencies on the staff by totalling element 55, &quot;Bilingual competency code,&quot; in each School and in the Agency.</td>
</tr>
</tbody>
</table>

**Intertree Algorithms**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Obtain the degree of positive relationship between higher salaried personnel and positive responses on job perception codes such as job involvement, personal security, autonomy, etc. for each Occupational Category in each Agency Component.</td>
</tr>
</tbody>
</table>
Assessment of the Listings in the Staff Personnel Tree

Table 15 depicts each of the listings and the responses by both groups to each statement. Each of the 12 intratreer statements and the one intertree statement received majority agreement responses by each of the groups.

### TABLE 15

ASSESSMENTS OF LISTINGS IN THE STAFF PERSONNEL TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intratreer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>11</td>
<td>50</td>
<td>33</td>
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<tr>
<td>14</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td>20</td>
<td>33</td>
<td>67</td>
</tr>
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<td>22</td>
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<td>35</td>
<td>50</td>
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<td>67</td>
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<td>67</td>
</tr>
<tr>
<td>55</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td><strong>Intertree</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>67</td>
</tr>
</tbody>
</table>
Educational Facilities Algorithmic Profile Data Listing

Table 16 explicates 14 intratre e algorithmic profile data statements. Each of these statements has the potential of providing data and generating information about educational facilities. No intertree statements were provided.

**TABLE 16**

**EDUCATIONAL FACILITIES TREE ALGORITHMIC PROFILE DATA STATEMENTS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratre e Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Determine the number of rooms or definable areas in each Building and each School by totalling the number of entries in element 1, &quot;Number (I.D.)&quot; for each Building and each School.</td>
</tr>
<tr>
<td>6</td>
<td>Obtain information about the potential painting needs in each building by totalling all rooms or definable areas where five or more years have lapsed since last painting as indicated from element 6, &quot;Date of last interior painting&quot; for each Building.</td>
</tr>
<tr>
<td>8</td>
<td>Obtain information about the magnitude of fire extinguisher recharging by totalling the values in element 8, &quot;Number of fire extinguishers&quot; for each Building and each Agency Component.</td>
</tr>
<tr>
<td>9</td>
<td>Ascertai n the toilet provisions made for the handicapped by totalling the entries in element 9, &quot;Toilet provisions for the handicapped,&quot; for each Building and each Agency Component.</td>
</tr>
<tr>
<td>11</td>
<td>Obtain information indicating the number of rooms designed for each functional use by totalling the values in each code from element 11, &quot;Room design code,&quot; for each Building and each Agency Component.</td>
</tr>
<tr>
<td>12</td>
<td>Obtain information indicating the utilization of rooms for each specified use by totalling the values in each code of element 12, &quot;Room use code,&quot; in each Building and in the Agency Component.</td>
</tr>
<tr>
<td>13</td>
<td>Obtain information indicating the total number of student learning stations available in rooms designed for each designated use by totalling element 15, &quot;Number of learning stations,&quot; for each room design code in each Building and in each School and in each Agency Component.</td>
</tr>
</tbody>
</table>
TABLE 16 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>69</td>
<td>Ascertain information indicating the number of relocatable units available in each Agency Component by totalling the values in element 69, &quot;Number of relocatable units,&quot; for each School and each Agency Component.</td>
</tr>
<tr>
<td>94</td>
<td>Obtain an historical perspective on annual costs of custodial services by displaying in graphical form the values in element 94, &quot;Annual custodial costs,&quot; for each of the past five years for each Building.</td>
</tr>
<tr>
<td>95</td>
<td>Obtain an historical perspective on annual costs of maintenance services by displaying in graphical form the values in element 95, &quot;Annual maintenance costs&quot; for each of the past five years for each Building.</td>
</tr>
<tr>
<td>96</td>
<td>Obtain an historical perspective on annual costs of utilities services by displaying in graphical form the values in element 96, &quot;Annual utilities costs,&quot; for each Building in each of the past five years.</td>
</tr>
<tr>
<td>107,108</td>
<td>Ascertain the square foot cost of initial construction for each Building by dividing the values in element 107, &quot;Cost of construction,&quot; by the corresponding values in element 108, &quot;Total square feet of building.&quot;</td>
</tr>
<tr>
<td>123</td>
<td>Obtain information indicating the total number of acres of sites in each Agency Component by totalling the values in element 123, &quot;Site size in acres,&quot; for each Agency Component.</td>
</tr>
<tr>
<td>124,125</td>
<td>Ascertain the magnitude of parking lots in each parking lot surface code category by totalling the values in element 124, &quot;Number of parking spaces,&quot; for each code in element 125, &quot;Parking lot surface code&quot; at each Building and in each Agency Component.</td>
</tr>
</tbody>
</table>

Assessment of the Listings in the Educational Facilities Tree

Table 17 depicts the per cent responses for each of the two groups of assessors. Thirteen of the 14 statements received majority agreement from the university staff respondents. One item, labeled 107, 108, failed to receive endorsement. This item sought to provide data about "the square
foot cost of initial construction for each Building." Information of this order could be more useful for operational planning than tactical planning. Additionally, during the present period of rapidly escalating costs, such information could be insignificant. After restudy and with the lack of endorsement from the university staff respondents, this item was omitted from the central office staff assessment instrument.

Table 17 shows all 13 items receiving endorsement from the central office staff respondents.

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td>8</td>
<td>33</td>
<td>50</td>
</tr>
<tr>
<td>9</td>
<td>33</td>
<td>50</td>
</tr>
<tr>
<td>11</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>12</td>
<td>50</td>
<td>33</td>
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<tr>
<td>13</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>69</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>94</td>
<td>33</td>
<td>67</td>
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<tr>
<td>95</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>96</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>107,108</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>123</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>124,125</td>
<td>33</td>
<td>50</td>
</tr>
</tbody>
</table>
Financial Resources Algorithmic Profile Data Listings

Table 18 explicates seven intratree algorithmic profile data statements. These statements are designed to provide information about the financial resources in a school district. In addition to the seven intratree statements, three intertree statements are provided.

TABLE 18
FINANCIAL RESOURCES TREE
ALGORITHMIC PROFILE DATA STATEMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree Algorithms</th>
</tr>
</thead>
</table>
| 1-6  | Obtain information indicating the total revenue collected by Schools for each of the following elements by totalling the values in each element:  
  element 1, "Revenue from student fees"  
  element 2, "Revenue from internal accounts"  
  element 3, "Revenue from sale of consummable supplies"  
  element 4, "Revenue from sale of other items"  
  element 5, "Revenue from fines"  
  element 6, "Other revenue received"  
for each School and for the Agency. |
| 7-8  | Ascertain the total assessed valuation in the Agency by adding the values in element 7, "Assessed valuation of personal property in the local district" to the values in element 8, "Assessed valuation of real property in the local district." |
| 9    | Develop information indicating anticipated annual revenue from local real and personal property taxes by multiplying the sum of the assessed valuations, elements 7 and 8, by the value in element 9, "Local district tax rate for operating monies." |
| 10   | Develop information indicating anticipated annual bond retirement revenue by multiplying the sum of elements 7 and 8 by the value in element 10, "Local district tax rate for bond retirement." |
| 9, 10| Present an historical perspective on the tax rates for each of the past ten years for operating monies and bond retirement monies in graphical form. |
TABLE 18 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7, 8</td>
<td>Present an historical perspective on the sums of each, the assessed valuation on personal property and the assessed valuation on real property, for each of the past ten years and develop and display in chart form the index of change from the base year. Total the revenue received by the Agency from all sources, determine the amount from each source and present a per cent figure for each source by dividing the revenue from each source by the total revenue received for each of the past ten years. Display these per cents in graphical form.</td>
</tr>
</tbody>
</table>

**Intertree Algorithms**

1. Ascertain the assessed valuation per pupil by dividing the total personal and real property valuation of the Agency by the total public school pupil population in the Agency.

2. Ascertain the assessed personal property valuation per pupil by dividing the total assessed personal property valuation in the Agency by the total number of pupils in the Agency.

3. Ascertain the assessed personal property valuation for each general use code category for non-dwelling units; i.e. light industry, heavy industry, commercial, retail, agriculture, in the Agency.

Assessments of the Listings in the Financial Resources Data Tree

Table 19 depicts each item responses and shows majority endorsement by each group on each item. In fact, the university staff responses indicate either "agree" or "strongly agree" on each item. The central office staff indicated "agree" or "strongly agree" on each intratree statement with the exception of item 1-6 and the intertree statements but all items received majority agreement.

Item 10 in Table 19 indicates no responses for the university staff. The rating scale was erroneously omitted from the assessment instrument.
Because this item was deemed to be important it was included in the assessment instrument for the central office staff. It received 100 per cent in the "strongly agree" response category.

**TABLE 19**

**ASSESSMENTS OF LISTINGS IN THE FINANCIAL RESOURCES TREE**

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
</tr>
<tr>
<td>Intratree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-6</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>7-8</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>9</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9, 10</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>7, 8</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>--</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Intertree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td>3</td>
<td>17</td>
<td>83</td>
</tr>
</tbody>
</table>

**Transportation Algorithmic Profile Data Listings**

Table 20 explicates 11 intratree algorithmic profile data statements and two intertree statements. Each of these statements is designed to profile data for school district transportation planning.
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ascertain the number of buses operating in each Agency Component; i.e., Decentralized unit or Planning area, by totalling the entries in element 1, &quot;Bus number assigned,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>2</td>
<td>Obtain the number of buses with an excess of 60,000 on the odometer in each Agency Component; i.e. Decentralized unit or Planning area, by totalling the number of entries in element 3, &quot;Mileage registered on odometer at beginning of year,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>3</td>
<td>Ascertain the number of buses in each year of age by totalling the number of entries at each age from element 4, &quot;Age,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>4</td>
<td>Obtain the maximum total number of students who can be transported on a single run of all buses by totalling the entries in element 5, &quot;Pupil capacity,&quot; for each Agency Component.</td>
</tr>
<tr>
<td>5</td>
<td>Obtain the total number of buses of each body type in the Agency by totalling the number of buses of each body type from element 14, &quot;Body type code,&quot; in the Agency.</td>
</tr>
<tr>
<td>6</td>
<td>Ascertain the total number of accidents by accident type in each Agency Component by totalling the number of entries for each code from element 19, &quot;Classification of accident by code,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>7</td>
<td>Obtain the number of miles traveled by buses for each Program Component; i.e. Regular routes, Non-public, Extracurricular, etc. by totalling the entries for each Program Component from element 22, &quot;Number of miles on trips,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>8</td>
<td>Ascertain the total number of students transported in each Agency Component for each Program Component; i.e. Regular routes, Non-public, Extracurricular, etc. by totalling the entries for each Program Component from element 23, &quot;Number of pupils transported on trips,&quot; for each Agency Component.</td>
</tr>
<tr>
<td>9</td>
<td>Ascertain the total amount of driving time in each Program Component by totalling element 26 &quot;Driving time on trips,&quot; for each Program Component in each Agency Component.</td>
</tr>
</tbody>
</table>
TABLE 20 (continued)

- Ascertain a ratio of miles traveled per student transported for each Program Component by dividing the totals in each Program Component in element 22, "Number of miles on trips" by element 23, "Number of pupils transported on trips," for each Agency Component.

Intertree Algorithms

1. Ascertain the cost per pupil transported in the Agency Component by dividing the total costs for transportation of pupils by the total number of pupils transported in each Agency Component.

2. Ascertain the average total cost per mile of travel for the transportation fleet by dividing the total costs of transportation by the total number of miles logged for each transportation vehicle in each Agency Component.

Assessment of the Listings in the Transportation Data Tree

Table 21 depicts the responses to each of the 11 intratree listings and the two intertree listings. Nine of the 11 intratree listings received majority endorsement as did both intertree listings. The two items, 14 and 15, which failed to receive majority endorsement, could be determined to be more meaningful for operational planning than tactical planning. These items sought data about the number of buses of each "body type" and each "chassis type." After restudy and with lack of endorsement by the university respondents, it was decided to omit items 14 and 15 in the iteration for the central office staff assessment instrument.

TABLE 21

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Central Office Staff</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intratree</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
<td></td>
<td>SA</td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>1</td>
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<td>50</td>
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<td>78</td>
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<td>56</td>
<td>44</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>17</td>
<td>67</td>
<td>17</td>
<td>0</td>
<td></td>
<td>67</td>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>33</td>
<td>67</td>
<td>0</td>
<td>0</td>
<td></td>
<td>67</td>
<td>33</td>
<td>0</td>
</tr>
</tbody>
</table>
TABLE 21 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
</tr>
<tr>
<td>14</td>
<td>17</td>
<td>33</td>
</tr>
<tr>
<td>15</td>
<td>17</td>
<td>33</td>
</tr>
<tr>
<td>19</td>
<td>17</td>
<td>67</td>
</tr>
<tr>
<td>22</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>23</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>26</td>
<td>20</td>
<td>40</td>
</tr>
</tbody>
</table>

Intertree

| Item | | |
|------|------------------|
|      | 40   | 60  | 0   | 0  |
|      | 89   | 11  | 0   | 0  |
| 2    | 40   | 60  | 0   | 0  |
|      | 78   | 22  | 0   | 0  |

Food Service Algorithmic Profile Data Listings

Table 22 explicates 13 intratree and two intertree algorithmic profile data statements. These statements are designed to provide data for tactical planning in the food service area.

TABLE 22

FOOD SERVICE TREE
ALGORITHMIC PROFILE DATA STATEMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ascertain the total numbers of serving kitchens and food preparation kitchens by totalling the number of responses for each category from element 1, &quot;Kitchen description (serving and/or preparation)&quot; for each Agency Component; i.e. Decentralized unit or Planning area.</td>
</tr>
<tr>
<td>2</td>
<td>Ascertain the magnitude of the a la carte programs in each of the Schools by totalling the entries in element 2, &quot;Total receipts from a la carte meals,&quot; for each School.</td>
</tr>
</tbody>
</table>
TABLE 22 (continued)

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
</tr>
<tr>
<td>2, 3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>13, 14</td>
</tr>
<tr>
<td>24</td>
</tr>
</tbody>
</table>
TABLE 22 (continued)

| Item | Obtain attitudinal data concerning the food service program by summing the corresponding values in element 25, "Extent to which the following groups believe the objectives of the food service program are being achieved (superior achievement, above average, average, below average, hardly at all)"
| | a. students
| | b. staff
| | c. parents
| | d. board of education
| | e. others"
| for each School.

Obtain the difference between the total receipts and the total expenditures for all food service operations in each School for each of the past five years and display these answers in graphical form.

**Intertree Algorithms**

1. Ascertain the numbers of families in various income ranges from element 14 of the Population Data Tree and the numbers of students, ages 5-17, from element 15 of this tree in families with the different income ranges and correlate the numbers of pupils served free lunches from the Food Service Tree, element 4, for each School in the Agency.

2. Ascertain the numbers of families in various income ranges from element 14 of the Population Data Tree and the numbers of students, ages 5-17, from element 15 of this tree in families with the different income ranges and correlate the numbers of pupils served reduced price lunches from the Food Service Tree, element 5, for each School in the Agency.

**Assessments of the Listings in the Food Service Data Tree**

Table 23 depicts the responses of the university staff members and the central office staff members to the assessments of the algorithmic profile data statements in the food service tree. The tabulation of the assessments of the 13 intratree and two intertree listings indicates majority agreement by each of the two groups on each of the items.
### TABLE 23
ASSSESSMENTS OF THE LISTINGS IN THE FOOD SERVICE TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
</tr>
<tr>
<td>Intratree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>33</td>
<td>67</td>
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<tr>
<td>2, 3</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
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<td>5</td>
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<td>-</td>
<td>33</td>
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<tr>
<td>13, 14</td>
<td>50</td>
<td>50</td>
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<tr>
<td>24</td>
<td>0</td>
<td>60</td>
</tr>
<tr>
<td>25</td>
<td>0</td>
<td>83</td>
</tr>
<tr>
<td>-</td>
<td>40</td>
<td>60</td>
</tr>
</tbody>
</table>

| Intertree |      |      |      |    |      |      |      |    |
| 1    | 17   | 67   | 17   | 0  | 33   | 33   | 33   | 0  |
| 2    | 17   | 67   | 17   | 0  | 33   | 33   | 33   | 0  |

**Business Management Algorithmic Profile Data Listings**

Table 24 explicates 13 intratree algorithmic profile data statements and one intertree statement. These statements are designed to provide data for tactical planning in the area of business management.
TABLE 24
BUSINESS MANAGEMENT TREE
ALGORITHMIC PROFILE DATA STATEMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ascertain a dimension of the magnitude of the bookkeeping process in each School by totalling the values in element 1, &quot;Number of active accounts,&quot; for each School.</td>
</tr>
<tr>
<td>7</td>
<td>Ascertain the extent to which individuals from the following categories participate in ordering of supplies, materials and equipment by totalling the values in each category in element 7, &quot;Extent to which the following groups participate in ordering supplies, materials and equipment (constantly, frequently, moderately, rarely, or never) pupils teachers building administrators parents skill or craft committees central office administrators board of education members others&quot; in each School and each Agency Component.</td>
</tr>
<tr>
<td>8</td>
<td>Ascertain the extent to which individuals from the same categories as element 7 participate in the determination of the allocation of funds to the different purchase categories by totalling the values in each category in element 8, &quot;Extent to which the following groups participate in the determination of the allocation of funds to the different purchase categories (constantly, frequently, moderately, rarely, or never) pupils . . . others&quot; in each School and each Agency Component.</td>
</tr>
<tr>
<td>9</td>
<td>Ascertain the extent to which individuals from the same categories as element 7 participate in an evaluation of the budgetary processes (constantly, frequently, moderately, rarely, or never) pupils . . . others&quot; in each School and in each Agency Component.</td>
</tr>
</tbody>
</table>
TABLE 24 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>27, 28</td>
<td>Ascertain the trend in operational costs for supplies and equipment by constructing an historical record of operational costs from the values in element 27, &quot;Operational costs for materials and supplies: program-related,&quot; and element 28, &quot;Operational costs for materials and supplies: student-related&quot; for each of the past five years in each School and each Agency Component.</td>
</tr>
<tr>
<td>38</td>
<td>Ascertain information about the extent of cooperative purchasing procedures in the Agency by totalling the values for each group in element 46, &quot;Assessment of purchasing procedures (good, fair, poor)&quot; by: pupils teachers building administrators parents skill or craft committees central office administrators board of education members others&quot; for the Agency.</td>
</tr>
<tr>
<td>47</td>
<td>Obtain attitudinal information about the assessment of auditing procedures in the Agency by totalling the values for each group in element 47, &quot;Assessment of auditing procedures (good, fair, poor)&quot; by:</td>
</tr>
</tbody>
</table>
TABLE 24 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>others&quot; for the Agency.</td>
</tr>
</tbody>
</table>

48 Obtain attitudinal information about the assessment of the accounting procedures in the Agency by totalling the values for each group in element 48, "Assessment of the accounting procedures (good, fair, poor) by: pupils |
|      |        |
|      |        |
|      | others" for the Agency. |

49 Obtain attitudinal information about the assessment of the inventory procedures in the Agency by totalling the values for each group in element 49, "Assessment of the inventory procedures (good, fair, poor) by: pupils |
|      |        |
|      |        |
|      | others" for the Agency. |

50 Obtain attitudinal information about the assessment of payroll procedures in the Agency by totalling the values for each group in element 50, "Assessment of the payroll procedures (good, fair, poor) by: pupils |
|      |        |
|      |        |
|      | others" for the Agency. |

51 Obtain attitudinal information about the assessment of budgetary procedures in the Agency by totalling the values for each group in element 51, "Assessment of the budgetary procedures (good, fair, poor) by: pupils |
|      |        |
|      |        |
|      | others" for the Agency. |
Assessments of the Listings in the Business Management Data Tree

Table 25 depicts the responses by the university staff and the central office staff members to the 13 intratree and one intertree statements in the Business Management Tree. Ten of the 13 intratree statements and the one intertree statement received majority agreement responses by the university staff members. The three items, 7, 47, and 49, failed to receive majority endorsement. Each of these items could be determined to provide data more appropriate to the operational planner than the tactical planner. They sought data about "the extent to which selected groups or individuals participated in the ordering of supplies and materials; attitudinal information about auditing procedures by these same groups or individuals; and attitudinal information about inventory procedures." After restudy and with the lack of endorsement by the university staff respondents, it was decided to omit these items in the iteration for the central office staff assessment. In the assessment by the central office staff members each item assessed received majority endorsement.
TABLE 25

ASSESSMENTS OF THE LISTINGS IN THE BUSINESS MANAGEMENT TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
</tr>
<tr>
<td>Intratree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>7</td>
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<td>33</td>
</tr>
<tr>
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<td>17</td>
<td>83</td>
</tr>
<tr>
<td>9</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td>27,28</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>23-26</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>38</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td>46</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>47</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>48</td>
<td>17</td>
<td>50</td>
</tr>
<tr>
<td>49</td>
<td>0</td>
<td>50</td>
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<tr>
<td>50</td>
<td>0</td>
<td>67</td>
</tr>
<tr>
<td>51</td>
<td>17</td>
<td>67</td>
</tr>
<tr>
<td>Intertree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Organizational Management Algorithmic Profile Listings

Table 26 explicates five intratree and two intertree algorithmic profile data statements. These statements are designed to provide data for the tactical planner in the area of organizational management of the school district. Each of the five intratree statements are multi-dimensional. The first four statements utilize the first 31 elements from data level one in four different analyses.
TABLE 26
ORGANIZATIONAL MANAGEMENT TREE
ALGORITHMIC PROFILE DATA STATEMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-31</td>
<td>For each of the 15 job perception codes, and the 16 measures determine the perceptions of each School, Agency Component and the Agency by totalling the responses of staff in each School, Agency Component and Agency for each element 1-31 as follows:</td>
</tr>
</tbody>
</table>

  element 1, "Job involvement" (degree to which the job is perceived as having priority over all other things in life)
  element 2, "Personal security" (degree to which individuals are happy with amount of job security)
  element 3, "Autonomy" (degree to which group functions independently of other groups and occupies an independent position in society)
  element 4, "Control exercised on individuals" (degree of regulation of individuals while functioning as group members)
  element 5, "Flexibility" (degree of informality of group procedures, in contrast to adherence to established procedures)
  element 6, "Hedonic tone" (degree to which membership is accompanied by pleasant effect)
  element 7, "Homogenity" (degree to which members are similar with respect to socially relevant characteristics)
  element 8, "Intimacy" (degree to which members are mutually acquainted and familiar with personal details of one another's lives)
  element 9, "Participation" (degree to which members apply time and effort to group activities)
  element 10, "Permeability" (degree to which group permits ready access to membership)
  element 11, "Polarization" (degree to which group is oriented and works toward a single goal which is clear and specific to all members)
  element 12, "Potency" (degree to which group has primary significance to members)
  element 13, "Stability" (degree of persistence over time with essentially unchanged characteristics)
  element 14, "Stratification" (degree to which membership is ordered into status hierarchies)
  element 15, "Viscidity" (degree to which members function as a unit) |
TABLE 26 (continued)

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
</table>

Measures of Normative Environment Codes
- element 16, "Clarity of objectives toward which to work"  
- element 17, "Clarity of rules, policies and guidelines"  
- element 18, "Extent to which workers are given conflicting priorities"  
- element 19, "Extent to which central office changes policies without advance notice"  

Measures of Intertask Structure (coordination) Codes
- element 20, "Extent to which related jobs are meshed to achieve objectives"  
- element 21, "Extent to which independent assignments are well planned"  

Measures of Conditions for Negotiating Orders Codes
- element 22, "Ease of exchanging ideas and information with others doing related work"  
- element 23, "Extent to which people doing related work avoid creating problems for one another"  
- element 24, "Extent to which coordination problems with others doing related work are handled"  

Measures of Levels of Skills Codes
- element 25, "Proportion of personnel who are competent to do the work assigned to them"  
- element 26, "Perception of self as competent to do work assigned"  

Measures of Rational-Trust Relationship Codes
- element 27, "Extent to which central office is perceived as following its own rules"  
- element 28, "Extent to which central office is perceived as understanding teachers' needs, problems and points of view"  
- element 29, "Extent to which central office is perceived as understanding non-certificated staff needs, problems, and points of view"  
- element 30, "Extent to which central office is perceived as understanding all other employee needs, problems, and points of view"  
- element 31, "Extent to which top management is perceived as fair and reasonable"  

1-31 For each of the 15 job perception codes and the 16 measures, determine the perceptions of each Occupational Category, i.e. Teacher, Nurse, Bus Driver, Secretary, etc., in each Agency Component and in the Agency by totalling the responses to each element (1-31) for each Occupational Category in each Agency Component and for the Agency. (The same job perception codes and measures elements 1-31 will be used as in (A) above.)
TABLE 26 (continued)

**Item**

| 1-31 | If longitudinal data are available, determine the changes in job perceptions and measures over the past five years in each of the 31 elements in each School, Agency Component and the Agency by totalling the responses to each element 1-31 in each of the past five years for each School, Agency Component and the Agency and present this data in graphical form. (The same job perception codes and measures elements 1-31 will be used as were printed in (A) above.) |

| 1-31 | If longitudinal data are available, determine the changes in job perceptions and measures over the past five years in each Occupational Category for each Agency Component and in the Agency by totalling the responses to each element 1-31 in each of the past five years for each Agency Component and the Agency and present this data in graphical form. The same job perception codes and measures, elements 1-31, will be used as were printed in (A) above.) |

**Data to be Collected on the Agency Component**

If there is a ruling board, this body can compose the answers to each of the elements 32-43. Likewise, the staff of the Agency Component can be surveyed to compile the answers to these elements. Each of the elements will be scaled to present a range of expectations. As many different stratifications of expectations can be made as there are employee groups. If major changes occur in central staff personnel, a before and after listing of expectations ranges can be made. Without major changes in staff personnel at the central office, it may still be desirable to make periodic, once every five years, survey to determine if changes in expectations have occurred.

**32-43** To ascertain these expectations, total the responses to each individual element, 32-43, for each Occupational Category for each Agency Component.

- element 32, "Contributions to be made"
- element 33, "Freedom to act"
- element 34, "Goal (outcome) values"
- element 35, "Freedom to interact"
- element 36, "Discontinuity of membership"
- element 37, "Mutual liking"
- element 38, "Non-task performance"
- element 39, "Task specialization"
- element 40, "Returns from the organization"
- element 41, "Task performance"
- element 42, "Task urgency"
- element 43, "Reference group support"
TABLE 26 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Intertree Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Correlate the responses to job perception categories from the Organizational Management Tree with the different salary levels of each Occupational Category from the Staff Personnel Tree in each Agency Component.</td>
</tr>
<tr>
<td>2</td>
<td>Correlate the degree of satisfaction indicated from the Organization Management Tree with total working experience ranges in each Occupational Category from the Staff Personnel Tree in each Agency Component.</td>
</tr>
</tbody>
</table>

Assessments of the Listings in the Organizational Management Data Tree

Table 27 depicts the responses of the university staff and the central office staff members on the five intratree and the two intertree algorithmic profile data statements. Each of the groups responded with majority endorsement on each of the items in the two assessments.

TABLE 27

ASSESSMENTS OF LISTINGS IN THE ORGANIZATIONAL MANAGEMENT TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA   A   D   SD</td>
<td>SA   A   D   SD</td>
</tr>
<tr>
<td><strong>Intratree</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-31</td>
<td>17  83  0  0</td>
<td>78  22  0  0</td>
</tr>
<tr>
<td>1-31</td>
<td>17  83  0  0</td>
<td>56  44  0  0</td>
</tr>
<tr>
<td>1-31</td>
<td>17  67  17 0</td>
<td>44  56  0  0</td>
</tr>
<tr>
<td>1-31</td>
<td>17  67  17 0</td>
<td>33  67  0  0</td>
</tr>
<tr>
<td>32-43</td>
<td>17  67  17 0</td>
<td>56  44  0  0</td>
</tr>
<tr>
<td><strong>Intertree</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>17  83  0  0</td>
<td>56  22  22  0</td>
</tr>
<tr>
<td>2</td>
<td>17  83  0  0</td>
<td>44  44  11  0</td>
</tr>
</tbody>
</table>
Population Algorithmic Profile Listings

This is the first of four listings devoted to community data. This listing, Table 28, explicates 15 intratree algorithmic profile data statements designed to provide data from the area of population facts for the tactical planner. No intertree algorithmic profile data statements were constructed for this tree.

TABLE 28

POPULATION TREE
ALGORITHMIC PROFILE DATA STATEMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To determine the total number heads of households in a School Component Planning Area, total the number of responses to element 1, &quot;Address of head of household,&quot; in each School Component Planning Area.</td>
</tr>
<tr>
<td>2</td>
<td>Construct a graph showing the different numbers of heads of households in each age range by totalling the entries in element 2, &quot;Birth date,&quot; for each desired age range in each School Component Planning Area and for the Agency.</td>
</tr>
<tr>
<td>4</td>
<td>Determine the per cent in each ethnic group of heads of households by totalling the entries in element 4, &quot;Ethnic characteristic code,&quot; and totalling the number in each ethnic group and dividing each total in each ethnic group by the total number of heads of households in each School Component Planning Area and in the Agency.</td>
</tr>
<tr>
<td>5</td>
<td>Construct a graph showing the numbers of different heads of households in each educational attainment level range in the School Component Planning Area and in the Agency by totalling the number of responses in element 5, &quot;Educational attainment code,&quot; for each educational attainment level range in each School Component Planning Area and in the Agency.</td>
</tr>
<tr>
<td>6</td>
<td>Ascertain the total numbers of heads of households in each Occupational Group from element 6, &quot;Occupational code (defined by federal census),&quot; in each School Component Planning Area and in the Agency.</td>
</tr>
</tbody>
</table>
TABLE 28 (continued)

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>11</td>
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<tr>
<td>12</td>
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<tr>
<td>13</td>
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<tr>
<td>14</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
</tr>
</tbody>
</table>
TABLE 28 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Determine the number of children attending non-public schools, K-12, by totalling the responses in element 17, &quot;Number of children attending non-public schools, K-12,&quot; for each School Component Planning Area and in the Agency.</td>
</tr>
<tr>
<td>18</td>
<td>Determine the numbers of different families with different principle languages spoken in the home by totalling the responses in element 18, &quot;Principle language spoken in home code,&quot; by code in each School Component Planning Area and in the Agency.</td>
</tr>
</tbody>
</table>

Assessments of the Listings in the Population Data Tree

The responses by the university staff and the central office staff members are presented in Table 29. The assessment by the university staff members indicated majority endorsement for 14 of the 15 items. The item labeled 11 failed to receive majority endorsement in the agreement columns. This item sought to determine "the educational attainment level of spouses of heads of households." It may be that this data consideration was not significant enough in the perception of the university assessors. After restudy and with the lack of endorsement of item 11, it was decided to omit it in the iteration of the statements to be assessed by the central office staff members. In the assessment by the central office staff members, all items assessed received majority endorsement.
### TABLE 29
ASSESSMENTS OF THE LISTINGS IN THE POPULATION DATA TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th></th>
<th></th>
<th></th>
<th>Central Office Staff</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>Intratree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>17</td>
<td>83</td>
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<td>0</td>
<td>56</td>
<td>44</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>83</td>
<td>0</td>
<td>0</td>
<td>44</td>
<td>44</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>33</td>
<td>67</td>
<td>0</td>
<td>0</td>
<td>33</td>
<td>44</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
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<td>83</td>
<td>0</td>
<td>0</td>
<td>33</td>
<td>56</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>17</td>
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<td>56</td>
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<td>89</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
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<td>67</td>
<td>17</td>
<td>0</td>
<td>44</td>
<td>56</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>17</td>
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<td>50</td>
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<td>22</td>
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</tr>
<tr>
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<td>80</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>67</td>
<td>22</td>
<td>0</td>
</tr>
</tbody>
</table>

**Physical Algorithmic Profile Data Listings**

This listing is designed to provide facts about the physical attributes of the community and includes data about the different physical facilities within the community but excluding the school facilities. Table 30 explicates 28 intratree and 2 intertree algorithmic profile data statements.
### TABLE 30

**PHYSICAL TREE**

**ALGORITHMIC PROFILE DATA STATEMENTS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Determine the total number of dwelling units in each Block and each Agency Component by totalling the number of entries in element 1, &quot;Address,&quot; for each Block and each Agency Component.</td>
</tr>
<tr>
<td>2</td>
<td>Obtain the total number of dwelling units of each type by totalling the number of entries in each type from element 2, &quot;Type of unit code, single-family-detached, duplex, townhouse, garden apartment, mid-rise apartment, high-rise apartment, mobile home),&quot; for each Block and each Agency Component.</td>
</tr>
<tr>
<td>3</td>
<td>Determine the total number of dwelling units at each age range by totalling the number of entries for each age range from element 3, &quot;Year of construction,&quot; in each Block and in the Agency Component.</td>
</tr>
<tr>
<td>4</td>
<td>Determine the per cent of owner occupied dwelling units by totalling all the entries in element 4, &quot;Owner occupied or rented,&quot; totalling the number of entries in the owner occupied category and dividing this total by the total number of entries in element 4 for each Block and each Agency Component.</td>
</tr>
<tr>
<td>5</td>
<td>Display a graph of the various values of home if owner occupied by totalling the values in each price range from element 5, &quot;Estimated value of dwelling unit if owner occupied,&quot; for each Block and each Agency Component.</td>
</tr>
<tr>
<td>6</td>
<td>Display a graph of the various monthly rental rates of rented dwelling units by totalling the number of residences in each monthly rental rate range from the responses to element 6, &quot;Monthly rent of unit if rented,&quot; for each Block and each Agency Component.</td>
</tr>
<tr>
<td>7</td>
<td>Determine the number of dwelling units by type of unit code; i.e., single-family-detached, duplex, townhouse, garden apartment, mid-rise apartment, mobile home, with various numbers of bedrooms by using responses to element 7, &quot;Number of bedrooms,&quot; and element 2, &quot;Type of unit code,&quot; totalling for each Block and each Agency Component.</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>8</td>
<td>Obtain an indication of the stability of the population by determining the number of years of residency for heads of households by totalling each of the different lengths of occupancy from element 8, &quot;Year occupied by present head of household,&quot; for each Block and each Agency Component.</td>
</tr>
<tr>
<td>9</td>
<td>Determine the total number of non-dwelling units by totalling the entries in element 9, &quot;Address,&quot; for each Block and each Agency Component.</td>
</tr>
<tr>
<td>10</td>
<td>Ascertain the magnitude of the varieties of non-dwelling units by totalling the entries in each category of element 10, &quot;General use code (light industry, heavy industry, commercial, retail, agriculture),&quot; for each Block and each Agency Component.</td>
</tr>
<tr>
<td>12</td>
<td>Ascertain the number in each type of affiliation for occupants of non-dwelling units by totalling each occupant category code from element 12, &quot;Occupant category code (governmental, religious, private, etc.),&quot; for each Block and each Agency Component.</td>
</tr>
<tr>
<td>10, 13</td>
<td>Obtain information indicating a dimension of magnitude of non-dwelling units by general use code; i.e., light industry, heavy industry, commercial, retail, agriculture, by totalling element 13, &quot;Acreage of site,&quot; for each general use code category in each Block and each Agency Component.</td>
</tr>
<tr>
<td>14, 15</td>
<td>Ascertain the number of outside pools in each size category by totalling element 14, &quot;Outside pools,&quot; in size ranges from element 15, &quot;Dimensions of pools,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>16</td>
<td>Determine the number of baseball diamonds by totalling the responses to element 16, &quot;Baseball diamond,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>17</td>
<td>Determine the number of outside tennis courts by totalling the responses to element 17, &quot;Outside tennis courts,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>18</td>
<td>Determine the number of football and/or soccer fields by totalling the responses to element 18, &quot;Football and/or soccer fields,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>19</td>
<td>Determine the number of outside basketball courts by totalling the responses to element 19, &quot;Outside basketball courts,&quot; in each Agency Component.</td>
</tr>
</tbody>
</table>
### TABLE 30 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Determine the total acreage of developed general playground area by totalling the responses to element 21, &quot;Acreage of developed general playground area,&quot; for each Agency Component.</td>
</tr>
<tr>
<td>24</td>
<td>Determine the total acreage of nature exhibit area by totalling the responses to element 24, &quot;Acreage of nature exhibit area,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>25, 26</td>
<td>Determine the number of enclosed pools of each size by totalling the responses to element 25, &quot;Enclosed pools,&quot; by the sizes indicated in element 26, &quot;Dimensions of pools,&quot; in each Agency Component.</td>
</tr>
<tr>
<td>27</td>
<td>Determine the number of inside tennis courts in each Agency Component by totalling the number of entries in element 27, &quot;Inside tennis court(s),&quot; for each Agency Component.</td>
</tr>
<tr>
<td>28</td>
<td>Determine the number of inside basketball courts in each Agency Component by totalling the number of entries in element 28, &quot;Inside basketball court(s),&quot; for each Agency Component.</td>
</tr>
<tr>
<td>29</td>
<td>Determine the number of bowling allies in each Agency Component by totalling the number of entries in element 29, &quot;Bowling allies,&quot; for each Agency Component.</td>
</tr>
<tr>
<td>30, 31</td>
<td>Determine the number of equipped exercise rooms in each size category in each Agency Component by totalling the number of entries in element 30, &quot;Equipped exercise rooms,&quot; in each size category from element 31, &quot;Square footage of exercise rooms,&quot; for each Agency Component.</td>
</tr>
<tr>
<td>32, 33</td>
<td>Determine the number of facilities classified as inside multi-use recreational areas by size category in each Agency Component by totalling the entries in element 32, &quot;Inside multi-use recreational areas,&quot; in each size category indicated in element 33, &quot;Square footage of multi-use recreational areas,&quot; for each Agency Component.</td>
</tr>
<tr>
<td>34, 35</td>
<td>Determine the number of large-group meeting spaces of each size range category in each Agency Component by totalling the number of entries in element 34, &quot;Auditorium and/or theater,&quot; by each size-range category from element 35, &quot;Seating capacity of auditorium and/or theater,&quot; in each Agency Component.</td>
</tr>
</tbody>
</table>

Elements 14-40 can be recycled to determine eligibility for use by code for each Agency Component.

Elements 14-40 can be recycled to determine availability status.
TABLE 30 (continued)

Intertree Algorithms

1 Obtain the ratio of children per dwelling unit in each Agency Component by dividing the total number of dwelling units from the Physical Data Tree element 1 into the number of entries in Population Tree element 15 for birth dates showing children under 19.

2 Ascertain the extent of use of community special use facilities as such use accommodates the curriculum of the LEA by totalling the number of incidences of use and the total number of pupils involved in each community special use facility for each Curricular Area and for each Curricular Component--Age and Grade Level.

Assessments of the Listings in the Physical Data Tree

Table 31 depicts the tabulation of responses to the algorithmic profile data statements in the Physical Data Tree by both the university staff and the central office staff members. In each assessment each of the groups provided greater than majority endorsement for each of the 28 intratree and the two intertree statements.

TABLE 31
ASSSESSMENTS OF THE LISTINGS IN THE PHYSICAL DATA TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
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<td>SA A D SD</td>
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</table>
Activities and Services Algorithmic Profile Data Listings

This listing of algorithmic profile data statements is designed to provide data about the activities and services available in the community and in addition to the school offerings. Table 32 explicates nine statements of algorithmic profile data as intratree statements. No statements of intertree data relationships were drawn.

TABLE 32
ACTIVITIES AND SERVICES TREE
ALGORITHMIC PROFILE DATA STATEMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ascertain the total number of agencies categorized by Program Classification; i.e. General instruction, Job training, Employment placement, Counseling, General health, Mental health, Recreational, Cultural, by totalling the entries in element 1, &quot;Sponsoring agency name,&quot; in Program Classification categories in the Agency and in each Agency Component. Ascertain the total number of agencies in each Program Classification in each Agency Type; i.e. Local government, State government, Federal government, Religious institution, Industrial-business organization, other private organization, by totalling the agencies from element 1, &quot;Sponsoring agency name,&quot; categorized by Program Classification for each Agency Type in each Agency Component.</td>
</tr>
<tr>
<td>7</td>
<td>Ascertain the annual number of individuals seeking participation by age and sex in each Program Classification category in each Agency Component by totalling the entries in element 7, &quot;Annual number of individuals seeking participation by age and sex,&quot; for each Program Classification category in each Agency Component.</td>
</tr>
<tr>
<td>8, 9</td>
<td>Obtain a ratio indicating the degree to which programs are operating at desired capacity levels in each Agency Component for each Program Classification category by totalling element 8, &quot;Annual number of individuals participating by age and sex,&quot; and by totalling element 9, &quot;Desired annual program participation capacity by age and sex,&quot; with each total categorized for each Program Classification in each Agency Component by dividing the element 8 totals by the corresponding totals in element 9.</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>7, 9</td>
<td>Obtain a ratio indicating the degree to which individuals are accommodated who seek participation in each Program Classification in each Agency Component within the desired participation capacity of each Program Classification in each Agency Component by totalling for each Program Classification in each Agency Component element 7, &quot;Annual number of individuals seeking participation by age and sex,&quot; and element 9, &quot;Desired annual program participation capacity by age and sex,&quot; and by dividing the totals in element 7 by the corresponding totals in element 9.</td>
</tr>
<tr>
<td>9</td>
<td>Ascertain the magnitude of desired accommodation of each Program Classification by each Agency Type in each Agency Component by totalling element 9, &quot;Desired annual program participation capacity by age and sex,&quot; for each Program Classification in each Agency Type in each Agency Component.</td>
</tr>
<tr>
<td>12</td>
<td>Ascertain the annual cost of each Program Classification by Agency Type in each Agency Component by totalling element 12, &quot;Total annual cost of program,&quot; for each Program Classification in each Agency Type in each Agency Component.</td>
</tr>
<tr>
<td>8, 12</td>
<td>Ascertain the average annual participation cost for each Program Classification in each Agency Type in each Agency Component by dividing the totals in element 12, &quot;Total annual cost of program,&quot; by the corresponding totals in element 8, &quot;Annual number of individuals participating by age and sex,&quot; for each Program Classification in each Agency Type in each Agency Component.</td>
</tr>
<tr>
<td>8, 12, 13, 14, 15</td>
<td>Ascertain the average hourly cost per participant for each Program Classification in each Agency Type in each Agency Component by finding the product of element 13, &quot;Length of program in weeks per year,&quot; element 14, &quot;Number of meeting times per week,&quot; element 15, &quot;Length of meeting in hours,&quot; for each Program Classification in each Agency Type in each Agency Component and Classification in each Agency Type in each Agency Component and by dividing the above totals by the corresponding totals from element 8, &quot;Average number of individuals participating by age and sex.&quot;</td>
</tr>
</tbody>
</table>

Assessment of the Listings in the Activities and Services Data Tree

Table 33 depicts the responses of each group on each listing in Table 32. Each item received majority endorsement by each group.
TABLE 33
ASSESSMENTS OF THE LISTINGS IN THE ACTIVITIES AND SERVICES DATA TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
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</tr>
<tr>
<td>Intratree</td>
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<td>7, 9</td>
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<td>83</td>
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<td>12</td>
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<td>67</td>
</tr>
<tr>
<td>8, 12</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td>8, 12, 13, 14, 15</td>
<td>17</td>
<td>50</td>
</tr>
</tbody>
</table>

Governance Algorithmic Profile Data Listings

This governance data listing is designed to provide data about the political lines of communication, authority and organizational functioning within the community. Table 34 explicates 18 intratree algorithmic profile data statements constructed to show the relationships of data elements and data keys within the Governance Tree. No intertree listings are provided with this Tree.
TABLE 34
GOVERNANCE TREE
ALGORITHMIC PROFILE DATA STATEMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Intratree Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ascertain the total number of organizations by Type of Organization; i.e., Governmental, Religious, Service, Business and/or Industrial, Private organization, in each Agency Component; i.e., Decentralized unit or Planning area, by totalling the entries in element 1, &quot;Name of organization,&quot; by Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>8</td>
<td>Ascertain the total number of organizations of each Type which employ executive heads at less than 50 per cent time by totalling all entries to element 8, &quot;Percentage of time used for executive head position,&quot; which are less than 50 per cent and total by Type of Organization categories in each Agency Component.</td>
</tr>
<tr>
<td>9</td>
<td>Ascertain the total number of elected executive heads in each Type of Organization in each Agency Component by totalling the &quot;elected&quot; responses in element 9, &quot;Executive Head (elected or appointed),&quot; for each Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>10</td>
<td>Ascertain the lengths of terms of executive heads for each Type of Organization in each Agency Component by totalling the different length of term codes, one year, two year, etc. in element 10, &quot;Length of term of executive head by code,&quot; for each Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>11</td>
<td>Ascertain the number of salaried executive heads in each Type of Organization in each Agency Component by totalling the &quot;salaried&quot; responses in element 11, &quot;Executive head (salaried or non-salaried),&quot; categorized by each Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>12</td>
<td>Obtain organizational membership sizes for each Type of Organization in each Agency Component by totalling the values in element 12, &quot;Number in current total membership,&quot; for each Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>13</td>
<td>Ascertain membership eligibility requirements by Type of Organization in each Agency Component by totalling the responses to element 13, &quot;Membership eligibility code (employed, appointed, elected, anyone applying, restricted by geographic area, restricted by socio-economic level, restricted by occupation, restricted by religious affiliation, restricted by political affiliation),&quot; by Type of Organization in each Agency Component.</td>
</tr>
</tbody>
</table>
TABLE 34 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Ascertain the numbers of organizations of each Type of Organization in each Agency Component serving different specified age levels by totalling each specified age level response from element 14, &quot;Average age of membership,&quot; for each Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>15</td>
<td>Ascertain the number of new members this year in each Type of Organization in each Agency Component by totalling the values in element 15, &quot;Number of new members this year,&quot; for each Type of Organization in each Agency Component. Obtain relative rates of growth for this year of organizations by Type of Organization in each Agency Component by dividing totals from element 5, &quot;Number of new members this year,&quot; by corresponding totals from element 12, &quot;Number of current total membership,&quot; for each Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>16</td>
<td>Ascertain the characteristics of membership in each Type of Organization in each Agency Component by totalling each social or ethnic code by percentage ranges from element 16, &quot;Characteristics of membership by social or ethnic code and percentage ranges (black, white, American-Indian, Spanish-American, Oriental, other),&quot; for each Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>17</td>
<td>Ascertain the tenure of the numbers of different Types of Organizations in each Agency Component by totalling each code in element 17, &quot;Date of founding of organization by code,&quot; for each Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>18</td>
<td>Ascertain the geographical reach of organizations by Type of Organization in each Agency Component by totalling each category of element 18, &quot;Geographical breadth of organization (local, state, regional, national, international),&quot; for each Type of Organization in each Agency Component.</td>
</tr>
<tr>
<td>19</td>
<td>Obtain a dimension of stability of organizations by Type of Organization in each Agency Component by totalling the responses to element 19, &quot;Organization life span (temporary or long term),&quot; for each Type of Organization in each Agency Component.</td>
</tr>
</tbody>
</table>

For the following algorithm the ranking system will be:

- Singlemost important source .................. 1
- Among the most important source .......... 2
- A minor source .................................. 3
- Not at all important as a source .......... 4
**TABLE 34 (continued)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Task</th>
</tr>
</thead>
</table>
| 20   | Ascertain information about the extent to which membership perceives their organization as an information source to City Council, Mayor, City Commissioner, Board of Education, Superintendent of Schools, Zoning Board, Board of Health, Police Department, County Commissioners, Minority Special Interest Groups, Council of Churches, Chamber of Commerce, Service Clubs, PTA Organizations, Largest Local Industries and/or Businesses, Major Labor Unions, Voter Leagues, Realtors Association by totalling their responses about each group or individual from element 20, "How would you rank your organization as a source of ideas and advice to the following groups or individuals: City Council, Mayor...Realtors Association," in the Agency. The following rating system is used for elements 21, 22, and 23:  
Always.................................1  
Usually..............................2  
Sometimes...........................3  
Rarely.................................4  
Never........................................5 |
| 21   | Ascertain the extent to which members perceive their organizations seeking information concerning financial allocations within their organizations from the following groups or individuals: City Council, Mayor...Realtors Association by totalling the responses for each group or individual listed in element 21, "When your organization considers financial resource allocations with what frequency do you seek information from the following groups or individuals: City Council, Mayor...Realtors Association," in the Agency. |
| 22   | Ascertain the extent to which members perceive their organization as being requested to assist City Council, Mayor...Realtors Association in allocation of resources within each organization or individual's realm of responsibility by totalling the responses concerning each group or individual cited in element 22, "With what frequency do the following groups or individuals contact you to gain information when they are making decisions on allocations of resources: City Council, Mayor...Realtors Association," in the Agency. |
| 23   | Ascertain a dimension of cooperation between groups and/or individuals by totalling the responses for each group and/or individual cited in element 23, "Number of times in the past year your organization coordinated financial and/or personnel resources in a combined effort to reach a commonly held objective with each of the following groups or individuals: City Council, Mayor...Realtors Association," in the Agency. |
Assessments of the Listings of the Governance Data Tree

Table 35 depicts the responses of both groups of assessors on each of the items in the assessment instruments. The university staff responded in majority agreement to 13 of the 18 algorithmic profile data listings. Items 8, 9, 10, 11, and 17 failed to receive majority agreement by the university staff members. Statements 8, 9, 10 and 11 sought data about the organizational executive head. The data sought described whether the executive head was part-time or full-time; whether the executive head was appointed or elected; the length of tenure of the executive head's contract; and the total number of salaried executive heads in each Type of Organization in each Agency Component. Item 17 sought to determine the total number of organizations in each organizational tenure category in each Type of Organization by Agency Component.

Each of the statements, 8, 9, 10, 11 and 17, could be seen as insignificant to the tactical planner and/or more important to the operational planner. After restudy of each of the items and with the lack of majority agreement on each item by the university staff, it was decided to omit these from the listing of algorithmic profile data statements to be assessed by central office staff members.
### Table 35
ASSESSMENTS OF THE LISTINGS FOR THE GOVERNANCE DATA TREE

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
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<th></th>
<th>Central Office Staff</th>
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</table>
Assessments of the Illustrative Algorithmic Profile Data Statements from Three Selected Coordinate Agencies

The following three tables, 36, 37 and 38 present the tabulation of responses, in per cents, for each of the illustrative algorithmic profile statements from each of the three coordinate systems. Each of the items received majority endorsement from each of the two groups of respondents. The listings which were assessed are found in Tables 5, 6 and 7 respectively on pages 45, 46 and 47.

TABLE 36

ASSESSMENTS OF THE ILLUSTRATIVE LISTINGS FROM THE FEDERAL CENSUS COORDINATE SYSTEM

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th></th>
<th>Central Office Staff</th>
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</table>
TABLE 37
ASSESSMENTS OF ILLUSTRATIVE LISTINGS FROM THE REGIONAL PLANNING AGENCY COORDINATE SYSTEM

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>7</td>
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<td>60</td>
</tr>
</tbody>
</table>

TABLE 38
ASSESSMENTS OF ILLUSTRATIVE LISTINGS FROM LABOR UNIONS OR TEACHERS ASSOCIATIONS AGENCIES COORDINATE SYSTEMS

<table>
<thead>
<tr>
<th>Item</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
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<tr>
<td>1</td>
<td>40</td>
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<td>80</td>
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<tr>
<td>6</td>
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<td>60</td>
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</tbody>
</table>
Assessment of the Total Process

Five statements were posed to be assessed by the respondents. These statements sought a determination of the usefulness of the processes used in the development of the algorithmic profile data array. The five statements used are presented in Table 39.

**TABLE 39**

GENERAL STATEMENTS CONCERNING MEANINGFULNESS OF PROCESSES

<table>
<thead>
<tr>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The displays of algorithmic profile data in the three examples of listings from coordinate systems suggests an organization of data which is meaningful and useful.</td>
</tr>
<tr>
<td>2. The concept of developing an array of data relationships from raw profile data in a base data system is a meaningful concept and useful for planning information systems.</td>
</tr>
<tr>
<td>3. The combined array of data from intertree, intratree and coordinate systems presents a comprehensive array of data relationships needed in planning information systems.</td>
</tr>
<tr>
<td>4. This array of algorithmic profile data can increase the quality of the planning information system.</td>
</tr>
<tr>
<td>5. This array of algorithmic profile data can increase the quantity of information used in the planning information system.</td>
</tr>
</tbody>
</table>

Assessment of the General Statements Concerning Meaningfulness of Processes

Each respondent rated each of the above statements. The ratings are shown in Table 40. Each statement received high endorsement with all responses in either the "strongly agree" or "agree" categories.
### TABLE 40
**ASSESSMENTS OF GENERAL STATEMENTS**

<table>
<thead>
<tr>
<th>Statement Number</th>
<th>University Staff</th>
<th>Central Office Staff</th>
</tr>
</thead>
<tbody>
<tr>
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<td>A</td>
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<td>67</td>
</tr>
<tr>
<td>5</td>
<td>67</td>
<td>33</td>
</tr>
</tbody>
</table>

The following questions were included in each instrument with space for responses.

1. Are there additional intratree listings you think should be included? If so, please indicate them.
2. Are there additional intertree listings you think should be included? If so, please indicate them.
3. Are there any other important algorithmic profile data relationships which you think should be included? If so, what are they?

None of the respondents from the university staff or from the central office staffs indicated any additional algorithmic profile data statements to be added to the array. However, two university staff members included comments which were considered. None of the central office staff members wrote any comments regarding changing the listings.

One university staff member suggested "combining the Business Management Tree with the Financial Resources Tree." Because these exist as separate entities in the raw profile, data level one development and because each of these trees has sufficiently separate functions, this suggestion was rejected.
The other university staff member had several concerns. First, he indicated an apparent lack of emphasis on data for elementary level planning. After restudy, this investigator agreed with this comment and will add a data key entitled Program Component--Age or Grade Level to the appropriate statements. This addition will provide information about elementary dimensions equal to secondary dimensions.

This respondent questioned the lack of emphasis on the future. Such concern is valid but development of alternative futures is beyond the scope of this investigation and is indicated as an additional level of the data system.

Additionally, this respondent indicated "concern for the individual in this document." Any data system can be misused or used appropriately. The data system itself is neutral and its function must be determined by the planner. To the extent the planner is functioning to provide the best and most educational experiences for individual pupils, the planner is using this tool, the planning information system, for the benefit of the individual pupil.

**Summary**

From the tables and the preceding discussion, it can be discerned that the respondents endorsed highly the concept of the data system and the linking of coordinate systems. By far the majority of responses indicated agreement with most of the algorithmic profile data statements. The second iteration of listings received majority endorsement for each listing by the respondents in central office positions. The relative responses total per cents can be seen in Table 41.
The following statements are made in summarizing the findings:

1. Of the 179 intratree and intertree algorithmic profile data statements on the assessment instrument used by the university staff respondents, 164 statements received majority endorsement.

2. All 164 intratree and intertree algorithmic profile data statements assessed by respondents in central office positions received majority endorsement.

3. All 23 illustrative algorithmic profile data statements from the three selected examples of coordinate agency systems received majority endorsement.

4. Each general statement about the processes used received endorsement by each respondent to the extent of being rated either "strongly agree" or "agree."

5. None of the respondents suggested any additional algorithmic profile data statements.

6. Only two of the 15 respondents indicated any suggestions.
CHAPTER V

CONCLUSIONS, OBSERVATIONS, RECOMMENDATIONS AND A FINAL STATEMENT
OF THE DEVELOPED ARRAY OF USEFUL ALGORITHMIC PROFILE DATA

The major conclusion is the final statement of the array of algorithmic profile data. This array is the major portion of this chapter and the latter part of the chapter. The minor conclusions, observations and recommendations are stated in the first part of the chapter.

Minor Conclusions

The assessment instrument elicited responses on five general statements and the conclusions from these are cited in the order found in the instrument. The first statement was concerned with the relationship of coordinate systems and the base data system and was presented as follows: "The displays of algorithmic profile data in the three examples of listings from coordinate systems suggests an organization of data which is meaningful and useful." The complete endorsement of this statement by all respondents, leads to the conclusion that this process is meaningful and useful to these respondents. No suggestions for change in process are indicated.

The second through the fifth statements eliciting responses were stated as follows:

"1. The concept of developing an array of data relationships from raw profile data in a base data system is a meaningful concept and useful for planning information systems.

-111-
2. The combined array of data from intertree, intratree and coordinate systems presents a comprehensive array of data relationships needed in planning information systems.

3. This array of algorithmic profile data can increase the quality of the planning information system.

4. This array of algorithmic profile data can increase the quantity of information used in the planning information system.

Because these statements received total agreement from the respondents, it can be concluded that the concept of developing algorithmic profile data statements is endorsed as presented to these respondents.

No substantial change was indicated as desirable from any of the respondents. None of the respondents suggested additional algorithmic profile data statements in any of the categories. Only two of the fifteen respondents made any suggestions in the open-ended section of the instrument. Therefore, it is concluded that additional algorithmic profile statements are not necessary at this time.

Observations

The process of development of these algorithmic profile data statements is time-consuming and heavily biased by personal experience of the developer. The fact that such high agreement could be reached from others not as personally involved is indicative of the comprehensiveness of the development.

The word "overwhelming" was used by more than one respondent when the concept of the algorithmic profile data was presented. This can be indicative of the admiration of the product and also the breadth and depth of consideration necessary in understanding the total concept.
This process of development is an excellent strategy in a project of this type. The refinement of the product was important before it was submitted to its first audience. Refinement, with the knowledge gained from the first audience, was sufficiently correct to gain majority endorsement of the complete product on the second assessment.

Recommendations

Because this level two, algorithmic profile data, is a part of a larger total concept, it is suggested that field-testing of actual use of these data relationships be accomplished. This field-testing could be done with or without automatic data processing equipment. If computers are available, the field testing can be more comprehensive and in greater depth.

Further, it is recommended that the planning information system development be augmented by the development of data levels three and four. This further development can add importance to the level two development. The development of data level four can utilize the data at level two. Analyses at greater depth can occur when data level four is developed. Because of the magnitude of this level of data development, it is anticipated that many different projects could be formulated. Examples could include school building capacity indices development; pupil population projection techniques; organizational climate as it relates to staff efficiency and effectiveness and many other studies could evolve and further the total development of this Total Data System for Comprehensive Planning in Education.

Level three is not of the same order as levels one, two and four. Level three is identified as policy environmental conditions: present
and alternative futures. It is seen as descriptive of conditions which exist or are projected to exist. As such, it becomes the parameters within which the system functions. Development of level three will probably be of a definitive order and only require minimal kinds of efforts.

The fact that this system is an open system should be noted and used. One of the principles of data systems states that they should be "situation specific and user determined." With an open system this principle can be met. As this system is used, it should be used only to the extent that each part is needed. It is designed to be used in parts or as a total system. As new data relationships are needed, additional algorithmic statements should be drawn. If new needs replace old needs, old algorithmic profile data statements can be removed from the system.

Major Conclusion

The following array of algorithmic profile data has been judged and perceived as useful by 15 assessors. The only change in content from the last iteration, the listing assessed by central office personnel, is the addition of a data key in some of the listings in the Curriculum and Instruction Tree. This data key is Program Component-Age or Grade Level; i.e., Nursery, Kindergarten, Grades 1-14 or Age group, Adult Education. The addition of this key resulted from careful consideration and subsequent agreement by this investigator with a statement that "the listings in this tree did not appear to be comprehensive enough to include elementary grades." With the addition of data collected on this data key, elementary grades or age groups will be included where appropriate.
There is a change in form from the last iteration. The listings are now algorithmic profile data. The statements on the assessment instruments included the language necessary for greater understanding of the assessors. The algorithmic process was indicated in the assessment instrument. The product of the algorithmic process is stated as data in the final array.

The final array is organized with intratree algorithmic profile data stated for each of the fourteen data trees. Intertree algorithmic profile data are listed with one of the trees to which they relate. These data are not repeated with the other trees to which they relate. The three selected coordinate systems and their illustrative algorithms are stated at the end of the array.

It is reiterated here that the array of algorithmic profile data is part of a specific planning information system. This planning information system is designed to service a specific model for comprehensive planning in education. These were both described on pages 4-10. Because the array of algorithmic profile data does not exist of and by itself, it is necessary to recognize it as a part of a larger whole.

This array of algorithmic profile data augments the use of the planning information system and is built upon the raw profile data generated at level one in the Base Data System. A portrayal of the Base Data System can be found on page seven. Table I on pages 37 and 38 illustrates the level one data.

The array of algorithmic profile data continues the same taxonomy used with level one data. The fourteen trees are used as grouping categories and the item numbers, in the intratree listings, identify the raw profile data elements used in the array from level one.
1. **Curriculum and Instruction Tree—Algorithmic Profile Data**

A. **Intratree Data**

1. Total number of sections in each Curricular Area in each School.
   Total number of sections in each Age or Grade Level in each School.

5. Average section size in each Curricular Area in each School.
   Average section size at each Age or Grade Level in each School.

9-15. Frequency of use of the following data elements in each Curricular Area and at each Age or Grade Level in each School:
   9. Adopted course texts
   10. Other texts
   11. Variety of supplementary materials
   12. Teacher and pupil cooperatively created substance
   13. Teacher created substance
   14. Pupil created substance
   15. Other sources

16-26. Extent to which the course includes the following elements in each Curricular Area and at each Age or Grade Level in each School:
   16. Career education content
   17. Sex education content
   18. Environmental education
   19. Drug abuse education
   20. Alcohol abuse education
   21. Safety education
   22. Consumer education
   23. Library Science
   24. Patriotism
   25. Minority studies
   26. Other State required content

34-42. Extent to which the following participate in decision making regarding the content and organization for each course in each Curricular Area and at each Age or Grade Level in each School:
   34. Central office staff
   35. Building administrators
   36. Department head
   37. Team of teachers
   38. Teacher
   39. Pupil
   40. Parents
   41. Craft and/or other specialists committees
43-51. Extent to which the following participate in the selection of curricular materials in each Curricular Area and at each Age or Grade Level in each School:

43. Central office staff
44. Building administrators
45. Department head
46. Team of teachers
47. Teachers
48. Pupils
49. Parents
50. Craft and/or other specialists committee
51. Other citizens

52-67. Frequency of use of the following instructional materials for each Curricular Area and at each Age or Grade Level:

52. Adopted texts
53. Other texts
54. Other printed materials: hard bound
55. Other printed materials: soft bound
56. Filmstrips
57. Records
58. Tape recordings
59. Films
60. Video-recordings
61. Learning kits
62. Learning games
63. Maps
64. Charts
65. Globes
66. Other learning materials
67. Other community resources

68-79. Frequency of use of the following instructional strategies in each Curricular Area and at each Age or Grade Level:

68. Reaction (group and/or lecture or demonstration)
69. Interaction (small group discussion)
70. Action (learning by doing, independent work, etc.)
71. Discovery method
72. Simulation
73. Video-recordings
74. Computer assisted instruction
75. Field trips
76. Outside resource persons (speakers, etc.)
77. Building media center with materials used in class
78. Building media center with students sent to center to work
79. Variation of strategies to accommodate pupil differences

80-86. Frequency of use of the following instructional strategies in each Curricular Area and at each Age or Grade Level:

80. Programmed instruction
81. Teacher prepared instructional packages
82. Contract fulfillment
83. Criterion-referenced objectives fulfillment
84. Outdoor education
85. Montessori
86. British informal education

122-131. Frequency of use of the following evaluation techniques in each Curricular Area and at each Age or Grade Level:
122. Pupil-teacher evaluation conferences
123. Teacher-parent evaluation conferences
124. Pupil-teacher-parent evaluation conferences
125. Teacher does home visitation for pupil evaluation purposes
126. Pupil-peer evaluation provided for by teacher
127. Pupil self-evaluation provided for by teacher
128. Pupil evaluated by more than one teacher
129. Conferences scheduled between teachers to evaluate pupils
130. Conferences scheduled between teacher and counselor to effect pupil evaluation
131. Conferences scheduled between teacher and psychologist to effect pupil evaluation

132-143. Extent to which pupil evaluation is based on the following elements in each Curricular Area and at each Age or Grade Level:
132. Academic achievement
133. Ability to function independently
134. Ability to plan and use time efficiently
135. Effort expended toward course objectives
136. Attainment of course objectives
137. Behavior (conduct)
138. Peer-relations
139. Teacher-pupil relations
140. Learning style
141. Use of personal resources
142. Use of material resources
143. Ascertained pupil attitude toward class

144-153. Extent to which the following participate in program evaluation in each Curricular Area and at each Age or Grade Level:
144. Central office staff
145. Building administrator
146. Department head
147. Course teachers
148. Other teachers
149. Pupils
150. Parents
151. Craft and/or other specialists committees
152. Other citizens
153. Specialists from outside LEA
154-174. Extent to which the following elements are a part of program evaluation in each Curricular Area and at each Age or Grade Level:

154. Degree of individualization of content
155. Degree of individualization of instructional methods
156. Grade level appropriateness
157. Appropriateness of materials
158. Appropriate construction of objectives
159. Pupil evaluation procedures
160. Organization of content
161. Sequential order of content
162. Appropriateness of instructional strategies
163. Pupils' attitudes toward program
164. Parents' attitudes toward program
165. Teachers' attitudes toward program
166. Administrators' attitudes toward program
167. Overall pupil achievement
168. Relative cost of program
169. To the extent pupils are meeting the course objectives
170. The extent to which the objectives of the course are fulfilling the needs of pupils
171. The extent to which teachers are actualizing their potential
172. The extent to which administrators are actualizing their potential
173. The extent to which other staff members are actualizing their potential
174. The extent to which the community is actualizing its potential

B. Intertree Data

1. Pupil-teacher ratio in each School in each Curricular Area
2. Pupil-teacher ratio in each School at each Age or Grade Level

II. Instructional Services Tree--Algorithmic Profile Data

A. Intratree Data

4-31. Adequacy of each of the following elements in each Curricular Area and at each Age or Grade Level:

4. Texts: issued to students
5. Texts: multiple or supplemental
6. Printed materials: hard bound
7. Printed materials: soft bound
8. Filmstrips
9. Records
10. Tape recordings
11. Films
12. Video-recordings
13. Learning kits
14. Learning games
15. Maps
16. Charts
17. Globes
18. Calculators
19. Models
20. Other learning materials
21. Filmstrip projectors
22. Record players
23. Tape recorders
24. Language masters
25. Film projectors
26. Video-tape recorders
27. T.V. sets
28. Opaque projectors
29. Over-head projects
30. Computer terminals
31. Other audio-visual materials

40-42. Average number of pupil contacts recorded per week for guidance counselors in each School

46. Average number of pupils served each week in the speech and hearing therapy program in each School

54. Average number of pupil contacts per week by psychologists in each School

61,63,64. Average amount of time per week furnished in each tutorial service in each Agency Component

B. Intertree Datum

1. Comparison of the perceived adequacy of instructional and learning materials ratings and the achievement tests results in each School and each Agency Component

III. Student Personnel Tree-Algorithmic Profile Data

A. Intratree Data

1,6. Total number of students in each age group in each grade in each School

7. Total number of students in each School in each category of place of birth

8. Total number of boys and total number of girls in each School
9. Total number of students in each ethnic characteristic code in each School
10. Total number of students at each category of grading in each School
11. Total number of students at each intelligence test score category in each School
12. Total number of students at each aptitude category in each School
13. Total number of students at each achievement level in each School
14. Total number of students at each general interest category in each School
15. Total number of students at each occupational interest category in each School
22-23. Compare the total number of students identified in each learning difficulties category with the total amount of special instructional services received by students in each learning difficulties category for each School
8,25. Total number of boys and total number of girls participating in extracurricular activities in each School

B. Intertree Data
1. Compare the per cent composition of students in each ethnic characteristic code in each School with the per cent composition of staff in each ethnic characteristic code in that School
2. Compare the student achievement test score levels with the perceived competency ratings of staff in each School

IV. Staff Personnel Tree--Algorithmic Profile Data
A. Intratree Data
1. Total number of staff members in each Occupational Category in each School and each Agency Component
4. Total number of staff members "on leave" in each Occupational Category in each Agency Component

8. Total number of staff members in each ethnic characteristic category in each Occupational Category in each School and in each Agency Component

11. Total number of staff members in each Occupational Category at each contract category in each School

14. Total revenue needed for salaries in each Occupational Category for the Agency

20. Total annual absentee rate by Occupational Category in each Agency Component

22. Total number in each Occupational Category in each performance appraisal category in each School

31. Total number in each Occupational Category in each reason for termination category in each School

35. Total number in each Occupation Category in each educational attainment level in each School and in the Agency

46. Total pre-employment experience by previous experience code in each Occupational Category in each School

49. Total pre-employment experience by LEA location code for each Occupational Category in each School and in the Agency

55. Total number of teachers with bilingual competencies in each School and in the Agency

B. Intertree Datum

1. Relationship between higher salaried personnel and positive responses on job perception codes in each Occupational Category and in each Agency Component

V. Educational Facilities Tree—Algorithmic Profile Data

A. Intratree Data

1. Total number of rooms or definable areas in each Building and in each School

6. Total number of rooms or definable areas needing painting
8. Total number of fire extinguishers in each Building and in each Agency Component

9. Total number of toilets for the handicapped in each Building and each Agency Component

11. Total number of rooms designed for each functional use in each Building and each Agency Component

12. Total number of rooms utilized for each definable function in each Building and each Agency Component

13. Total number of student learning stations available for each designated use of room category in each Building, each School and in each Agency Component

69. Total number of relocatable units available at each School and in each Agency Component

94. A graph of annual costs of custodial services at each Building for the past five years

95. A graph of annual costs of maintenance services at each Building for the past five years

96. A graph of annual costs of utilities services at each Building for the past five years

123. Total number of acres of sites in each Agency Component

124,125. Total number of parking spaces by parking lot surface category at each Building and in each Agency Component

VI. Financial Resources Tree--Algorithmic Profile Data

A. Intratree Data

1-6. Total revenue collected by schools in each of the following categories for each School and for the Agency:
   1. Revenue from student fees
   2. Revenue from internal accounts
   3. Revenue from sale of consummable supplies
   4. Revenue from sale of other items
   5. Revenue from fines
   6. Other revenue received

7-8. Total assessed valuation in the Agency

9. Total anticipated annual revenue from local real and personal property taxes in the Agency
10. Total anticipated annual bond retirement revenue in the Agency

9, 10. A graph of tax rates in the Agency for the past 10 years

7, 8. A chart of the index of change of the total assessed valuation on personal property and on real property for each of the past ten years in the Agency

- A graph of the per cent that the revenue from each source is of the total revenue in the Agency for each of the past ten years

B. Intertree Data

1. Total assessed property valuation per pupil in the Agency

2. Total assessed personal property valuation per pupil in the Agency

3. Total assessed personal property valuation for each general use code category for non-dwelling units in the Agency

VII. Transportation Tree—Algorithmic Profile Data

A. Intratree Data

1. Total number of buses operating in each Agency Component

3. Total number of buses with an excess of 60,000 miles on the odometer in each Agency Component

4. Total number of buses at each age of bus category in each Agency Component

5. Total pupil transportation capacity of all buses in each Agency Component

19. Total number of accidents by accident type for the past year in each Agency Component

22. Total number of miles traveled by buses for each Program Component in the past year in each Agency Component

23. Total number of pupils transported by buses for each Program Component in the past year in each Agency Component

- Ratio of miles traveled per pupil transported for each Program Component in the past year in each Agency Component
26. Total hours of driving time in each Program Component in the past year in each Agency Component

B. Intertree Data

1. Average cost per pupil transported in the past year in each Agency Component

2. Average cost per mile of travel in the past year in each Agency Component

VIII. Food Service Tree—Algorithmic Profile Data

A. Intratree Data

1. Total number of serving kitchens and total number of food preparation kitchens in each Agency Component

2. Total receipts for a la carte meals in each School

3. Total expenditures for supplies for a la carte meals in each School

2,3. Gross profits from a la carte meals in each School

4. Total number of free lunches served in each School and in each Agency Component

5. Total number of reduced price lunches served in each School and in each Agency Component

6. Total number of regular priced lunches served in each School and in each Agency Component

7. Total number of adult priced lunches served in each School and in each Agency Component

4,5,6,7. Total of all lunches served in each School and each Agency Component

13,14. Gross profits from food vending machine operation in each School and each Agency Component

24. Extent to which the following groups believe they are involved in food service planning in each School:
   a. students
   b. staff
   c. parents
   d. board of education
   e. others
25. Extent to which the following groups believe the objectives of the food service program are being achieved in each School:
   a. students
   b. staff
   c. parents
   d. board of education
   e. others

8. Intertree Data

1. Correlation of the numbers of families in various income ranges and the numbers of pupils receiving free lunches in each School and in the Agency

2. Correlation of the numbers of families in various income ranges and the number of pupils receiving reduced price lunches in each School and in the Agency

IV. Business Management Tree--Algorithmic Profile Data

A. Intratree Data

1. Total number of active accounts in each School

8. Extent to which the following groups participate in the determination of the allocation of funds to the different purchase categories in each School and each Agency Component:
   a. pupils
   b. teachers
   c. building administrators
   d. parents
   e. skill or craft committees
   f. central office administrators
   g. board of education members
   h. others

9. Extent to which the following groups participate in an evaluation of the budgetary processes in each School and in each Agency Component:
   a. pupils
   h. others
28. Compare the total operational costs for materials and supplies: program related with the operational costs for materials and supplies: student-related for each of the past five years in each School and each Agency Component

23-36. Total operating costs for the educational program in each School and in each Agency Component for each of the past five years

38. Listing of categories of items purchased under cooperative purchasing agreement for the Agency

46. Assessment of purchasing procedures in the Agency by each of the following groups:
   a. pupils
   b. teachers
   c. building administrators
   d. parents
   e. skill or craft committees
   f. central office administrators
   g. board of education members
   h. others

48. Assessment of the accounting procedures in the Agency by each of the following groups:
   a. pupils
     
     h. others

50. Assessment of payroll procedures in the Agency by each of the following groups:
   a. pupils
     
     h. others

51. Assessment of the budgetary processes in the Agency by each of the following groups:
   a. pupils
     
     h. others

B. Intertree Datum

1. Total operating expenditures per pupil for each Curricular Area and for each Age or Grade Level in each School, each Agency Component and the Agency
X. Organizational Management Tree—Algorithmic Profile Data

A. _Intratree Data_

1. Degree of satisfaction expressed in each of the following 15 job perception codes and 16 measures in each School, Agency Component and the Agency:
   - Job perception codes:
     1. Job involvement
     2. Personal security
     3. Autonomy
     4. Control exercised on individuals
     5. Flexibility
     6. Hedonic tone
     7. Homogenity
     8. Intimacy
     9. Participation
    10. Permeability
    11. Polarization
    12. Potency
    13. Stability
    14. Stratification
    15. Viscidity
   - Measures:
     16. Clarity of objectives toward which to work
     17. Clarity of rules, policies and guidelines
     18. Extent to which workers are given conflicting priorities
     19. Extent to which central office changes policies without advance notice
     20. Extent to which related jobs are meshed to achieve objectives
     21. Extent to which independent assignments are well planned
     22. Ease of exchanging ideas and information with others doing related work
     23. Extent to which people doing related work avoid creating problems for one another
     24. Extent to which coordination problems with others doing related work are handled
     25. Proportion of personnel who are competent to do the work assigned to them
     26. Perception of self as competent to do work assigned
     27. Extent to which central office is perceived as following its own rules
     28. Extent to which central office is perceived as understanding teachers' needs, problems and points of view
     29. Extent to which central office is perceived as understanding non-certificated staff needs, problems and points of view
30.Extent to which central office is perceived as understanding all other employee needs, problems and points of view.

31. Extent to which top management is perceived as fair and reasonable.

1-31. Degree of satisfaction expressed in each of the above 15 job perception codes and 16 measures by each Occupational Category in each Agency Component and in the Agency.

1-31. Changes in the degree of satisfaction expressed in each of the above 15 job perception codes and 16 measures in each School, Agency Component and the Agency for each of the past five years.

1-31. Changes in the degree of satisfaction expressed in each of the above 15 job perception codes and 16 measures in each Occupational Category for each Agency Component and the Agency for the past five years.

32-43. Total rating of the expectations of staff in the following elements for each Occupational Category in each Agency Component:
   32. Contributions to be made
   33. Freedom to act
   34. Goal values
   35. Freedom to interact
   36. Discontinuity of membership
   37. Mutual liking
   38. Non-task performance
   39. Task specialization
   40. Returns from the organization
   41. Task performance
   42. Task urgency
   43. Reference group support

8. Intertree Data

1. Correlation of the responses of job perception categories with the salary levels of each Occupational Category in each Agency Component.

2. Correlation of the degree of satisfaction with total experience ranges in each Occupational Category in each Agency Component.
XI. Population Tree--Algorithmic Profile Data

A. Intratree Data

1. Total number of heads of households in each School Component Planning Area

2. A graph of the different numbers of heads of households in each age range in each School Component Planning Area and in the Agency

4. Per cent in each ethnic group of the heads of households in each School Component Planning Area and in the Agency

5. A graph of the numbers of heads of households in each educational attainment level range in each School Component Planning Area and in the Agency

6. Total number of heads of households in each Occupational Group for each School Component Planning Area and in the Agency

7. A graph of the employment status of all heads of households in each School Component Planning Area and in the Agency

8. Attitudinal information totals of heads of households in each School Component Planning Area and in the Agency

12. Total number of spouses of heads of households in each Occupational Group in each School Component Planning Area and in the Agency

13. A graph showing the employment status of spouses of heads of households in each School Component Planning Area and in the Agency

14. A graph of the number of families in each income range code in each School Component Planning Area and in the Agency

15. Total numbers, at each age range, of other members of the household in each School Component Planning Area and in the Agency

16. Total number of pre-school age children likely to attend non-public schools in each School Component Planning Area and in the Agency

17. Total number of children attending non-public schools, K-12, in each School Component Planning Area and in the Agency

18. Total numbers of families in each "principal language spoken in home code" in each School Component Planning Area and in the Agency
XII. Physical Tree—Algorithmic Profile Data

A. Intratree Data

1. Total number of dwelling units in each Block and each Agency Component
2. Total number of dwelling units by type of unit code in each Block and each Agency Component
3. Total number of dwelling units at each age range in each Block and in the Agency Component
4. Per cents of owner-occupied homes and per cents of rental homes in each Block and each Agency Component
5. A graph of the numbers in each category of different values of owner-occupied homes in each Block and each Agency Component
6. A graph of the numbers of rental dwelling units at each monthly rental rate range in each Block and each Agency Component
7. Total number of dwelling units in each type of unit code for each number of bedrooms in each Block and in each Agency Component
8. Total number in each year of residency range of years of residency for heads of households in each Block and each Agency Component
9. Total number of non-dwelling units in each Block and in each Agency Component
10. Total number of non-dwelling units in each 'General use code' in each Block and in each Agency Component
12. Total number of non-dwelling units in each occupant category code in each Block and each Agency Component
10,13. Total acres of site in each category of non-dwelling unit, general use code, in each Block and each Agency Component
14,15. Total number of outside pools in each size category in each Agency Component
16. Total number of baseball diamonds in each Agency Component
17. Total number of outside tennis courts in each Agency Component
18. Total number of football and/or soccer fields in each Agency Component

19. Total number of outside basketball courts in each Agency Component

21. Total acreage of developed general playground area in each Agency Component

24. Total acreage of nature exhibit area in each Agency Component

25, 26. Total number of enclosed pools of each size in each Agency Component

27. Total number of inside tennis courts in each Agency Component

28. Total number of inside basketball courts in each Agency Component

29. Total number of bowling allies in each Agency Component

30, 31. Total number of equipped exercise rooms in each size category in each Agency Component

32, 33. Total number of facilities classified as inside multi-use recreational areas in each size category in each Agency Component

34, 35. Total number of large-group meeting spaces in each size category in each Agency Component

34-40. Total number of facilities in each functional category which are eligible for school use in each Agency Component

34-40. Total number of facilities in each functional category which are available at each availability day code in each Agency Component

B. Intertree Data

1. Ratio of children per dwelling unit in each Agency Component

2. Total number of incidences of school use of each community special use facility for each Curricular Area and for each Age or Grade Level in each School, Agency Component and the Agency
XIII. Activities and Services Tree—Algorithmic Profile Data

A. Intratree Data

1. Total number of agencies categorized by Program Classification in each Agency Component and each Agency

- Total number of agencies in each Program Classification by Agency Type in each Agency Component

7. Total annual number of individuals seeking participation by age and sex in each Program Classification category in each Agency Component

8,9. A ratio indicating the degree to which programs are operating at desired capacity levels in each Program Classification category in each Agency Component

7,9. A ratio indicating the degree to which individuals are accommodated who seek participation in each Program Classification category in each Agency Component

9. Total desired annual program capacity by age and sex in each Program Classification category in each Agency Type in each Agency Component

12. Total annual program cost in each Program Classification category by Agency Type in each Agency Component

8,12. Average annual individual participation cost for each Program Classification in each Agency Type in each Agency Component

8,12-15. Average hourly cost per participant for each Program Classification in each Agency Type in each Agency Component

XIV. Governance Tree—Algorithmic Profile Data

A. Intratree Data

1. Total number of organizations of each Type of Organization in each Agency Component

12. Total organizational membership for each Type of Organization in each Agency Component

13. Total number of each Type of Organization where each membership eligibility code is applicable in each Agency Component
14. Total numbers of organizations of each Type of Organization at each average age of membership level in each Agency Component

15. Total number of new members this year in each Type of Organization in each Agency Component

12, 15. Per cent of growth in membership over the past year in each Type of Organization in each Agency Component

16. Total membership by social or ethnic code in per cent ranges for each Type of Organization in each Agency Component

18. Total number of each Type of Organization in each "geographical breadth of organization code" in each Agency Component

19. Total number of each Type of Organization in each Agency Component classified as temporary and as long term

20. Extent to which membership perceives their organization as an information source to City Council, Mayor, City Commissioner, Board of Education, Superintendent of Schools, Zoning Board, Board of Health, Police Department, County Commissioners, Minority Special Interest Groups, Council of Churches, Chamber of Commerce, Service Clubs, PTA Organizations, Largest Local Industries and/or Businesses, Major Labor Unions, Voter Leagues, Realtors Association, in the Agency

21. Extent to which members perceive their organization seeking information concerning financial allocations within their organization from the same groups or individuals as item 20; i.e., City Council...Realtors Association, in the Agency

22. Extent to which members perceive their organization as being requested to assist the groups and individuals identified in item 20; i.e., City Council...Realtors Association, in allocation of resources within each organization in the Agency

23. Total number of times in the past year your organization coordinated financial and/or personnel resources in a combined effort to reach a commonly held objective with each of the following groups or individuals; i.e., City Council...Realtors Association, in the Agency
Coordinate Systems—Illustrative Algorithmic Profile Data

In the study, 45 different coordinate systems were identified. Algorithmic profile data could be drawn from each of these. Because of the limitation of resources, this investigator chose to select three coordinate systems and construct illustrative algorithmic profile data from each of these. The data listings are not exhaustive in the examples chosen.

I. Federal Census Coordinate System—Illustrative Algorithmic Profile Data

1. The sum of the numbers of residents by age group by blocks
2. The sum of the number of families in different income ranges by blocks
3. The sum of ADC categorized youth by age by block
4. The sum of welfare recipients by numbers of children by age range by block
5. The sum of the numbers of residents by housing type by block
6. The sum of the numbers of residents by ethnic characteristic code by block
7. The sum of the numbers of residents whose native language is not English by language code by block divided by total number of residents in the block
8. The sum of the numbers of households when only one parent resides by block divided by total number of households in the block
9. The sum of the number of residents who have resided one, two, three, four, five years in present location by block divided by total number of residents by block
10. The sum of the cost of single family dwelling units by price code by block by number of children by age code

II. Regional Planning Agency Coordinate System—Illustrative Algorithmic Profile Data

1. The sum of the projection of population by age group by year in the school district
2. The sum of the potential numbers of home sites by zoning code in the school district
3. The sum of the acres available for industrial development in the school district

4. The sum of the number of miles of improved highways in the school district

5. The sum of the acres available at recreational sites by activity code in the school district

6. The sum of the number of acres of water available by recreational code in the school district

7. The sum of the number of acres of farmland in the school district divided by the total number of acres in the school district

III. Labor Unions or Teachers Associations Coordinate Systems—Illustrative Algorithmic Profile Data

1. The sum of the numbers of teachers who are members of each organization in the school district

2. The sum of the numbers of teachers who have been members in each organization in the school district for each of the past ten years

3. The sum of the benefits awarded to teachers in negotiations, summed by labor organizations or associations in the school district for each of the past ten years

4. The sum of the number of days of work stoppage by majority organization for each of the past ten years in the school district

5. The sum of the dues paid to each labor organization in the school district for each of the past ten years

6. The sum of the number of inservice teacher-days provided and financed by the labor organization for each of the past ten years
APPENDIX A

The instrument used for assessment of the initial formulation of algorithmic profile data statements is submitted as Appendix A. This instrument was used by the six university staff members.

The second instrument used for assessment purposes was very similar to this first one. The differences included a few corrections due to typographical mistakes, and omission of 15 statements. These were determined not to be useful for tactical planning in comprehensive educational planning by the first assessors and this investigator. Nine individuals in central office positions in school districts in Ohio completed the assessment with this second instrument. Because inclusion in this document of this second assessment instrument would be very redundant, it is not included here.
Assessment of the Array of Algorithmic Profile Data

You are asked to assess the potential usefulness of each statement of data relationships and the data handling herein. Additionally you are requested to respond to other questions concerned with the completeness of the listings, the inclusion of the relationships of coordinate systems and the concept of the total system of related data in this Base Data System for Comprehensive Planning in Education.

One general explanation is warranted at this point. This Data Information System is designed to serve the tactical planner in comprehensive planning at the local educational level of the hierarchy of school systems. It is not constructed to serve the state level planner; that would be strategic planning. Nor is it designed to serve the building level planner; that is operational planning. The following statements should be assessed within the context of the planning parameters of the planner working at the central office level of school systems and planning for the over-all functioning of the school systems.

To understand the task, it is necessary that the constructed data relationships be perceived as a part of the Base Data System for Comprehensive Educational Planning. This system was delineated in outline form by Higgins and Conrad.1 A copy of the model they developed is included as figure 1. This shows four levels of data within the system. The first level, raw profile data, has been developed and field tested.

1Ronald K. Higgins and Marion J. Conrad, A Data System for Comprehensive Planning in Education (a paper developed as a part of Project Simu-School, Council of Education Facility Planners, The Ohio State University, Columbus, Ohio), p. 8.
BASE DATA SYSTEM for COMPREHENSIVE EDUCATIONAL PLANNING

DATA TREES

Educational Data

Community Data

DATA LEVEL 1

Curriculum & Instruction
Instructional Services
Student Personnel
Facilities
Finance
Transportation
Food Service
Business Management
Organizational Management
Population
Physical
Activities & Services
Governance

Raw Profile Data

DATA LEVEL 2

Algorithmic Profile Data

DATA LEVEL 3

Policy Environmental Conditions:
Present and Alternative Futures

Projected Alternative States

DATA LEVEL 4

FIGURE 1

The data elements at this level represent the minutest parts of the data system. To be most useful, these data elements must be related and combined to produce information for the planner. This is the function of the second level data. The second level data is defined as algorithmic profile data. It is this level, the useful data relationships, which is developed in this investigation.

This development has followed the form of the existing level one data statements. The fourteen trees have been retained as categories of related data and useful combinations of data elements have been constructed within these large categories. Additional data relationships have been developed across trees. These intertree algorithms are found at the end of each tree to which they are related.

The existence of coordinate systems was alluded to in the first paragraph. Coordinate systems are defined as educational and noneducational agencies outside the district level system having data and information useful to the tactical planner. It is anticipated that data from coordinate systems will be used in the comprehensive planning process. The exact use of such data will depend upon its existing form; the need for such data; and the cost in using the data. If data in coordinate systems exist in forms compatible with the form of the data in the Base Data System, mere transfer to the Base Data System can occur at the level desired. However, data may not exist in coordinate systems at the raw profile level. It may only exist at the algorithmic profile level. When such is the case, data can be transferred at this level when needed when it is in compatible form. A portrayal of the relationship between the Base Data System and Coordinate Systems is shown in figure 2. This
TOTAL DATA SYSTEM for COMPREHENSIVE EDUCATIONAL PLANNING

Some of the data from the reports of other systems and related agencies will be extracted and entered into the base data system.

Figure 2

Within the context of the above brief discussion you are requested to assess each listing on the four point scale provided. Your assessment is to be related to the potential usefulness of these statements for the tactical planner. Usefulness is defined as your perception of the potential that exists for each statement to generate information for the tactical planner working in comprehensive planning in education.

Specific Instructions Concerning the Assessment Instrument

There are two basic parts in the raw profile level in each Tree. These are the data keys and the data elements. The data keys are designed as summative categories but function as linking elements between trees too. Also, the data keys can be used with other mathematical operations. When a data key is used in the instrument, it is capitalized.

Data elements are the categories which contain data within each tree. When these are used in the instrument, they are documented as element 1, 2, etc. with the complete category cited within quotation marks.

You are requested to encircle the rating (SA), strongly agree; (A) agree; (D) disagree, or; (SD) strongly disagree to the left of each statement assessed. It is intended that you only judge the potential usefulness of the concept presented in each algorithm.

You will find both intertree and intratree algorithms. The intratree algorithms are categorized into the 14 trees from which they were generated. The intertree algorithms are found at the end of each listing and with one of the listings to which they are related.

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I. Curriculum and Instruction Data Tree

A. Intratree Algorithms

1. Determine the number of sections in each Curricular Area by totalling the entries in data element, "section identification," for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School.

5. Determine average section size in each Curricular Area by totalling the values in data element, "Enrollment (number)," for each Curricular Area, i.e. mathematics, science, automotives, etc. in each School and dividing each Curricular Area total by the number of sections in each Curricular Area in each School.

9-15. The entries for data elements, 9 through 17**, contain a rating scale of 1 to 6 with each scale indicating: (1) extensive (greater than 75%); (2) considerable (50% to 75%); (3) frequent (25% to 50%); (4) some (5% to 25%); (5) limited (1% to 5%); (6) less than 1% or none. Determine one dimension of curriculum analysis by obtaining the totals in each of the following data elements which have been valued to indicate the extent to which course content is derived from:
   element 9, "Adopted course text(s)"
   element 10, "Other texts"
   element 11, "Variety of supplementary materials"
   element 12, "Teacher and pupil cooperatively created substance"
   element 13, "Teacher created substance"
   element 14, "Pupil created substance"
   element 15, "Other sources"
for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School.

16-26. Determine another dimension of curriculum analysis by obtaining the totals in each of the following data elements which have been valued to indicate the extent to which the course includes:
   element 16, "Career education content"
   element 17, "Sex education content"
   element 18, "Environment education"
   element 19, "Drug abuse education"
   element 20, "Alcohol abuse education"
   element 21, "Safety education"
   element 22, "Consumer education"
   element 23, "Library science"
   element 24, "Patriotism"
   element 25, "Minority studies"
   element 26, "Other State required content"
for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School.
34-42. Obtain information about the process of decision making in curriculum content and organization determination by totalling the values indicating the extent to which the following participate in decision making regarding the content and organization for each course:

- element 34, "Central office staff"
- element 35, "Building administrators"
- element 36, "Department head"
- element 37, "Team of teachers"
- element 38, "Teacher"
- element 39, "Pupil"
- element 40, "Parents"
- element 41, "Craft and/or other specialists committees"
- element 42, "Other citizens"

by Curricular Area, i.e. mathematics, science, automotives, etc. in each School.

43-51. Provide information about the extent of participation in the selection of curriculum materials by each of the following groups by totalling the values in each of the following data elements:

- element 43, "Central office staff"
- element 44, "Building administrators"
- element 45, "Department head"
- element 46, "Team of teachers"
- element 47, "Teachers"
- element 48, "Pupils"
- element 49, "Parents"
- element 50, "Craft and/or other specialists committees"
- element 51, "Other citizens"

for each Curricular Area; i.e. mathematics, science, automotives, etc. for each School.

52-67. Obtain information about the frequency of use of the following 16 categories of instructional materials by totalling the values in each of the following elements:

- element 52, "Adopted texts"
- element 53, "Other texts"
- element 54, "Other printed materials: hard bound"
- element 55, "Other printed materials: soft bound"
- element 56, "Filmstrips"
- element 57, "Records"
- element 58, "Tape recordings"
- element 59, "Films"
- element 60, "Video-recordings"
- element 61, "Learning kits"
- element 62, "Learning games"
- element 63, "Maps"
- element 64, "Charts"
- element 65, "Globes"
- element 66, "Other learning materials"
element 67, "Other community resources"
for each Curricular Area; i.e. mathematics, science, auto-
motives, etc. in each School.

68-79. Obtain information about the frequency of use of the follow-
ing 12 instructional strategies by totalling the values in
each of the following elements:

- element 68, "Reaction (group and/or lecture-demonstration)"
- element 69, "Interaction (small group discussion)"
- element 70, "Action (learning by doing, independent
  work, etc.)"
- element 71, "Discovery method"
- element 72, "Simulation"
- element 73, "Video-recordings"
- element 74, "Computer assisted instruction"
- element 75, "Field trips"
- element 76, "Outside resource persons (speakers, etc.)"
- element 77, "Building media center with materials used
  in class"
- element 78, "Building media center with students sent
to the center to work"
- element 79, "Variation of strategies to accommodate
  pupil differences"
for each Curricular Area, i.e. mathematics, science, auto-
motives, etc. in each School.

80-86. Obtain information about the frequency of use of the follow-
ing seven instructional strategies by totalling the values
in each of the following elements:

- element 80, "Programmed instruction"
- element 81, "Teacher prepared instructional packages"
- element 82, "Contract fulfillment"
- element 83, "Criterion-referenced objectives fulfillment"
- element 84, "Outdoor education"
- element 85, "Montessori"
- element 86, "British information education"
for each Curricular Area; i.e. mathematics, science, auto-
motives, etc. in each School and for each Age or Grade Level;
i.e. Nursery, Kindergarten, Grades, 1-14, or Age group,
Adult education, etc. in each School.

116-121. Obtain information about the extent to which the following
pupil evaluation and/or grading methods are used in each
course by totalling the values in each of the following
elements:

- element 116, "Letter or percentage grade"
- element 117, "Pass-fail"
- element 118, "Written narrative given to pupil"
- element 119, "Written narrative given to parent"
- element 120, "Check list rating scales"
- element 121, "A system indicating effort applied"
for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School and for each Age or Grade Level in each School.

122-131. Obtain information about the frequency of use of ten evaluation techniques by totalling the values in each of the following elements:

- element 122, "Pupil-teacher evaluation conferences"
- element 123, "Teacher-parent evaluation conferences"
- element 124, "Pupil-teacher-parent evaluation conferences"
- element 125, "Teacher does home visitation for pupil evaluation purposes"
- element 126, "Pupil-peer evaluation provided for by teacher"
- element 127, "Pupil self-evaluation provided for by teacher"
- element 128, "Pupil evaluated by more than one teacher"
- element 129, "Conferences scheduled between teachers to evaluate pupils"
- element 130, "Conferences scheduled between teacher and counselor to effect pupil evaluation"
- element 131, "Conferences scheduled between teacher and psychologist to effect pupil evaluation"

for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School and for each Age or Grade Level in each School.

132-143. Obtain information concerning the extent to which pupil evaluation is based on the following 12 elements by totalling the values in each of the elements:

- element 132, "Academic achievement"
- element 133, "Ability to function independently"
- element 134, "Ability to plan and use time effectively"
- element 135, "Effort expended toward course objectives"
- element 136, "Attainment of course objectives"
- element 137, "Behavior (conduct)"
- element 138, "Peer-relations"
- element 139, "Teacher-pupil relations"
- element 140, "Learning style"
- element 141, "Use of personal resources"
- element 142, "Use of material resources"
- element 143, "Ascertained pupil attitude toward class"

for each Curricular Area; i.e. mathematics, science, automotives, etc. for each School and for each Age or Grade Level in each School.

144-153. Determine the extent to which the following ten categories of school system actors participate in program evaluation by totalling the values in each of the ten elements:

- element 144, "Central office staff"
- element 145, "Building administrators"
Determine the extent to which the following 21 items are a part of program evaluation by totalling the values in each of the following 21 elements for each course:

- Degree of individualization of content
- Degree of individualization of instructional methods
- Grade level appropriateness
- Appropriateness of materials
- Appropriate construction of objectives
- Pupil evaluation procedures
- Organization of content
- Sequential order of content
- Appropriateness of instructional strategies
- Pupils' attitudes toward program
- Parents' attitudes toward program
- Teachers' attitudes toward program
- Administrators' attitudes toward program
- Overall pupil achievement
- Relative cost of program
- To the extent pupils are meeting the course objectives
- The extent to which the objectives of the course are fulfilling the needs of pupils
- The extent to which teachers are actualizing their potential
- The extent to which administrators are actualizing their potential
- The extent to which other staff members are actualizing their potential
- The extent to which the community is actualizing its potential

for each Curricular Area; i.e. mathematics, science, automotives, etc. in each School and for each Age and Grade Level in each School.

B. Intertree Algorithms

1. The Curriculum and Instruction Tree and the Staff Personnel Tree
Determine the pupil-teacher ratio in each Curricular Area; i.e. mathematics, science, automotives, etc. in each School by totalling the number of pupils enrolled in each Curricular Area and totalling the number of teachers assigned to each Curricular Area and by dividing each former total by each corresponding latter total for each School.

Determine the pupil-teacher ratio in each Age or Grade Level; i.e. Nursery, Kindergarten, Grades 1-14, or Age Group, Adult education, etc. in each School by totalling the number of pupils enrolled in each Age or Grade Level and by totalling the number of teachers assigned to each Age or Grade Level and by dividing each former total by each corresponding latter total.

II. Instructional Services Data Tree

A. Intratree Algorithms

4-31. Each of the 28 categories of instructional and learning materials which are stored and are available for use have been given an adequacy rating from 1-4. This rating is a combined qualitative and quantitative expression of adequacy. Determine information indicating adequacy of each of these 28 categories by totalling the values in each element and by dividing by the number of entries in each of the following elements:

- element 4, "Texts: issued to students"
- element 5, "Texts: multiple or supplemental"
- element 6, "Printed materials: hard bound"
- element 7, "Printed materials: soft bound"
- element 8, "Filmstrips"
- element 9, "Records"
- element 10, "Tape recordings"
- element 11, "Films"
- element 12, "Video-recordings"
- element 13, "Learning kits"
- element 14, "Learning games"
- element 15, "Maps"
- element 16, "Charts"
- element 17, "Globes"
- element 18, "Calculators"
- element 19, "Models"
- element 20, "Other learning materials"
- element 21, "Filmstrip projectors"
- element 22, "Record players"
- element 23, "Tape recorders"
- element 24, "Language masters"
- element 25, "Film projectors"
- element 26, "Video-tape recorders"
- element 27, "T.V. sets"
element 28, "Opaque projectors"  
element 29, "Overhead projectors"  
element 30, "Computer terminals"  
element 31, "Other audio-visual equipment"  
for each Curricular Area; i.e. mathematics, science, automobiles, etc. in each School.

40-42. Ascertain a dimension of the quantitative aspects of guidance services by totalling the values in element 40, "Average number of referrals received from teaching and/or administrative staff per week," the values in element 41; "Average number of students initiating contact per week;" the values in element 42, "Average number of students contacted through guidance counselors initiative per week" for each School.

46. Obtain information about the number of pupils served in speech and hearing therapy by adding the values in element 46, "Number of students served (in speech and hearing therapy)," in each School.

54. Obtain information about the extent of psychological services provided to students by totalling the values in element 54, "Average number of student contacts made per week," in each School.

61,63,64. Obtain information about the amount time expended in tutorial services for each type of tutorial service by identifying the types of tutorial service from element 61, "Type of tutorial service code (neurological, home instruction, remedial reading, musical, etc.)," and by finding the product of element 63, "Average number of contacts per week," and element 64, "Average length of meeting," for each identified tutorial service in each Agency Component, i.e. decentralized unit of the school district or designated planning area.

69,71,72,73. From element 69, "Type of special event code (assembly program, career days, field days, etc.,)" identify each special event and for each special event provide information in numerical magnitude by ascertaining the product of element 71, "Number of meeting times or events per year," element 72, "Average length of meeting or event in hours," and element 73, "Average number of student participants per meeting or event," for each School.

75-84. Obtain information indicating the cost per student hour of each extracurricular activity by dividing element 84, "Annual expenditure for activity," for each activity by the product of element 77, "Number of meeting times per week," element 78, "Average length of meeting (in hours)," element 79, "Duration of activity in weeks," element 80, "Average number of student participants" for each activity in each School.
B. **Intertree Algorithms**

The Instructional Services Data Tree and the Student Personnel Data Tree

1. Compare the perceived adequacy of instructional and learning materials ratings with the achievement tests results in each School and in each Agency Component.

III. Student Personnel Data Tree

A. **Intratree Algorithms**

1,6. Obtain information about the total number of students at each age group in each grade in each School by totalling the number of entries in element 2, "Name," having the same year of birth as ascertained from element 6, "Date of birth" for each Grade Level; i.e., Nursery, Kindergarten, Grades 1-14, in each School.

7. Obtain information about the numbers of students in each School from different categories of birth places by totalling the entries in element 7, "Place of birth code;" i.e. suburban, urban, rural, small city, etc. for each category of birth place in each School.

8. Obtain information about the numbers of boys and numbers of girls by totalling the entries in each sex category in element 8, "Sex" in each School.

9. Obtain information about the ethnic stratification of the student body by totalling the number of entries in element 9, "Ethnic characteristic code" for each School.

Obtain information about the Curricular Organization; i.e. General, College prep, Honors, Career education, Special education, etc. enrollments for each ethnic characteristic group by totalling the numbers of students from each ethnic characteristic group enrolled in each Curricular Organization in each School.

10. Obtain information about the assessment of student performance by totalling the numbers of students receiving each category of grade in element 10, "Academic record (schedule, credits, grades)," in each School.

11. Obtain information indicating the numbers of students attaining intelligence test score levels by totalling the entries in element 11, "Intelligence test(s) (name, date, score)" for each desired score level in each School.
12. Ascertain information indicating the aptitude levels of students by totalling the entries in element 12, "Aptitude tests (name, date, score)" for desired score levels of students in each School and each category of aptitude desired.

13. Ascertain information indicating the achievement levels of students by totalling the entries in element 13, "Achievement test(s) (name, date, total score, sub-scores)" for the desired levels in the desired achievement categories and/or sub-categories for each School.

14. Ascertain information indicating the interests of students by totalling the entries in each interest category from element 14, "General interest inventory(ies) (name, date, score)" for each School.

15. Ascertain information indicating the occupational interests of students by totalling the entries for each designated occupation in element 15, "Occupational interest inventory(ies), (name, date, score)" in each School.

22-23. Obtain information about the discrepancy existing between learning difficulties existing and instructional services received by totalling the number of entries in element 22, "Learning difficulties code," and comparing these totals with the totals in element 23, "Instructional services received code (tutoring for neurologically handicapped, home instruction, etc.)" for each School.

8,25. Ascertain the comparative numerical magnitude of girls and boys participation in extracurricular activities by totalling the number of boys and the number of girls cited as entries in element 25, "Extracurricular activities code" in each School.

B. Intertree Algorithms

1. Obtain information about the relative percentage composition of the student body and the School staff in ethnic characteristics by comparing the per cent of students in each ethnic characteristic code with the per cent of staff in each ethnic characteristic code in each School.

2. Determine if there is a positive relationship between students' achievement test score levels and the perceived competency ratings of staff in individual Schools by comparing the student achievement test score levels with the perceived competency ratings of staff in each School.
IV. Staff Personnel Data Tree

A. Intratree Algorithms

1. Obtain the total number of staff members in each Occupational Category; i.e. teacher, nurse, bus driver, secretary, etc. in each School and in each Agency Component; i.e. decentralized unit or planning area, by totalling the entries in element 1, "Name," by Occupational Category for each School and each Agency Component.

4. Ascertain information indicating the number of staff members "on leave" for each Occupational Category in each Agency Component by totalling the entries in the "on leave" category of element 4, "Present status (assigned, on leave, released, terminated)" by Occupational Category for each Agency Component.

8. Ascertain the stratification of ethnic characteristics of staff by Occupational Category, School and Agency Component by totalling the entries in each ethnic characteristic code from element 8, "Ethnic characteristic code," for each Occupational Category, each School and each Agency Component.

11. Obtain information about a dimension of the tenure status of staff by totalling the entries in element 11, "Present contract code (one year, one year probationary, etc.)" for each contract code by Occupational Category in each School and in each Agency Component.

14. Ascertain the total revenue needed for salaries of all employees in each Occupational Category and the total revenue needed in the Agency by totalling the values in element 14, "Present total contracted salary," for each Occupational Category and for the Agency.

20. Ascertain the annual absentee rate by Occupational Category in each Agency Component by totalling the values in element 20, "Days absent per year," for each Occupational Category in each Agency Component and by dividing each total by the number of entries in each Occupational Category in each Agency Component.

22. Obtain a generalized concept of the staff performance in each School by totalling the entries in element 22, "Position performance appraisal" for each category of performance appraisal for each Occupation Category in each School.
31. Ascertain information about staff members who terminate their employment by totalling element 31, "Reason for termination code" for each code for each Occupational Category for each School.

35. Obtain a composite picture of the educational attainment level of the staff by totalling the entries in each code of element 35, "Highest degree or certificate received code," for each Occupational Category in each School and in the Agency.

46. Ascertain one of the dimensions of the pre-employment history of staff members by totalling each category of element 46, "All previous experience code (teacher, secretary, painter, bus driver, etc.)" by each Occupational Category in each School.

49. Ascertain information about the location of pre-employment experience by totalling each code from element 49, "Experience by LEA location code (central city urban, non-central city urban, suburban, rural)" for each Occupation Category in each School and in the Agency.

55. Obtain the number of teachers with bilingual competencies on the staff by totalling element 55, "Bilingual competency code," in each School and in the Agency.

B. Intertree Algorithms

1. Obtain the degree of positive relationship between higher salaried personnel and positive responses on job perception codes such as job involvement, personal security, autonomy, etc. for each Occupational Category in each Agency Component.

V. Educational Facilities Data Tree

A. Intratree Algorithms

1. Determine the number of rooms or definable areas in each Building and each School by totalling the number of entries in element 1, "Number (I.D.)" for each Building and each School.

6. Obtain information about the potential painting needs in each building by totalling all rooms or definable areas where five or more years have lapsed since last painting as indicated from element 6, "Date of last interior painting" for each Building.
8. Obtain information about the magnitude of fire extinguisher recharging by totalling the values in element 8, "Number of fire extinguishers" for each Building and each Agency Component.

9. Ascertain the toilet provisions made for the handicapped by totalling the entries in element 9, "Toilet provisions for the handicapped," for each Building and each Agency Component.

11. Obtain information indicating the number of rooms designed for each functional use by totalling the values in each code from element 11, "Room design code," for each Building and each Agency Component.

12. Obtain information indicating the utilization of rooms for each specified use by totalling the values in each code of element 12, "Room use code," in each Building and in the Agency Component.

13. Obtain information indicating the total number of student learning stations available in rooms designed for each designated use by totalling element 15, "Number of learning stations," for each room design code in each Building and in each School and in each Agency Component.

69. Ascertain information indicating the number of relocatable units available in each Agency Component by totalling the values in element 69, "Number of relocatable units," for each School and each Agency Component.

94. Obtain an historical perspective on annual costs of custodial services by displaying in graphical form the values in element 94, "Annual custodial costs," for each of the past five years for each Building.

95. Obtain an historical perspective on annual costs of maintenance services by displaying in graphical form the values in element 95, "Annual maintenance costs" for each of the past five years for each Building.

96. Obtain an historical perspective on annual costs of utilities services by displaying in graphical form the values in element 96, "Annual utilities costs," for each Building in each of the past five years.

107,108. Ascertain the square foot cost of initial construction for each Building by dividing the values in element 107, "Cost of construction," by the corresponding values in element 108, "Total square feet of building."
123. Obtain information indicating the total number of acres of sites in each Agency Component by totalling the values in element 123, "Site size in acres," for each Agency Component.

124, 125. Ascertain the magnitude of parking lots in each parking lot surface code category by totalling the values in element 124, "Number of parking spaces," for each code in element 125, "Parking lot surface code" at each Building and in each Agency Component.

VI. Financial Resources Data Tree

A. Intratree Algorithms

1-6. Obtain information indicating the total revenue collected by Schools for each of the following elements by totalling the values in each element:
- element 1, "Revenue from student fees"
- element 2, "Revenue from internal accounts"
- element 3, "Revenue from sale of consummable supplies"
- element 4, "Revenue from sale of other items"
- element 5, "Revenue from fines"
- element 6, "Other revenue received"
for each School and for the Agency.

7-8. Ascertain the total assessed valuation in the Agency by adding the values in element 7, "Assessed valuation of personal property in the local district" to the values in element 8, "Assessed valuation of real property in the local district."

9. Develop information indicating anticipated annual revenue from local real and personal property taxes by multiplying the sum of the assessed valuations, elements 7 and 8, by the value in element 9, "Local district tax rate for operating monies."

10. Develop information indicating anticipated annual bond retirement revenue by multiplying the sum of elements 7 and 8 by the value in element 10, "Local district tax rate for bond retirement."

9, 10. Present an historical perspective on the tax rates for each of the past ten years for operating monies and bond retirement monies in graphical form.

7, 8. Present an historical perspective on the sums of each, the assessed valuation on personal property and the assessed valuation on real property, for each of the past ten years and develop and display in chart form the index of change from the base year.
Total the revenue received by the Agency from all sources, determine the amount for each source and present a per cent figure for each source by dividing the revenue from each source by the total revenue received for each of the past ten years. Display these per cents in graphical form.

B. **Intertree Algorithms**

1. Ascertain the assess valuation per pupil by dividing the total personal and real property valuation of the Agency by the total public school pupil population in the Agency.

2. Ascertain the assessed personal property valuation per pupil by dividing the total assessed personal property valuation in the Agency by the total number of pupils in the Agency.

3. Ascertain the assessed personal property valuation for each general use code category for non-dwelling units; i.e. light industry, heavy industry, commercial, retail, agriculture, in the Agency.

**VII. Transportation Data Tree**

A. **Intratree Algorithms**

1. Ascertain the number of buses operating in each Agency Component; i.e., Decentralized unit or Planning area, by totalling the entries in element 1, "Bus number assigned," in each Agency Component.

3. Obtain the number of buses with an excess of 60,000 on the odometer in each Agency Component; i.e. Decentralized unit or Planning area, by totalling the number of entries in element 3, "Mileage registered on odometer at beginning of year," in each Agency Component.

4. Ascertain the number of buses in each year of age by totalling the number of entries at each age from element 4, "Age," in each Agency Component.

5. Obtain the maximum total number of students who can be transported on a single run of all buses by totalling the entries in element 5, "Pupil Capacity," for each Agency Component.

14. Obtain the total number of buses of each body type in the Agency by totalling the number of buses of each body type from element 14, "Body type code," in the Agency.

15. Obtain the total number of buses of each chassis type in the Agency by totalling the number of buses of each chassis type from element 15, "Chassis type code," in the Agency.
19. Ascertain the total number of accidents by accident type in each Agency Component by totalling the number of entries for each code from element 19, "Classification of accident by code," in each Agency Component.

22. Obtain the number of miles traveled by buses for each Program Component; i.e. Regular routes, Non-public, Extracurricular, etc., by totalling the entries for each Program Component from element 22, "Number of miles on trips," in each Agency Component.

23. Ascertain the total number of students transported in each Agency Component for each Program Component; i.e. Regular routes, Non-public, Extracurricular, etc., by totalling the entries for each Program Component from element 23, "Number of pupils transported on trips," for each Agency Component.

Ascertain a ratio of miles traveled per student transported for each Program Component by dividing the totals in each Program Component in element 22, "Number of miles on trips" by element 23, "Number of pupils transported on trips," for each Agency Component.

26. Ascertain the total amount of driving time in each Program Component by totalling element 26, "Driving time on trips," for each Program Component in each Agency Component.

B. Intertree Algorithms

1. Ascertain the cost per pupil transported in the Agency Component by dividing the total costs for transportation of pupils by the total number of pupils transported in each Agency Component.

2. Ascertain the average total cost per mile of travel for the transportation fleet by dividing the total costs of transportation by the total number of miles logged for each transportation vehicle in each Agency Component.

VIII. Food Service Tree

A. Intratree Algorithms

1. Ascertain the total numbers of serving kitchens and food preparation kitchens by totalling the number of responses for each category from element 1, "Kitchen description (serving and/or preparation)" for each Agency Component; i.e., Decentralized unit or Planning area.
2. Ascertain the magnitude of the a la carte programs in each of the Schools by totalling the entries in element 2, "Total receipts from a la carte meals," for each School.

3. Ascertain the total expenditures for a la carte meals supplies by totalling the entries in element 3, "Total expenditures for supplies for a la carte meals," in each School.

2,3. Obtain a figure representing gross profits from a la carte meals for each School by subtracting the totals in element 2 from the corresponding totals in element 2 for each School.

4. Ascertain the magnitude of the free lunch program in each School and in each Agency Component by totalling the entries in element 4, "Total number of free lunches served," for each School and each Agency Component.

5. Ascertain the magnitude of the reduced price lunch program in each School and in each Agency Component by totalling the entries in element 5, "Total number of reduced price lunches served," for each School and each Agency Component.

6. Ascertain the magnitude of the regular price lunch program in each School and in each Agency Component by totalling the entries in element 6, "Total number of regular price lunches served," for each School and each Agency Component.

7. Ascertain the magnitude of the adult price lunch program in each School and in each Agency Component by totalling the entries in element 7, "Total number of adult price lunches served," in each School and in each Agency Component.

Obtain the figure indicating the total number of lunches served, excluding a la carte, in each School and in each Agency Component by summing the figures in elements 4, 5, 6, and 7 for each School and each Agency Component.

13,14. Ascertain a gross profit figure from the food vending machine business in each School and in each Agency Component by subtracting the values in element 14, "Total expenditure for vending machine supplies," from the corresponding values in element 13, "Total receipts from vending machines" in each School and each Agency Component.

24. Obtain attitudinal data concerning the food service program by summing the corresponding values in element 24, "Extent to which the following groups believe they are involved in food service planning (constantly, frequently, moderately, rarely, never)"
25. Obtain attitudinal data concerning the food service program by summing the corresponding values in element 25, "Extent to which the following groups believe the objectives of the food service program are being achieved (superior achievement, above average, average, below average, hardly at all)
   a. students
   b. staff
   c. parents
   d. board of education
   e. others," for each School.

Obtain the difference between the total receipts and the total expenditures for all food service operations in each School for each of the past five years and display these answers in graphical form.

B. Intertree Algorithms

1. Ascertain the numbers of families in various income ranges from element 14 of the Population Data Tree and the numbers of students, ages 5-17, from element 15 of this tree in families with the different income ranges and correlate the numbers of pupils served free lunches from the Food Service Tree, element 4, for each School in the Agency.

2. Ascertain the numbers of families in various income ranges from element 14 of the Population Data Tree and the numbers of students, ages 5-17, from element 15 of this tree in families with the different income ranges and correlate the numbers of pupils served reduced price lunches from the Food Service Tree, element 5, for each School in the Agency.

IX. Business Management Tree

A. Intratree Algorithms

1. Ascertain a dimension of the magnitude of the bookkeeping process in each School by totalling the values in element 1, "Number of active accounts," for each School.

7. Ascertain the extent to which individuals from the following categories participate in ordering of supplies, materials and equipment by totalling the values in each category in element 7, "Extent to which the following groups participate in ordering supplies, materials and equipment (constantly, frequently, moderately, rarely, or never)"
pupils
teachers
building administrators
parents
skill or craft committees
central office administrators
board of education members
others"
in each School and each Agency Component.

8. Ascertain the extent to which individuals from the same categories as element 7 participate in the determination of the allocation of funds to the different purchase categories by totalling the values in each category in element 8, "Extent to which the following groups participate in the determination of the allocation of funds to the different purchase categories (constantly, frequently, moderately, rarely, or never)"
pupils

others"
in each School and each Agency Component.

9. Ascertain the extent to which individuals from the same categories as element 7 participate in an evaluation of the budgetary processes (constantly, frequently, moderately, rarely, or never)
pupils

others"
in each School and in each Agency Component.

27,28. Ascertain the trend in operational costs for supplies and equipment by constructing an historical record of operational costs from the values in element 27, "Operational costs for materials and supplies: program-related," and element 28, "Operational costs for materials and supplies: student-related" for each of the past five years in each School and each Agency Component.

23-26. Obtain total operating costs for the educational program in each School and each Agency Component by totalling the values in all the following elements for each of the past five years:
element 23, "Salaries: teachers"
element 24, "Salaries: paraprofessionals"
element 25, "Salaries: specialists"
element 26, "Salaries: other"
element 27, "Materials and supplies: program-related"
element 28, "Materials and supplies: student-related"
element 29, "Equipment: replacement"
element 30, "Equipment: maintenance"
 element 31, "Inservice training"
 element 32, "Facilities operation"
 element 33, "Facilities maintenance"
 element 34, "Media services"
 element 35, "Transportation"
 element 36, "Contracted services"

for each School and each Agency Component and display totals in graphical form.

38. Ascertain information about the extent of cooperative purchasing by totalling the entries in element 38, "If yes, list categories of items so purchased" for the Agency.

46. Obtain attitudinal information about the assessment of purchasing procedures in the Agency by totalling the values for each group in element 46, "Assessment of purchasing procedures (good, fair, poor) by:
- pupils
- teachers
- building administrators
- parents
- skill or craft committees
- central office administrators
- board of education members
- others"
for the Agency.

47. Obtain attitudinal information about the assessment of auditing procedures in the Agency by totalling the values for each group in element 47, "Assessment of auditing procedures (good, fair, poor) by:
- pupils
- teachers
- building administrators
- parents
- skill or craft committees
- central office administrators
- board of education members
- others"
for the Agency.

48. Obtain attitudinal information about the assessment of the accounting procedures in the Agency by totalling the values for each group in element 48, "Assessment of the accounting procedures (good, fair, poor) by:
- pupils
- teachers
- building administrators
- parents
- skill or craft committees
- central office administrators
- board of education members
- others"
for the Agency.
49. Obtain attitudinal information about the assessment of the inventory procedures in the Agency by totalling the values for each group in element 49, "Assessment of the inventory procedures (good, fair, poor) by: pupils

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for the Agency.

50. Obtain attitudinal information about the assessment of payroll procedures in the Agency by totalling the values for each group in element 50, "Assessment of the payroll procedures (good, fair, poor) by: pupils

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others"

for the Agency.

51. Obtain attitudinal information about the assessment of budgetary procedures in the Agency by totalling the values for each group in element 51, "Assessment of the budgetary procedures (good, fair, poor) by: pupils

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others"

for the Agency.

B. Intertree Algorithms

1. Ascertain the operating expenditures per pupil for each Curricular Area; i.e. mathematics, science, automotives, etc., in each School, each Agency Component and the Agency.

X. Organizational Management Tree

A. Intratree Algorithms

1-31. For each of the 15 job perception codes, and the 16 measures determine the perceptions of each School, Agency Component and the Agency by totalling the responses of staff in each School, Agency Component and Agency for each element 1-31 as follows:
element 1, "Job involvement" (degree to which the job is perceived as having priority over all other things in life)

element 2, "Personal security" (degree to which individuals are happy with amount of job security)

element 3, "Autonomy" (degree to which group functions independently of other groups and occupies an independent position in society)

element 4, "Control exercised on individuals" (degree of regulation of individuals while functioning as group members)

element 5, "Flexibility" (degree of informality of group procedures, in contrast to adherence to established procedures)

element 6, "Hedonic tone" (degree to which membership is accompanied by pleasant effect)

element 7, "Homogeneity" (degree to which members are similar with respect to socially relevant characteristics)

element 8, "Intimacy" (degree to which members are mutually acquainted and familiar with personal details of one another's lives)

element 9, "Participation" (degree to which members apply time and effort to group activities)

element 10, "Permeability" (degree to which group permits ready access to membership)

element 11, "Polarization" (degree to which group is oriented and works toward a single goal which is clear and specific to all members)

element 12, "Potency" (degree to which group has primary significance to members)

element 13, "Stability" (degree of persistence over time with essentially unchanged characteristics)

element 14, "Stratification" (degree to which membership is ordered into status hierarchies)

element 15, "Viscosity" (degree to which members function as a unit)

Measures of Normative Environment Codes

element 16, "Clarity of objectives toward which to work"

element 17, "Clarity of rules, policies and guidelines"

element 18, "Extent to which workers are given conflicting priorities"

element 19, "Extent to which central office changes policies without advance notice"

Measures of Intertask Structure (coordination) Codes

element 20, "Extent to which related jobs are meshed to achieve objectives"

element 21, "Extent to which independent assignments are well planned"
Measures of Conditions for Negotiating Order Codes

element 22, "Ease of exchanging ideas and information with others doing related work"

element 23, "Extent to which people doing related work avoid creating problems for one another"

element 24, "Extent to which coordination problems with others doing related work are handled"

Measures of Levels of Skills Codes

element 25, "Proportion of personnel who are competent to do the work assigned to them"

element 26, "Perception of self as competent to do work assigned"

Measures of Rational-trust Relationship Codes

element 27, "Extent to which central office is perceived as following its own rules"

element 28, "Extent to which central office is perceived as understanding teachers' needs, problems and points of view"

element 29, "Extent to which central office is perceived as understanding non-certificated staff needs, problems, and points of view"

element 30, "Extent to which central office is perceived as understanding all other employee needs, problems and points of view"

element 31, "Extent to which top management is perceived as fair and reasonable"

1-31. For each of the 15 job perception codes and the 16 measures, determine the perceptions of each Occupational Category, i.e., Teacher, Nurse, Bus Driver, Secretary, etc., in each Agency Component and in the Agency by totalling the responses to each element (1-31) for each Occupational Category in each Agency Component and for the Agency. (The same job perception codes and measures elements 1-31 will be used as in (A) above.)

1-31. If longitudinal data are available, determine the changes in job perceptions and resources over the past five years in each of the 31 elements in each School, Agency Component and the Agency by totalling the responses to each element 1-31 in each of the past five years for each School, Agency Component and the Agency and present this data in graphical form. (The same job perception codes and measures elements 1-31 will be used as were printed in (A) above.)

1-31. If longitudinal data are available, determine the changes in job perceptions and measures over the past five years in each Occupational Category for each Agency Component and in the Agency by totalling the responses to each element 1-31 in each of the past five years for each Agency Component and the Agency and present this data in graphical form. The same job perception codes and measures, elements 1-31, will be used as were printed in (A) above.)
Data to be Collected on the Agency Component

If there is a ruling board, this body can compose the answers to each of the elements 32-43. Likewise, the staff of the Agency Component can be surveyed to compile the answers to these elements. Each of the elements will be scaled to present a range of expectations. As many different stratifications of expectations can be made as there are employee groups. If major changes occur in central staff personnel, a before and after listing of expectations ranges can be made. Without major changes in staff personnel at the central office, it may still be desirable to make a periodic survey, once every five years, to determine if changes in expectations have occurred.

32-43. To ascertain these expectations, total the responses to each individual element, 32-43, for each Occupational Category for each Agency Component.

- element 32, "Contributions to be made"
- element 33, "Freedom to act"
- element 34, "Goal (outcome) values"
- element 35, "Freedom to interact"
- element 36, "Discontinuity of membership"
- element 37, "Mutual liking"
- element 38, "Non-task performance"
- element 39, "Task specialization"
- element 40, "Returns from the organization"
- element 41, "Task performance"
- element 42, "Task urgency"
- element 43, "Reference group support"

B. Intertree Algorithms

1. Correlate the responses to job perception categories from the Organizational Management Tree with the different salary levels of each Occupational Category from the Staff Personnel Tree in each Agency Component.

2. Correlate the degree of satisfaction indicated from the Organization Management Tree with total working experience ranges in each Occupational Category from the Staff Personnel Tree in each Agency Component.

XI. Population Data Tree

A. Intratree Algorithms

1. To determine the total number heads of households in a School Component Planning Area, total the number of responses to element 1, "Address of head of household," in each School Component Planning Area.
2. Construct a graph showing the different numbers of heads of households in each age range by totalling the entries in element 2, "Birth date," for each desired age range in each School Component Planning Area and for the Agency.

4. Determine the per cent in each ethnic group of heads of households by totalling the entries in element 4, "Ethnic characteristic code," and totalling the number in each ethnic group and dividing each total in each ethnic group by the total number of heads of households in each School Component Planning Area and in the Agency.

5. Construct a graph showing the numbers of different heads of households in each educational attainment level range in the School Component Planning Area and in the Agency by totalling the number of responses in element 5, "Educational attainment code," for each educational attainment level range in each School Component Planning Area and in the Agency.

6. Ascertain the total numbers of heads of households in each Occupational Group from element 6, "Occupational code (defined by federal census)," in each School Component Planning Area and in the Agency.

7. Construct a graph showing the employment status of all the heads of households in each School Component Planning Area and in the Agency by totalling the responses to element 7, "Employment status code," for each School Component Planning Area and in the Agency.

8. Ascertain attitudinal information from heads of households by totalling their responses to element 8, "Attitudinal data (based on individual responses to community opinionaire)," in each School Component Planning Area and in the Agency.

11. Construct a graph showing the numbers of different spouses of heads of households in each educational attainment level range in each School Component Planning Area and in the Agency by totalling the responses in element 11, "Educational attainment code," for each educational attainment level range in each School Component Planning Area and in the Agency.

12. Ascertain the total number of spouses of heads of households in each Occupational Group by totalling each Occupational Group Category entry in element 12, "Occupational code for spouses of heads of households," in each School Component Planning Area and in the Agency.
13. Construct a graph showing the employment status of all the
spouses of heads of households in each School Component
Planning Area and in the Agency by totalling the responses
to element 7, "Employment status code," for each code in
each School Component Planning Area and in the Agency.

14. Obtain a composite picture of the incomes of families in
each School Component Planning Area and in the Agency by
graphing the totals of the numbers of families at each,"Family income range code," element 14, in each School
Component Planning Area and in the Agency.

15. Determine the numbers at each age range of other members of
the households by totalling the responses at each age range
from birth date data in element 15, "Birth dates of other
members of household," in each School Component Planning
Area and in the Agency.

16. Determine the number of pre-school age children likely to
attend non-public schools by totalling the responses to
element 16, "Number of pre-school age children likely to
attend non-public schools," in each School Component
Planning Area and in the Agency.

17. Determine the number of children attending non-public
schools, K-12, by totalling the responses in element 17,
"Number of children attending non-public schools, K-12,"
for each School Component Planning Area and in the Agency.

18. Determine the numbers of different families with different
principal languages spoken in the home by totalling the
responses in element 18, "Principal language spoken in
home code," by code in each School Component Planning
Area and in the Agency.

XII. Physical Data Tree

A. Intertree Algorithms

1. Determine the total number of dwelling units in each block
and each Agency Component by totalling the number of entries
in element 1, "Address," for each Block and each Agency
Component.

2. Obtain the total number of dwelling units of each type by
totalling the number of entries in each type from element
2, "Type of unit code, single-family-detached, duplex,
townhouse, garden apartment, mid-rise apartment, high-rise
apartment, mobile home)," for each Block and each Agency
Component.
3. Determine the total number of dwelling units at each age range by totalling the number of entries for each age range from element 3, "Year of construction," in each Block and in the Agency Component.

4. Determine the per cent of owner occupied dwelling units by totalling all the entries in element 4, "Owner occupied or rented," totalling the number of entries in the owner occupied category and dividing this total by the total number of entries in element 4 for each Block and each Agency Component.

5. Display a graph of the various values of home if owner occupied by totalling the values in each price range from element 5, "Estimated value of dwelling unit if owner occupied," for each Block and each Agency Component.

6. Display a graph of the various monthly rental rates of rented dwelling units by totalling the number of residences in each monthly rental rate range from the responses to element 6, "Monthly rent of unit if rented," for each Block and each Agency Component.

7. Determine the number of dwelling units by type of unit code; i.e., single-family-detached, duplex, townhouse, garden apartment, mid-rise apartment, mobile home, with various numbers of bedrooms by using responses to element 7, "Number of bedrooms," and element 2, "Type of unit code," totalling for each Block and each Agency Component.

8. Obtain an indication of the stability of the population by determining the number of years of residency for heads of households by totalling each of the different lengths of occupancy from element 8, "Year occupied by present head of household," for each Block and each Agency Component.

9. Determine the total number of non-dwelling units by totalling the entries in element 9, "Address," for each Block and each Agency Component.

10. Ascertain the magnitude of the varieties of non-dwelling units by totalling the entries in each category of element 10, "General use code (light industry, heavy industry, commercial, retail, agriculture)," for each Block and each Agency Component.

12. Ascertain the number in each type of affiliation for occupants of non-dwelling units by totalling each occupant category code from element 12, "Occupant category code (governmental, religious, private, etc.)," for each Block and each Agency Component.
10,13. Obtain information indicating a dimension of magnitude of non-dwelling units by general use code; i.e. light industry, heavy industry, commercial, retail, agriculture, by totalling element 13, "Acreage of site," for each general use code category in each Block and each Agency Component.

14,15. Ascertain the number of outside pools in each size category by totalling element 14, "Outside pools," in size ranges from element 15, "Dimensions of pools," in each Agency Component.

16. Determine the number of baseball diamonds by totalling the responses to element 16, "Baseball diamond," in each Agency Component.

17. Determine the number of outside tennis courts by totalling the responses to element 17, "Outside tennis courts," in each Agency Component.

18. Determine the number of football and/or soccer fields by totalling the responses to element 18, "Football and/or soccer fields," in each Agency Component.

19. Determine the number of outside basketball courts by totalling the responses to element 19, "Outside basketball courts," in each Agency Component.

21. Determine the total acreage of developed general playground area by totalling the responses to element 21, "Acreage of developed general playground area," for each Agency Component.

24. Determine the total acreage of nature exhibit area by totalling the responses to element 24, "Acreage of nature exhibit area," in each Agency Component.

25,26. Determine the number of enclosed pools of each size by totalling the responses to element 25, "Enclosed pools," by the sizes indicated in element 26, "Dimensions of pools," in each Agency Component.

27. Determine the number of inside tennis courts in each Agency Component by totalling the number of entries in element 27, "Inside tennis court(s)," for each Agency Component.

28. Determine the number of inside basketball courts in each Agency Component by totalling the number of entries in element 28, "Inside basketball court(s)," for each Agency Component.

29. Determine the number of bowling allies in each Agency Component by totalling the number of entries in element 29, "Bowling allies," for each Agency Component.
30,31. Determine the number of equipped exercise rooms in each size category in each Agency Component by totalling the number of entries in element 30, "Equipped exercise rooms," in each size category from element 31, "Square footage of exercise rooms," for each Agency Component.

32,33. Determine the number of facilities classified as inside multi-use recreational areas by size category in each Agency Component by totalling the entries in element 32, "Inside multi-use recreational areas," in each size category indicated in element 33, "Square footage of multi-use recreational areas," for each Agency Component.

34,35. Determine the number of large-group meeting spaces of each size range category in each Agency Component by totalling the number of entries in element 34, "Auditorium and/or theater," by each size-range category from element 35, "Seating capacity of auditorium and/or theater," in each Agency Component.

Elements 14-40 can be recycled to determine eligibility for use by code for each Agency Component.

Elements 14-40 can be recycled to determine availability status.

B. Intertree Algorithms

1. Obtain the ratio of children per dwelling unit in each Agency Component by dividing the total number of dwelling units from the Physical Data Tree element 1 into the number of entries in Population Tree element 15 for birth dates showing children under 19.

2. Ascertain the extent of use of community special use facilities as such use accommodates the curriculum of the LEA by totalling the number of incidences of use and the total number of pupils involved in each community special use facility for each Curricular Area and for each Curricular Component--Age and Grade Level.

XIII. Activities and Services Data Tree

A. Intratree Algorithms

1. Ascertain the total number of agencies categorized by Program Classification; i.e. General instruction, Job training, Employment placement, Counseling, General health, Mental health, Recreational, Cultural, by totalling the entries in
element 1, "Sponsoring agency name," in Program Classification categories in the Agency and in each Agency Component.

Ascertain the total number of agencies in each Program Classification in each Agency Type; i.e. Local government, State government, Federal government, Religious institution, Industrial-business organization, other private organization, by totalling the agencies from element 1, "Sponsoring agency name," categorized by Program Classification for each Agency Type in each Agency Component.

7. Ascertain the annual number of individuals seeking participation by age and sex in each Program Classification category in each Agency Component by totalling the entries in element 7, "Annual number of individuals seeking participation by age and sex," for each Program Classification category in each Agency Component.

8, 9. Obtain a ratio indicating the degree to which programs are operating at desired capacity levels in each Agency Component for each Program Classification category by totalling element 8, "Annual number of individuals participating by age and sex," and by totalling element 9, "Desired annual program participation capacity by age and sex," with each total categorized for each Program Classification in for each Agency Component by dividing the element 8 totals by the corresponding totals in element 9.

7, 9. Obtain a ratio indicating the degree to which individuals are accommodated who seek participation in each Program Classification in each Agency Component within the desired participation capacity of each Program Classification in each Agency Component by totalling for each Program Classification in each Agency Component element 7, "Annual number of individuals seeking participation by age and sex," and element 9, "Desired annual program participation capacity by age and sex," and by dividing the totals in element 7 by the corresponding totals in element 9.

9. Ascertain the magnitude of desired accommodation of each Program Classification by each Agency Type in each Agency Component by totalling element 9, "Desired annual program participation capacity by age and sex," for each Program Classification in each Agency Type in each Agency Component.

12. Ascertain the annual cost of each Program Classification by Agency Type in each Agency Component by totalling element 12, "Total annual cost of program," for each Program Classification in each Agency Type in each Agency Component.
8, 12. Ascertain the average annual participation cost for each Program Classification in each Agency Type in each Agency Component by dividing the totals in element 12, "Total annual cost of program," by the corresponding totals in element 8, "Annual number of individuals participating by age and sex," for each Program Classification in each Agency Type in each Agency Component.

8, 12, 13, 14, 15. Ascertain the average hourly cost per participant for each Program Classification in each Agency Type in each Agency Component by finding the product of element 13, "Length of program in weeks per year," element 14, "Number of meeting times per week," element 15, "Length of meeting in hours," for each Program Classification in each Agency Type in each Agency Component and by dividing the above totals by the corresponding totals from element 8, "Average number of individuals participating by age and sex."

XIV. Governance Data Tree

A. Intratree Algorithms

1. Ascertain the total number of organizations by Type of Organization; i.e., Governmental, Religious, Service, Business and/or Industrial, Private organization, in each Agency Component; i.e., Decentralized unit or Planning area, by totalling the entries in element 1, "Name of organization," by Type of Organization in each Agency Component.

8. Ascertain the total number of organizations of each Type which employ executive heads at less than 50% time by totalling all entries to element 8, "Percentage of time used for executive head position," which are less than 50% and total by Type of Organization categories in each Agency Component.

9. Ascertain the total number of elected executive heads in each Type of Organization in each Agency Component by totalling the "elected" responses in element 9, "Executive Head (elected or appointed)," for each Type of Organization in each Agency Component.

10. Ascertain the lengths of terms of executive heads for each Type of Organization in each Agency Component by totalling the different length of term codes, one year, two year, etc., in element 10, "Length of term of executive head by code," for each Type of Organization in each Agency Component.
11. Ascertain the number of salaried executive heads in each Type of Organization in each Agency Component by totalling the "salaried" responses in element 11, "Executive head (salaried or non-salaried)," categorized by each Type of Organization in each Agency Component.

12. Obtain organizational membership sizes for each Type of Organization in each Agency Component by totalling the values in element 12, "Number in current total membership," for each Type of Organization in each Agency Component.

13. Ascertain membership eligibility requirements by Type of Organization in each Agency Component by totalling the responses to element 13, "Membership eligibility code (employed, appointed, elected, anyone applying, restricted by geographic area, restricted by socioeconomic level, restricted by occupation, restricted by religious affiliation, restricted by political affiliation)," by Type of Organization in each Agency Component.

14. Ascertain the numbers of organizations of each Type of Organization in each Agency Component serving different specified age level response from element 14, "Average age of membership," for each Type of Organization in each Agency Component.

15. Ascertain the number of new members this year in each Type of Organization in each Agency Component by totalling the values in element 15, "Number of new members this year," for each Type of Organization in each Agency Component.

Obtain relative rates of growth for this year of organizations by Type of Organization in each Agency Component by dividing totals from element 5, "Number of new members this year," by corresponding totals from element 12, "Number of current total membership," for each Type of Organization in each Agency Component.

16. Ascertain the characteristics of membership in each Type of Organization in each Agency Component by totalling each social or ethnic code by percentage ranges from element 16, "Characteristics of membership by social or ethnic code and percentage ranges (black, white, American-Indian, Spanish-American, Oriental, other)," for each Type of Organization in each Agency Component.

17. Ascertain the tenure of the numbers of different Types of Organizations in each Agency Component by totalling each code in element 17, "Date of founding of organization by code," for each Type of Organization in each Agency Component.
18. Ascertain the geographical reach of organizations by Type of Organization in each Agency Component by totalling each category of element 18, "Geographical breadth of organization (local, state, regional, national, international)," for each Type of Organization in each Agency Component.

19. Obtain a dimension of stability of organizations by Type of Organization in each Agency Component by totalling the responses to element 19, "Organizational life span (temporary or long term)," for each Type of Organization in each Agency Component.

For the following algorithm the ranking system will be:
- Singlemost important source ................. 1
- Among the most important source .......... 2
- A minor source .................................. 3
- Not at all important as a source .......... 4

20. Ascertain information about the extent to which membership perceives their organization as an information source to City Council, Mayor, City Commissioner, Board of Education, Superintendent of Schools, Zoning Board, Board of Health, Police Department, County Commissioners, Minority Special Interest Groups, Council of Churches, Chamber of Commerce, Service Clubs, PTA Organizations, Largest Local Industries and/or Businesses, Major Labor Unions, Voter Leagues, Realtors Association by totalling their responses about each group or individual from element 20, "How would you rank your organization as a source of ideas and advice to the following groups or individuals: City Council, Mayor...Realtors Association," in the Agency.

The following rating system is used for elements 21, 22, and 23:
- Always ........................................ 1
- Usually ........................................ 2
- Sometimes .................................... 3
- Rarely .......................................... 4
- Never ............................................ 5

21. Ascertain the extent to which members perceive their organizations seeking information concerning financial allocations within their organizations from the following groups or individuals: City Council, Mayor...Realtors Association by totalling the responses for each group or individual listed in element 21, "When your organization considers financial resource allocations with what frequency do you seek information from the following groups or individuals: City Council, Mayor...Realtors Association," in the Agency.
22. Ascertain the extent to which members perceive their organization as being requested to assist City Council, Mayor... Realtors Association in allocation of resources within each organization or individual's realm of responsibility by totalling the responses concerning each group or individual cited in element 22, "With what frequency do the following groups or individuals contact you to gain information when they are making decisions on allocations of resources: City Council, Mayor...Realtors Association," in the Agency.

23. Ascertain a dimension of cooperation between groups and/or individuals by totalling the responses for each group and/or individual cited in element 23, "Number of times in the past year your organization coordinated financial and/or personnel resources in a combined effort to reach a commonly held objective with each of the following groups or individuals: City Council, Mayor...Realtors Association," in the Agency.
You have examined and assessed the algorithmic profile data statements as intertree and intratreedata relationships. You are now asked to assess the procedure of incorporating coordinate systems data and information into the Total System for Comprehensive Planning in Education. To envision the total relationship your attention is again directed to figure 2 of the introductory information.

This third dimension of algorithmic profile data development seeks data useful to the tactical planner in comprehensive educational planning. A personal inspection of coordinate systems taxonomies resulted in the listing which follows. One of the latest taxonomies developed in the literature was accomplished by Kenneth Brooks in his dissertation written in 1972. He based his taxonomy on hierarchical levels and listed 35 such coordinate systems. However, the coordinate systems, ranked in hierarchical order, are not coterminous from one organization to another. Therefore, data from a coordinate system high in the hierarchical order of an organization may be useful at a lower hierarchical level in another organization. Because of this, it was deemed to be more important to develop a listing which would be more empirically useful. As it is reported here, it is an open system where additional coordinate systems may be added if needed.

Because each listed coordinate system is anticipated to have at least some measure of utility in providing useful data, a listing of each useful algorithmic profile data quantity would be very voluminous and beyond the resources of this investigator. For this reason, only selected illustrative examples have been provided. These are not exhaustive even in the examples chosen. They are indicative only of some of the listing which can
be generated.

Listing of Coordinate Information Systems Having Potentially Useful Information for the Tactical Planner in Comprehensive Educational Planning

1. Federal Census
2. Other planning agencies
   a. City planning agency
   b. Regional planning agency
3. Metropolitan Church Board
4. City Chamber of Commerce
5. Regional Chamber of Commerce
6. Community Improvement Corporation
7. Athletic league (local, regional and state)
8. Community recreation program
9. Higher education agencies
10. Other local governmental agencies
    a. Local building authority
    b. Department of Health
    c. Fire department
    d. Police department
11. Public library
12. PTA (local, council and state)
13. Model cities program
14. Affirmative action program
15. School boosters organizations
    a. Athletic boosters
    b. Music boosters
    c. Other boosters
16. Art league
17. League of women voters
18. Service Clubs
    a. Lions
    b. Kiwanis
    c. Rotary
    d. Sertoma
    e. Others
19. Veterans organizations
    a. Veterans of Foreign Wars
    b. American Legions
20. Welfare department
21. Civil Service Commission
22. Labor organizations
    a. AFL
    b. CIO
    c. Local professional organization
    d. Non-professional organization (local)
23. County budget commission
24. County prosecuting attorney or city solicitor
25. State agencies
   a. Department of Education
   b. Department of Buildings
   c. State auditor's office
   d. Legislative Services Commission
   e. State Highway Patrol

From the above listing of coordinate systems, three examples are chosen from which algorithmic profile data may be used in the data information system for comprehensive planning in education. These three examples are illustrative. The first one chosen is the "Federal Census" system. This system is chosen because known data exist which are needed by the tactical planner. Some of these data are unavailable at the raw profile level because confidentiality is guaranteed its individuals in their answers. Therefore, it is necessary to utilize algorithmic profile data from this system for these data. The following are examples of listing which have potential utility:

SA A D SD 1. The sum of the numbers of residents by age group by blocks.
SA A D SD 2. The sum of the number of families in different income ranges by blocks.
SA A D SD 3. The sum of ADC categorized youth by age by block.
SA A D SD 4. The sum of welfare recipients by numbers of children by age range by block.
SA A D SD 5. The sum of the numbers of residents by housing type by block.
SA A D SD 6. The sum of the numbers of residents by ethnic characteristic code by block.
SA A D SD 7. The sum of the numbers of residents whose native language is not English by language code by block divided by total number of residents in the block.
SA A D SD 8. The sum of the numbers of households when only one parent resides by block divided by total number of households in the block.
SA A D SD 9. The sum of the number of residents who have resided one, two, three, four, five years in present location by block.
divided by total number of residents by block.

SA A D SD 10. The sum of the cost of single family dwelling units by price code by block by number of children by age code.

The second and third coordinate systems to be used as examples are picked at random. The following algorithmic listings are illustrative examples which have potential utility for the tactical planner in comprehensive planning in education:

Coordinate System—Regional Planning Agency

SA A D SD 1. The sum of the projection of population by age group by year in the school district.

SA A D SD 2. The sum of the potential numbers of home sites by zoning code in the school district.

SA A D SD 3. The sum of the acres available for industrial development in the school district.

SA A D SD 4. The sum of the number of miles of improved highways in the school district.

SA A D SD 5. The sum of the acres available at recreational sites by activity code in the school district.

SA A D SD 6. The sum of the number of acres of water available by recreational code in the school district.

SA A D SD 7. The sum of the number of acres of farmland in the school district divided by the total number of acres in the school district.

Coordinate System—Labor Unions or Teachers Associations Which Have School District Teachers As Members

SA A D SD 1. The sum of the numbers of teachers who are members of each organization in the school district.

SA A D SD 2. The sum of the numbers of teachers who have been members in each organization in the school district for each of the past ten years.
3. The sum of the benefits awarded to teachers in negotiations, summed by labor organizations or associations in the school district for each of the past ten years.

4. The sum of the number of days of work stoppage by majority organization for each of the past ten years in the school district.

5. The sum of the dues paid to each labor organization in the school district for each of the past ten years.

6. The sum of the number of inservice teacher-days provided and financed by the labor organization for each of the past ten years.

Please respond to the following general statement:

1. The displays of algorithmic profile data in the three examples of listings from coordinate systems suggests an organization of data which is meaningful and useful.

Please respond to the following general statements or questions:

1. The concept of developing an array of data relationships from raw profile data in a base data system is a meaningful concept and useful for planning information systems.

2. The combined array of data from intertree, intratree and coordinate systems presents a comprehensive array of data relationships needed in planning information systems.

3. This array of algorithmic profile data can increase the quality of the planning information system.

4. This array of algorithmic profile data can increase the quantity of information used in the planning information system.

Now that you have completed your assessment of the specific listing and you have responded to the general statements, please respond to the following additional questions:

1. Are there additional intratree listings you think should be included? If so, please indicate them.
2. Are there additional intertree listings you think should be included? If so, please indicate them.

3. Are there any other important algorithmic profile data relationships which you think should be included? If so, what are they?

Your help is appreciated greatly. Your comments will be used to refine the finished array of algorithmic data.

Calvin E. Leader
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