ARIZONA DEPARTMENT OF TRANSPORTATION

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INFORMATION SYSTEMS IN ADOT: ANALYSIS OF; INTRA-FUNCTION FLOW, DECISION SUPPORT NEEDS, EXISTING SYSTEMS UTILITY AND USER ATTITUDES.

Final Report
Volume III: Appendices

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16. Abstract

A report is offered on a study of the information activities within the Right-of-Way section of ADOT. The objectives of the study were to adapt and apply techniques to measure user-perceived needs, satisfaction and utility of services provided Right-of-Way by the Information Systems Group (ISG).

A background of the four tested techniques is given along with a review of related literature. The techniques were:

(1) a functional analysis using the IDEF methodology (LeClair, 1982)
(2) a user needs analysis using the Bailey and Federle methodology (Bailey and Federle, 1983)
(3) a systems utility analysis using the Krobock methodology (Krobock, 1981)
(4) a user satisfaction analysis using the Pearson methodology (Bailey and Pearson, 1983)

The procedure used to collect and analyze the data collected in Right-of-Way is briefly discussed. A manual for ISG use of the techniques is offered.

Conclusions from the study include the following observations. The techniques are not hard to learn or use but are time consuming. With the exception of the IDEF technique, the techniques were applied at little cost to the Right-of-Way staff. The techniques by themselves did yield useful insights for ISG. Using the techniques in combination suggested insights not possible when they were used alone. The ISG users manual does provide a reasonable guide to further application of the techniques.

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APPENDIX B

ARIZONA STATE UNIVERSITY

HUMAN SUBJECTS RESEARCH REVIEW COMMITTEE

INFORMED CONSENT FORM

I,_____, in return for the opportunity of participating as a subject in a scientific investigation and for other considerations, hereby authorize the performance upon me of the following procedure: interviews and questionnaires concerning my information environment and use of information systems will be administered.

This consent I give voluntarily as the nature and purpose of the experimental procedure, the known dangers and the possible risks and complications have been fully explained to me by _____. I understand the potential benefits of the investigation to be an improved information environment.

I understand that, as a participant, my rights will not be jeopardized, that my privacy will be maintained and that the data obtained in this study will be used in a manner to maintain confidentiality and personal rights.

I knowingly assume the risks involved, and I am aware that I may withdraw my consent and discontinue participation at any time without penalty to myself.

Dated:_____ _____
Signature

Dated:_____ _____
Signature

APPENDIX C

$IDEF_0$ ANALYSIS

IDEF METHODOLOGY

The first methodology used in the gathering of data for this research project was IDEF - The Integrated Computer Aided Manufacturing Definition methodology. The methodology was developed for the U.S. Air Force over the past several years to model the functions and information flow required to manage a manufacturing facility; however it is a flexible methodology and can be used in any environment.

The purpose in using IDEF is to model an organization's existing functions, showing relationships and information flows among those functions. LeClair[1] notes that a visual language can give more information than almost any other type of communication. The end product of the IDEF methodology is a picture; a visual model which aids in a better understanding of an environment than could be had with a list or most other types of function identification.

There are three types of IDEF models. IDEF0 is a model showing functions of an organization and relationships between those functions. It is not concerned with how long a function takes to perform or with the sequence of functions. IDEF1 is an information model representing the structure of data which would be needed to support the functional model. IDEF2 is a dynamic model which shows time-varying behavior of the functions of the organization. It was originally intended that both the IDEF0 and

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[1]Steven R. LeClair, "IDEF - A Language for Industrial Engineers", Engineering Report, Arizona State University, 1983, p. 46.

IDEF1 models would be used; however as the research progressed, it became apparent that IDEF0 alone gave a clear indication of the functions and information flows in the environment. IDEF1 would be a possible methodology for modeling the structure for databases after determining the informational needs of the subjects of a study. The functions and information needs in the type of organization this study was performed for are generally static with time and IDEF2 would not be a useful model.

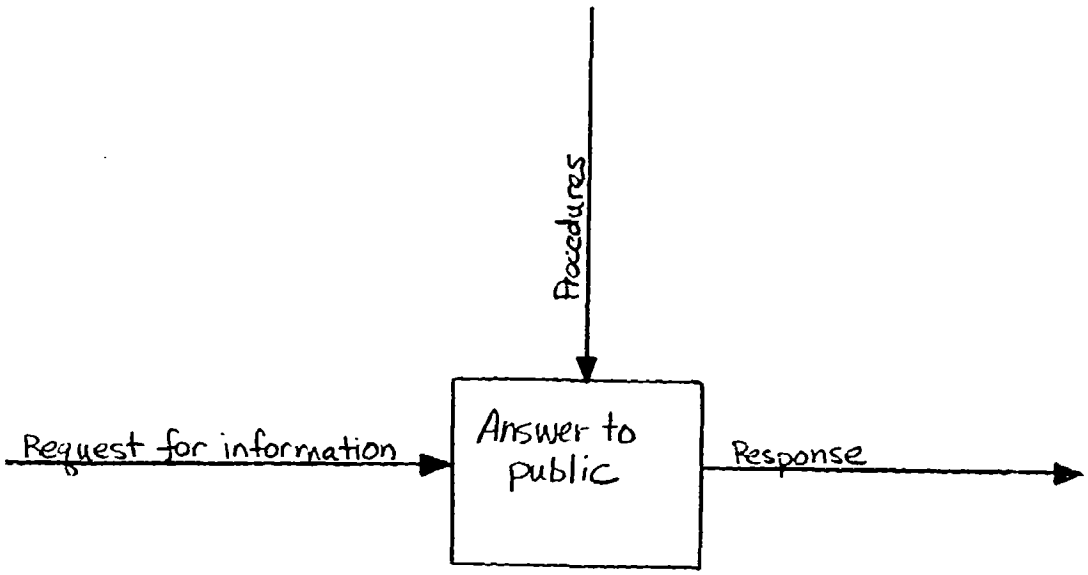
IDEF models are developed for a specific purpose and with a specific viewpoint. Examples of purposes might be to show relationships among departments in a hospital or among different aspects of a construction business. For this research, the purpose was to model the functions of several Services of the Right of Way Section of the Arizona Department of Transportation in order to understand the functions in the environment and the relationships and information flows among those functions. Examples of viewpoints might be from the viewpoint of a doctor or a construction foreman. Each viewpoint shows a different way of looking at a system. The viewpoint selected should give the desired result. Since the objective of this research was to develop a tool for future use by information system specialists in an organization, the viewpoint selected was that of an information systems specialist without knowledge of the specific environment wishing to understand the functional relationships and information flows. When administering the IDEF methodology, it is necessary to obtain information and feedback from those persons who know the functions and information used in the environment being modeled in order to insure accuracy.

Managers and supervisors were interviewed and feedback was encouraged in creating the resulting model.

The construction of the model is illustrated in Figure 1. A box is drawn for the major function of the organization being modeled. The box is labeled with the name of the function - using a verb, since a function is something that is performed (i.e. an activity). Inputs into that function (such as "request for information") are indicated with an arrow going into the left side of the box. Controls (influences on the function which do not themselves produce output, such as written procedures) are indicated with arrows coming into the top of the box. Outputs are indicated with arrows going out of the right side of the box. This first model is call the A-0 (A minus zero) diagram.

From the A-0 diagram, several major subfunctions are identified. Boxes representing these functions are drawn on a new diagram, called the A0 (A zero) diagram. The same procedure is applied to these functions as for the organization's major function but now relationships are identifed among the functions. An output of one function may be an input to, or a control on, another function. Any of the functions on this diagram may be likewise broken down into further subfunctions. Only those functions the analyst is concerned with need be broken down. Figure 2 illustrates the identifying of relationships among functions.

Each diagram is given a number which identifies its place in the sequence of diagrams. The first diagram is the A-0 diagram. The next diagram is the A0 diagram. On the A0 diagram, the subfunctions of the major organizational function are drawn.



A-Ø

FIGURE 1 Construction of the Model

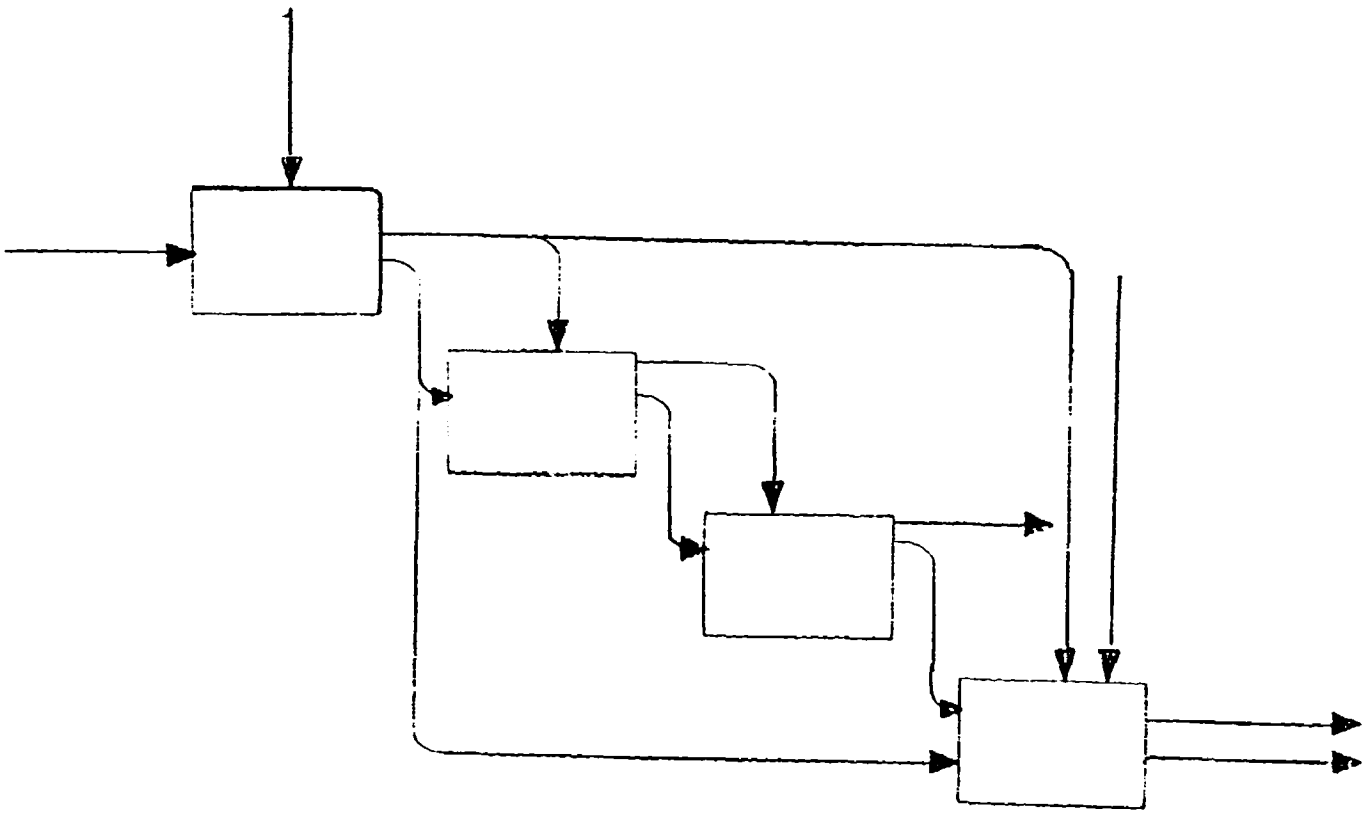


FIGURE 2 Relationships Among the Functions

Each of these boxes is given a number (1, 2, 3, etc.). Any of these boxes which are further broken down will carry its number into its new diagram. For example, if box 1 on diagram A0 is to be broken down, its new diagram will be A1. The boxes in this new diagram (A1) will be numbered (1, 2, 3, etc.). Should any of these boxes be further broken down, their new diagrams will be numbered A11, A12, A13, etc., adding to the last diagram number the number of the box being broken down. In this way the diagrams can be traced back through all of its breakdowns to the original diagram. Because new diagrams are broken down from previous diagrams, the diagram being broken down is called the parent diagram and the new diagram is called the daughter diagram. The breaking down of functions into subfunctions and the numbering procedure is illustrated in Figure 3.

In order to show which loose-ended inputs, controls, and outputs on a parent diagram are the corresponding loose-ended inputs, controls, and outputs on its daughter diagram, codes may be used. The codes number the inputs I1, I2, etc., the controls C1, C2, etc., and the outputs O1, O2, etc. The same code number would be used on the corresponding loose-ended arrows in the parent and daughter diagrams. This is illustrated in Figure 4. For this project, it was apparent which loose-ended arrows in parent diagrams corresponded with loose-ended arrows in daughter diagrams; therefore the codes were not used. This was done to avoid clutter. However, in a situation where the codes make the model easier to read, the codes should be used.

In order to relate the above explanation of IDEF to the actual research done for this project, several examples are

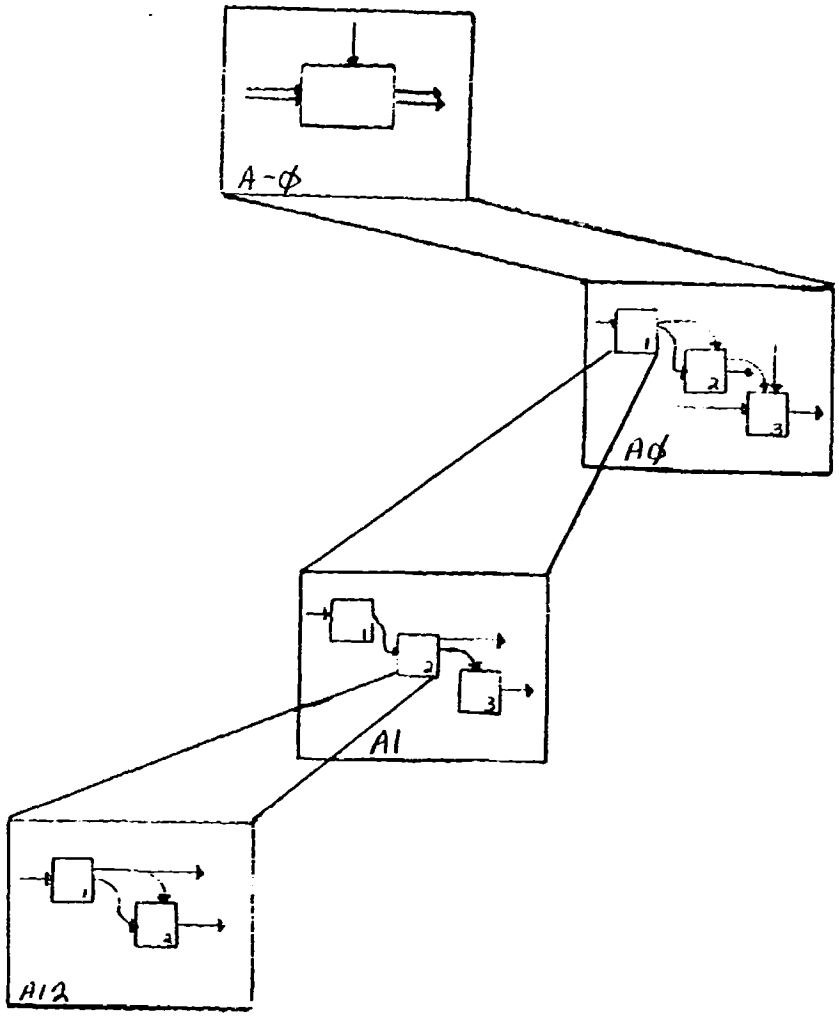


FIGURE 3 Breaking the Functions into Subfunctions and the Numbering Procedure

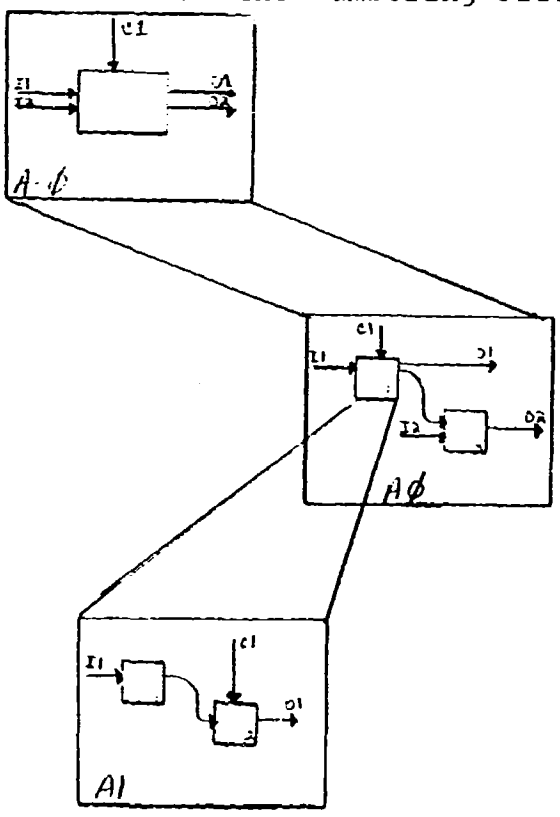


FIGURE 4 Coding Loose-Ended Arrows

provided. Figure 5 is the A-0 diagram (showing the major function of the Right of Way Section of ADOT). Figure 6 is the A0 diagram (showing Right of Way's major function broken down into its major subfunctions). Figure 7 is the A1 diagram (a daughter diagram of A0 - its parent box is box 1 of the A0 diagram). Figure 8 is the A12 diagram (a daughter diagram of A1 - its parent box is box 2 of the A1 diagram). The completed model may be found in Appendix A.

Besides the actual IDEF drawings, several other items are included in an IDEF model. The purpose and viewpoint should always be stated so that anyone reading the model will understand the perspective taken in modeling. Any terms used in modeling which need clarification can be defined in a glossary, preferably on the page on which the term was used. For explanations of functions which do not lend themselves to specific IDEF modeling techniques, an "FEO" or "For Exposition Only" diagram may be created. These diagrams may use any technique necessary to clarify the function and are simply attached to the IDEF drawings.

IDEF models may be general or specific. An entire organization may be modeled without consideration of who performs what function or a specific position in an organization may be modeled. The purpose for creating an IDEF model determines what kind of a model it will need to be. Information flows for an organization as a whole may be needed in some cases, and in other cases an analyst may wish to model a single position. For inputs, outputs, and controls in a general model, general terms such as "report" could be used and in a specific model, actual

IDEF FORM

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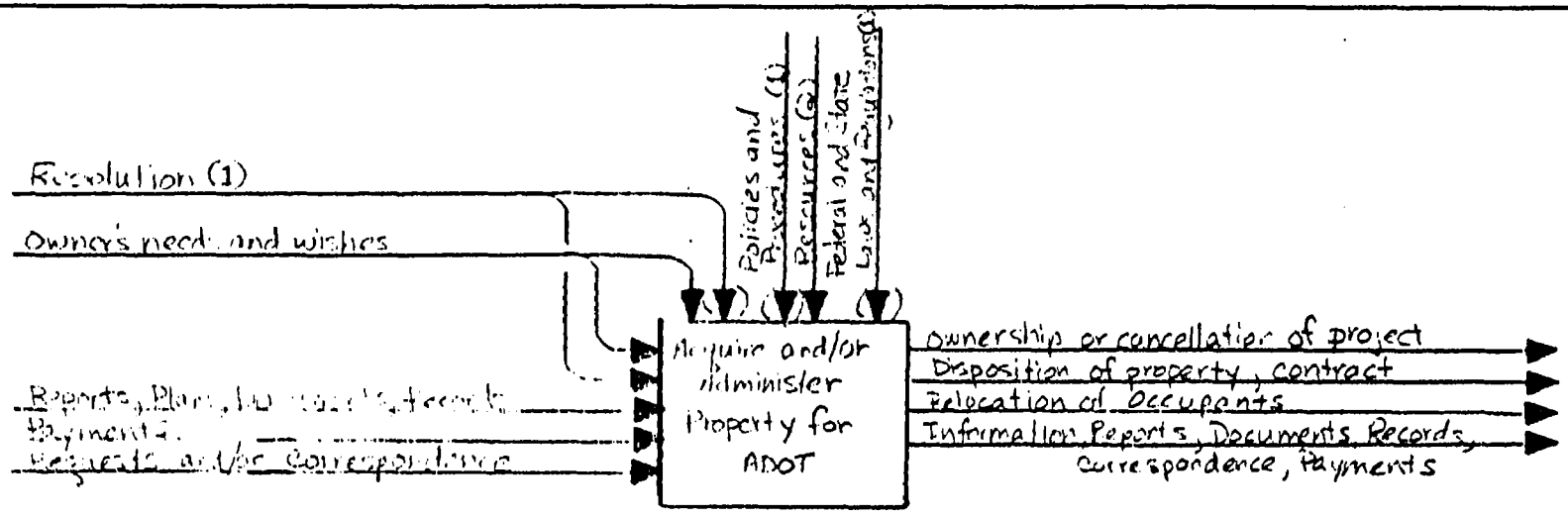

(1) Federal and State Laws and Regulations, Policies and Procedures, and Resolutions are assumed to influence all functions in Right of Way and will therefore be shown only on this model, but carry through to all attached models. Other inputs, outputs, and controls may or may not appear in every function in Right of Way, and will therefore be shown on each model they affect.

(2) Resources include funding, time, manpower, sources of information, documents, specifications and standards, and property.

GLOSSARY: Resolution - Formal Action of the Transportation Board

PURPOSE: To model the functions of several services of the Right of Way Section of The Arizona Department of Transportation in order to understand the functions in the environment and the relationships and information flows between those functions.

VIEWPOINT: An information systems consultant with prior knowledge of the environment wishing to understand these relationships and information flows.

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FIGURE 5 The Organization's Major Function (Diagram A-0)

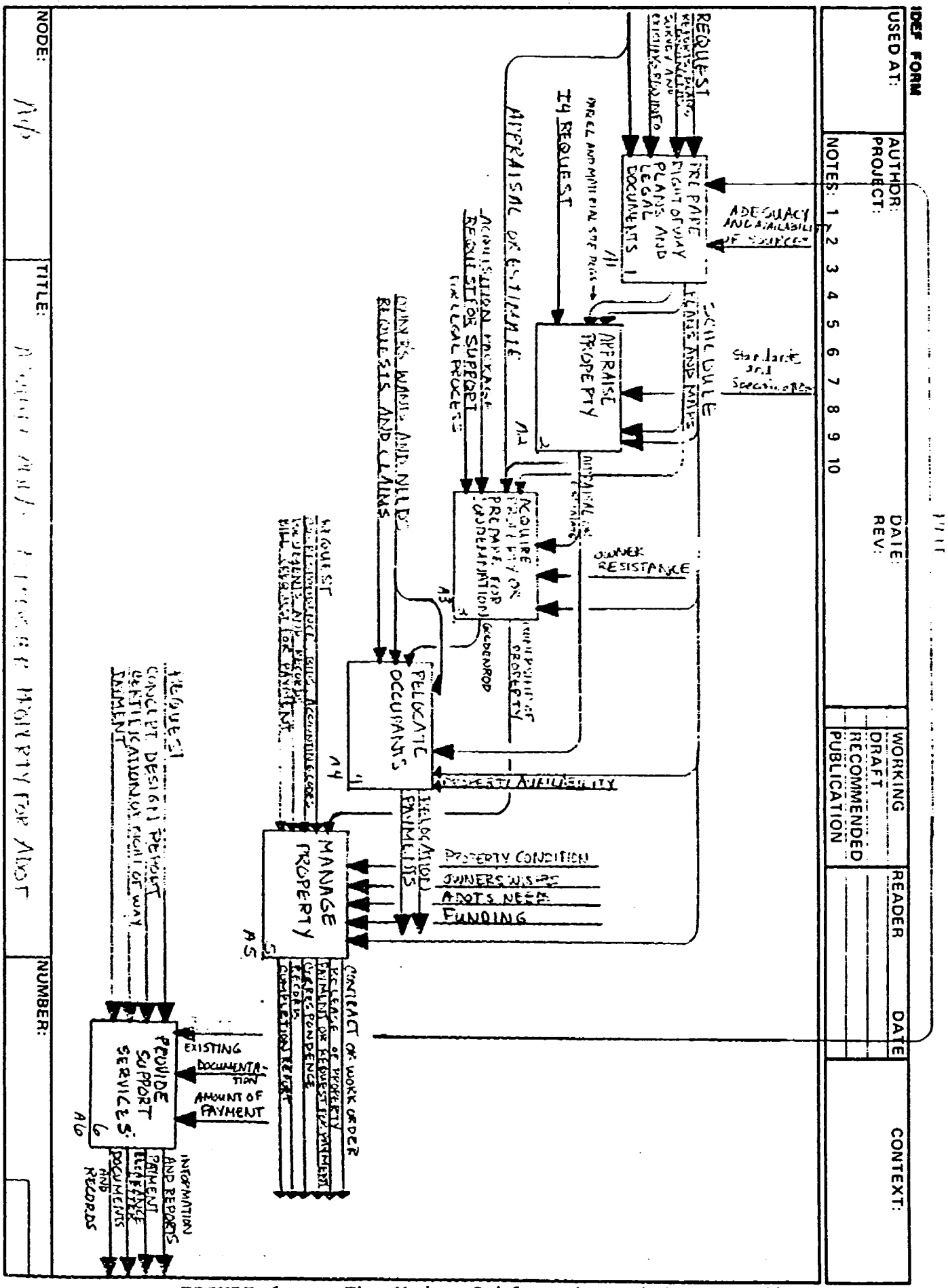

FIGURE 6 The Major Subfunctions (Diagram A0)

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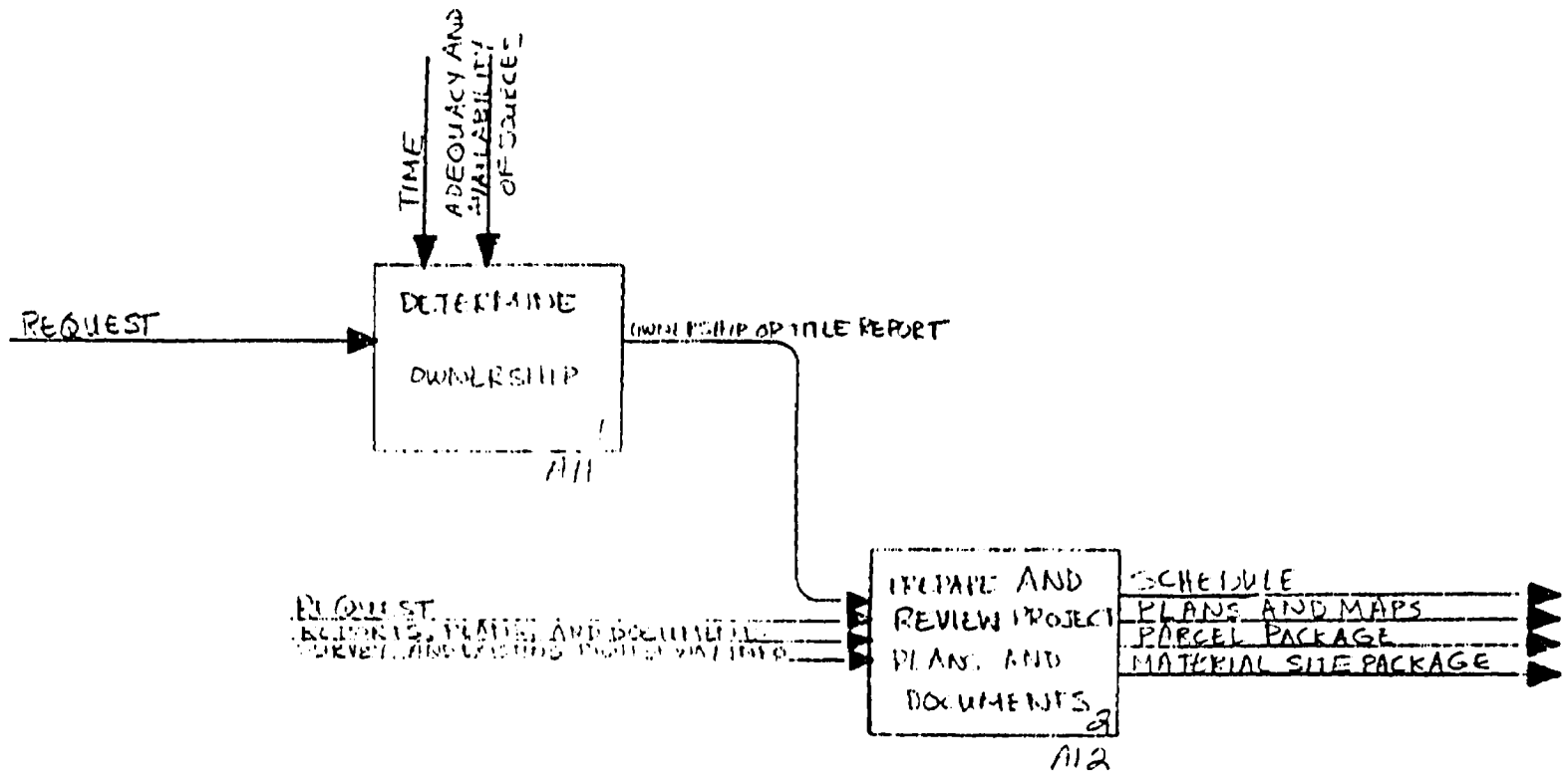

* 4 FEOs are in this category concerning preparing documents and files. Breakdowns follow.

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A1	[illegible]	

FIGURE 7 Diagram A1 (A Daughter Diagram of A0)

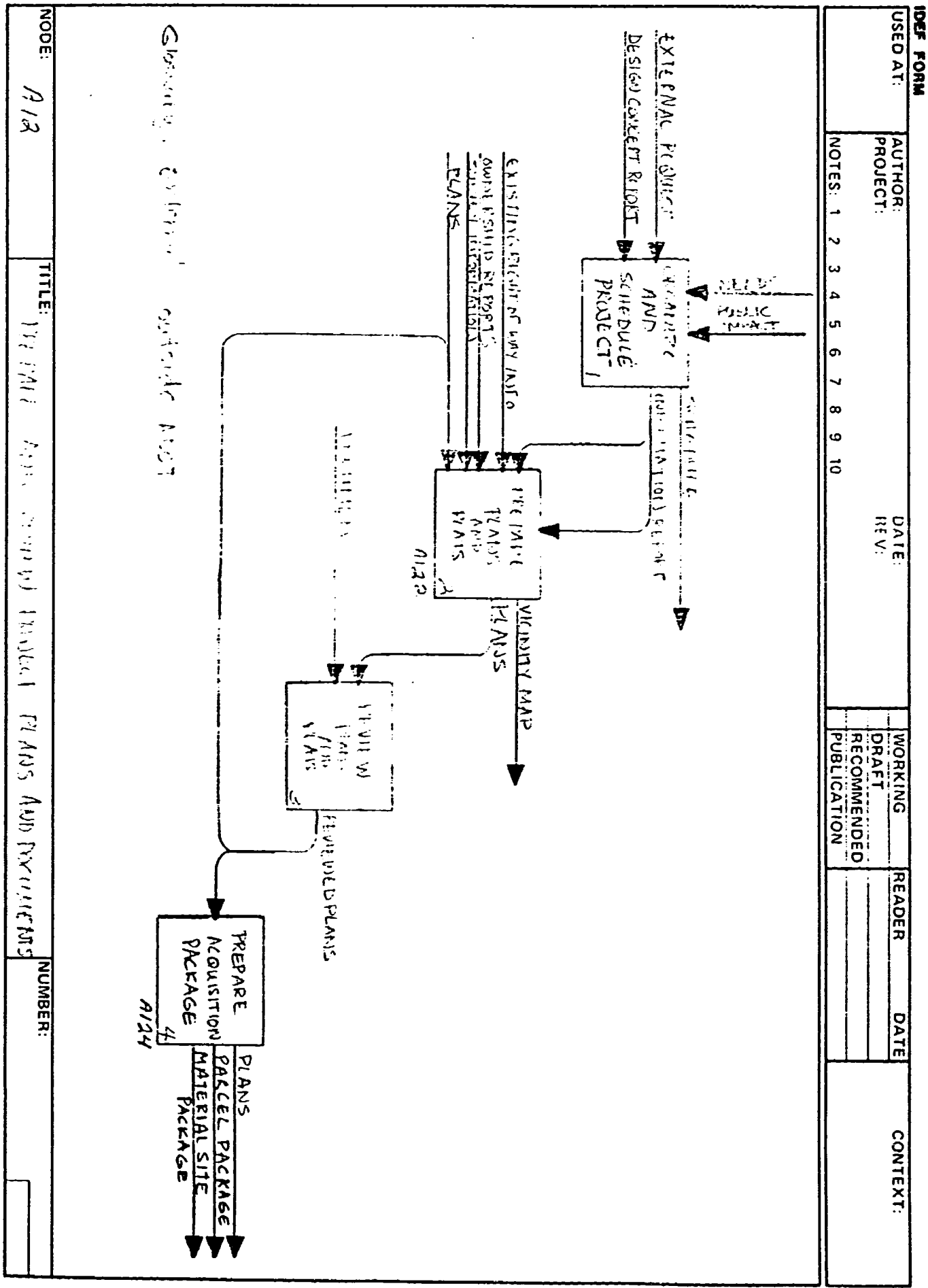

FIGURE 8 Diagram A12 (A Daughter Diagram of A1)

report titles could be used.

Advantages of using the IDEF methodology are that it is a step by step procedure (facilitating the collection of all necessary data needed to document existing information needs), it is easy to show interrelationships of functions (helping to show where different functions may use the same information), and its end product (a visual model) is easy to read and easy to show to others.

IDEF's main disadvantage is that it can be a time-consuming project to undertake. For this research project, approximately 150 manhours were spent interviewing 22 people (consisting of all Right of Way managers plus all supervisors in the three services about which the study was done), drawing the IDEF model, recirculating the model for review, and preparing the final model. This was a relatively small project and it is evident that for a large project, using the IDEF methodology would be extremely time-consuming.

There are several possible uses for results of the IDEF methodology. Most important to the objective of this research is that it shows relationships among different functions in an environment and can aid in the identification and documentation of existing information needs.

Another possible use is the identification of areas in an environment in which it may be beneficial to provide stand-alone information systems (i.e. those areas which do not share information needs with other areas) or access to mainframe computers with shared databases. Figure 9 illustrates a function which is not in any way related to any other function at Right of

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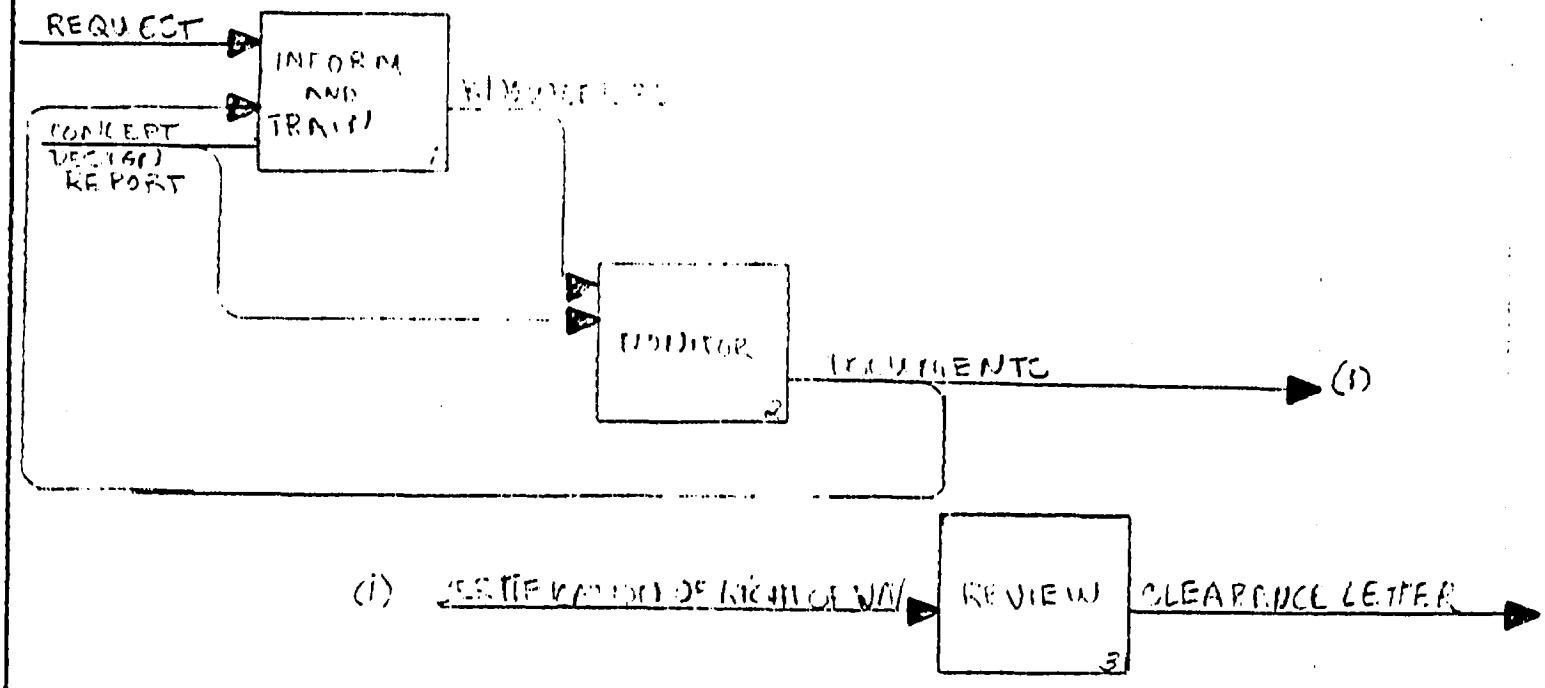

(1) Documents are returned to the local agency. When the local agency has acquired Right of Way, they notify Abot Right of Way.

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A61	LOCAL AGENCY ACQUISITION	

FIGURE 9 A Model of a Function which is not Related to any other Function in the Organization

Way. This is one area where a stand-alone system might be useful. Access to mainframe computers might be indicated if there are like functions needing the same type of computer-generated information being performed in several different physical areas.

The IDEF methodology gives a picture of the functions and information flows in an organization; therefore it can provide valuable information to a systems analyst. If a long-term, complete analysis is to be performed, it is recommended that the IDEF methodology be used to aid in giving a clear understanding of an environment. If a short-term analysis is to be performed, IDEF is not a feasible methodology. The time required to perform the methodology would not be available in this type of analysis. A possible solution to this problem would be to do a long-term general study of an entire organization, then as specific applications needed analysis, those areas could be modeled with a more specific technique. The analyst could then relate the two models to extract whatever information is needed.

If more information about IDEF is desired, material explaining the methodology in great detail is available from the ICAM CM Library, AFWAL/MLTC, Wright-Patterson Air Force Base, Ohio 45433.

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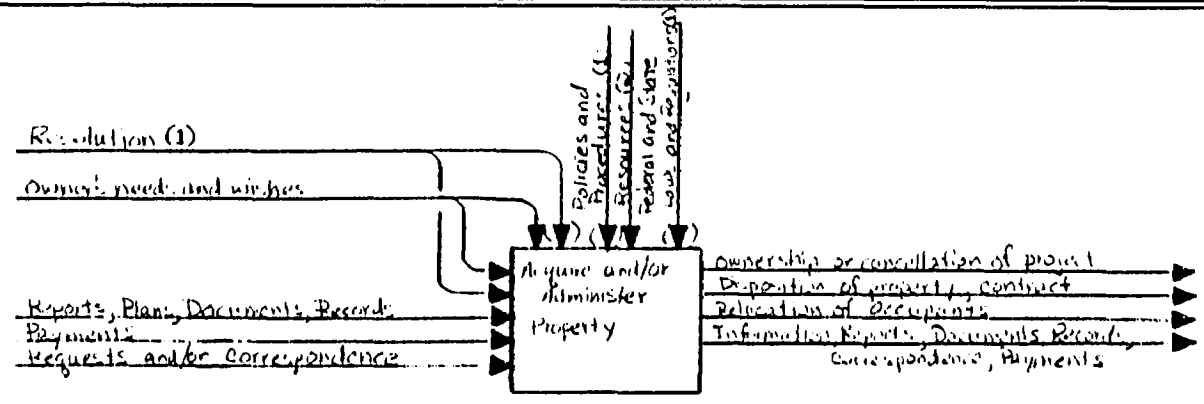

(1) Federal and State Laws and Regulations, Policies and Procedures, and Resolutions are assumed to influence all functions in the organization and will therefore be shown only on this model, but carry through to all attached models. Other inputs, outputs, and controls may or may not appear in every function and will therefore be shown on each model they affect.

(2) Resources include funding, time, manpower, sources of information, documents, specifications and standards, and property.

GLOSSARY: Resolution - Formal Action

PURPOSE: To model the functions of several units of a government organization in order to understand the functions in the environment and the relationships and information flows between these functions.

VIEWPOINT: An information systems specialist without prior knowledge of the environment wishing to understand these relationships and information flows.

NODE: A-0	TITLE: MAJOR FUNCTIONS OF ORGANIZATION	NUMBER:

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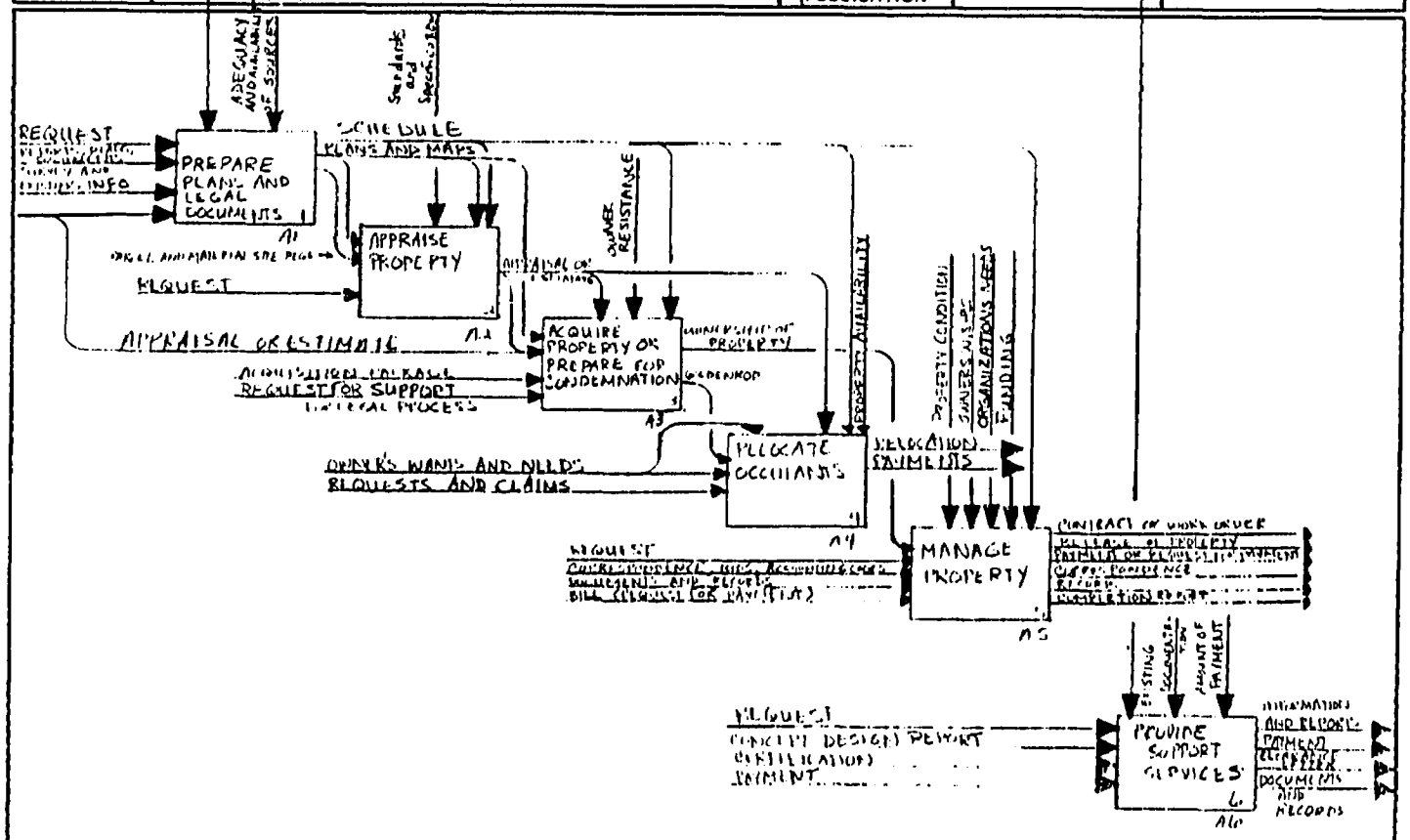

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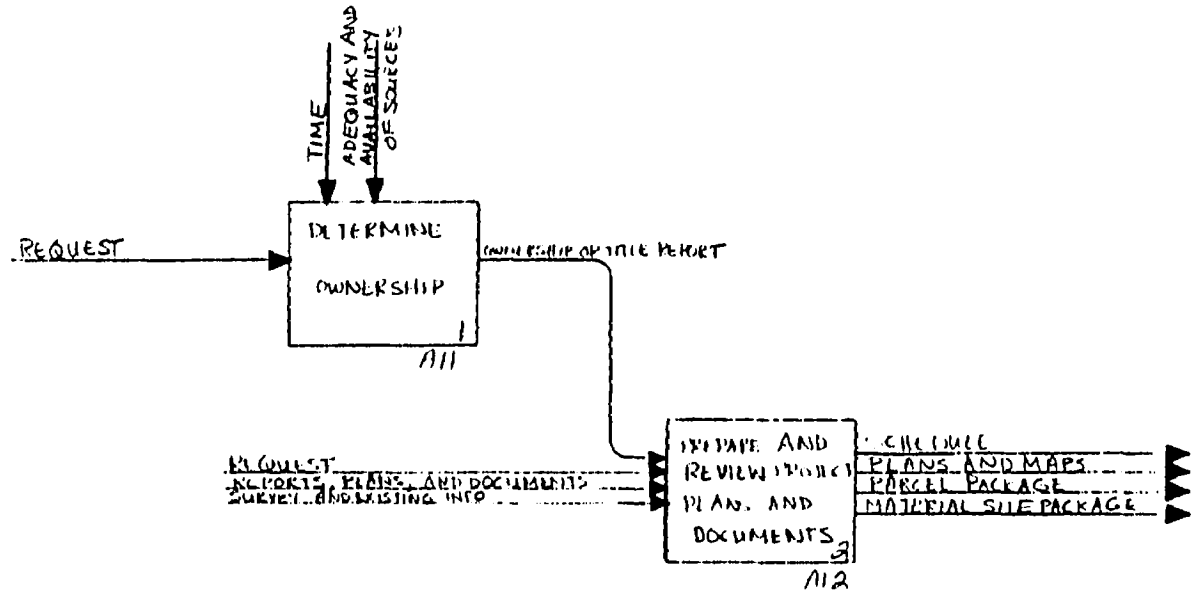

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A1	PREPARE PLAN. AND LEGAL DOCUMENTS	

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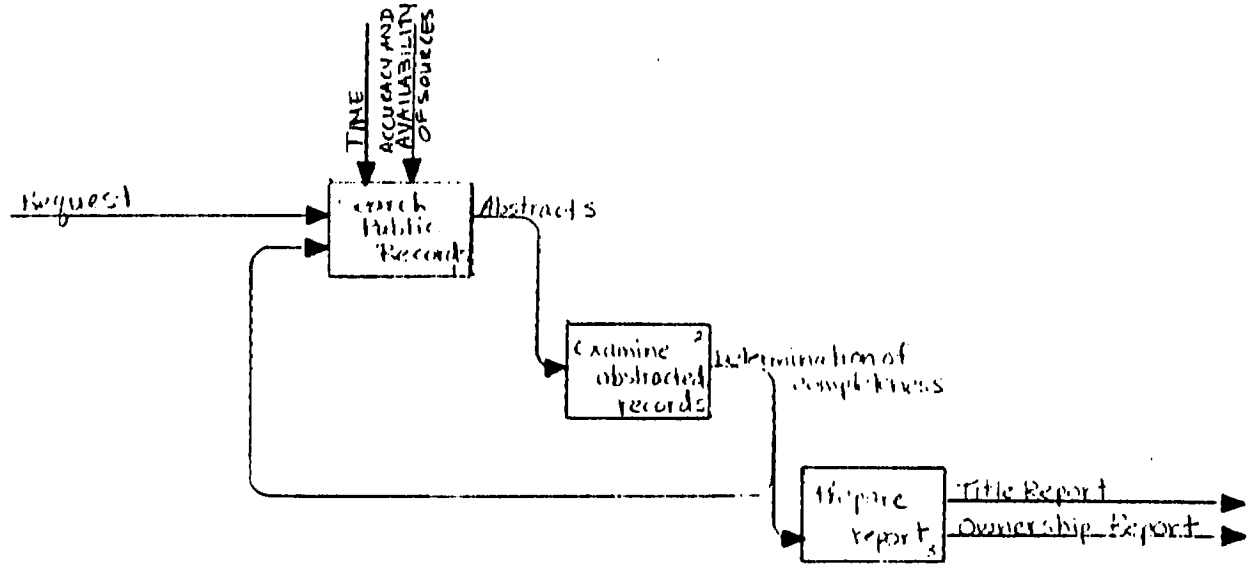

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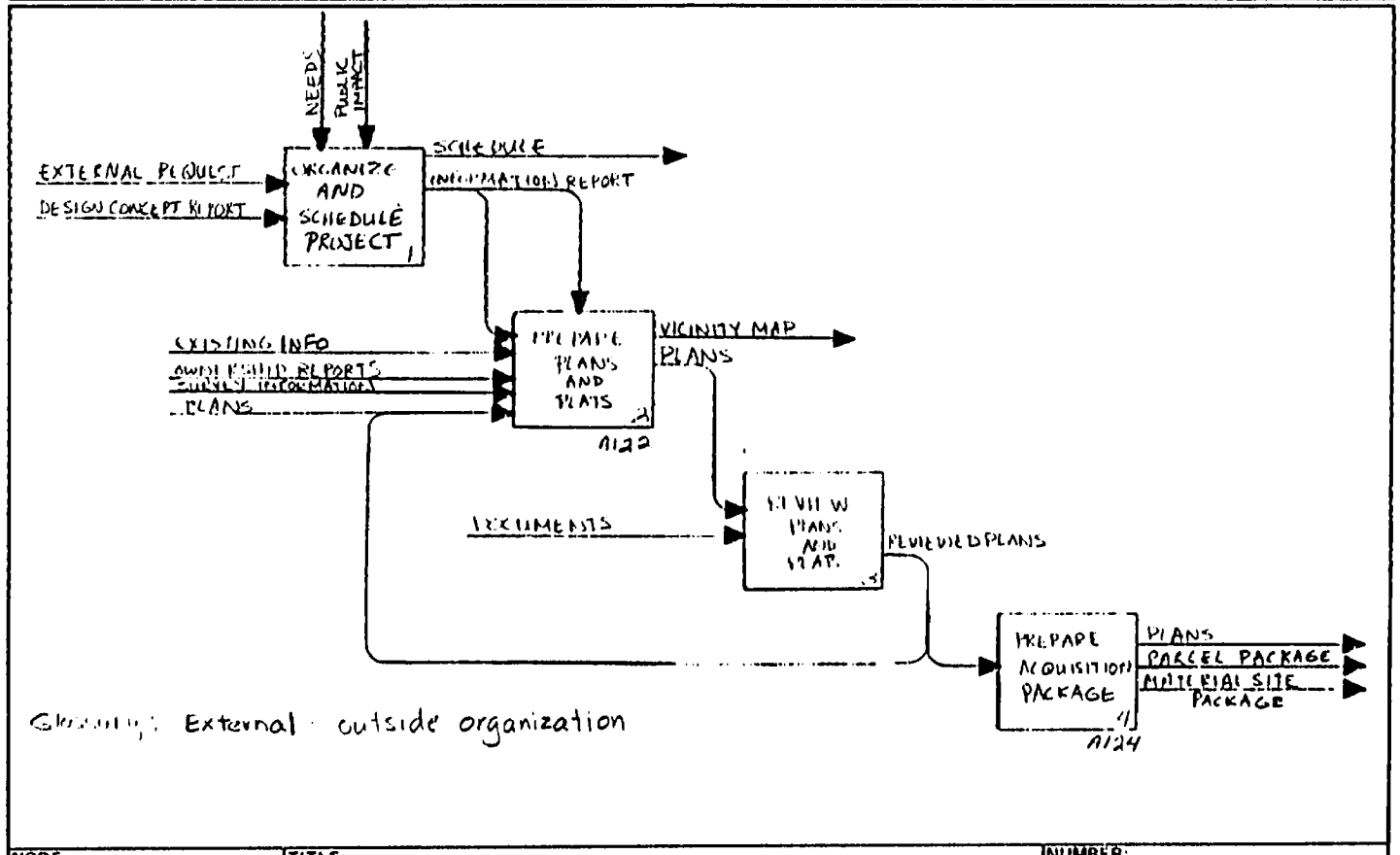

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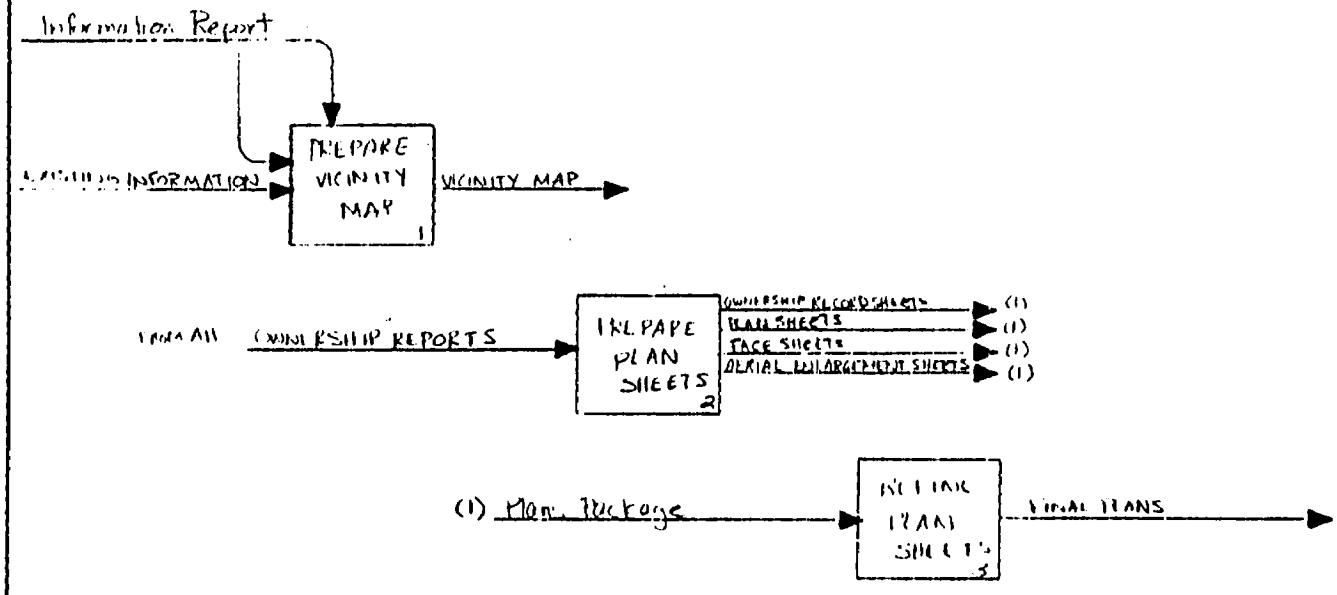
IDEF FORM

USED AT:	AUTHOR: PROJECT: NOTES 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT:

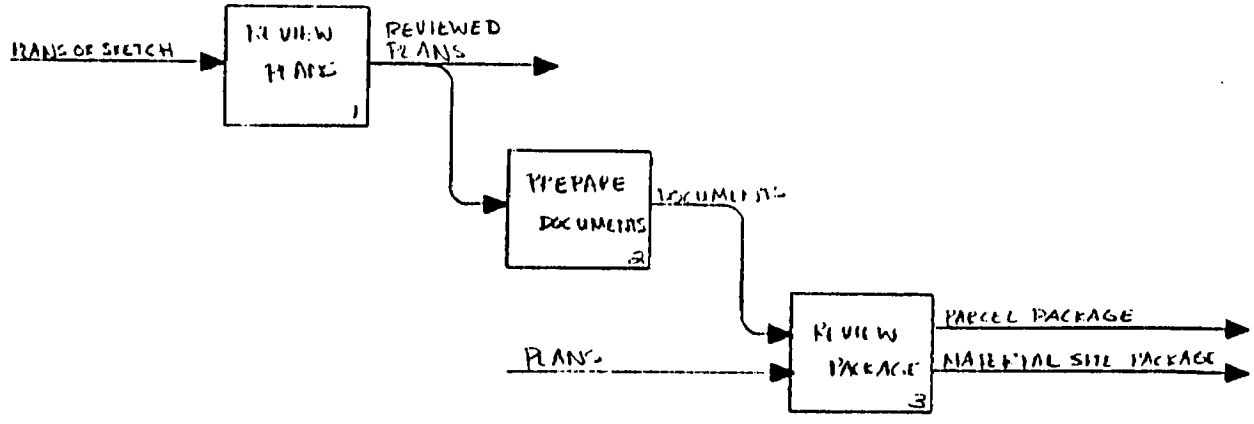


(1) Plans Package - Copies are distributed to interested parties, then returned for refinements

NODE: A122	TITLE: PREPARE PLANS AND PLAT.	NUMBER:

IDEF FORM

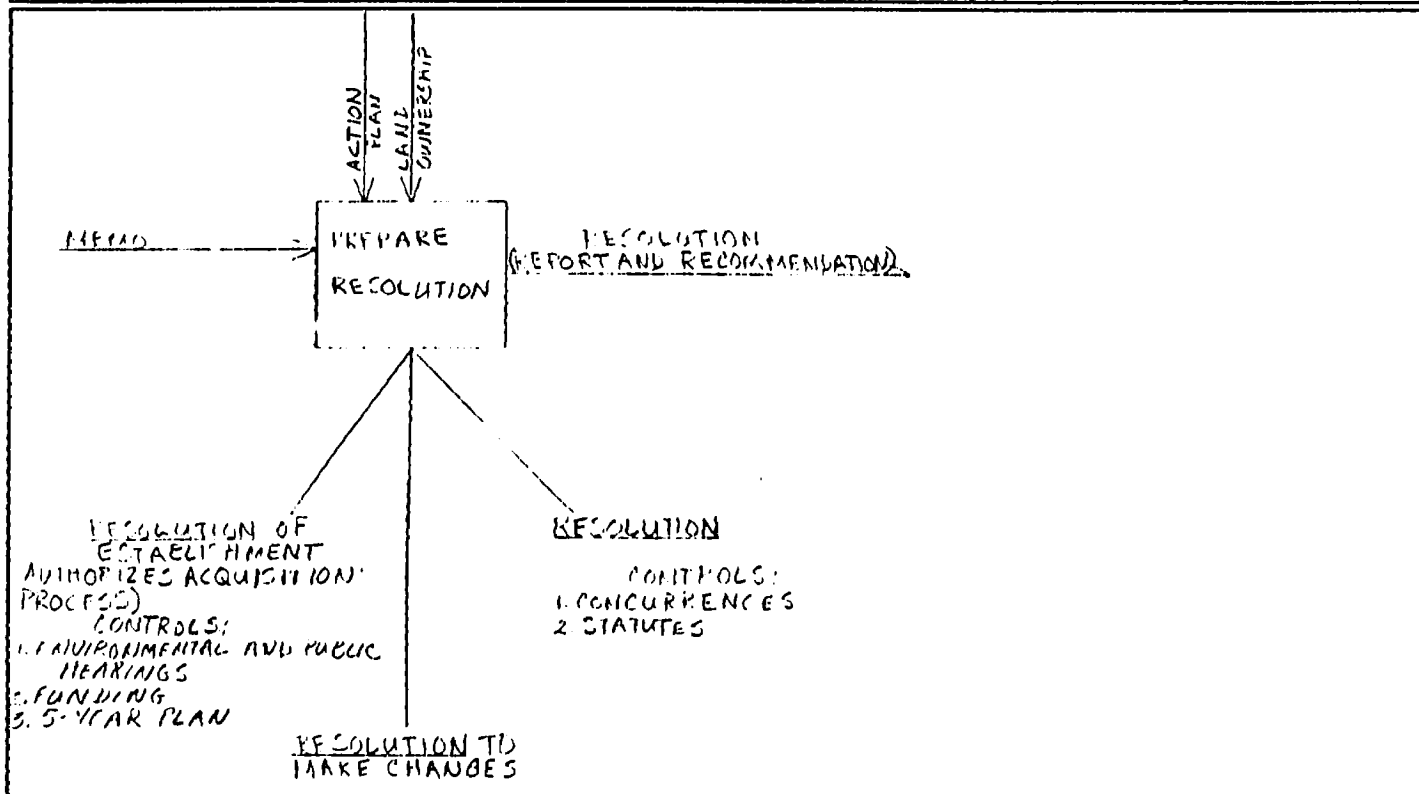
USED AT:	AUTHOR: PROJECT: NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT:



NODE: A124	TITLE: PREPARE ACQUISITION PACKAGE	NUMBER:

IDEF FORM

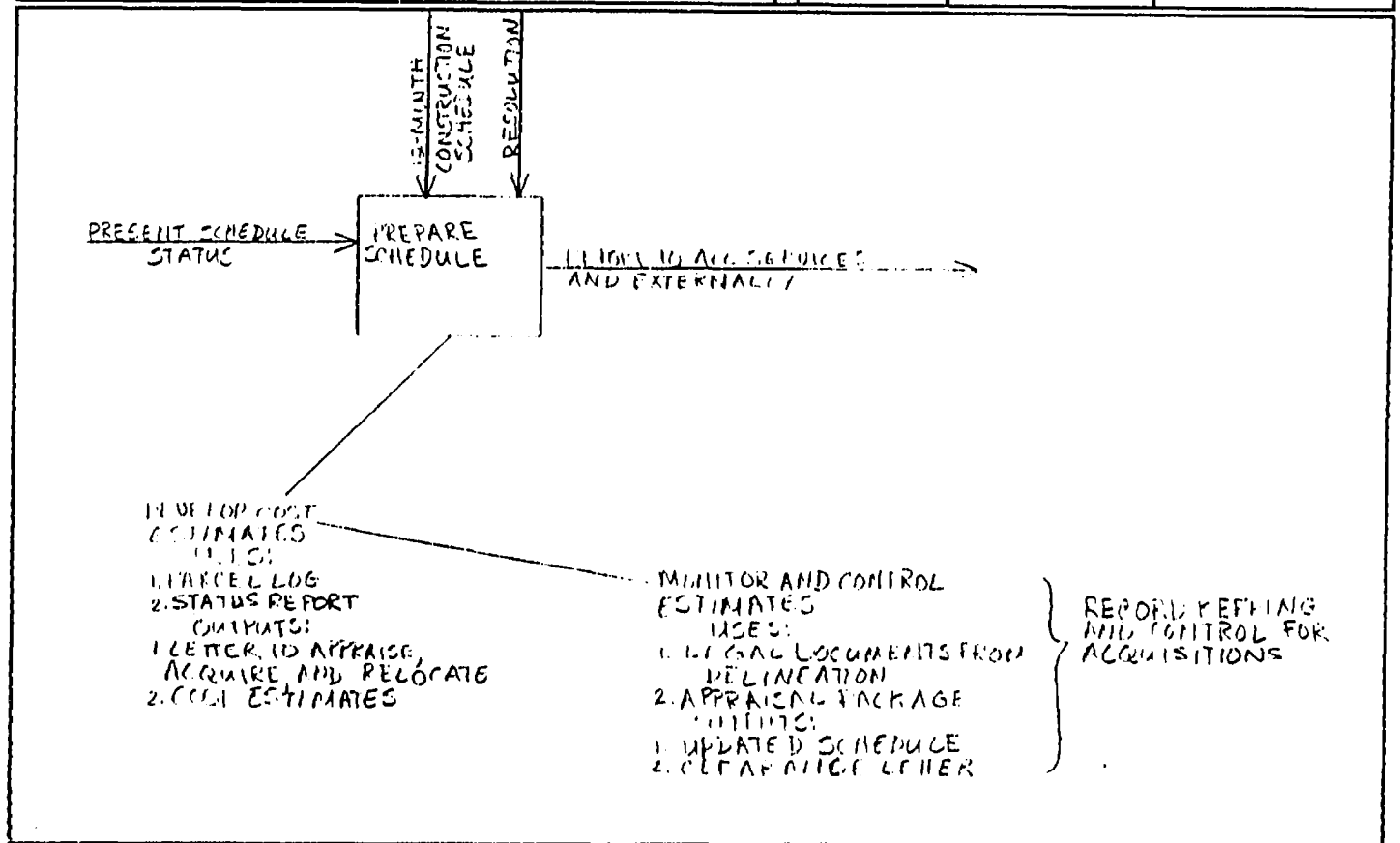
USED AT:	AUTHOR: PROJECT: NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING / DRAFT / RECOMMENDED / PUBLICATION	READER	DATE	CONTEXT: FEO



NODE: AIEI	TITLE: PREPARE DOCUMENTS AND FILES	NUMBER:

IDEF FORM

USED AT:	AUTHOR: PROJECT:	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT: FEO
	NOTES: 1 2 3 4 5 6 7 8 9 10					



NODE:	TITLE:	NUMBER:
A1E2	PREPARE [illegible] AND FILES	

IDEF FORM

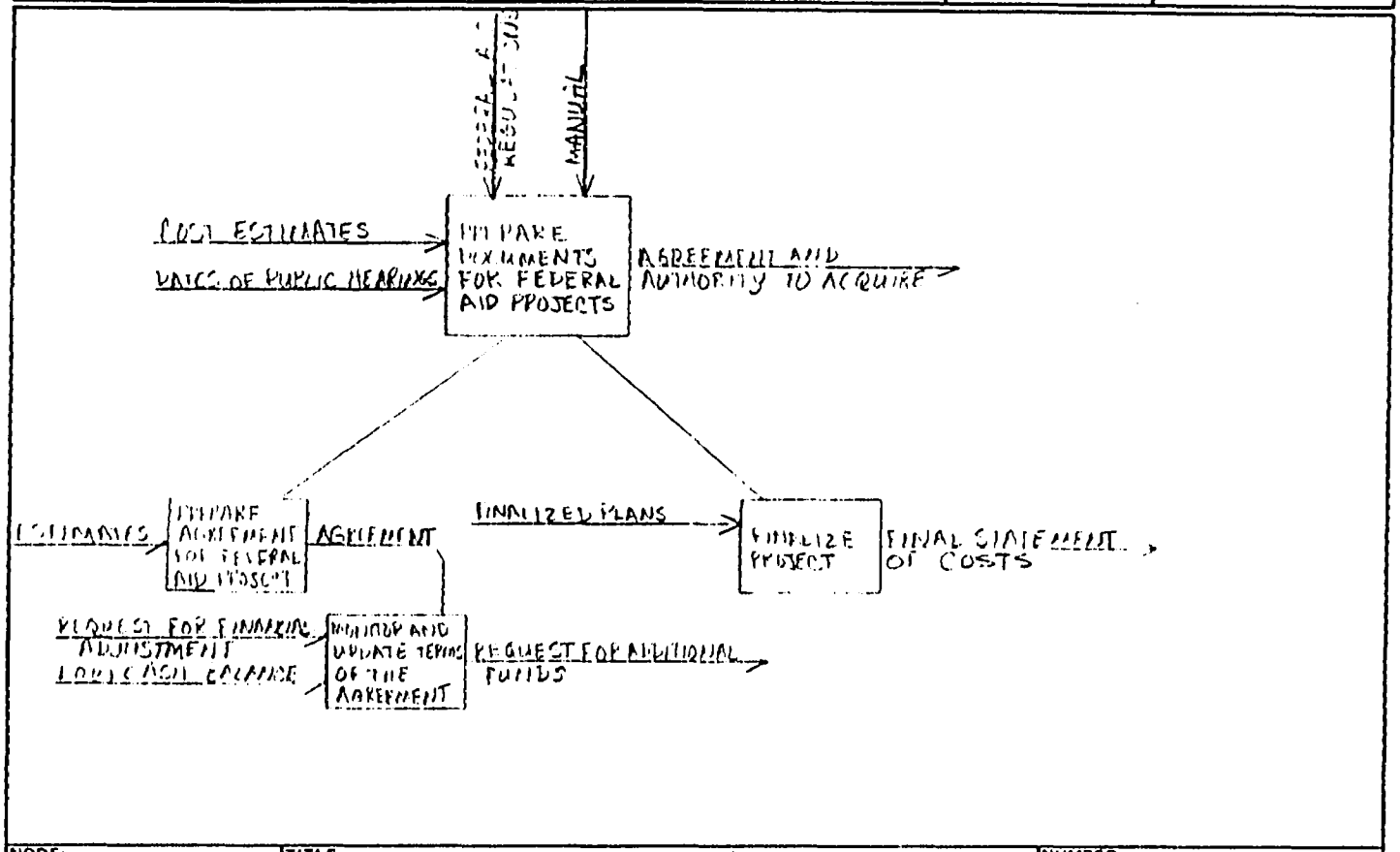
USED AT:	AUTHOR: PROJECT: NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT: IFO

CONTROLS: POLICIES, PROCEDURES, LAWS, AND REGULATIONS

NODE: A11	TITLE: PREPARE DOCUMENTS AND FILES	NUMBER:

IDEF FORM

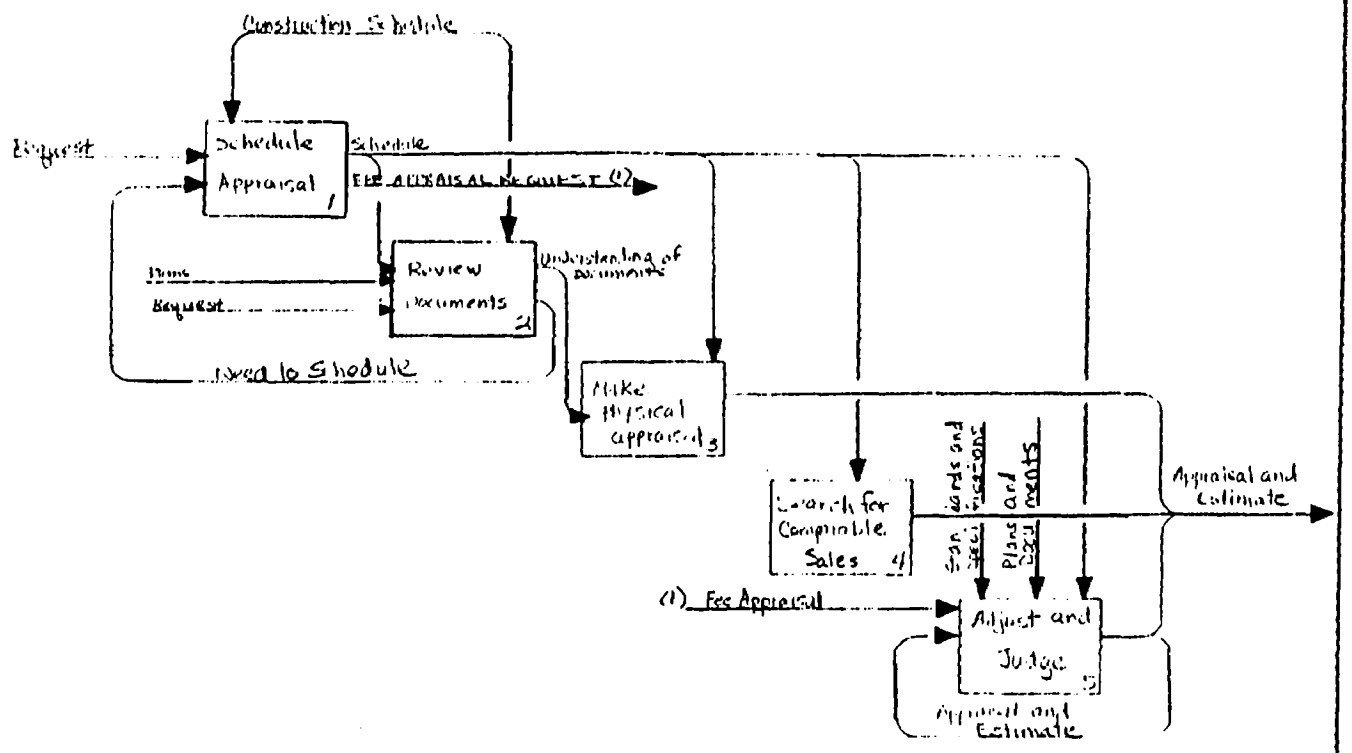
USED AT:	AUTHOR: / PROJECT: / NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: / REV:	WORKING / DRAFT / RECOMMENDED / PUBLICATION	READER	DATE	CONTEXT: FED



NODE: A-L4	TITLE: PREPARE DOCUMENTS AND FILES	NUMBER:

IDEF FORM

USED AT:	AUTHOR: PROJECT: NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT:

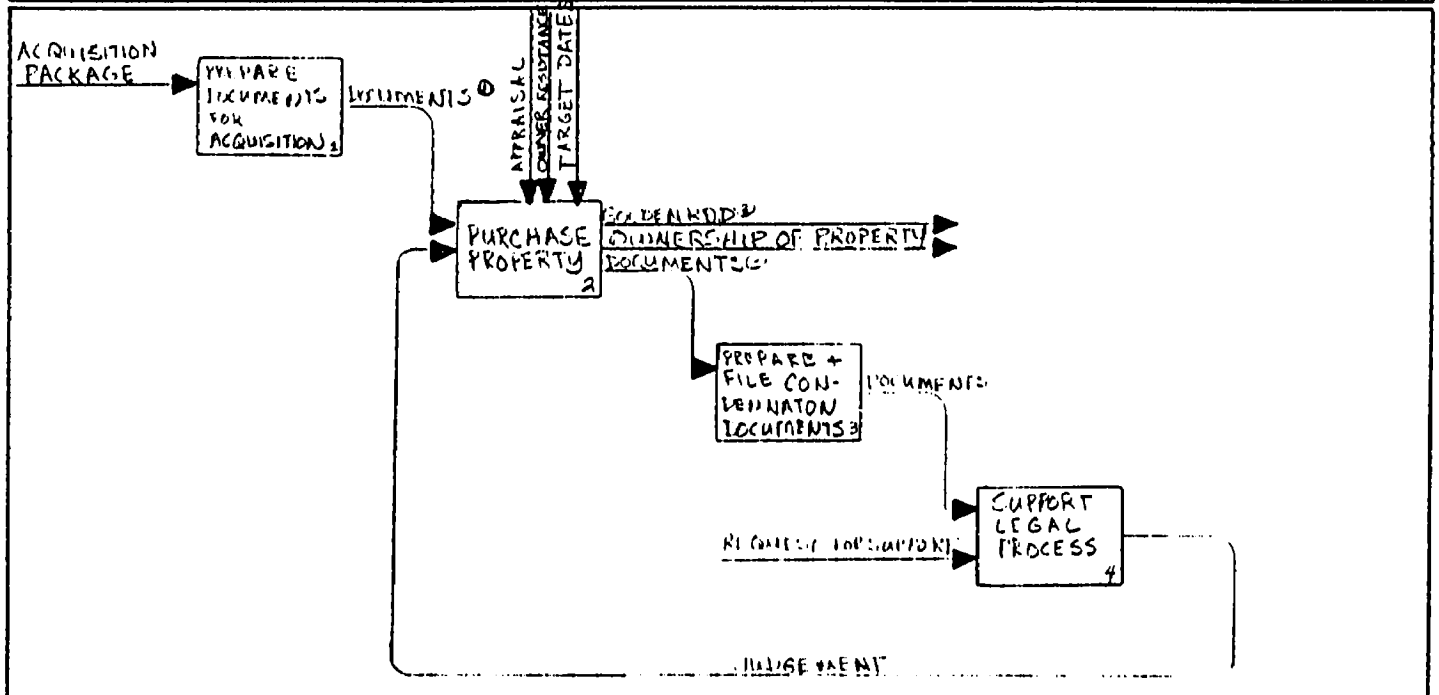


(1) Fee appraisal is requested from private appraiser, and appraisal is submitted

NODE: A2	TITLE: Appraise Property	NUMBER:

IDEF FORM

USED AT:	AUTHOR: PROJECT: NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT:

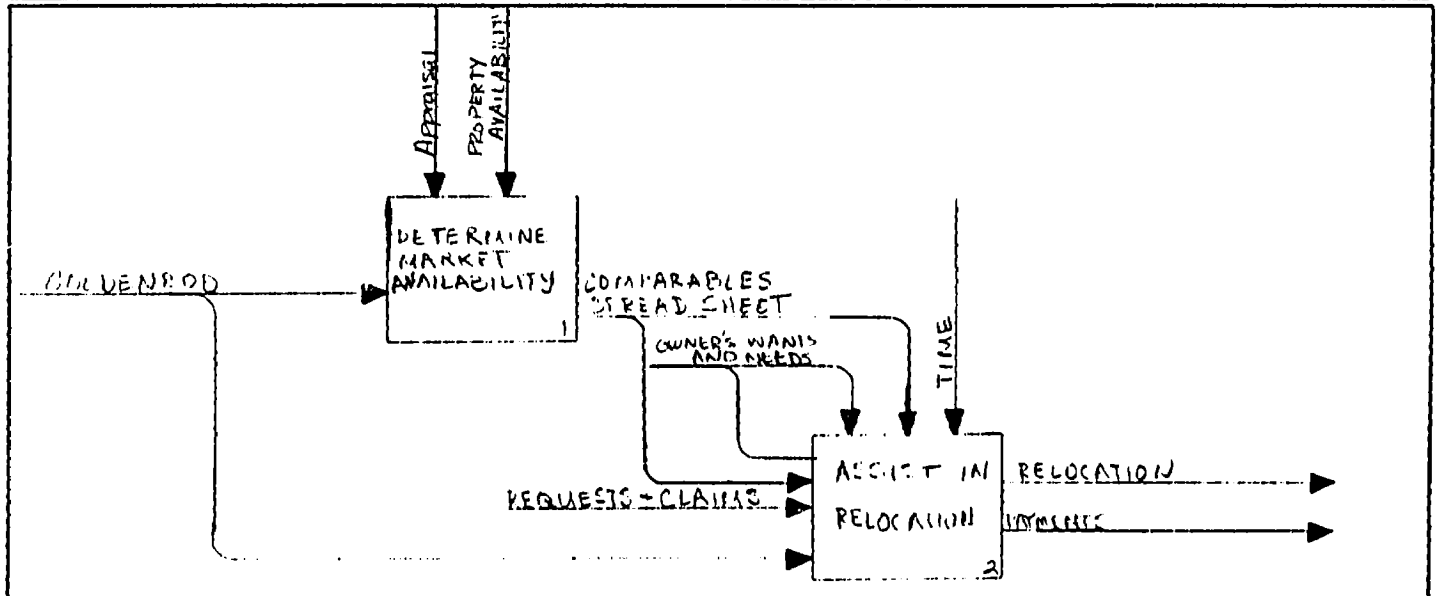


① Documents include Deeds, Offer to Purchase, Building Reports, Release of Lease
② Goes to Relocation
③ If refusal, includes additional memos, correspondence

NODE: A3	TITLE: ACQUIRE PROPERTY/PREPARE FOR CONDEMNATION	NUMBER:

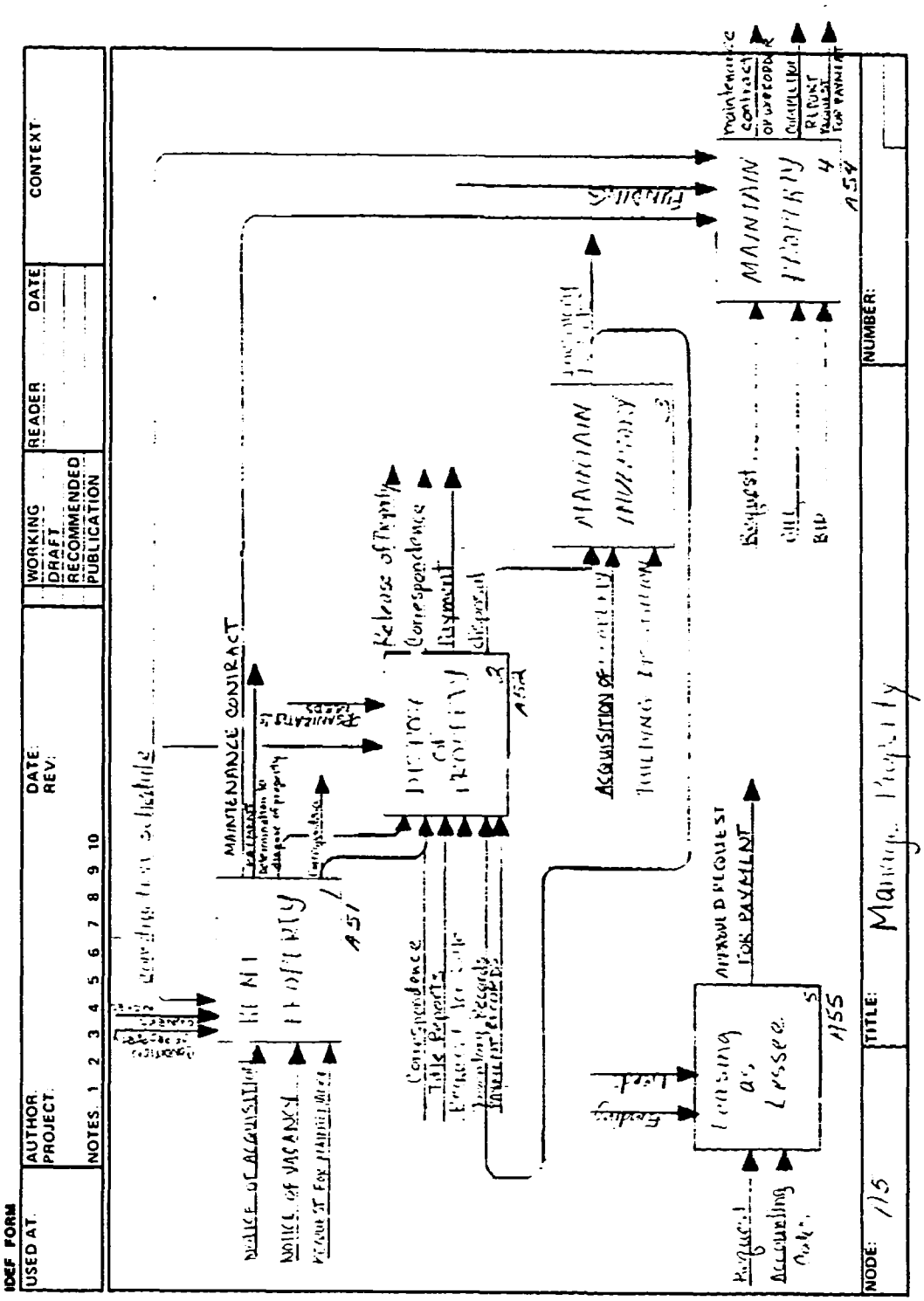
IDEF FORM

USED AT:	AUTHOR: PROJECT: NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT:



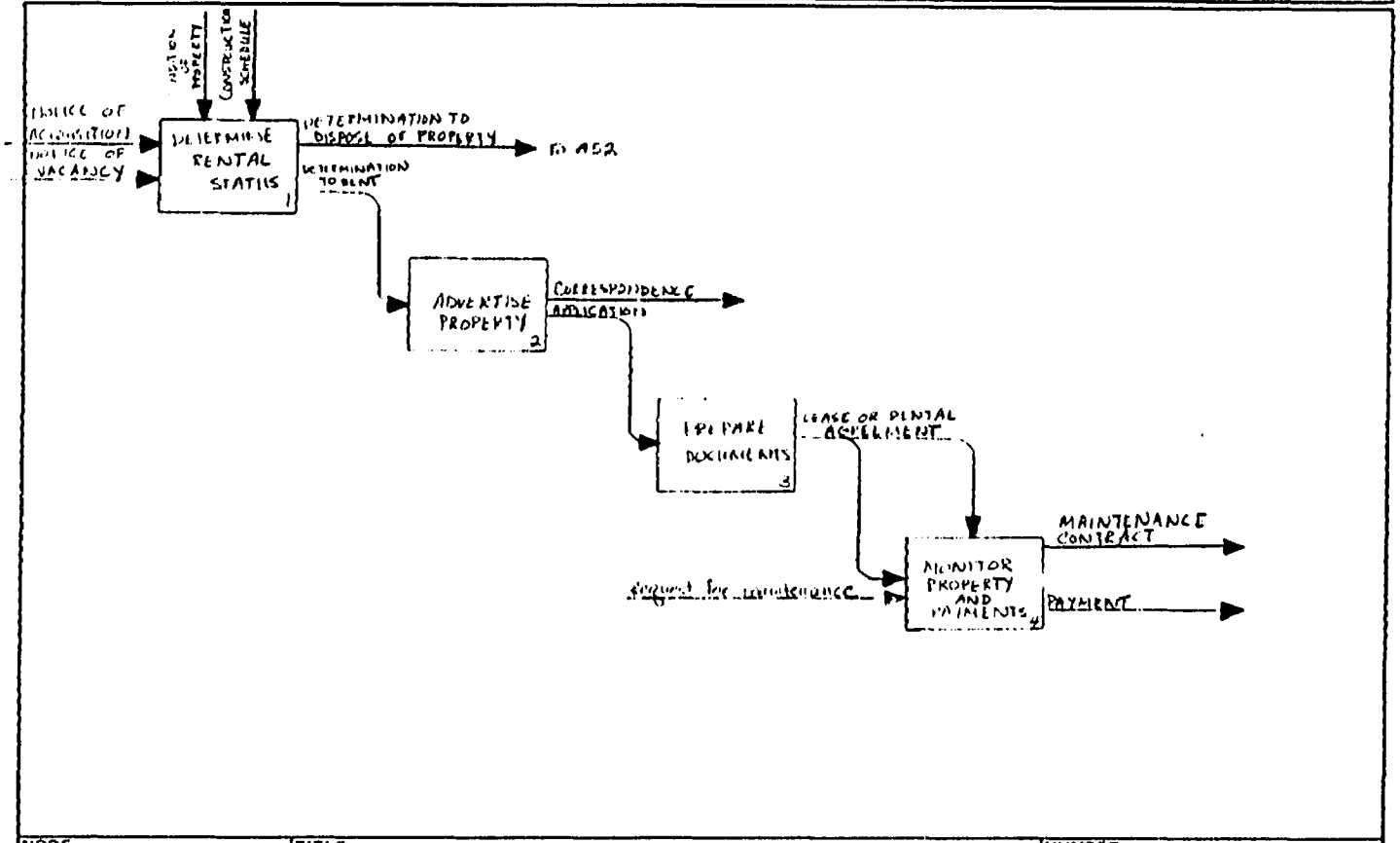
Glossary: Goldenrod - Notice that offer to purchase has been presented

NODE: A1	TITLE: RELOCATE [illegible]	NUMBER:


IDEF FORM
USED AT:
AUTHOR:
PROJECT:
NOTES: 1 2 3 4 5 6 7 8 9 10
DATE:
REV:
WORKING
DRAFT
RECOMMENDED
PUBLICATION
READER
DATE
CONTEXT:
NOTICE OF ACQUISITION
NOTICE OF VACANCY
MAINTENANCE CONTRACT
Correspondence
Title Reports
Release of Property
Correspondence
Payment
Request
Accounting
Leasing as Lessee
APPROVED REQUEST FOR PAYMENT
Request
BID
Funding
Maintenance contract
NODE:
TITLE:
NUMBER:

IDEF FORM

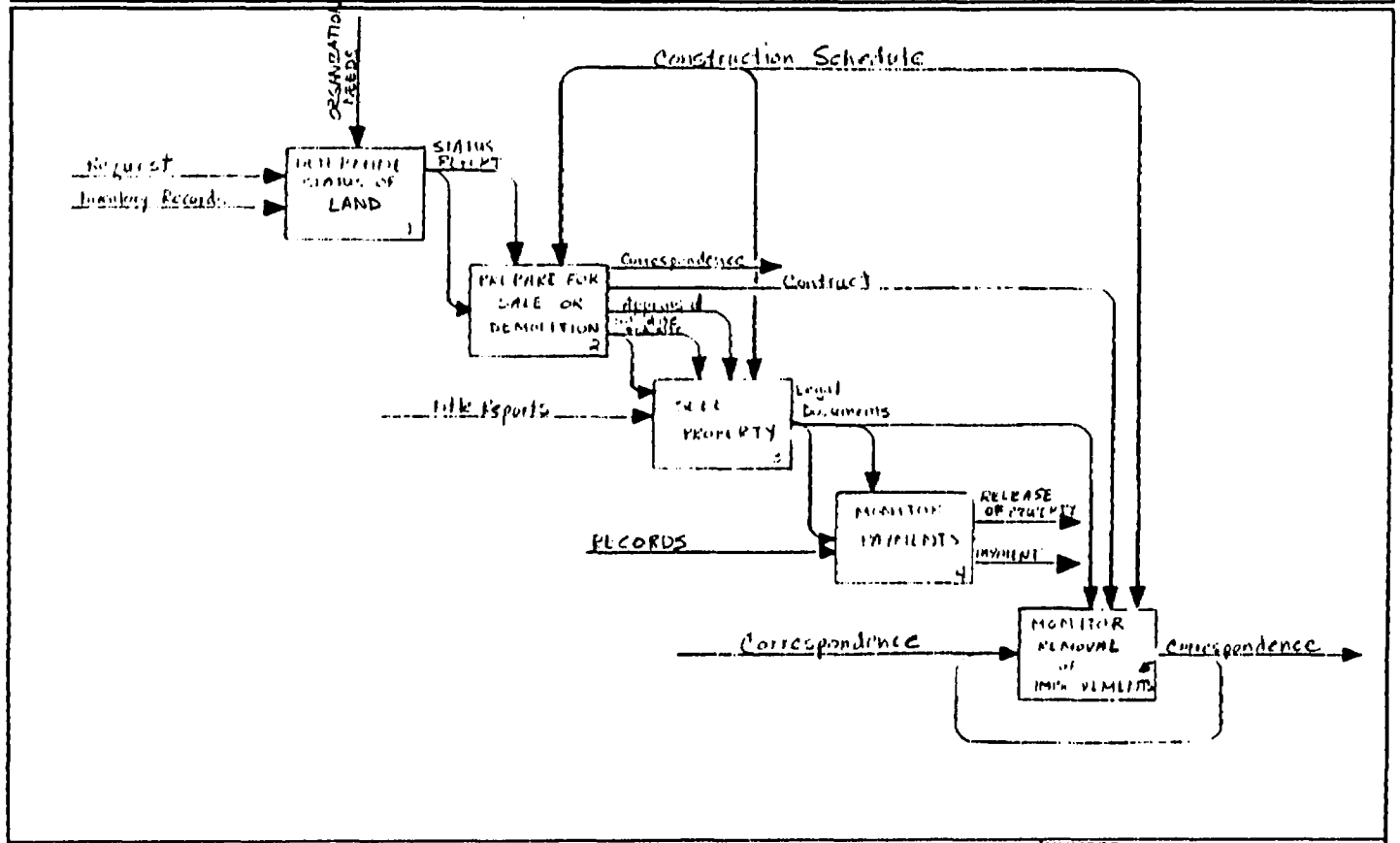
USED AT:	AUTHOR: PROJECT: NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT:



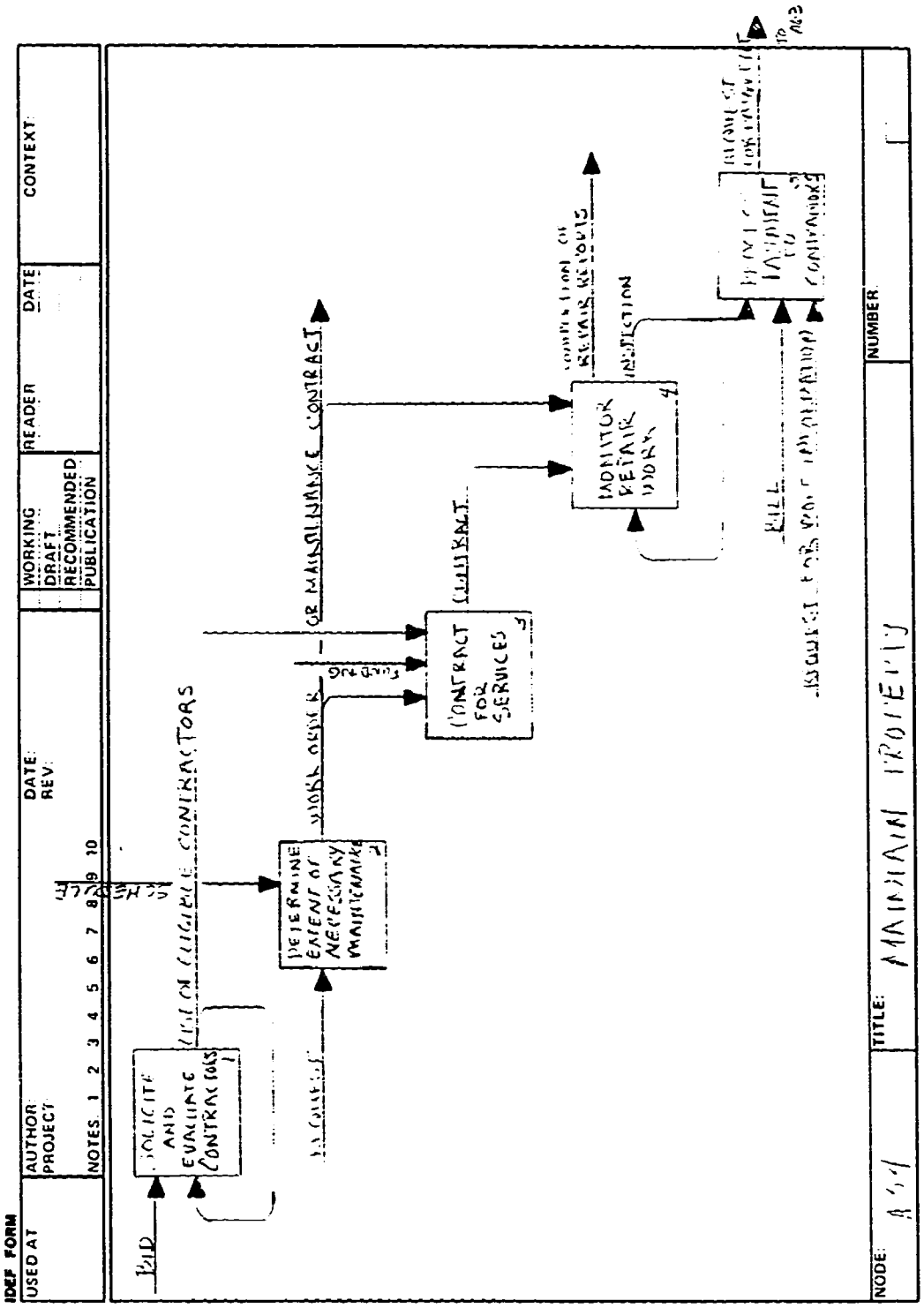
NODE: A51	TITLE: RENT PROPERTY	NUMBER:

IDEF FORM

USED AT:	AUTHOR: PROJECT: NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING / DRAFT / RECOMMENDED / PUBLICATION	READER	DATE	CONTEXT:

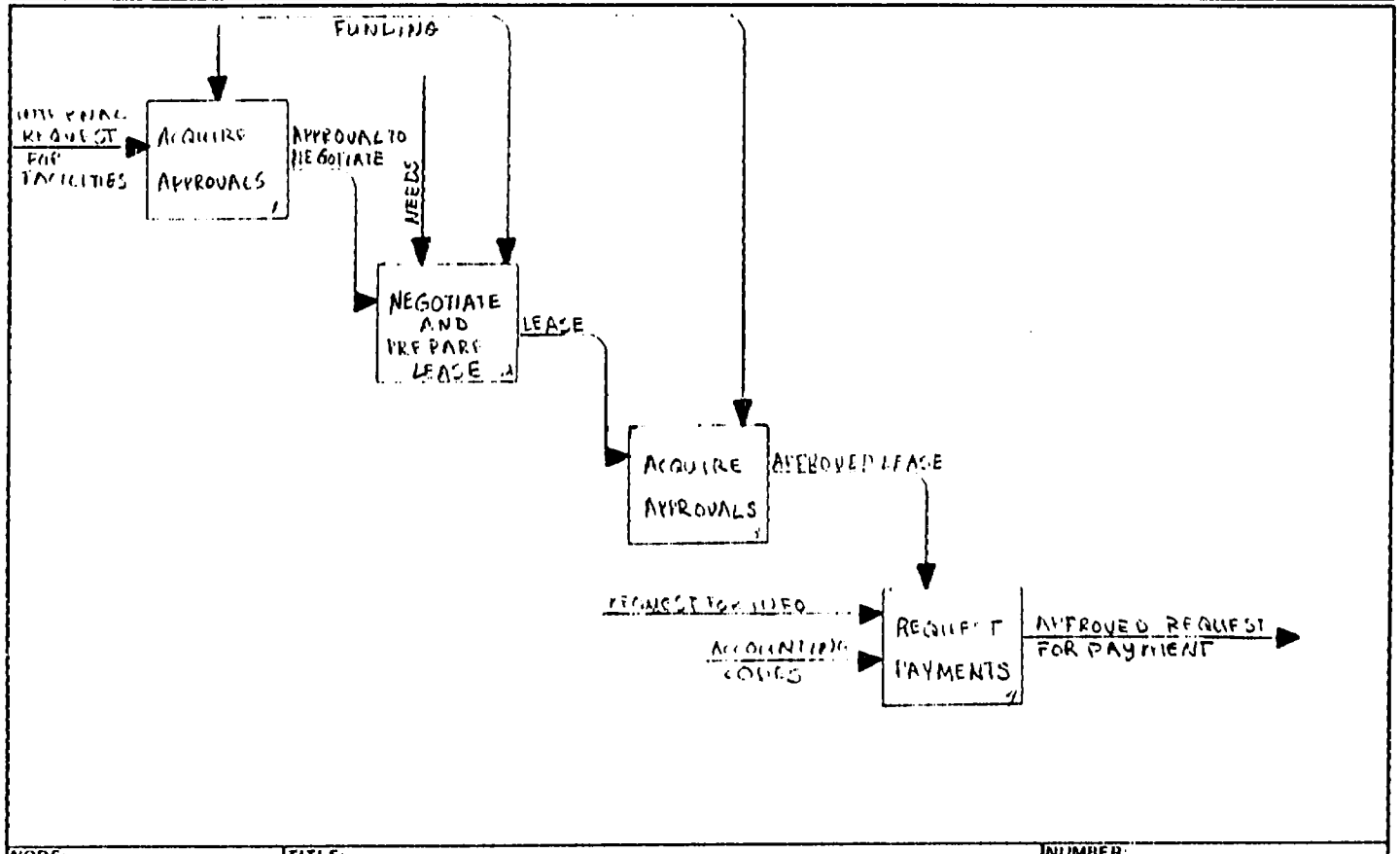


NODE:	TITLE:	NUMBER:
A52	DISPOSE OF PROPERTY	


IDEF FORM
USED AT
AUTHOR:
PROJECT:
NOTES: 1 2 3 4 5 6 7 8 9 10
DATE:
REV:
WORKING
DRAFT
RECOMMENDED
PUBLICATION
READER
DATE
CONTEXT:
BID
SOLICITE AND EVALUATE CONTRACTORS 1
LIST OF ELIGIBLE CONTRACTORS
SCHEDULE
DETERMINE EXTENT OF NECESSARY MAINTENANCE 2
WORK ORDER
FUNDING
OR MAINTENANCE CONTRACT
CONTRACT FOR SERVICES 3
CONTRACT
MONITOR REPAIR WORK 4
INSPECTION
BILL
TO A63
NODE:
TITLE:
MAINTAIN PROPERTY
NUMBER:

IDEF FORM

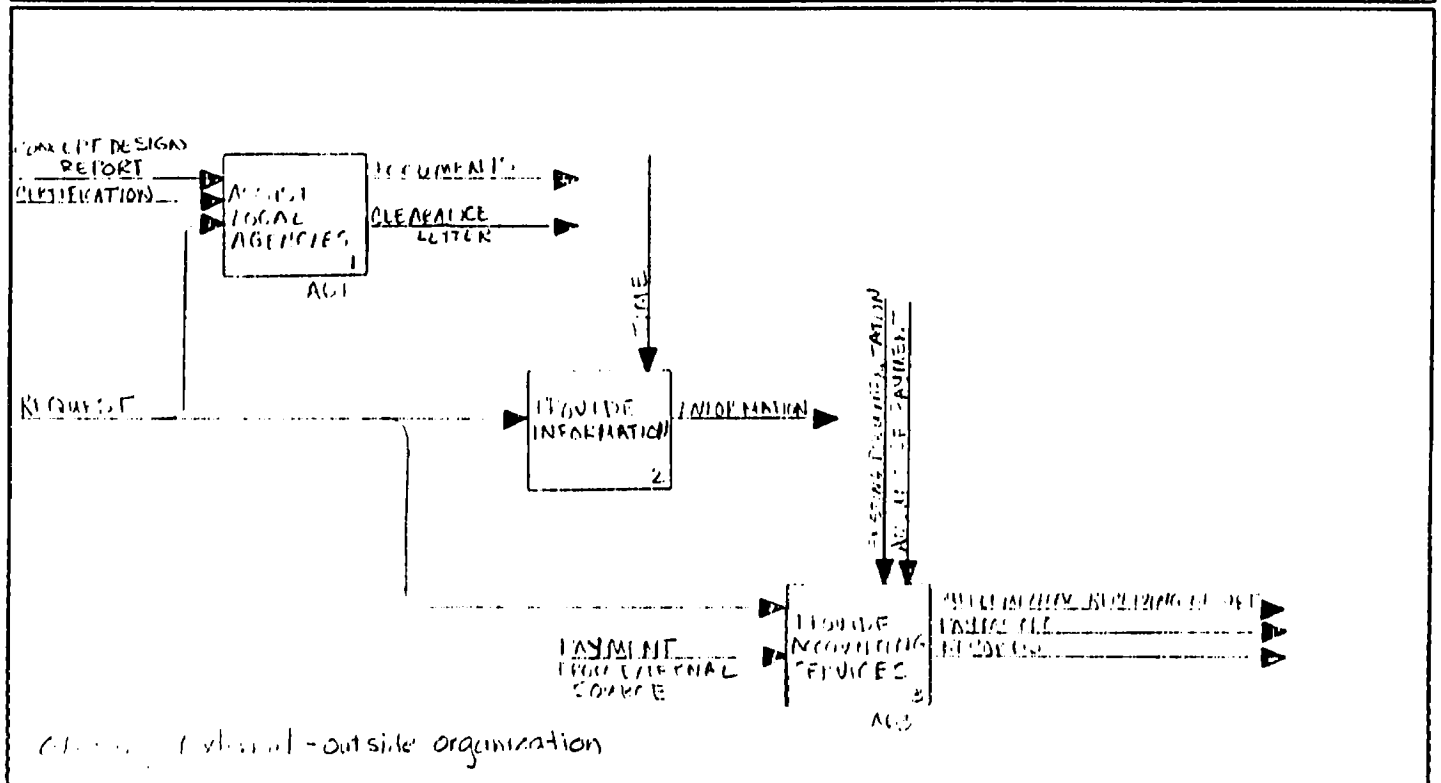
USED AT:	AUTHOR: PROJECT: NOTES: 1 2 3 4 5 6 7 8 9 10	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT:



NODE:	TITLE:	NUMBER:
A-0	LEASING ACQUISITION	

IDEF FORM

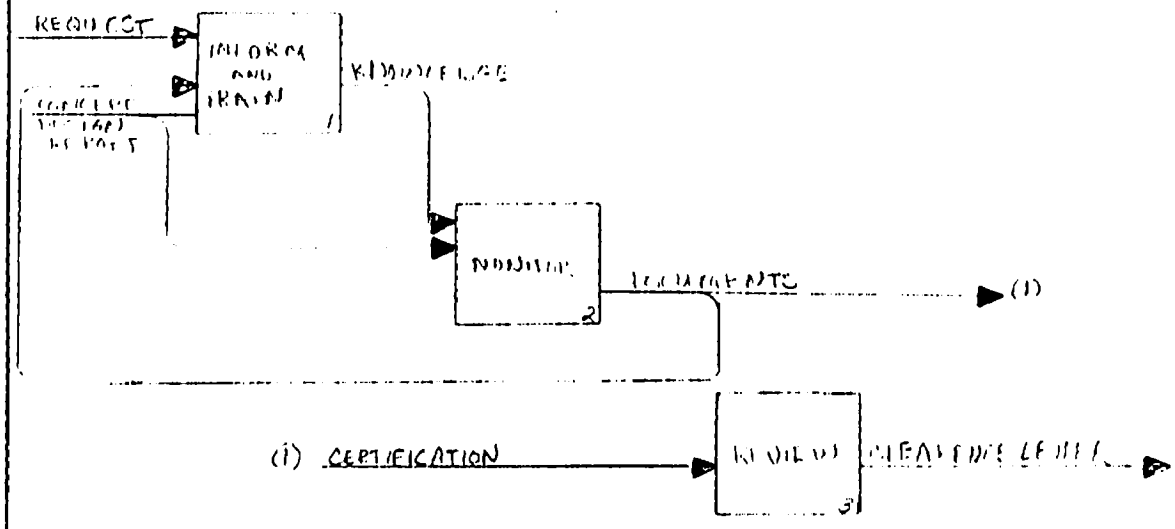
USED AT	AUTHOR: PROJECT:	DATE: REV:	WORKING DRAFT RECOMMENDED PUBLICATION	READER	DATE	CONTEXT:
	NOTES: 1 2 3 4 5 6 7 8 9 10					



NODE: A0	TITLE: PROVIDE RECORDING SERVICES	NUMBER:

IDEF FORM

USED AT:	AUTHOR:	DATE:	WORKING	READER	DATE	CONTEXT:
	PROJECT:	REV:	DRAFT			
			RECOMMENDED			
	NOTES: 1 2 3 4 5 6 7 8 9 10		PUBLICATION			

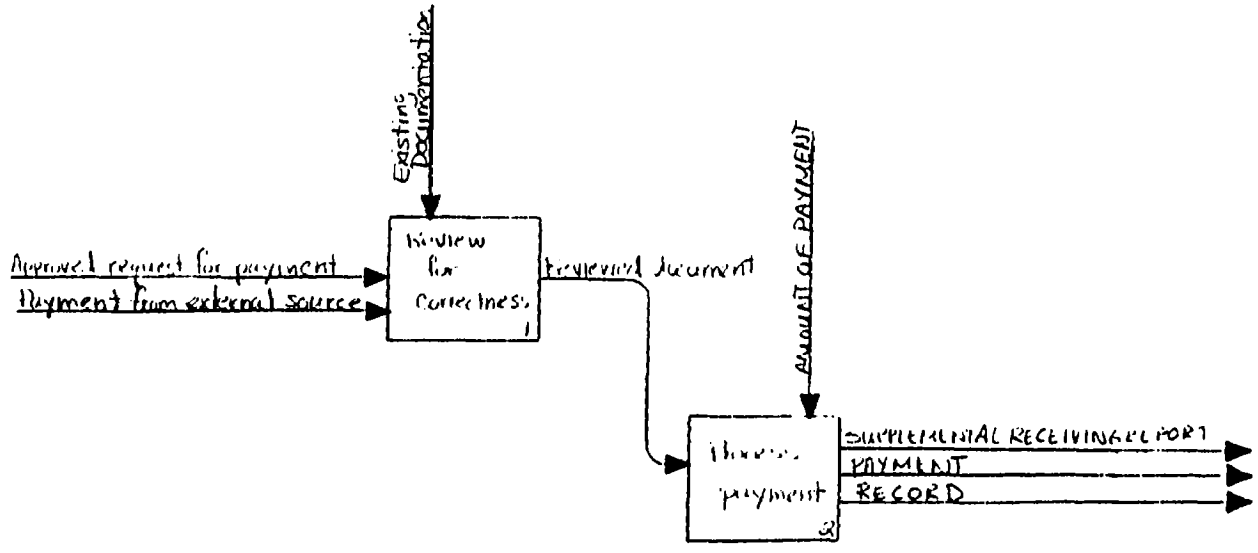


(i) Documents are released to the local agency. When the local agency has acquired what it needs they notify this organization.

NODE:	TITLE:	NUMBER:
A61	LOCAL AGENCY ACQUIRED	

IDEF FORM

USED AT:	AUTHOR:	DATE:	WORKING	READER	DATE	CONTEXT:
	PROJECT:	REV:	DRAFT			
	NOTES: 1 2 3 4 5 6 7 8 9 10		RECOMMENDED			
			PUBLICATION			



Glossary: External - outside organization

NODE:	TITLE:	NUMBER:
A0.5	Provide accounting service	

APPENDIX D

QUESTIONNAIRE 1 AS USED IN THIS STUDY

ROLES

INTRODUCTION:

In the course of doing your job on a day to day basis, you assume many roles. Each role is composed of many activities. Some of these activities are more important to your success and some consume more of your time than others. The following is a list of 11 POSSIBLE roles with example activities you might assume. Each activity has a brief explanation of its meaning. In completing the form titled "CRITICAL ACTIVITIES" (on p.4), attempt to select from the activities (which are underlined) which follow. All or none of the activities under each role category may pertain to you. If an important or time consuming activity that you perform is not on the list, identify it and use it as a critical activity.

POSSIBLE ROLES AND ACTIVITIES

ENTREPRENEURIAL ROLE ACTIVITIES

Forecasting: To predict future situations.
Organizational Planning: To assess, acquire or alter organizational capabilities.

DISTRUBANCE HANDLER ROLE ACTIVITIES

Conflict Management: To identify and resolve conflicts between subordinates.
Resource Crisis Resolution: To implement decisions caused by personnel on material shortfall.

RESOURCE ALLOCATOR (PLANNING) ROLE ACTIVITIES

Programming: To establish the sequence and priority for resource acquisition and use.
Staffing: To establish staffing needs.
Establish Operating Policies: To establish wage and operational policies and procedures.

RESOURCE ALLOCATOR (CONTROL) ROLE ACTIVITIES

Budgeting: To establish budgets for subordinates' activities.
Financial Analysis and Control: To manage cash flow and capital structure.
Scheduling: To establish and coordinate the occurence of subordinate's activities.
Auditing and Inspecting: To monitor and evaluate the performance of subordinates.

NEGOTIATOR ROLE ACTIVITIES

Budget Negotiating: To negotiate budgetary needs with subordinates.

MONITOR ROLE ACTIVITIES

Committee Work: To attend meetings so as to gain and pass on information.
Monitor Operating Performance: To gain and pass on information as to subordinate's performance.

Mail and Report Analysis: To read received documents and gain general information.
Monitor Business Indicators: To gain information about internal, external and political developments.

DISSEMINATOR ROLE ACTIVITIES

Communicating with Subordinates: To pass on oral or written information to subordinates.
Professional (Technical) Consulting: To gain or pass on specialized or technical information.

SPOKESMAN ROLE ACTIVITIES

Responding to Info. Requests from Outsiders: To pass on information to non-subordinates.
Performance Reporting: To pass on performance information.
Financial Reporting: To pass on financial information.
Public Relations: To represent the oranization to the public.

FIGUREHEAD ROLE ACTIVITIES

Document Authentication: To validate organization documents.

LEADER ROLE ACTIVITIES

Personal Interaction with Subordinates: To motivate and provide face to face leadership.
Coaching and Training: To train, council and advise subordinates.
Personnel Development: To plan and prepare for subordinate promotion.
Performance Counseling: To review and then correct or praise subordinates for their performance.
Employee Relations: To develop gook working attitudes in subordinates.
Committee Chairman: To lead non-subordinate groups.

LIAISON ROLE ACTIVITIES

Client/Customer Relations: To relate with customers.
Activities with Outsiders: To relate with the general public.
External Coordinating Activities: To work with others in organization.

CRITICAL ACTIVITIES

DIRECTIONS:

1) Please list 10 or fewer activities which are most critical to your job success. Try to select from the preceeding list or create new activity descriptors you feel relate more specifically to your job.

2) Now, divide 100 points of importance among the 11 or fewer items above. Give more points to those activities which have the greatest impact on your job performance. Place your responses in in the column marked "IMPORTANCE" corresponding to each item. Make sure the total equals 100 points.

3) Next, divide 100 points of time-consumption, meaning, in the long run, how your work time is divided. Show the relative amount of time spent on each item on your activity list. Place your responses in the column marked "TIME-CONSUMPTION" corresponding to each item. Make sure the total equals 100 points.

	IMPORTANCE	TIME-CONSUMPTION
1._____		
2._____		
3._____		
4._____		
5._____		
6._____		
7._____		
8._____		
9._____		
10._____		
11.ALL OTHER ACTIVITIES_____		
	100	100

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 1 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 1 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT	___	___	___	___	___	___	___	WIDE VARIATION
SIMILAR	___	___	___	___	___	___	___	FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL	___	___	___	___	___	___	___	INTUITIVE
CONSISTENT	___	___	___	___	___	___	___	CHANGING

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 2 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 2 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT	___	___	___	___	___	___	___	WIDE VARIATION
SIMILAR	___	___	___	___	___	___	___	FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL	___	___	___	___	___	___	___	INTUITIVE
CONSISTENT	___	___	___	___	___	___	___	CHANGING

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 3 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 3 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT	___	___	___	___	___	___	___	WIDE VARIATION
SIMILAR	___	___	___	___	___	___	___	FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL	___	___	___	___	___	___	___	INTUITIVE
CONSISTENT	___	___	___	___	___	___	___	CHANGING

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 4 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 4 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT	___	___	___	___	___	___	___	WIDE VARIATION
SIMILAR	___	___	___	___	___	___	___	FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL	___	___	___	___	___	___	___	INTUITIVE
CONSISTENT	___	___	___	___	___	___	___	CHANGING

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 5 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 5 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT	___	___	___	___	___	___	___	WIDE VARIATION
SIMILAR	___	___	___	___	___	___	___	FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL	___	___	___	___	___	___	___	INTUITIVE
CONSISTENT	___	___	___	___	___	___	___	CHANGING

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 6 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 6 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT								WIDE VARIATION
SIMILAR								FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL								INTUITIVE
CONSISTENT								CHANGING

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 7 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 7 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT	___	___	___	___	___	___	___	WIDE VARIATION
SIMILAR	___	___	___	___	___	___	___	FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL	___	___	___	___	___	___	___	INTUITIVE
CONSISTENT	___	___	___	___	___	___	___	CHANGING

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 8 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 8 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT	___	___	___	___	___	___	___	WIDE VARIATION
SIMILAR	___	___	___	___	___	___	___	FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL	___	___	___	___	___	___	___	INTUITIVE
CONSISTENT	___	___	___	___	___	___	___	CHANGING

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 9 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 9 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT	___	___	___	___	___	___	___	WIDE VARIATION
SIMILAR	___	___	___	___	___	___	___	FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL	___	___	___	___	___	___	___	INTUITIVE
CONSISTENT	___	___	___	___	___	___	___	CHANGING

SEMANTIC DIFFERENTIAL

DIRECTIONS: On the line below, write the activity 10 from your list on page 4.

_____

Four pairs of adjectives are listed below with adverbial modifiers. Reading one adverb vertically and one adjective horizontally, pairs are formed such as "extremely consistant". Rate activity 10 on each adverbial scale by placing an X under the most correct adverb for each pair of adjectives.

VARIETY OF CIRCUMSTANCES

(Variety indicates the frequency of unexpected and novel events that occur in the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
CONSISTENT	___	___	___	___	___	___	___	WIDE VARIATION
SIMILAR	___	___	___	___	___	___	___	FREQUENTLY NOVEL

STRUCTURE OF RESPONSE

(Structure indicates the stability of the process followed in doing the activity.)

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
PROCEDURAL	___	___	___	___	___	___	___	INTUITIVE
CONSISTENT	___	___	___	___	___	___	___	CHANGING

DATA AND INFORMATION FOR JOB RESPONSIBILITIES

DIRECTIONS:

1) Please indicate the percentage of the information you use in your job which comes from the following sources (Please be sure the total adds up to 100):

	Percentage
ELECTRONIC DATA PROCESSING (EDP) (Computer-generated)	_____
NON-ELECTRONIC DATA PROCESSING Examples are meetings (formal or informal), telephone calls, non-computer reports.	_____
TOTAL	100

2) Of the information which is "NON-ELECTRONIC DATA PROCESSING", please estimate how much you think could be computerized if there were resources to do so. (Please be sure the total adds up to 100).

	Percentage
PERCENTAGE YOU BELIEVE COULD BE COMPUTERIZED.	_____
PERCENTAGE YOU BELIEVE CANNOT BE COMPUTERIZED.	_____
TOTAL	100

VALUE OF CURRENT INFORMATION

DIRECTIONS:

1) Please list the computer-generated information you are currently receiving. Use exact names of reports, etc. whenever possible.

2) These reports should constitute the total ELECTRONIC DATA PROCESSING information which you receive. Divide 100 points among the listed reports as to the relative contribution of each report to your total information needs. (Please make sure the total equals 100).

TITLE OF INFORMATION	SCORE
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
TOTAL	100

APPENDIX E

QUESTIONNAIRE 2 AS USED IN THIS STUDY

USER SATISFACTION

Directions:

Each of the following questions has a set of four scales with pairs of words surrounding each scale. As with the first questionnaire, rate each question by placing an X under the most correct adverb.

1. Top management involvement: The positive or negative degree of interest, enthusiasm, support, or participation of any management level above the user's own level toward computer-based information systems or services or toward the computer staff which supports them.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
strong	___	___	___	___	___	___	___	weak
consistent	___	___	___	___	___	___	___	inconsistent
important	___	___	___	___	___	___	___	unimportant

2. Organizational competition with the ISG unit: The contention between the respondent's organizational unit and the ISG unit when vying for organizational resources or for responsibility for success or failure of computer-based information systems or services of interest to both parties.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
low	___	___	___	___	___	___	___	high
harmonious	___	___	___	___	___	___	___	dissonant
important	___	___	___	___	___	___	___	unimportant

3. Priorities determination: Policies and procedures which establish precedence for the allocation of ISG resources and services between different organizational units and their requests.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
fair	___	___	___	___	___	___	___	unfair
consistent	___	___	___	___	___	___	___	inconsistent
important	___	___	___	___	___	___	___	unimportant

4. Charge-back method of payment for services: The schedule or charges and the procedures for assessing users on a pro rata basis for the ISG resources and services that they utilize.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
reasonable	___	___	___	___	___	___	___	unreasonable
consistent	___	___	___	___	___	___	___	inconsistent
important	___	___	___	___	___	___	___	unimportant

5. Relationship with the ISG staff: The manner and methods of interaction, conduct, and association between the user and the ISG staff.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
good	___	___	___	___	___	___	___	bad
cooperative	___	___	___	___	___	___	___	uncooperative
important	___	___	___	___	___	___	___	unimportant

6. Communication with the ISG staff: The manner and methods or information exchange between the user and the ISG staff.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
precise	___	___	___	___	___	___	___	vague
meaningful	___	___	___	___	___	___	___	meaningless
important	___	___	___	___	___	___	___	unimportant

7. Technical competence of the ISG staff: The computer technology skills and expertise exhibited by the ISG staff.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
current	___	___	___	___	___	___	___	obsolete
sufficient	___	___	___	___	___	___	___	insufficient
important	___	___	___	___	___	___	___	unimportant

8. Attitude of the ISG staff: The willingness and commitment of the ISG staff to subjugate external, professional goals in favor of organizationally directed goals and tasks.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
cooperative	___	___	___	___	___	___	___	belligerent
courteous	___	___	___	___	___	___	___	discourteous
important	___	___	___	___	___	___	___	unimportant

9. Schedule of products and services: The ISG center timetable for production or information system outputs and for provision or computer-based services.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
regular	___	___	___	___	___	___	___	irregular
reasonable	___	___	___	___	___	___	___	unreasonable
important	___	___	___	___	___	___	___	unimportant

10. Time required for new development: The elapsed time between the user's request for new applications and the design, development, and/or implementation of the application systems by the ISG staff.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
short	___	___	___	___	___	___	___	long
acceptable	___	___	___	___	___	___	___	unacceptable
important	___	___	___	___	___	___	___	unimportant

11. Processing of change requests: The manner, method, and required time with which the ISG staff responds to user requests for changes in existing computer-based information systems or services.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
timely	___	___	___	___	___	___	___	untimely
flexible	___	___	___	___	___	___	___	rigid
important	___	___	___	___	___	___	___	unimportant

12. Vendor support: The type and quality of the service rendered by a vendor, either directly or indirectly, to the user to maintain the hardware or software required by that organizational status.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
sufficient	___	___	___	___	___	___	___	insufficient
eager	___	___	___	___	___	___	___	indifferent
important	___	___	___	___	___	___	___	unimportant

13. Response/turnaround time: The elapsed time between a user-initiated request for service or action and a reply to that request. Response time generally refers to the elapsed time for terminal type request or entry. Turnaround time generally refers to the elapsed time for execution or a program submitted or requested by a user and the return of the output to that user.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
good	___	___	___	___	___	___	___	bad
consistent	___	___	___	___	___	___	___	inconsistent
important	___	___	___	___	___	___	___	unimportant

14. Means of input/output with ISG center: The method and medium by which a user inputs data to and receives output from the ISG center.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
clear	___	___	___	___	___	___	___	hazy
efficient	___	___	___	___	___	___	___	inefficien.
important	___	___	___	___	___	___	___	unimportant

15. Convenience of access: The ease or difficulty with which the user may act to utilize the capability of the computer system.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
convenient	___	___	___	___	___	___	___	inconvenient
efficient	___	___	___	___	___	___	___	inefficient
important	___	___	___	___	___	___	___	unimportant

16. Accuracy: The correctness of the output information.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
accurate	___	___	___	___	___	___	___	inaccurate
consistent	___	___	___	___	___	___	___	inconsistent
important	___	___	___	___	___	___	___	unimportant

17. Timeliness: The availability of the output information at a time suitable for its use.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
timely	___	___	___	___	___	___	___	untimely
consistent	___	___	___	___	___	___	___	inconsistent
important	___	___	___	___	___	___	___	unimportant

18. Precision: The variability of the output information from that which it purports to measure.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
sufficient	___	___	___	___	___	___	___	insufficient
consistent	___	___	___	___	___	___	___	inconsistent
important	___	___	___	___	___	___	___	unimportant

19. Reliability: The consistency and dependability of the output information.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
consistent	___	___	___	___	___	___	___	inconsistent
sufficient	___	___	___	___	___	___	___	insufficient
important	___	___	___	___	___	___	___	unimportant

20. Currency: The age of the output information.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
timely	___	___	___	___	___	___	___	untimely
adequate	___	___	___	___	___	___	___	inadequate
important	___	___	___	___	___	___	___	unimportant

21. Completeness: The comprehensiveness of the output information content.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
complete	___	___	___	___	___	___	___	incomplete
consistent	___	___	___	___	___	___	___	inconsistent
important	___	___	___	___	___	___	___	unimportant

22. Format of output: The material design of the layout and display of the output contents.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
simple	___	___	___	___	___	___	___	complex
useful	___	___	___	___	___	___	___	useless
important	___	___	___	___	___	___	___	unimportant

23. Language: The set of vocabulary, syntax, and grammatical rules used to interact with the computer systems.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
powerful	___	___	___	___	___	___	___	weak
easy-to-use	___	___	___	___	___	___	___	hard-to-use
important	___	___	___	___	___	___	___	unimportant

24. Volume of output: The amount of information conveyed to a user from computer-based systems. This is expressed not only by the number or reports or outputs but also by the voluminousness of the output contents.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
concise	___	___	___	___	___	___	___	redundant
reasonable	___	___	___	___	___	___	___	unreasonable
important	___	___	___	___	___	___	___	unimportant

25. Relevancy: The degree of congruence between what the user wants or requires and what is provided by the information products and services.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
relevant	___	___	___	___	___	___	___	irrelevant
clear	___	___	___	___	___	___	___	hazy
important	___	___	___	___	___	___	___	unimportant

26. Error recovery: The methods and policies governing correction and rerun of system outputs that are incorrect.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
superior	___	___	___	___	___	___	___	inferior
complete	___	___	___	___	___	___	___	incomplete
important	___	___	___	___	___	___	___	unimportant

27. Security of data: The safeguarding of data from misappropriation or unauthorized alteration or loss.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
good	___	___	___	___	___	___	___	bad
definite	___	___	___	___	___	___	___	uncertain
important	___	___	___	___	___	___	___	unimportant

28. Documentation: The recorded description or an information system. This includes formal instructions for the utilization of the system.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
clear	___	___	___	___	___	___	___	hazy
current	___	___	___	___	___	___	___	obsolete
important	___	___	___	___	___	___	___	unimportant

29. Expectations: The set of attributes or features of the computer-based information products or services that a user considers reasonable and due from the computer-based information support rendered within his organization.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
pleased	___	___	___	___	___	___	___	displeased
definite	___	___	___	___	___	___	___	uncertain
important	___	___	___	___	___	___	___	unimportant

30. Understanding of systems: The degree of comprehension that a user possesses about the computer-based information systems or services that are provided.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
sufficient	___	___	___	___	___	___	___	insufficient
complete	___	___	___	___	___	___	___	incomplete
important	___	___	___	___	___	___	___	unimportant

31. Perceived utility: The user's judgment about the relative balance between the cost and the considered usefulness of the computer-based information products or services that are provided. The costs include any costs related to providing the resource, including money, time, manpower, and opportunity. The usefulness includes any benefits that the user believes to be derived from the support.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
positive	___	___	___	___	___	___	___	negative
useful	___	___	___	___	___	___	___	useless
important	___	___	___	___	___	___	___	unimportant

32. Confidence in the systems: The user's feelings or assurance or certainty about the systems provided.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
definite	___	___	___	___	___	___	___	uncertain
good	___	___	___	___	___	___	___	bad
important	___	___	___	___	___	___	___	unimportant

33. Feeling of participation: The degree of involvement and commitment which the user shares with the ISG staff and others toward the functioning of the computer-based information systems and services.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
encouraged	___	___	___	___	___	___	___	repelled
sufficient	___	___	___	___	___	___	___	insufficient
important	___	___	___	___	___	___	___	unimportant

34. Feeling of control: The user's awareness of the personal power or lack of power to regulate, direct or dominate the development, alteration, and/or execution of the computer-based information systems or services which serve the user's perceived function.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
sufficient	___	___	___	___	___	___	___	insufficient
precise	___	___	___	___	___	___	___	vague
important	___	___	___	___	___	___	___	unimportant

35. Degree of training: The amount of specialized instruction and practice that is afforded to the user to increase the user's proficiency in utilizing the computer capability that is unavailable.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
complete	___	___	___	___	___	___	___	incomplete
sufficient	___	___	___	___	___	___	___	insufficient
important	___	___	___	___	___	___	___	unimportant

36. Job effects: The changes in job freedom and job performance that are ascertained by the user as resulting from modifications induced by the computer-based information systems and services.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
significant	___	___	___	___	___	___	___	insignificant
valuable	___	___	___	___	___	___	___	worthless
important	___	___	___	___	___	___	___	unimportant

37. Organizational Position of the ISG Function: The hierarchical relationship of the ISG function to the overall organizational structure.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
appropriate	___	___	___	___	___	___	___	inappropriate
strong	___	___	___	___	___	___	___	weak
important	___	___	___	___	___	___	___	unimportant

38. Flexibility of Systems: The capacity of the information system to change or to adjust in response to new conditions, demands, or circumstances.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
flexible	___	___	___	___	___	___	___	rigid
sufficient	___	___	___	___	___	___	___	insufficient
important	___	___	___	___	___	___	___	unimportant

39. <u>Integration of systems</u>: The ability of systems to communicate/transmit data between systems servicing different functional areas.

	EXTREMELY	QUITE	SLIGHTLY	NEITHER	SLIGHTLY	QUITE	EXTREMELY	
complete	___	___	___	___	___	___	___	incomplete
successful	___	___	___	___	___	___	___	unsuccessful
important	___	___	___	___	___	___	___	unimportant

I. TITLE OF INFORMATION:

II. HOW OFTEN DELIVERED:

III. NUMBER OF TIMES USED IN A MONTH:

IV. DIRECTIONS:
Please score the computed-generated information listed above from 0 to 100 with regard to the aspects below. Base your ratings on how these aspects affect the usefulness of the above listed item. Your score should reflect the relative usefulness of each aspect as compared to the others. Your total score should add up to 100 points.

TIMELINESS AFFECTS ON USEFULNESS

1. Item must be delivered on TIME _____

2. Data must be current _____

CONTENT AFFECT ON USEFULNESS

3. Data must be accurate _____

4. Item must be relevant to use _____

5. Data must be adequate _____

CONVENIENCE AFFECTS ON USEFULNESS

6. Item must be easy to use _____

7. Item must be handy _____

TOTAL 100

V. COMMENTS ABOUT THIS REPORT:

APPENDIX F

NUMERIC LIST OF ACTIVITIES PERFORMED BY RIGHT OF WAY PERSONNEL

200 Forecasting: To predict future situations.

201 Organizational Planning: To assess, acquire, or alter organizational capabilities.

202 Conflict Management: To identify and resolve conflicts between subordinates.

203 Resource Crisis Resolution: To implement decisions caused by personnel or material shortfall.

204 Programming: To establish the sequence and priority for resource acquisition and use.

205 Staffing: To establish staffing needs.

206 Establish Operating Policies: To establish wage and operational policies and procedures.

207 Budgeting: To establish budgets for subordinates' activities.

208 Financial Analysis and Control: To manage cash flow and capital structure.

209 Scheduling: To establish and coordinate the occurrence of subordinates' activities.

210 Auditing and Inspecting: To monitor and evaluate the performance of subordinates.

211 Budget Negotiating: To negotiate budgetary needs with subordinates.

212 Committee Work: To attend meetings so as to gain and pass on information.

213 Monitor Operating Performance: To gain and pass on information as to subordinate's performance.

214 Mail and Report Analysis: To read received documents and gain general information.

215 Monitor Business Indicators: To gain information about internal, external, and political developments.

216 Communicating with Subordinates: To pass on oral or written information to subordinates.

217 Professional (Technical) Consulting: To gain or pass on specialized or technical information.

218 Responding to Information Requests from Outsiders: To pass on information to non-subordinates.

219 Performance Reporting: To pass on performance information.

220 Financial Reporting: To pass on financial information.

221 Document Authentication: To validate organization documents.

222 Personal Interaction with Subordinates: To motivate and provide face to face leadership.

223 Coaching and Training: To train, council, and advise subordinates.

224 Personnel Development: To plan and prepare for subordinate promotion.

225 Performance Counseling: To review and then correct or praise subordinates for their performance.

226 Employee Relations: To develop good working attitudes in subordinates.

227 Committee Chairman: To lead non-subordinate groups.

228 Client/Customer Relations: To relate with customers.

229 Activities with Outsiders: To relate with the general public.

230 External Coordinating Activities: To work with others in the organization.

231 Debugging

232 Resource Creation

233 Updating Construction Schedule

234 Secretarial Support

235 Administrative Support/Research

236 Store Recommendations and Resolutions

237 Right of Way Manual

238 Phones

239 Reports

240 Public Relations: To represent the organization to the public.

241 Monitor Rent Statistics

242 Assist Auditors

243 Assist Accounts Receivable

244 Assist Accounts Payable

245 Monitor Operating Performance of Local Public Agencies

246 Process Disposal Recommendations

247 Monitor Disposals

248 Prepare Resolutions

249 Correspondence

250 Computer Updating

251 Records Center Files

252 Purchasing

253 Inventory

254 Computing

255 Drafting

256 Interpret Survey Notes

257 Interpret Title Reports

APPENDIX G

NUMERIC LIST OF EDP INFORMATION
TITLES PRODUCED BY I.S.G.

300 Property Control Report

301 Project Numbering Reference

302 Correspondence

303 COGO

304 Material Site Report

305 Project Expenditures

306 Federal Aid Billing (CAP)

307 Selected Valid Project Cost History

308 Payroll

309 Vendor List

310 Project CAP

311 Escrow Deposits

312 Resolution Index

313 5-Year Construction Schedule

314 Project Scheduling

315 Documents

316 Vehicle Usage

317 Rental Program (Mark IV)

318 Administrative Services Division Financial and Project Analysis Section Supplement to Construction Schedule

319 Recommendation

320 Resolution

321 Memo

322 Report

323 Manual Chapter

324 Inventory by Project Number

325 Inventory by Route Number

326 Inventory by Parcel Number

327 Inventory by Grantor Name

328 Inventory by Location

329 Excess Land

330 Facility Sites

331 Lease Data (Lessee)

332 Lease Data (Lessor)

333 Contract and Specification Project Status Report

334 Project Scheduling - CPS - B Schedule and Monitoring

335 R/W Status: Construction Schedule and Active R/W Projects

336 Delinquent Rent Report

337 Project Scheduling - 12-month

338 Director's Report (Transaction List)

339 Log of Inquiries (Outer Loop Project)

340 Indexes

341 Active R/W Entries

342 Concurrent Audit Program

343 Annual Lien Tax to Counties

344 Condemnation Cash Deposit

345 Rent Receivables

346 Security Deposits

347 Rent and Refunds

348 6-Month Construction Report

349 Milepost Log: Arizona Highway System

350 Fact Data Table

351 Location and Project Table

352 Calendar Report

353 5-Year Highway Construction and Development Program

354 Finalize R/W and Construction Projects

355 Updated Inventory List

356 Inventory of State Property

357 1-Year Construction Schedule

358 Land Inventory Report by Map Number

359 Land Inventory Report by Subdivision

360 Land Inventory Report by Township and Range

361 Land Inventory Report by Interstate

362 Land Inventory Report by Secondary Road System

363 Land Inventory Report by Primary Road System

364 Land Inventory Report by Facility Sites

APPENDIX H

Bailey - Federle NX_V Matrix Sorted By Non-Zero Entries

	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	0	0	1	1	1	2
	0	1	3	5	6	9	1	4	9	0
ACT 230 NXV	61	68	86	86	71	25	43	0	46	89
ACT 214 NXV	82	0	79	43	0	21	75	0	36	100
ACT 217 NXV	93	61	46	0	0	29	0	46	29	0
ACT 218 NXV	0	0	36	43	43	21	36	0	0	0
ACT 228 NXV	29	0	0	86	0	0	61	0	0	64
ACT 216 NXV	71	0	0	43	57	0	39	86	57	0
ACT 221 NXV	0	0	0	43	86	68	0	100	0	0
ACT 229 NXV	82	0	0	86	0	29	43	0	0	57
ACT 200 NXV	0	0	50	0	0	14	0	0	32	0
ACT 223 NXV	0	0	0	0	0	0	0	57	0	0
ACT 220 NXV	0	0	0	43	0	14	0	0	36	0
ACT 204 NXV	0	0	0	0	86	0	0	57	0	0
ACT 222 NXV	0	0	0	0	0	0	0	43	43	0
ACT 209 NXV	0	0	0	0	0	0	0	57	39	0
ACT 213 NXV	0	0	0	0	68	0	0	71	71	0
ACT 210 NXV	0	0	0	0	0	0	0	0	0	0
ACT 212 NXV	0	0	0	0	0	0	0	0	0	0
ACT 225 NXV	0	0	0	0	0	0	0	0	0	0
ACT 215 NXV	0	0	0	0	0	0	0	0	0	0
ACT 208 NXV	0	0	0	0	0	36	0	0	36	0
ACT 224 NXV	0	0	0	0	0	0	0	86	0	0
ACT 234 NXV	0	0	0	0	0	0	0	0	0	93
ACT 235 NXV	0	0	0	0	0	0	0	0	0	79
ACT 236 NXV	0	0	0	0	0	0	0	0	0	0
ACT 240 NXV	0	0	0	0	0	39	0	0	0	0
ACT 233 NXV	0	0	0	0	0	0	0	0	0	93
ACT 219 NXV	0	0	0	0	0	0	0	0	0	0
ACT 202 NXV	0	0	0	0	0	0	0	0	0	0
ACT 231 NXV	0	46	0	0	0	0	0	0	0	0
ACT 237 NXV	0	0	0	0	0	0	0	0	0	0
ACT 238 NXV	0	0	0	0	0	0	0	0	0	0
ACT 239 NXV	0	0	0	0	0	0	0	0	0	0
ACT 232 NXV	0	0	0	0	0	0	0	68	0	0
ACT 241 NXV	0	0	0	0	0	0	0	0	0	0
ACT 242 NXV	0	0	0	0	0	0	0	0	0	0
ACT 243 NXV	0	0	0	0	0	0	0	0	0	0
ACT 244 NXV	0	0	0	0	0	0	0	0	0	0
ACT 245 NXV	0	0	0	0	0	0	0	0	0	0
ACT 246 NXV	0	0	0	0	0	0	0	0	0	0
ACT 247 NXV	0	0	0	0	0	0	0	0	0	0
ACT 248 NXV	0	0	0	0	0	0	0	0	0	0
ACT 249 NXV	0	0	0	0	0	0	0	0	0	0
ACT 250 NXV	0	0	0	0	0	0	0	0	0	0
ACT 251 NXV	0	0	0	0	0	0	0	0	0	0
ACT 252 NXV	0	0	0	0	0	0	0	0	0	0
ACT 253 NXV	0	0	0	0	0	0	0	0	0	0
ACT 254 NXV	0	0	0	0	0	0	0	0	0	0
ACT 255 NXV	0	0	0	0	0	0	0	0	0	0
ACT 256 NXV	0	0	0	0	0	0	0	0	0	0
ACT 257 NXV	0	0	0	0	0	0	0	0	0	0

	121	126	127	130	133	135	138	146	147	153
ACT 230 NXV	0	0	0	86	29	0	0	57	0	0
ACT 214 NXV	0	0	79	0	57	54	0	54	43	50
ACT 217 NXV	0	0	57	0	29	57	0	0	0	46
ACT 218 NXV	0	46	50	57	46	0	0	0	0	0
ACT 228 NXV	0	46	36	64	0	0	0	0	29	43
ACT 216 NXV	0	0	0	0	36	43	0	0	0	0
ACT 221 NXV	0	0	0	0	0	64	0	57	0	86
ACT 229 NXV	0	0	0	61	0	0	0	0	0	0
ACT 200 NXV	0	0	50	0	54	0	0	0	0	0
ACT 223 NXV	0	71	0	86	0	71	0	0	79	0
ACT 220 NXV	0	0	0	0	0	0	86	86	0	71
ACT 204 NXV	0	75	57	0	68	39	0	0	0	0
ACT 222 NXV	0	86	50	0	36	64	0	0	0	0
ACT 209 NXV	0	75	0	73	0	57	0	0	0	0
ACT 213 NXV	0	75	0	0	0	0	0	0	0	0
ACT 210 NXV	0	82	82	86	0	71	0	0	0	0
ACT 212 NXV	0	79	82	0	75	0	0	0	0	0
ACT 225 NXV	0	64	0	0	57	0	0	0	0	0
ACT 215 NXV	0	0	0	0	0	54	0	0	0	0
ACT 208 NXV	0	0	0	0	0	0	0	0	0	0
ACT 224 NXV	0	39	0	0	0	0	0	0	0	0
ACT 234 NXV	86	0	0	0	0	0	0	0	0	0
ACT 235 NXV	0	0	0	0	0	0	0	0	0	0
ACT 236 NXV	82	0	0	0	0	0	0	0	0	0
ACT 240 NXV	0	0	0	50	0	0	0	0	0	0
ACT 233 NXV	0	0	0	0	0	0	0	0	0	0
ACT 219 NXV	0	82	0	0	0	0	0	0	0	0
ACT 202 NXV	0	0	0	86	0	0	0	0	0	0
ACT 231 NXV	0	0	0	0	0	0	0	0	0	0
ACT 237 NXV	71	0	0	0	0	0	0	0	0	0
ACT 238 NXV	82	0	0	0	0	0	0	0	0	0
ACT 239 NXV	79	0	0	0	0	0	0	0	0	0
ACT 232 NXV	0	0	0	0	0	0	0	0	0	0
ACT 241 NXV	0	0	0	0	0	0	86	0	0	0
ACT 242 NXV	0	0	0	0	0	0	86	0	0	0
ACT 243 NXV	0	0	0	0	0	0	86	0	0	0
ACT 244 NXV	0	0	0	0	0	0	71	0	0	0
ACT 245 NXV	0	0	0	0	0	0	0	0	46	0
ACT 246 NXV	0	0	0	0	0	0	0	0	0	0
ACT 247 NXV	0	0	0	0	0	0	0	0	0	0
ACT 248 NXV	0	0	0	0	0	0	0	0	0	0
ACT 249 NXV	0	0	0	0	0	0	0	0	0	0
ACT 250 NXV	0	0	0	0	0	0	0	0	0	0
ACT 251 NXV	0	0	0	0	0	0	0	0	0	0
ACT 252 NXV	0	0	0	0	0	0	0	0	0	0
ACT 253 NXV	0	0	0	0	0	0	0	0	0	0
ACT 254 NXV	0	0	0	0	0	0	0	0	0	0
ACT 255 NXV	0	0	0	0	0	0	0	0	0	0
ACT 256 NXV	0	0	0	0	0	0	0	0	0	0
ACT 257 NXV	0	0	0	0	0	0	0	0	0	0

	155	156	157	159	161	AVG	TOTAL	# NON-ZERO
ACT 230 NXV	29	61	0	0	50	59.048	885.714	15.000
ACT 214 NXV	0	0	0	0	75	60.459	846.429	14.000
ACT 217 NXV	14	68	0	0	57	48.626	632.143	13.000
ACT 218 NXV	21	36	0	0	39	39.583	475.000	12.000
ACT 228 NXV	0	0	0	0	0	50.794	457.143	9.000
ACT 216 NXV	0	0	0	0	0	54.018	432.143	8.000
ACT 221 NXV	0	50	0	0	0	69.196	553.571	8.000
ACT 229 NXV	0	0	0	0	68	60.714	425.000	7.000
ACT 200 NXV	25	0	0	0	57	40.306	282.143	7.000
ACT 223 NXV	0	68	0	0	0	72.024	432.143	6.000
ACT 220 NXV	0	0	0	0	0	55.952	335.714	6.000
ACT 204 NXV	0	0	0	0	0	63.690	382.143	6.000
ACT 222 NXV	0	0	0	0	0	53.571	321.429	6.000
ACT 209 NXV	0	0	0	0	0	60.714	303.571	5.000
ACT 213 NXV	0	0	0	0	0	71.429	285.714	4.000
ACT 210 NXV	0	0	0	0	0	80.357	321.429	4.000
ACT 212 NXV	0	0	0	0	46	70.536	282.143	4.000
ACT 225 NXV	0	0	0	0	0	60.714	121.429	2.000
ACT 215 NXV	0	64	0	0	0	58.929	117.857	2.000
ACT 208 NXV	0	0	0	0	0	35.714	71.429	2.000
ACT 224 NXV	0	0	0	0	0	62.500	125.000	2.000
ACT 234 NXV	0	0	0	0	0	89.286	178.571	2.000
ACT 235 NXV	14	0	0	0	0	46.429	92.857	2.000
ACT 236 NXV	50	0	0	0	0	66.071	132.143	2.000
ACT 240 NXV	0	0	0	0	0	44.643	89.286	2.000
ACT 233 NXV	0	0	0	0	0	92.857	92.857	1.000
ACT 219 NXV	0	0	0	0	0	82.143	82.143	1.000
ACT 202 NXV	0	0	0	0	0	85.714	85.714	1.000
ACT 231 NXV	0	0	0	0	0	46.429	46.429	1.000
ACT 237 NXV	0	0	0	0	0	71.429	71.429	1.000
ACT 238 NXV	0	0	0	0	0	82.143	82.143	1.000
ACT 239 NXV	0	0	0	0	0	78.571	78.571	1.000
ACT 232 NXV	0	0	0	0	0	67.857	67.857	1.000
ACT 241 NXV	0	0	0	0	0	85.714	85.714	1.000
ACT 242 NXV	0	0	0	0	0	85.714	85.714	1.000
ACT 243 NXV	0	0	0	0	0	85.714	85.714	1.000
ACT 244 NXV	0	0	0	0	0	71.429	71.429	1.000
ACT 245 NXV	0	0	0	0	0	46.429	46.429	1.000
ACT 246 NXV	29	0	0	0	0	28.571	28.571	1.000
ACT 247 NXV	32	0	0	0	0	32.143	32.143	1.000
ACT 248 NXV	18	0	0	0	0	17.857	17.857	1.000
ACT 249 NXV	29	0	0	0	0	28.571	28.571	1.000
ACT 250 NXV	0	61	0	0	0	60.714	60.714	1.000
ACT 251 NXV	0	0	25	0	0	25.000	25.000	1.000
ACT 252 NXV	0	0	61	0	0	60.714	60.714	1.000
ACT 253 NXV	0	0	61	0	0	60.714	60.714	1.000
ACT 254 NXV	0	0	0	86	0	85.714	85.714	1.000
ACT 255 NXV	0	0	0	68	0	67.857	67.857	1.000
ACT 256 NXV	0	0	0	68	0	67.857	67.857	1.000
ACT 257 NXV	0	0	0	57	0	57.143	57.143	1.000

APPENDIX H-1

GUIDE FOR CREATING THE ANALYSIS DATA BASE AND LINKING ANALYSIS PROGRAMS TO IT

INTRODUCTION

The ISG (ADOT) has been provided four identical diskettes which contain the eight data analysis programs developed and used for this project. The programs are specific for the data collected, and therefore will require some modification if used for newly collected data. This will be further explained in the following sections.

These programs were developed on an IBM PC/XT microcomputer and therefore must be run on the same, or highly compatible, equipment. Specific needs of the programs are the EDLIN line editor and the BASICA Basic-Language compiler.

PREPARATION OF DATA FOR ENTRY

Repondent Identification Numbers

Each respondent should be assigned an identification number ranging from 100 to 199. This identification number must be used for each questionnaire completed by this respondent. Note that for a given analysis no more than 100 respondents can be identified by the programs (for later purposes of this report the respondent number is coded IDN).

Pearson Questionnaire Data

In the Pearson questionnaire, each respondent answers a series of 39 questionnaires by checking a set of three scales for each question.

The first two of these scales are identified as "Satisfaction" scale. Numeric values for these scales should be assigned according to Table 1.

TABLE 1 - Unweighted levels of satisfaction for individual participants for individual factors

Value	Level of Satisfaction
+3	Extremely Satisfied
+2	Quite Satisfied
+1	Slightly Satisfied
0	Neither Satisfied nor Dissatisfied or not applicable
-1	Slightly Dissatisfied
-2	Quite Dissatisfied
-3	Extremely Dissatisfied

The third scale is identified as the "Importance" scale. Numeric values of this scale should be assigned according to Table 2.

TABLE 2 - Levels of importance

Value	Level of Importance
1.00	Extremely Important
.85	Quite Important
.70	Slightly Important
.55	Neither Important nor Unimportant or not applicable
.40	Slightly Unimportant
.25	Quite Unimportant
.10	Extremely Unimportant

These three specific data points are coded as a Satisfaction Trio ("ST").

Bailey-Federle Questionnaire Data

In the Bailey-Federle questionnaire each respondent is asked to consider an initial list of 32 activities he/she might perform. In addition, the respondent is urged to add activities to this list that are peculiar to his/her own job.

A master list of all possible activities must be compiled after administration of this questionnaire and identification numbers assigned. The identification numbers for the original 32 activities are 200 through 231, all additional activities should be numbered consecutively starting with 232. No activity may be numbered greater than 299. (A maximum of 100 activities). Activity number is coded as "AN."

The respondent lists as many activities as he/she wishes (with a limit of 10) and evaluates the importance (coded IM) and time-consumption (coded TC) of each. (This may be a one-to-three digit number).

The respondent then evaluates each activity with four scales. Each of these scales allows a check mark to be placed in one of 7 categories. These responses must be assigned numeric values, with a 1 assigned to a check in the far right category and ranging to a 7 for a check in the far left category. (These values are coded "VS").

The number of different activities each respondent lists must be identified and maintained for use in the data analysis program.

Krobock Questionnaire Data

The Krobock questionnaire data is divided into three distinct components: 1) Computerizability of information; 2) Relative value of use for each computer generated report; and 3) usefulness of each computer generated report.

The data is coded so that it can be entered into the data base in two modules. The first module contains data from components 1) and 2) identified in the preceeding paragraph. The data for 1) computerizability of information are directly shown in one-to-three digit numeric values and are coded as "A", "B", "C" and "D." To properly code the data for, 2) relative value of use for report, all questionnaires must be collected and all reports identified by respondents must be tabulated. The report titles should be listed in order and identification numbers assigned ranging from 300 to 399 (a maximum of 100 reports). These numbers are coded "RN." For a given respondent, all reports listed must be assigned identification numbers and the total number of reports listed should be counted and kept for later use. The value score for each report is numeric (one-to-three digits) and is coded "VR." This concludes the data coding for the first module of the Krobock data.

The second module contains data for the 3) usefulness of each computer generated report. Each report the respondent lists is evaluated according to seven (7) aspects of usefulness. These evaluations (coded UE) are numeric (one-to-three digits).

DATA FILES AND DATA ENTRY

Three data files must be created using the EDLIN editor. There is one data file associated with each of the three sets of questionnaire data. Since the analysis programs are written in BASIC, each specific data point, or value, must be separated from the succeeding value by one or more blank spaces.

For convenience in explaining data entry format Table 3 presents a summary of the code names associated with the data collection questionnaires.

TABLE 3
Code Identification for Data Entry

Code	Description	Questionnaire
IDN	Respondent Number	All
ST	Satisfaction Trio (three data points for each question)	Pearson
AN	Activity Number	Bailey-Federle
IM	Importance of Activity	Bailey-Federle
TC	Time Consumption of Activity	Bailey-Federle
VS	Variety and Structure (four data points for each activity)	Bailey-Federle
A,B,C,D	Computerizability of Information Reports	Krobock
RN	Report Number	Krobock
VR	Value of Report	Krobock
UE	Usefulness Evaluations (seven data points for each report)	Krobock

DATA1 - Data File for Pearson Questionnaire Data

Using the EDLIN line editor to create (or identify) the data file DATA1, the data from the Pearson questionnaire is entered as follows (the commas are

used to delimit the code identification, they are <u>not</u> required for actual data entry).

For each respondent the <u>first</u> data line is:

IDN, ST_1, ST_2, . . ., ST_7

The second through fifth data lines are;

ST_{i+1}, ST_{i+2}, ., ST_{i+7} (Satisfaction trios for each successive set of seven questions)

the sixth data line includes the satisfaction trios for the last four questions.

Example 1 shows a sample of how the data is stored in DATA 1

EXAMPLE 1

```
C>TYPE A:DATA1
100  1  2 .85 -2  2 .85  2  2 1.0  1  1 .85  2  2 1.0  2  3 1.0  2  2 1.0
     3  3 1.0  2  2 1.0 -1  2 1.0  2  2 1.0  2  2 1.0  2  2 1.0  2  2 1.0
     2  2 1.0  2  2 1.0  2  2 1.0  2  2 1.0  2  2 1.0  3  3 1.0  2  2 1.0
     2  3 1.0  3 -1 1.0  2  2 1.0  2  2 1.0  2  2 1.0  2  3 1.0  2  2 1.0
     2  2 1.0  2  2 1.0  2  3 1.0  2  2 1.0  2  2 .85  2  2 1.0  1  1 1.0
     1  2 1.0  2  3 1.0  2  2 1.0  2  2 1.0
101  2  2 .85  2 -2 .70  1  1 .55  1  1 .70  0  2 .85 -2 -1 .85  1 -1 .85
     1  2 .70  0  0 .55 -2 -1 .70  1  1 .55 -1 -1 .70 -1 -1 .70  1  0 .55
     1 -1 .70  2  2 .85  1  1 .70  2  2 .85  1  1 .70  1  1 .55  1  1 .70
     0  0 .55  0 -1 .85 -1  0 .55  1  1 .70 -1  0 .70  0  0 .55  0  0 .55
    -1  0 .70 -1 -1 .70  1  1 .70  0  1 .70  0  0 .55 -1  0 .70 -2 -2 .70
     1 -1 .55  0  0 .55 -1  0 .70 -1 -1 .70
103  0  0 .55 -2  0 .85 -2  0 .85  0  0 .55  0 -1 1.0 -2  1 1.0 -1 -1 1.0
     1  2 1.0  2  0 1.0 -2  0 1.0 -2  0 1.0  0  0 .55  0  2 .85  2 -2 1.0
    -2 -2 1.0  2  2 1.0  1  3 1.0 -2  0 1.0  2  1 1.0 -1 -1 1.0 -2  0 1.0
    -1 -1 1.0 -1 -1 .70  2  2 .85  2  2 .85 -1  0 1.0  0  0 .40 -2 -1 1.0
    -2  2 .85 -1 -1 .85 -1 -1 .85 -1 -1 .85 -1 -1 .85 -1  0 .85 -2 -2 .85
     0  0 .55  0  0 .55 -1 -1 .85  0  0 .55
105  3  3 1.0 -3  3 1.0  0  0 .55  0  0 .55  2  2 .85  2  2 .85  2  2 .85
     3  2 .85  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  1  1 .70
     0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55 -1  0 .55
     0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55
     0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55
     0  0 .55  0  0 .55  0  0 .55  0  0 .55
```

DATA2 - Data File for Bailey-Federle Questionnaire Data

Using the EDLIN line editor to create (or identify) the data file DATA2, the data from the Bailey-Federle questionnaire is entered as follows.

For each respondent the first data line is:

IDN, AN, IM, TC, VS;

each succeeding data line is,

AN, IM, TC, VS.

Note that each activity identified by that respondent has its own data line and the total number of activities for each respondent must be tallied, in order of entry, and kept for later use.

Example 2 shows a sample of how the data is stored in DATA 2.

EXAMPLE 2

```
C>TYPE A:DATA2
100 214 35 35 5 6 6 6
    216 25 25 2 6 6 6
    217  5  5 7 7 6 6
    228 10 10 2 2 2 2
    229 15 15 5 6 6 6
    230 10 10 3 6 5 3
101 217 10 10 6 3 5 3
    230 15 35 4 3 6 6
    231 75 55 2 3 5 3
103 200  5 10 6 3 3 2
    214  5 10 5 5 6 6
    217  5 10 2 6 2 3
    218 75 40 2 2 3 3
    230  5  5 6 6 6 6
    299  5 25 0 0 0 0
105 214 30  0 6 0 6 0
    216 30  0 6 0 6 0
    218 2.5 0 6 0 6 0
    220 2.5 0 6 0 6 0
    221  5  0 6 0 6 0
    228 10  0 6 6 6 6
    229 10  0 6 6 6 6
    230 10  0 6 6 6 6
106 204 20 20 6 6 6 6
    213  5  5 2 5 6 6
    216 20 20 6 3 2 5
    218  5  5 2 3 2 5
    221 40 40 6 6 6 6
    230 10 10 5 5 5 5
```

DATA3 - Data File for Krobock Questionnaire Data

As noted earlier, data from the Krobock questionnaire is stored in data file, DATA3, in two distinct modules. The first module contains data regarding: 1) computerizability of information; and 2) relative value of use for each computer generated report.

For this module, use the EDLIN line editor to create (or locate the appropriate line number in the existing file) the data file DATA3, and enter the data from the Krobock questionnaire as follows.

For each respondent the data line is;

IDN, A, B, C, D, RN, VR, RN, VR, . . ., RN, VR

if necessary additional data lines may be entered as;

RN, VR, ... RN, VR

The second module contains the seven factors concerning the 3) usefulness of each computer generated report. This data must be listed in exactly the same order as the reports listed in the first module.

For this module, use the EDLIN line editor to add data lines to the existing data file, DATA3.

For each respondent the first data line is:

IDN, UE

each succeeding line (one per information report) is;

UE.

Example 3 shows a sample of how the data is stored in DATA3.

EXAMPLE 3

```
C>TYPE A:DATA3
100 50 50 30 70 300 30 301 25 302 45
101 85 15 0 100 303 97 304  3
103 15 85 90 10 305 20 306 75 307  5
105 30 70 60 40 310 50 308 25 309 25
106 10 90 20 80 301 90 309  5 311  5
109 20 80 50 50 312 45 313 45 314 10
111 0 100  2 98
114 60 40 50 50 315 60 303 40
119 20 80 50 50 310 50 314  5 301 25 317 10 314 10
120  2 98  5 95 318 100
121 75 25 80 20 319 15 320 15 302 20 321 10 322 10 323 30
   126 40 60 30 70 324 13 325  5 326 20 327 10 328 20 329 10 330 10 304  2 331 5
                   332  5
127 37 73 15 85 313 15 333 10 334 25 337 10 335 25 312 15
130 25 75  5 95 336 25 332 50 338 10 335 10 311  5
133 20 80 45 55 335 45 339  5 341 10 313  5 301 25 340 10
135  5 95 15 85 317 20 345 40 300 40
138 40 60 75 25 317 40 314 10 308 10 305 10 342 10 343 10 344 10
  146 40 60 20 80 345 50 336 10 344 10 343  5 347  5 311  5 305  5 344  5 301  5
147 0 100 0 100 348 100
153 10 90 35 65 301 70 309 30
155 10 90 40 60 312 36 301 37 349  5 353  5 348  1 350  1 351  1 352  1 313  5
334  1 333  1 335  1 354  5
156 65 35 0 100 348 100
157 10 90 10 90 355 50 356 50
159 50 50 90 10 303 100
161 50 50 75 25 313 85 334  5 357 10
100 0 30 30 20 10 0 10
   20 30 20 20 10 0 0
   20 20 20 10 10 10 10
101 5 5 50 10 15 10 5
    10 10 30 10 10 15 15
103 20 15 20 10 10 10 15
    20 15 20 10 10 10 15
    20 5 5 25 5 20 20
105 0 50 50 0 0 0 0
    75 0 12.5 12.5 0 0 0
    50 25 12.5 12.5 0 0 0
106 20 30 10 5 5 20 10
    10 20 30 5 5 20 10
    10 30 30 10 10 5 5
109 5 20 30 5 15 10 15
    5 20 20 10 15 15 15
    5 20 20 10 15 15 15
111
114 10 20 30 20 10 5 5
    20 10 50 10 5 6 0
119 15 15 20 10 15 15 10
    5 10 50 5 20 10 0
    5 5 50 10 20 10 0
    20 20 50 0 0 10 0
    25 20 40 0 5 10 0
120 10 45 45 0 0 0 0
121 25 20 20 10 5 10 10
    25 20 20 10 5 10 10
    20 20 20 10 10 10 10
    20 20 20 20 5 10 5
    20 20 20 10 15 5 10
    10 25 20 10 15 10 10
126 5 20 30 10 15 5 15
    5 30 25 10 10 5 15
```

PROGRAMS FOR DATA ANALYSIS

As noted earlier, eight data analysis programs were developed for this project. These programs use the data files (DATA1, DATA2 and DATA3) previously discussed. In addition, two of the programs create additional data files (DATA101 and DATA201) which are then stored. These two "new" data files will be explained in the next two sections of this report.

Since these programs were developed specifically for this project there are specific commands which must be altered when the questionnaires are used to develop additional data. Several of these commands apply to all eight programs and are presented in this section. Other commands are specific to specific programs and are presented with those programs.

The general commands, which must be changed in all programs, are:

1. NN=25. This study had 25 respondents, a different number of respondents will require NN=(new number). This command is line 10 or 20 in all programs.

2. All programs, in listing results, will stop after one page has been printed, to continue printing a Y`key must be pressed.

3. A three digit number must be used to identify all respondents.

The specific programs and command changes are presented below.

Programs P1S-NS and P1S-NSAG

These programs work in conjunction to create a matrix based on the Person questionnaire data (DATA1). This matrix is "Normalized Satisfaction" sorted by average. Program P1S-NS calculates average values of normalized satisfaction, sorts them according to average, creates DATA101, and stores these values in DATA101. Program P1S-NSAG uses DATA101 and produces the final result.

The only specific command which might need to be changed iS QN=39 (line 20) if fewer than 39 questions are used in the Pearson questionnaire.

Programs P1IMP2 and P1IMP3

These programs work in conjunction to create a matrix based on the Pearson questionnaire data (DATA1). This matrix is "Importance" sorted by average. Program P1IMP2 calculates average values of perceived importance, sorts them according to average, creates DATA201, and stores these values in DATA201. Program P1IMP3 uses DATA201 and produces the final result.

The only specific command which might need to be changed is QN=39 (line 20) if fewer than 39 questions are used in the Pearson questionnaire.

Program P2NXV

This program produces a matrix based on Bailey-Federle data (DATA2) which shows total scores for activity structure and consistency sorted by the number of non-zero entries.

Specific command changes which may be required are:

1. ACTN=58 (line 30). This project identified 58 different activities. A different use of the Bailey-Federle questionnaire will yield a different number.

2. The number of activities per respondent in the exact order in which respondent data is entered into DATA2 must be entered as DATA statements (lines 40, 50 and 60).

Program P2X

This program produces a matrix based on Bailey-Federle data (DATA2) which shows total computerizability scores sorted by the number of non-zero entries.

Specific command changes which may be required are:

1. ACTN=58 (line 30). This project identified 58 different activities. A different use of the Bailey-Federle questionnaire will yield a different number.

2. The number of activities per respondent in the exact order in which respondent data is entered into DATA2 must be entered as DATA statements (lines 40, 50 and 60).

Program P3SP

This program produces a set of matrices based on Krobock data (DATA3) which shows, by report number, the relative value individuals assign to that report.

Specific command changes which may be required are:

1. RN=61 (line 30). This project identified 61 different reports. A different use of the Krobock questionnaire will yield a different number.

2. The number of reports listed per respondent in the exact order in which respondent data is entered into DATA3 must be entered as DATA statements (lines 40, 50 and 60).

Program P3SI

This program produces a set of matrices based on Krobock data (DATA3) which shows, by individual respondent number, the relative value that individual assigns to all reports.

Specific command changes which may be required are:

1. RN=61 (line 30). This project identified 61 different reports. A different use of the Krobock questionnaire will yield a different number.

2. The number of reports listed per respondent in the exact order in which respondent data is entered into DATA3 must be entered as DATA statements (lines 40, 50 and 60).

APPENDIX H-2

BAILEY-FEDERLE QUESTIONNAIRE DATA AS STORED IN THE DATA BASE (DATA 2)

```
C>TYPE A:DATA2
100 214 35 35 5 6 6 6
    216 25 25 2 6 6 6
    217  5  5 7 7 6 6
    228 10 10 2 2 2 2
    229 15 15 5 6 6 6
    230 10 10 3 6 5 3
101 217 10 10 6 3 5 3
    230 15 35 4 3 6 6
    231 75 55 2 3 5 3
103 200  5 10 6 3 3 2
    214  5 10 5 5 6 6
    217  5 10 2 6 2 3
    218 75 40 2 2 3 3
    230  5  5 6 6 6 6
    299  5 25 0 0 0 0
105 214 30  0 6 0 6 0
    216 30  0 6 0 6 0
    218 2.5 0 6 0 6 0
    220 2.5 0 6 0 6 0
    221  5  0 6 0 6 0
    228 10  0 6 6 6 6
    229 10  0 6 6 6 6
    230 10  0 6 6 6 6
106 204 20 20 6 6 4 6
    213  5  5 2 5 6 6
    216 20 20 6 3 2 5
    218  5  5 2 3 2 5
    221 40 40 6 6 6 6
    230 10 10 5 5 5 5
109 200 15 20 1 1 1 1
    208  5  3 2 2 3 3
    214 10 10 1 1 2 2
    217 10 10 2 2 2 2
    218 10 10 1 1 2 2
    220 10 10 1 1 1 1
    240  5  2 3 3 2 3
    221 10 10 3 3 7 6
    229 10 10 2 2 2 2
    230 10 10 1 2 2 2
    299  5  5 0 0 0 0
111 214 50 30 6 3 6 6
    216 30 30 3 3 2 3
    218 10 10 2 3 2 3
    228  2  2 3 5 3 6
    229  2  2 3 3 3 3
    230  6  6 2 3 5 2
    299 0   0  0 0 0 0
114 232 15 50 2 3 7 7
    204  5  3 6 6 2 2
    209  5  3 6 6 2 2
    213 10  3 6 6 2 6
    216 10  5 6 6 6 6
    217  5  2 2 2 4 5
    221 20  5 7 7 7 7
    222 10  5 2 5 2 3
    223 10  5 2 3 6 5
    224 10  5 6 6 6 6
    299  0  9  0 0 0 0
```

119	200	14	20	2	2	3	2
	213	3	3	6	6	4	4
	208	7	10	2	2	3	3
	214	7	5	2	2	3	3
	216	3	3	4	4	4	4
	220	20	20	2	2	3	3
	230	14	10	2	2	5	4
	222	7	5	3	3	3	3
	209	10	9	2	2	4	3
	217	14	10	2	2	2	2
	299	1	5	0	0	0	0
120	228	5	5	2	4	6	6
	229	3	5	3	3	5	5
	230	7	5	5	6	7	7
	233	3	5	6	6	7	7
	234	65	70	6	6	7	7
	235	15	10	5	5	6	6
	214	10	10	7	7	7	7
121	236	40	25	6	5	5	7
	237	20	25	5	3	5	7
	234	15	35	6	6	6	6
	239	10	10	6	5	5	6
	238	15	10	6	6	6	5
126	222	25	15	6	6	6	6
	204	20	10	5	5	5	6
	228	10	15	3	3	2	5
	212	2	3	5	5	6	6
	219	2	2	7	5	6	5
	209	3	2	6	6	3	6
	223	3	10	5	3	6	6
	224	2	5	5	5	6	5
	225	10	5	5	3	5	5
	224	10	5	2	2	2	5
	213	2	7	5	5	6	5
	218	4	8	2	3	3	5
	210	3	3	6	6	6	5
	299	4	10	0	0	0	0
127	222	20	20	3	3	4	4
	217	15	15	2	2	6	6
	214	14	10	5	5	6	6
	200	12	5	2	2	5	5
	218	10	25	1	1	6	6
	204	9	10	2	2	6	6
	228	9	5	2	2	3	3
	212	6	5	6	5	6	6
	210	2	2	6	5	6	6
	299	3	3	2	3	3	3

130	202	2	1	6	6	6	6
	209	5	3	6	6	6	3
	210	3	2	6	6	6	6
	218	10	11	6	2	5	3
	240	27	30	2	2	5	5
	223	2	2	6	6	6	6
	228	10	11	3	3	6	6
	229	27	30	2	3	6	6
	230	14	10	6	6	6	6
133	200	15	5	3	5	5	2
	204	5	2	5	6	6	2
	212	5	3	4	5	6	6
	214	10	5	5	5	3	3
	216	5	10	2	3	3	2
	217	10	15	2	2	2	2
	218	20	25	3	3	3	4
	222	5	10	2	3	2	3
	225	5	5	3	4	4	5
	230	20	20	2	2	2	2
135	221	10	6	3	5	5	5
	204	10	7	3	2	3	3
	209	9	7	3	3	5	5
	210	9	8	5	5	5	5
	215	9	7	3	2	5	5
	214	9	8	3	2	5	5
	216	8	6	2	2	5	3
	217	10	8	3	3	5	5
	222	9	10	5	3	5	5
	223	9	10	5	5	5	5
	299	8	23	0	0	0	0
138	220	50	70	6	6	6	6
	241	15	15	6	6	6	6
	242	10	5	6	6	6	6
	243	15	5	6	6	6	6
	244	10	5	3	5	6	6
146	221	25	25	2	6	2	6
	214	25	35	2	6	1	6
	220	35	30	6	6	6	6
	230	15	10	2	6	6	2
147	245	80	60	3	4	3	3
	214	10	15	2	2	4	4
	228	5	20	2	2	2	2
	223	5	5	4	6	6	6
153	214	5	5	3	3	2	6
	217	10	10	2	3	3	5
	220	25	25	2	6	6	6
	221	50	50	6	5	7	6
	228	10	10	2	3	2	5
155	248	30	20	1	1	1	2
	246	25	20	2	2	2	2
	247	5	5	2	2	2	3
	236	5	4	2	2	3	7
	218	14	10	1	2	1	2
	235	1	1	1	1	1	1
	249	5	10	2	2	2	2
	200	5	5	2	2	1	2
	217	5	10	1	1	1	1
	230	3	5	2	2	2	2
	299	2	10	0	0	0	0
156	221	75	25	2	3	6	3
	215	10	2	6	3	4	5
	217	0	5	7	6	3	3
	218	0	3	1	2	5	2
	223	0	5	6	5	5	3
	230	5	10	2	3	6	6
	250	10	50	6	3	5	3
157	251	15	40	2	2	1	2
	252	45	40	3	3	6	5
	253	40	20	1	2	7	7
159	254	50	35	6	6	6	6
	255	25	55	2	6	5	6
	256	20	5	6	6	3	4
	257	5	5	3	5	4	4
161	200	10	5	5	5	2	4
	212	20	10	2	2	5	4
	214	5	10	6	5	7	3
	217	20	10	4	4	4	4
	218	30	30	1	2	4	4
	229	5	5	4	6	4	5
	230	10	30	3	3	4	4

APPENDIX H-3

LISTING OF PROGRAM (P2NXV) TO CREATE THE BAILEY-FEDERLE NX_V MATRIX SORTED BY NON-ZERO ENTRIES

```
1 CLEAR:ACTN=58: AN=ACTN+1      'ESTIMATE 58 ACTIVITIES INVOLVED
2 NN=25    ' # OF QUESTIONNAIRES
3 PN=INT(NN/10)+1        ' EACH PAGE PRINT 10 PEOPLE, MAXIMUM PAGE NUMBER
4 REM  NXV=(100/28)*(XV)    XV RANGE 4 TO 28
5 TI$="BAILEY AND FEDERLE STRUCTURE AND CONSISTENCY SORTED BY NON-ZERO"
10 DIM CODE(NN),ACTNUM(NN),POT(AN,NN+1),TOP$(NN),MC$(NN),BO$(NN),HSUM(AN)
11 DIM DOV(AN,NN+1),HDSUM(AN),KT(AN),CT(AN),RANK(AN)
20 FOR I=1 TO NN
30 READ ACTNUM(I): NEXT I        ' ACTNUM INDICATE HOW MANY ACTIVITIES INVOLVED
40 DATA 6,3,6,8,6,11,7,11,11,7
50 DATA 5,14,10,9,10,11,5,4,4
60 DATA 5,11,7,3,4,7
70 OPEN "A:DATA2" FOR INPUT AS #1
80 FOR I=1 TO NN: INPUT #1, CODE(I):CODE$=STR$(CODE(I)):TOP$(I)=MID$(CODE$,2,1):
MC$(I)=MID$(CODE$,3,1):BO$(I)=RIGHT$(CODE$,1): FOR J=1 TO ACTNUM(I)
90 INPUT #1, A1,A2,A3,A4,A5,A6,A7: IF A1=299 THEN GOTO 120    '299 INDICATE REMA
INDER PERCENTAGE PORTIONS
91 REM*** A2 IS XI(IMPORTANCE); A3 IS XT(TIME-CONSUMPTION)
100 POT(A1-199,I)=100*(A4+A5+A6+A7)/28
120 NEXT J: NEXT I   'BECAUSE ACTIVITY NUMBERED FROM #200
123 GOSUB 300
124 GOSUB 400        'SORTING PROCEDURE
125 GOSUB 500
130 END
300 REM *** CALCULATE BEFORE SORTING ***
310 FOR J=1 TO ACTN  : KT(J)=0
320 FOR I=1 TO NN
330 IF POT(J,I)=0 GOTO 350 ELSE KT(J)=KT(J)+1
350 NEXT I: NEXT J
399 RETURN
400 REM *** SORTING PROCESS ***
410 FOR J=1 TO AN: RANK(J)=J: NEXT J     'J IS THE RANKING BEFORE SORTING
420 FOR J=1 TO AN-1
430 MAX=KT(J)
440 FOR I=J+1 TO AN
450 IF KT(I)<=MAX THEN GOTO 480
460 MAX=KT(I): KT(I)=KT(J): KT(J)=MAX                'VALUE SORTED
470 TEMP=RANK(J): RANK(J)=RANK(I): RANK(I)=TEMP    'KEEP TRACK ON RANK
480 NEXT I: NEXT J
490 RETURN
500 S=1: SE=9
501 PRINT TI$
510 FOR PAGE=1 TO PN
520 PRINT TAB(17);FOR I=S TO S+SE: IF I=NN+1 THEN PRINT " " ELSE PRINT TOP$(I) S
PC(5);: NEXT I:PRINT
530 PRINT TAB(17);:FOR I=S TO S+SE:IF I=NN+1 THEN PRINT "AVG";"   TOTAL";"    # N
ON-ZERO" ELSE PRINT MC$(I) SPC(5);: NEXT I:PRINT
540 PRINT TAB(17);:FOR I=S TO S+SE:IF I=NN+1 THEN PRINT ". " ELSE PRINT BO$(I) SPC
(5);: NEXT I: PRINT
550 PRINT STRING$(80,45)
560 FOR J=1 TO ACTN   ' ACTIVITY 200-257
570 PRINT "ACT";199+RANK(J);:PRINT "NXV" ;
580 FOR I=S TO S+SE : IF I=NN+1 THEN GOSUB 651
590 PRINT USING "######"; POT(RANK(J),I);:HSUM(J)=HSUM(J)+POT(RANK(J),I)
600 NEXT I                    ' HSUM FOR HORIZONTAL SUM OF NXV(POT HERE)
601 PRINT
606 NEXT J
610 IF PAGE=PN GOTO 799  'LAST PAGE,
620 IF PAGE < PN-1 THEN S=S+10 ELSE GOTO 630
621 GOTO 649
630 S=21: SE=5
649 A$=INKEY$: IF A$="" GOTO 649
650 GOTO 700
651 IF KT(J)=0 THEN PRINT : GOTO 652 ELSE PRINT USING "#####.###"; HSUM(J)/KT(J)
;HSUM(J);KT(J)
652 RETURN   606
700 NEXT PAGE
799 RETURN
0
```

APPENDIX H-4

BAILEY-FEDERLE MATRIX SORTED BY AVERAGE NX_V

	10	10	10	10	10	10	11	11	11	12
	0	1	3	5	6	9	1	4	9	0
ACT 233 NXV	0	0	0	0	0	0	0	0	0	93
ACT 234 NXV	0	0	0	0	0	0	0	0	0	93
ACT 202 NXV	0	0	0	0	0	0	0	0	0	0
ACT 241 NXV	0	0	0	0	0	0	0	0	0	0
ACT 242 NXV	0	0	0	0	0	0	0	0	0	0
ACT 243 NXV	0	0	0	0	0	0	0	0	0	0
ACT 254 NXV	0	0	0	0	0	0	0	0	0	0
ACT 219 NXV	0	0	0	0	0	0	0	0	0	0
ACT 238 NXV	0	0	0	0	0	0	0	0	0	0
ACT 210 NXV	0	0	0	0	0	0	0	0	0	0
ACT 239 NXV	0	0	0	0	0	0	0	0	0	0
ACT 223 NXV	0	0	0	0	0	0	0	57	0	0
ACT 213 NXV	0	0	0	0	68	0	0	71	71	0
ACT 244 NXV	0	0	0	0	0	0	0	0	0	0
ACT 237 NXV	0	0	0	0	0	0	0	0	0	0
ACT 212 NXV	0	0	0	0	0	0	0	0	0	0
ACT 221 NXV	0	0	0	43	86	68	0	100	0	0
ACT 232 NXV	0	0	0	0	0	0	0	68	0	0
ACT 255 NXV	0	0	0	0	0	0	0	0	0	0
ACT 256 NXV	0	0	0	0	0	0	0	0	0	0
ACT 236 NXV	0	0	0	0	0	0	0	0	0	0
ACT 204 NXV	0	0	0	0	86	0	0	57	0	0
ACT 224 NXV	0	0	0	0	0	0	0	86	0	0
ACT 229 NXV	82	0	0	86	0	29	43	0	0	57
ACT 252 NXV	0	0	0	0	0	0	0	0	0	0
ACT 253 NXV	0	0	0	0	0	0	0	0	0	0
ACT 209 NXV	0	0	0	0	0	0	0	57	39	0
ACT 225 NXV	0	0	0	0	0	0	0	0	0	0
ACT 250 NXV	0	0	0	0	0	0	0	0	0	0
ACT 214 NXV	82	0	79	43	0	21	75	0	36	100
ACT 230 NXV	61	68	86	86	71	25	43	0	46	89
ACT 215 NXV	0	0	0	0	0	0	0	0	0	0
ACT 257 NXV	0	0	0	0	0	0	0	0	0	0
ACT 220 NXV	0	0	0	43	0	14	0	0	36	0
ACT 216 NXV	71	0	0	43	57	0	39	86	57	0
ACT 222 NXV	0	0	0	0	0	0	0	43	43	0
ACT 228 NXV	29	0	0	86	0	0	61	0	0	64
ACT 217 NXV	93	61	46	0	0	29	0	46	29	0
ACT 235 NXV	0	0	0	0	0	0	0	0	0	79
ACT 245 NXV	0	0	0	0	0	0	0	0	0	0
ACT 231 NXV	0	46	0	0	0	0	0	0	0	0
ACT 240 NXV	0	0	0	0	0	39	0	0	0	0
ACT 200 NXV	0	0	50	0	0	14	0	0	32	0
ACT 218 NXV	0	0	36	43	43	21	36	0	0	0
ACT 208 NXV	0	0	0	0	0	36	0	0	36	0
ACT 247 NXV	0	0	0	0	0	0	0	0	0	0
ACT 249 NXV	0	0	0	0	0	0	0	0	0	0
ACT 246 NXV	0	0	0	0	0	0	0	0	0	0
ACT 251 NXV	0	0	0	0	0	0	0	0	0	0
ACT 248 NXV	0	0	0	0	0	0	0	0	0	0

	121	126	127	130	133	135	138	146	147	153
ACT 233 NXV	0	0	0	0	0	0	0	0	0	0
ACT 234 NXV	86	0	0	0	0	0	0	0	0	0
ACT 202 NXV	0	0	0	86	0	0	0	0	0	0
ACT 241 NXV	0	0	0	0	0	0	86	0	0	0
ACT 242 NXV	0	0	0	0	0	0	86	0	0	0
ACT 243 NXV	0	0	0	0	0	0	86	0	0	0
ACT 254 NXV	0	0	0	0	0	0	0	0	0	0
ACT 219 NXV	0	82	0	0	0	0	0	0	0	0
ACT 238 NXV	82	0	0	0	0	0	0	0	0	0
ACT 210 NXV	0	82	82	86	0	71	0	0	0	0
ACT 239 NXV	79	0	0	0	0	0	0	0	0	0
ACT 223 NXV	0	71	0	86	0	71	0	0	79	0
ACT 213 NXV	0	75	0	0	0	0	0	0	0	0
ACT 244 NXV	0	0	0	0	0	0	71	0	0	0
ACT 237 NXV	71	0	0	0	0	0	0	0	0	0
ACT 212 NXV	0	79	82	0	75	0	0	0	0	0
ACT 221 NXV	0	0	0	0	0	64	0	57	0	86
ACT 232 NXV	0	0	0	0	0	0	0	0	0	0
ACT 255 NXV	0	0	0	0	0	0	0	0	0	0
ACT 256 NXV	0	0	0	0	0	0	0	0	0	0
ACT 236 NXV	82	0	0	0	0	0	0	0	0	0
ACT 204 NXV	0	75	57	0	68	39	0	0	0	0
ACT 224 NXV	0	39	0	0	0	0	0	0	0	0
ACT 229 NXV	0	0	0	61	0	0	0	0	0	0
ACT 252 NXV	0	0	0	0	0	0	0	0	0	0
ACT 253 NXV	0	0	0	0	0	0	0	0	0	0
ACT 209 NXV	0	75	0	75	0	57	0	0	0	0
ACT 225 NXV	0	64	0	0	57	0	0	0	0	0
ACT 250 NXV	0	0	0	0	0	0	0	0	0	0
ACT 214 NXV	0	0	79	0	57	54	0	54	43	50
ACT 230 NXV	0	0	0	86	29	0	0	57	0	0
ACT 215 NXV	0	0	0	0	0	54	0	0	0	0
ACT 257 NXV	0	0	0	0	0	0	0	0	0	0
ACT 220 NXV	0	0	0	0	0	0	86	86	0	71
ACT 216 NXV	0	0	0	0	36	43	0	0	0	0
ACT 222 NXV	0	36	50	0	36	64	0	0	0	0
ACT 228 NXV	0	46	36	64	0	0	0	0	29	43
ACT 217 NXV	0	0	57	0	29	57	0	0	0	46
ACT 235 NXV	0	0	0	0	0	0	0	0	0	0
ACT 245 NXV	0	0	0	0	0	0	0	0	46	0
ACT 231 NXV	0	0	0	0	0	0	0	0	0	0
ACT 240 NXV	0	0	0	50	0	0	0	0	0	0
ACT 200 NXV	0	0	50	0	54	0	0	0	0	0
ACT 218 NXV	0	46	50	57	46	0	0	0	0	0
ACT 208 NXV	0	0	0	0	0	0	0	0	0	0
ACT 247 NXV	0	0	0	0	0	0	0	0	0	0
ACT 249 NXV	0	0	0	0	0	0	0	0	0	0
ACT 246 NXV	0	0	0	0	0	0	0	0	0	0
ACT 251 NXV	0	0	0	0	0	0	0	0	0	0
ACT 248 NXV	0	0	0	0	0	0	0	0	0	0

	155	156	157	159	161	AVG	TOTAL	# NON-ZERO
ACT 233 NXV	0	0	0	0	0	92.857	92.857	1.000
ACT 234 NXV	0	0	0	0	0	89.286	178.571	2.000
ACT 202 NXV	0	0	0	0	0	85.714	85.714	1.000
ACT 241 NXV	0	0	0	0	0	85.714	85.714	1.000
ACT 242 NXV	0	0	0	0	0	85.714	85.714	1.000
ACT 243 NXV	0	0	0	0	0	85.714	85.714	1.000
ACT 254 NXV	0	0	0	86	0	85.714	85.714	1.000
ACT 219 NXV	0	0	0	0	0	82.143	92.143	1.000
ACT 238 NXV	0	0	0	0	0	82.143	82.143	1.000
ACT 210 NXV	0	0	0	0	0	80.357	321.429	4.000
ACT 239 NXV	0	0	0	0	0	78.571	78.571	1.000
ACT 223 NXV	0	58	0	0	0	72.024	432.143	6.000
ACT 213 NXV	0	0	0	0	0	71.429	285.714	4.000
ACT 244 NXV	0	0	0	0	0	71.429	71.429	1.000
ACT 237 NXV	0	0	0	0	0	71.429	71.429	1.000
ACT 212 NXV	0	0	0	0	46	70.536	282.143	4.000
ACT 221 NXV	0	50	0	0	0	69.196	553.571	8.000
ACT 232 NXV	0	0	0	0	0	67.857	67.857	1.000
ACT 255 NXV	0	0	0	68	0	67.857	67.857	1.000
ACT 256 NXV	0	0	0	68	0	67.857	67.857	1.000
ACT 236 NXV	50	0	0	0	0	66.071	132.143	2.000
ACT 204 NXV	0	0	0	0	0	63.690	382.143	6.000
ACT 224 NXV	0	0	0	0	0	62.500	125.000	2.000
ACT 229 NXV	0	0	0	0	68	60.714	425.000	7.000
ACT 252 NXV	0	0	61	0	0	60.714	60.714	1.000
ACT 253 NXV	0	0	61	0	0	60.714	60.714	1.000
ACT 209 NXV	0	0	0	0	0	60.714	303.571	5.000
ACT 225 NXV	0	0	0	0	0	60.714	121.429	2.000
ACT 250 NXV	0	61	0	0	0	60.714	60.714	1.000
ACT 214 NXV	0	0	0	0	75	60.459	846.429	14.000
ACT 230 NXV	29	61	0	0	50	59.048	885.714	15.000
ACT 215 NXV	0	64	0	0	0	58.929	117.857	2.000
ACT 257 NXV	0	0	0	57	0	57.143	57.143	1.000
ACT 220 NXV	0	0	0	0	0	55.952	335.714	6.000
ACT 216 NXV	0	0	0	0	0	54.018	432.143	8.000
ACT 222 NXV	0	0	0	0	0	53.571	321.429	6.000
ACT 228 NXV	0	0	0	0	0	50.794	457.143	9.000
ACT 217 NXV	14	68	0	0	57	48.626	632.143	13.000
ACT 235 NXV	14	0	0	0	0	46.429	92.857	2.000
ACT 245 NXV	0	0	0	0	0	46.429	46.429	1.000
ACT 231 NXV	0	0	0	0	0	46.429	46.429	1.000
ACT 240 NXV	0	0	0	0	0	44.643	89.286	2.000
ACT 200 NXV	25	0	0	0	57	40.306	282.143	7.000
ACT 218 NXV	21	36	0	0	39	39.583	475.000	12.000
ACT 208 NXV	0	0	0	0	0	35.714	71.429	2.000
ACT 247 NXV	32	0	0	0	0	32.143	32.143	1.000
ACT 249 NXV	29	0	0	0	0	28.571	28.571	1.000
ACT 246 NXV	29	0	0	0	0	28.571	28.571	1.000
ACT 251 NXV	0	0	25	0	0	25.000	25.000	1.000
ACT 248 NXV	18	0	0	0	0	17.857	17.857	1.000

APPENDIX H-5

LISTING OF THE PROGRAM (P2NXVSA) TO CREATE THE BAILEY-FEDERLE NX_V MATRIX SORTED BY AVERAGE NX_V

```
C>
1 CLEAR:ACTN=58: AN=ACTN+1      'ESTIMATE 58 ACTIVITIES INVOLVED
2 NN=25·   ' # OF QUESTIONNAIRES
3 PN=INT(NN/10)+1        ' EACH PAGE PRINT 10 PEOPLE, MAXIMUM PAGE NUMBER
4 REM  NXV=(100/28)*(XV)   XV RANGE 4 TO 28
5 TI$="BAILEY AND FEDERLE STRUCTURE AND CONSISTENCY SORTED BY AVERAGE"
10 DIM CODE(NN),ACTNUM(NN),POT(AN,NN+1),TOP$(NN),MC$(NN),BO$(NN),HSUM(AN)
11 DIM DOV(AN,NN+1),HDSUM(AN),KT(AN),CT(AN),RANK(AN),AVG(AN)
20 FOR I=1 TO NN
30 READ ACTNUM(I): NEXT I        ' ACTNUM INDICATE HOW MANY ACTIVITIES INVOLVED
40 DATA 6,3,6,8,6,11,7,11,11,7
50 DATA 5,14,10,9,10,11,5,4,4
60 DATA 5,11,7,3,4,7
70 OPEN "A:DATA2" FOR INPUT AS #1
80 FOR I=1 TO NN: INPUT #1, CODE(I):CODE$=STR$(CODE(I)):TOP$(I)=MID$(CODE$,2,1):
MC$(I)=MID$(CODE$,3,1):BO$(I)=RIGHT$(CODE$,1): FOR J=1 TO ACTNUM(I)
90 INPUT #1, A1,A2,A3,A4,A5,A6,A7: IF A1=299 THEN GOTO 120    '299 INDICATE REMA
INDER PERCENTAGE PORTIONS
91 REM** A2 IS XI(IMPORTANCE); A3 IS XT(TIME-CONSUMPTION)
100 POT(A1-199,I)=100*(A4+A5+A6+A7)/28
120 NEXT J: NEXT I   'BECAUSE ACTIVITY NUMBERED FROM #200
123 GOSUB 300
124 GOSUB 400         'SORTING PROCEDURE
125 GOSUB 500
130 END
300 REM *** CALCULATE BEFORE SORTING ***
310 FOR J=1 TO ACTN  : KT(J)=0: HSUM(J)=0
320 FOR I=1 TO NN              /
330 IF POT(J,I)=0 THEN GOTO 350 ELSE KT(J)=KT(J)+1: HSUM(J)=HSUM(J)+POT(J,I)
350 NEXT I:IF KT(J)=0 GOTO 351 ELSE AVG(J)=HSUM(J)/KT(J)
351 NEXT J
399 RETURN
400 REM *** SORTING PROCESS ***
410 FOR J=1 TO AN: RANK(J)=J: NEXT J      'J IS THE RANKING BEFORE SORTING
420 FOR J=1 TO AN-1
430 MAX=AVG(J)
440 FOR I=J+1 TO AN
450 IF AVG(I)<=MAX THEN GOTO 480
460 MAX=AVG(I): AVG(I)=AVG(J): AVG(J)=MAX               'VALUE SORTED
470 TEMP=RANK(J): RANK(J)=RANK(I): RANK(I)=TEMP    'KEEP TRACK ON RANK
480 NEXT I: NEXT J      'AVG(RANK(J)) STORE THE ORIGINAL VALUE
490 RETURN              'AVG(1) IS THE LARGEST VALUE NOW
500 S=1: SE=9
501 PRINT TI$
510 FOR PAGE=1 TO PN
520 PRINT TAB(17):FOR I=S TO S+SE: IF I=NN+1 THEN PRINT " " ELSE PRINT TOP$(I) S
PC(5);: NEXT I:PRINT
530 PRINT TAB(17):FOR I=S TO S+SE:IF I=NN+1 THEN PRINT "AVG";"   TOTAL";"    # N
ON-ZERO" ELSE PRINT MC$(I) SPC(5);: NEXT I:PRINT
540 PRINT TAB(17):FOR I=S TO S+SE:IF I=NN+1 THEN PRINT " " ELSE PRINT BO$(I) SPC
(5);: NEXT I: PRINT
550 PRINT STRING$(80,45)
560 FOR J=1 TO ACTN   ' ACTIVITY 200~257
570 PRINT "ACT";199+RANK(J);:PRINT "NXV" ;
580 FOR I=S TO S+SE : IF I=NN+1 THEN GOSUB 651
590 PRINT USING "######"; POT(RANK(J),I);
600 NEXT I:PRINT     ' HSUM FOR HORIZONTAL SUM OF NXV(ROT HERE)
606 NEXT J
610 IF PAGE=PN GOTO 799  'LAST PAGE,
620 IF PAGE < PN-1 THEN S=S+10 ELSE GOTO 630
621 GOTO 649
630 S=21: SE=5
649 A$=INKEY$: IF A$="" GOTO 649
650 GOTO 700
651 IF KT(RANK(J))=0 THEN PRINT : GOTO 652 ELSE PRINT USING "#####.###";AVG(J);A
VG(J)*KT(RANK(J));KT(RANK(J))
652 RETURN   606
700 NEXT PAGE
799 RETURN
0
```

APPENDIX I

BAILEY-FEDERLE X MATRIX SORTED BY NON-ZERO ENTRIES

		10	11	13	15	16	19	11	14	19	20
ACT 230	X=	707	1543	454	857	814	350	293	0	790	660
ACT 214	X=	4100	0	443	1286	0	314	3250	0	285	1100
ACT 217	X=	489	707	282	0	0	386	0	242	540	0
ACT 218	X=	0	0	5679	107	239	314	457	0	0	0
ACT 228	X=	386	0	0	857	0	0	125	0	0	346
ACT 216	X=	2411	0	0	1286	1543	0	2079	907	180	0
ACT 221	X=	0	0	0	214	5029	779	0	2100	0	0
ACT 229	X=	1457	0	0	857	0	386	90	0	0	186
ACT 200	X=	0	0	300	0	0	514	0	0	730	0
ACT 220	X=	0	0	0	107	0	243	0	0	1114	0
ACT 204	X=	0	0	0	0	2114	0	0	301	0	0
ACT 222	X=	0	0	0	0	0	0	0	479	335	0
ACT 223	X=	0	0	0	0	0	0	0	621	0	0
ACT 209	X=	0	0	0	0	0	0	0	301	483	0
ACT 213	X=	0	0	0	0	364	0	0	744	223	0
ACT 210	X=	0	0	0	0	0	0	0	0	0	0
ACT 212	X=	0	0	0	0	0	0	0	0	0	0
ACT 225	X=	0	0	0	0	0	0	0	0	0	0
ACT 215	X=	0	0	0	0	0	0	0	0	0	0
ACT 208	X=	0	0	0	0	0	194	0	0	320	0
ACT 224	X=	0	0	0	0	0	0	0	907	0	0
ACT 234	X=	0	0	0	0	0	0	0	0	0	10586
ACT 235	X=	0	0	0	0	0	0	0	0	0	1329
ACT 236	X=	0	0	0	0	0	0	0	0	0	0
ACT 240	X=	0	0	0	0	0	206	0	0	0	0
ACT 233	X=	0	0	0	0	0	0	0	0	0	294
ACT 219	X=	0	0	0	0	0	0	0	0	0	0
ACT 202	X=	0	0	0	0	0	0	0	0	0	0
ACT 231	X=	0	7607	0	0	0	0	0	0	0	0
ACT 237	X=	0	0	0	0	0	0	0	0	0	0
ACT 238	X=	0	0	0	0	0	0	0	0	0	0
ACT 239	X=	0	0	0	0	0	0	0	0	0	0
ACT 232	X=	0	0	0	0	0	0	0	1768	0	0
ACT 241	X=	0	0	0	0	0	0	0	0	0	0
ACT 242	X=	0	0	0	0	0	0	0	0	0	0
ACT 243	X=	0	0	0	0	0	0	0	0	0	0
ACT 244	X=	0	0	0	0	0	0	0	0	0	0
ACT 245	X=	0	0	0	0	0	0	0	0	0	0
ACT 246	X=	0	0	0	0	0	0	0	0	0	0
ACT 247	X=	0	0	0	0	0	0	0	0	0	0
ACT 248	X=	0	0	0	0	0	0	0	0	0	0
ACT 249	X=	0	0	0	0	0	0	0	0	0	0
ACT 250	X=	0	0	0	0	0	0	0	0	0	0
ACT 251	X=	0	0	0	0	0	0	0	0	0	0
ACT 252	X=	0	0	0	0	0	0	0	0	0	0
ACT 253	X=	0	0	0	0	0	0	0	0	0	0
ACT 254	X=	0	0	0	0	0	0	0	0	0	0
ACT 255	X=	0	0	0	0	0	0	0	0	0	0
ACT 256	X=	0	0	0	0	0	0	0	0	0	0
ACT 257	X=	0	0	0	0	0	0	0	0	0	0

		121	126	127	130	133	135	138	146	147	153
ACT 230	X=	0	0	0	1340	971	0	0	1007	0	0
ACT 214	X=	0	0	1240	0	621	554	0	2214	579	275
ACT 217	X=	0	0	1082	0	436	651	0	0	0	564
ACT 218	X=	0	218	750	681	1429	0	0	0	0	0
ACT 228	X=	0	614	366	753	0	0	0	0	243	529
ACT 216	X=	0	0	0	0	229	391	0	0	0	0
ACT 221	X=	0	0	0	0	0	703	0	2054	0	6786
ACT 229	X=	0	0	0	2449	0	0	0	0	0	0
ACT 200	X=	0	0	660	0	879	0	0	0	0	0
ACT 220	X=	0	0	0	0	0	0	7786	4050	0	2411
ACT 204	X=	0	1700	604	0	349	463	0	0	0	0
ACT 222	X=	0	2518	1400	0	229	669	0	0	0	0
ACT 223	X=	0	244	0	175	0	733	0	0	418	0
ACT 209	X=	0	231	0	390	0	577	0	0	0	0
ACT 213	X=	0	164	0	0	0	0	0	0	0	0
ACT 210	X=	0	255	168	263	0	715	0	0	0	0
ACT 212	X=	0	163	523	0	390	0	0	0	0	0
ACT 225	X=	0	693	0	0	311	0	0	0	0	0
ACT 215	X=	0	0	0	0	0	545	0	0	0	0
ACT 208	X=	0	0	0	0	0	0	0	0	0	0
ACT 224	X=	0	443	0	0	0	0	0	0	0	0
ACT 234	X=	1811	0	0	0	0	0	0	0	0	0
ACT 235	X=	0	0	0	0	0	0	0	0	0	0
ACT 236	X=	4286	0	0	0	0	0	0	0	0	0
ACT 240	X=	0	0	0	2160	0	0	0	0	0	0
ACT 233	X=	0	0	0	0	0	0	0	0	0	0
ACT 219	X=	0	168	0	0	0	0	0	0	0	0
ACT 202	X=	0	0	0	173	0	0	0	0	0	0
ACT 231	X=	0	0	0	0	0	0	0	0	0	0
ACT 237	X=	1929	0	0	0	0	0	0	0	0	0
ACT 238	X=	1382	0	0	0	0	0	0	0	0	0
ACT 239	X=	886	0	0	0	0	0	0	0	0	0
ACT 232	X=	0	0	0	0	0	0	0	0	0	0
ACT 241	X=	0	0	0	0	0	0	1511	0	0	0
ACT 242	X=	0	0	0	0	0	0	907	0	0	0
ACT 243	X=	0	0	0	0	0	0	1361	0	0	0
ACT 244	X=	0	0	0	0	0	0	764	0	0	0
ACT 245	X=	0	0	0	0	0	0	0	0	8514	0
ACT 246	X=	0	0	0	0	0	0	0	0	0	0
ACT 247	X=	0	0	0	0	0	0	0	0	0	0
ACT 248	X=	0	0	0	0	0	0	0	0	0	0
ACT 249	X=	0	0	0	0	0	0	0	0	0	0
ACT 250	X=	0	0	0	0	0	0	0	0	0	0
ACT 251	X=	0	0	0	0	0	0	0	0	0	0
ACT 252	X=	0	0	0	0	0	0	0	0	0	0
ACT 253	X=	0	0	0	0	0	0	0	0	0	0
ACT 254	X=	0	0	0	0	0	0	0	0	0	0
ACT 255	X=	0	0	0	0	0	0	0	0	0	0
ACT 256	X=	0	0	0	0	0	0	0	0	0	0
ACT 257	X=	0	0	0	0	0	0	0	0	0	0

		155	156	157	159	161	AVG	TOTAL	# NON-ZERO
ACT 230	X=	101	354	0	0	800	734.1	11041.0	15.0
ACT 214	X=	0	0	0	0	425	1334.7	18686.3	14.0
ACT 217	X=	121	0	0	0	1343	570.4	6844.3	12.0
ACT 218	X=	440	0	0	0	2079	1126.6	12392.7	11.0
ACT 228	X=	0	0	0	0	0	466.9	4219.7	9.0
ACT 216	X=	0	0	0	0	0	1128.1	9024.9	8.0
ACT 221	X=	0	5625	0	0	0	2911.1	23288.6	8.0
ACT 229	X=	0	0	0	0	364	827.1	5789.7	7.0
ACT 200	X=	150	0	0	0	621	550.6	3854.3	7.0
ACT 220	X=	0	0	0	0	0	2618.5	15710.7	6.0
ACT 204	X=	0	0	0	0	0	921.9	5531.4	6.0
ACT 222	X=	0	0	0	0	0	938.1	5628.6	6.0
ACT 223	X=	0	0	0	0	0	438.4	2191.9	5.0
ACT 209	X=	0	0	0	0	0	396.4	1981.9	5.0
ACT 213	X=	0	0	0	0	0	374.0	1495.9	4.0
ACT 210	X=	0	0	0	0	0	350.4	1401.7	4.0
ACT 212	X=	0	0	0	0	1129	551.1	2204.6	4.0
ACT 225	X=	0	0	0	0	0	501.8	1003.6	2.0
ACT 215	X=	0	663	0	0	0	604.0	1208.0	2.0
ACT 208	X=	0	0	0	0	0	256.8	513.6	2.0
ACT 224	X=	0	0	0	0	0	675.0	1350.0	2.0
ACT 234	X=	0	0	0	0	0	6198.2	12396.4	2.0
ACT 235	X=	15	0	0	0	0	671.9	1343.9	2.0
ACT 236	X=	270	0	0	0	0	2277.9	4555.7	2.0
ACT 240	X=	0	0	0	0	0	1183.2	2366.4	2.0
ACT 233	X=	0	0	0	0	0	293.6	293.6	1.0
ACT 219	X=	0	0	0	0	0	168.3	168.3	1.0
ACT 202	X=	0	0	0	0	0	173.4	173.4	1.0
ACT 231	X=	0	0	0	0	0	7607.1	7607.1	1.0
ACT 237	X=	0	0	0	0	0	1928.6	1928.6	1.0
ACT 238	X=	0	0	0	0	0	1382.1	1382.1	1.0
ACT 239	X=	0	0	0	0	0	885.7	885.7	1.0
ACT 232	X=	0	0	0	0	0	1767.9	1767.9	1.0
ACT 241	X=	0	0	0	0	0	1510.7	1510.7	1.0
ACT 242	X=	0	0	0	0	0	907.1	907.1	1.0
ACT 243	X=	0	0	0	0	0	1360.7	1360.7	1.0
ACT 244	X=	0	0	0	0	0	764.3	764.3	1.0
ACT 245	X=	0	0	0	0	0	8514.3	8514.3	1.0
ACT 246	X=	1214	0	0	0	0	1214.3	1214.3	1.0
ACT 247	X=	186	0	0	0	0	185.7	185.7	1.0
ACT 248	X=	1136	0	0	0	0	1135.7	1135.7	1.0
ACT 249	X=	193	0	0	0	0	192.9	192.9	1.0
ACT 250	X=	0	1107	0	0	0	1107.1	1107.1	1.0
ACT 251	X=	0	0	975	0	0	975.0	975.0	1.0
ACT 252	X=	0	0	4532	0	0	4532.1	4532.1	1.0
ACT 253	X=	0	0	3229	0	0	3228.6	3228.6	1.0
ACT 254	X=	0	0	0	6036	0	6035.7	6035.7	1.0
ACT 255	X=	0	0	0	3071	0	3071.4	3071.4	1.0
ACT 256	X=	0	0	0	1457	0	1457.1	1457.1	1.0
ACT 257	X=	0	0	0	311	0	310.7	310.7	1.0

APPENDIX I-1

LISTING OF PROGRAM (P2X) TO CREATE BAILEY-FEDERLE X MATRIX SORTED BY NON-ZERO ENTRIES

```
1 CLEAR:ACTN=58: AN=ACTN+1      'ESTIMATE 58 ACTIVITIES INVOLVED
2 NN=25    ' # OF QUESTIONNAIRES
3 PN=INT(NN/10)+1        ' EACH PAGE PRINT 10 PEOPLE, MAXIMUM PAGE NUMBER
4 REM   X =XI(XT+NXV)
5 TI$="BAILEY AND FEDERLE COMPUTERIZABILITY SORTED BY NON-ZERO"
10 DIM CODE(NN),ACTNUM(NN),POT(AN,NN+1),TOP$(NN),MC$(NN),BO$(NN),HSUM(AN)
11 DIM DOV(AN,NN+1),HDSUM(AN),KT(AN),CT(AN),RANK(AN)
20 FOR I=1 TO NN
30 READ ACTNUM(I): NEXT I        ' ACTNUM INDICATE HOW MANY ACTIVITIES INVOLVED
40 DATA 6,3,6,8,6,11,7,11,11,7
50 DATA 5,14,10,9,10,11,5,4,4
60 DATA 5,11,7,3,4,7
70 OPEN "A:DATA2" FOR INPUT AS #1
80 FOR I=1 TO NN: INPUT #1, CODE(I):CODE$=STR$(CODE(I)):TOP$(I)=MID$(CODE$,2,1):
MC$(I)=MID$(CODE$,3,1):BO$(I)=RIGHT$(CODE$,1): FOR J=1 TO ACTNUM(I)
90 INPUT #1, A1,A2,A3,A4,A5,A6,A7: IF A1=299 THEN GOTO 120    '299 INDICATE REMA
INDER PERCENTAGE PORTIONS
91 REM## A2 IS XI(IMPORTANCE); A3 IS XT(TIME-CONSUMPTION)
100 POT:A1-199,I)=100*(A4+A5+A6+A7)/28:DOV(A1-199,I)=A2*(A3+POT(A1-199,I))
120 NEXT J: NEXT I    'BECAUSE ACTIVITY NUMBERED FROM #200
123 GOSUB 300
124 GOSUB 400         'SORTING PROCEDURE
125 GOSUB 500
130 END
300 REM ### CALCULATE BEFORE SORTING ###
310 FOR J=1 TO ACTN  : KT(J)=0
320 FOR I=1 TO NN
330 IF DOV(J,I)=0 GOTO 350 ELSE KT(J)=KT(J)+1
350 NEXT I: NEXT J
399 RETURN
400 REM ### SORTING PROCESS ###
410 FOR J=1 TO AN: RANK(J)=J: NEXT J      'J IS THE RANKING BEFORE SORTING
420 FOR J=1 TO AN-1
430 MAX=KT(J)
440 FOR I=J+1 TO AN
450 IF KT(I)<=MAX THEN GOTO 480
460 MAX=KT(I): KT(I)=KT(J): KT(J)=MAX                'VALUE SORTED
470 TEMP=RANK(J): RANK(J)=RANK(I): RANK(I)=TEMP     'KEEP TRACK ON RANK
480 NEXT I: NEXT J
490 RETURN
500 S=1: SE=9
501 PRINT TI$
510 FOR PAGE=1 TO PN
520 PRINT TAB(17):FOR I=S TO S+SE: IF I=NN+1 THEN PRINT " " ELSE PRINT TOP$(I) S
PC(5);: NEXT I:PRINT
530 PRINT TAB(17):FOR I=S TO S+SE:IF I=NN+1 THEN PRINT "AVG";"   TOTAL";"    # N
ON-ZERO" ELSE PRINT MC$(I) SPC(5);: NEXT I:PRINT
540 PRINT TAB(17):FOR I=S TO S+SE:IF I=NN+1 THEN PRINT " " ELSE PRINT BO$(I) SPC
(5);: NEXT I: PRINT
550 PRINT STRING$(80,45)
560 FOR J=1 TO ACTN    ' ACTIVITY 200-257
570 PRINT "ACT";199+RANK(J);:PRINT " X=" ;
580 FOR I=S TO S+SE : IF I=NN+1 THEN GOSUB 651
590 PRINT USING "#######"; DOV(RANK(J),I);:HSUM(J)=HSUM(J)+DOV(RANK(J),I)
600 NEXT I:PRINT     ' HSUM FOR HORIZONTAL SUM OF  X (DOV HERE)
606 NEXT J
610 IF PAGE=PN GOTO 799  'LAST PAGE,
620 IF PAGE < PN-1 THEN S=S+10 ELSE GOTO 630
621 GOTO 649
630 S=21: SE=5
649 A$=INKEY$: IF A$="" GOTO 649
650 GOTO 700
651 IF KT(J)=0 THEN PRINT : GOTO 652 ELSE PRINT USING "########.#"; HSUM(J)/KT(J)
;HSUM(J);KT(J)
652 RETURN   606
700 NEXT PAGE
799 RETURN
0
```

APPENDIX J

BAILEY-FEDERLE X MATRIX SORTED BY AVERAGE X

		10	103	105	106	109	111	114	119	120
ACT 245	X=	0	0	0	0	0	0	0	0	0
ACT 231	X=	0	7607	0	0	0	0	0	0	0
ACT 234	X=	0	0	0	0	0	0	0	0	10586
ACT 254	X=	0	0	0	0	0	0	0	0	0
ACT 252	X=	0	0	0	0	0	0	0	0	0
ACT 253	X=	0	0	0	0	0	0	0	0	0
ACT 255	X=	0	0	0	0	0	0	0	0	0
ACT 221	X=	0	0	0	214	5029	779	0	2100	0	0
ACT 220	X=	0	0	0	107	0	243	0	0	1114	0
ACT 236	X=	0	0	0	0	0	0	0	0	0	0
ACT 237	X=	0	0	0	0	0	0	0	0	0	0
ACT 232	X=	0	0	0	0	0	0	0	1768	0	0
ACT 241	X=	0	0	0	0	0	0	0	0	0	0
ACT 256	X=	0	0	0	0	0	0	0	0	0	0
ACT 238	X=	0	0	0	0	0	0	0	0	0	0
ACT 243	X=	0	0	0	0	0	0	0	0	0	0
ACT 214	X=	4100	0	443	1286	0	314	5250	0	285	1100
ACT 246	X=	0	0	0	0	0	0	0	0	0	0
ACT 240	X=	0	0	0	0	0	206	0	0	0	0
ACT 248	X=	0	0	0	0	0	0	0	0	0	0
ACT 216	X=	2411	0	0	1286	1543	0	2079	907	180	0
ACT 218	X=	0	0	5679	107	239	314	457	0	0	0
ACT 250	X=	0	0	0	0	0	0	0	0	0	0
ACT 251	X=	0	0	0	0	0	0	0	0	0	0
ACT 222	X=	0	0	0	0	0	0	0	479	335	0
ACT 204	X=	0	0	0	0	2114	0	0	301	0	0
ACT 242	X=	0	0	0	0	0	0	0	0	0	0
ACT 239	X=	0	0	0	0	0	0	0	0	0	0
ACT 229	X=	1457	0	0	857	0	386	90	0	0	186
ACT 244	X=	0	0	0	0	0	0	0	0	0	0
ACT 230	X=	707	1543	454	857	814	350	293	0	790	660
ACT 224	X=	0	0	0	0	0	0	0	907	0	0
ACT 235	X=	0	0	0	0	0	0	0	0	0	1329
ACT 215	X=	0	0	0	0	0	0	0	0	0	0
ACT 217	X=	489	707	282	0	0	386	0	242	540	0
ACT 212	X=	0	0	0	0	0	0	0	0	0	0
ACT 200	X=	0	0	300	0	0	514	0	0	730	0
ACT 225	X=	0	0	0	0	0	0	0	0	0	0
ACT 228	X=	386	0	0	857	0	0	125	0	0	346
ACT 223	X=	0	0	0	0	0	0	0	621	0	0
ACT 209	X=	0	0	0	0	0	0	0	301	483	0
ACT 213	X=	0	0	0	0	364	0	0	744	223	0
ACT 210	X=	0	0	0	0	0	0	0	0	0	0
ACT 257	X=	0	0	0	0	0	0	0	0	0	0
ACT 233	X=	0	0	0	0	0	0	0	0	0	294
ACT 208	X=	0	0	0	0	0	194	0	0	320	0
ACT 249	X=	0	0	0	0	0	0	0	0	0	0
ACT 247	X=	0	0	0	0	0	0	0	0	0	0
ACT 202	X=	0	0	0	0	0	0	0	0	0	0
ACT 219	X=	0	0	0	0	0	0	0	0	0	0

		121	126	127	130	133	135	138	146	147	153
ACT 245	X=	0	0	0	0	0	0	0	0	8514	0
ACT 231	X=	0	0	0	0	0	0	0	0	0	0
ACT 234	X=	1811	0	0	0	0	0	0	0	0	0
ACT 254	X=	0	0	0	0	0	0	0	0	0	0
ACT 252	X=	0	0	0	0	0	0	0	0	0	0
ACT 253	X=	0	0	0	0	0	0	0	0	0	0
ACT 255	X=	0	0	0	0	0	0	0	0	0	0
ACT 221	X=	0	0	0	0	0	703	0	2054	0	6786
ACT 220	X=	0	0	0	0	0	0	7786	4050	0	2411
ACT 236	X=	4286	0	0	0	0	0	0	0	0	0
ACT 237	X=	1929	0	0	0	0	0	0	0	0	0
ACT 232	X=	0	0	0	0	0	0	0	0	0	0
ACT 241	X=	0	0	0	0	0	0	1511	0	0	0
ACT 256	X=	0	0	0	0	0	0	0	0	0	0
ACT 238	X=	1382	0	0	0	0	0	0	0	0	0
ACT 243	X=	0	0	0	0	0	0	1361	0	0	0
ACT 214	X=	0	0	1240	0	621	554	0	2214	579	275
ACT 246	X=	0	0	0	0	0	0	0	0	0	0
ACT 240	X=	0	0	0	2160	0	0	0	0	0	0
ACT 248	X=	0	0	0	0	0	0	0	0	0	0
ACT 216	X=	0	0	0	0	229	391	0	0	0	0
ACT 218	X=	0	218	750	681	1429	0	0	0	0	0
ACT 250	X=	0	0	0	0	0	0	0	0	0	0
ACT 251	X=	0	0	0	0	0	0	0	0	0	0
ACT 222	X=	0	2518	1400	0	229	669	0	0	0	0
ACT 204	X=	0	1700	604	0	349	463	0	0	0	0
ACT 242	X=	0	0	0	0	0	0	907	0	0	0
ACT 239	X=	386	0	0	0	0	0	0	0	0	0
ACT 229	X=	0	0	0	2449	0	0	0	0	0	0
ACT 244	X=	0	0	0	0	0	0	764	0	0	0
ACT 230	X=	0	0	0	1340	971	0	0	1007	0	0
ACT 224	X=	0	443	0	0	0	0	0	0	0	0
ACT 235	X=	0	0	0	0	0	0	0	0	0	0
ACT 215	X=	0	0	0	0	0	545	0	0	0	0
ACT 217	X=	0	0	1082	0	436	651	0	0	0	564
ACT 212	X=	0	163	523	0	390	0	0	0	0	0
ACT 200	X=	0	0	660	0	879	0	0	0	0	0
ACT 225	X=	0	693	0	0	311	0	0	0	0	0
ACT 228	X=	0	614	366	753	0	0	0	0	243	529
ACT 223	X=	0	244	0	175	0	733	0	0	418	0
ACT 209	X=	0	231	0	390	0	577	0	0	0	0
ACT 213	X=	0	164	0	0	0	0	0	0	0	0
ACT 210	X=	0	255	168	263	0	715	0	0	0	0
ACT 257	X=	0	0	0	0	0	0	0	0	0	0
ACT 233	X=	0	0	0	0	0	0	0	0	0	0
ACT 208	X=	0	0	0	0	0	0	0	0	0	0
ACT 249	X=	0	0	0	0	0	0	0	0	0	0
ACT 247	X=	0	0	0	0	0	0	0	0	0	0
ACT 202	X=	0	0	0	173	0	0	0	0	0	0
ACT 219	X=	0	158	0	0	0	0	0	0	0	0

		155	156	157	159	161	AVG	TOTAL	# NON-ZERO
ACT 245	X=	0	0	0	0	0	8514.3	8514.3	1.0
ACT 231	X=	0	0	0	0	0	7607.1	7607.1	1.0
ACT 234	X=	0	0	0	0	0	6198.2	12396.4	2.0
ACT 254	X=	0	0	0	6036	0	6035.7	6035.7	1.0
ACT 252	X=	0	0	4532	0	0	4532.1	4532.1	1.0
ACT 253	X=	0	0	3229	0	0	3228.6	3228.6	1.0
ACT 255	X=	0	0	0	3071	0	3071.4	3071.4	1.0
ACT 221	X=	0	5625	0	0	0	2911.1	23288.6	8.0
ACT 220	X=	0	0	0	0	0	2618.5	15710.7	6.0
ACT 236	X=	270	0	0	0	0	2277.9	4555.7	2.0
ACT 237	X=	0	0	0	0	0	1928.6	1928.6	1.0
ACT 232	X=	0	0	0	0	0	1767.9	1767.9	1.0
ACT 241	X=	0	0	0	0	0	1510.7	1510.7	1.0
ACT 256	X=	0	0	0	1457	0	1457.1	1457.1	1.0
ACT 238	X=	0	0	0	0	0	1382.1	1382.1	1.0
ACT 243	X=	0	0	0	0	0	1360.7	1360.7	1.0
ACT 214	X=	0	0	0	0	425	1334.7	18686.3	14.0
ACT 246	X=	1214	0	0	0	0	1214.3	1214.3	1.0
ACT 240	X=	0	0	0	0	0	1183.2	2366.4	2.0
ACT 248	X=	1136	0	0	0	0	1135.7	1135.7	1.0
ACT 216	X=	0	0	0	0	0	1128.1	9024.9	8.0
ACT 218	X=	440	0	0	0	2079	1126.6	12392.7	11.0
ACT 250	X=	0	1107	0	0	0	1107.1	1107.1	1.0
ACT 251	X=	0	0	975	0	0	975.0	975.0	1.0
ACT 222	X=	0	0	0	0	0	938.1	5628.6	6.0
ACT 204	X=	0	0	0	0	0	921.9	5531.4	6.0
ACT 242	X=	0	0	0	0	0	907.1	907.1	1.0
ACT 239	X=	0	0	0	0	0	885.7	885.7	1.0
ACT 229	X=	0	0	0	0	364	827.1	5789.7	7.0
ACT 244	X=	0	0	0	0	0	764.3	764.3	1.0
ACT 230	X=	101	354	0	0	800	736.1	11041.0	15.0
ACT 224	X=	0	0	0	0	0	675.0	1350.0	2.0
ACT 235	X=	15	0	0	0	0	671.9	1343.9	2.0
ACT 215	X=	0	663	0	0	0	604.0	1208.0	2.0
ACT 217	X=	121	0	0	0	1343	570.4	6844.3	12.0
ACT 212	X=	0	0	0	0	1129	551.1	2204.6	4.0
ACT 200	X=	150	0	0	0	621	550.6	3854.3	7.0
ACT 225	X=	0	0	0	0	0	501.8	1003.6	2.0
ACT 228	X=	0	0	0	0	0	468.9	4219.7	9.0
ACT 223	X=	0	0	0	0	0	438.4	2191.9	5.0
ACT 209	X=	0	0	0	0	0	396.4	1981.9	5.0
ACT 213	X=	0	0	0	0	0	374.0	1495.9	4.0
ACT 210	X=	0	0	0	0	0	350.4	1401.7	4.0
ACT 257	X=	0	0	0	311	0	310.7	310.7	1.0
ACT 233	X=	0	0	0	0	0	293.6	293.6	1.0
ACT 208	X=	0	0	0	0	0	256.8	513.6	2.0
ACT 249	X=	193	0	0	0	0	192.9	192.9	1.0
ACT 247	X=	186	0	0	0	0	185.7	185.7	1.0
ACT 202	X=	0	0	0	0	0	173.4	173.4	1.0
ACT 219	X=	0	0	0	0	0	168.3	168.3	1.0

APPENDIX J-1

LISTING OF PROGRAM (P2XSA) TO CREATE BAILEY-FEDERLE MATRIX SORTED BY AVERAGE X

```
1 CLEAR:ACTN=58: AN=ACTN+1      'ESTIMATE 58 ACTIVITIES INVOLVED
2 NN=25    ' # OF QUESTIONNAIRES
3 PN=INT(NN/10)+1        ' EACH PAGE PRINT 10 PEOPLE, MAXIMUM PAGE NUMBER
4 REM   X =XI(XT+NXV)
5 TI$="BAILEY AND FEDERLE COMPUTERIZABILITY SORTED BY AVERAGE"
10 DIM CODE(NN),ACTNUM(NN),POT(AN,NN+1),TOP$(NN),MC$(NN),BO$(NN),HSUM(AN)
11 DIM DOV(AN,NN+1),HDSUM(AN),KT(AN),CT(AN),RANK(AN),AVG(AN)
20 FOR I=1 TO NN
30 READ ACTNUM(I): NEXT I        ' ACTNUM INDICATE HOW MANY ACTIVITIES INVOLVED
40 DATA 6,3,6,8,6,11,7,11,11,7
50 DATA 5,14,10,9,10,11,5,4,4
60 DATA 5,11,7,3,4,7
70 OPEN "A:DATA2" FOR INPUT AS #1
80 FOR I=1 TO NN: INPUT #1, CODE(I):CODE$=STR$(CODE(I)):TOP$(I)=MID$(CODE$,2,1):
MC$(I)=MID$(CODE$,3,1):BO$(I)=RIGHT$(CODE$,1): FOR J=1 TO ACTNUM(I)
90 INPUT #1, A1,A2,A3,A4,A5,A6,A7: IF A1=299 THEN GOTO 120     '299 INDICATE REMA
INDER PERCENTAGE PORTIONS
91 REM## A2 IS XI(IMPORTANCE); A3 IS XT(TIME-CONSUMPTION)
100 POT(A1-199,I)=100*(A4+A5+A6+A7)/28:DOV(A1-199,I)=A2*(A3+POT(A1-199,I))
120 NEXT J: NEXT I    'BECAUSE ACTIVITY NUMBERED FROM #200
123 GOSUB 300
124 GOSUB 400          'SORTING PROCEDURE
125 GOSUB 500
130 END
300 REM *** CALCULATE BEFORE SORTING ***
310 FOR J=1 TO ACTN  : KT(J)=0: HSUM(J)=0
320 FOR I=1 TO NN
330 IF DOV(J,I)=0 GOTO 350 ELSE KT(J)=KT(J)+1: HSUM(J)=HSUM(J)+DOV(J,I)
350 NEXT I
351 IF KT(J)=0 GOTO 352 ELSE AVG(J)=HSUM(J)/KT(J)
352 NEXT J
399 RETURN
400 REM *** SORTING PROCESS ***
410 FOR J=1 TO AN: RANK(J)=J: NEXT J      'J IS THE RANKING BEFORE SORTING
420 FOR J=1 TO AN-1
430 MAX=AVG(J)
440 FOR I=J+1 TO AN
450 IF AVG(I)<=MAX THEN GOTO 480
460 MAX=AVG(I): AVG(I)=AVG(J): AVG(J)=MAX                'VALUE SORTED
470 TEMP=RANK(J): RANK(J)=RANK(I): RANK(I)=TEMP     'KEEP TRACK ON RANK
480 NEXT I: NEXT J
490 RETURN
500 S=1: SE=9
501 PRINT TI$
510 FOR PAGE=1 TO PN
520 PRINT TAB(17):FOR I=S TO S+SE: IF I=NN+1 THEN PRINT " " ELSE PRINT TOP$(I) S
PC(5);: NEXT I:PRINT
530 PRINT TAB(17):FOR I=S TO S+SE:IF I=NN+1 THEN PRINT "AVG";"   TOTAL";"    # N
ON-ZERO" ELSE PRINT MC$(I) SPC(5);: NEXT I:PRINT
540 PRINT TAB(17):FOR I=S TO S+SE:IF I=NN+1 THEN PRINT " " ELSE PRINT BO$(I) SPC
(5);: NEXT I: PRINT
550 PRINT STRING$(80,45)
560 FOR J=1 TO ACTN    ' ACTIVITY 200-257
570 PRINT "ACT";199+RANK(J);:PRINT " X=" ;
580 FOR I=S TO S+SE : IF I=NN+1 THEN GOSUB 651
590 PRINT USING "#######"; DOV(RANK(J),I);
600 NEXT I:PRINT     ' HSUM FOR HORIZONTAL SUM OF  X (DOV HERE)
606 NEXT J
610 IF PAGE=PN GOTO 799  'LAST PAGE,
620 IF PAGE < PN-1 THEN S=S+10 ELSE GOTO 630
621 GOTO 649
630 S=21: SE=5
649 A$=INKEY$: IF A$="" GOTO 649
650 GOTO 700
651 IF KT(RANK(J))=0 THEN PRINT : GOTO 652 ELSE PRINT USING "#######.#"; AVG(J);
AVG(J)*KT(RANK(J));KT(RANK(J))
652 RETURN   606
700 NEXT PAGE
799 RETURN
0
```

APPENDIX K

KROBOCK DATA REDUCTION MATRIX

KROBOCK DATA

	A	B	C	D	B*C	A/(A+(B*C))
100	0.500	0.500	0.300	0.700	0.150	0.769
101	0.850	0.150	0.000	1.000	0.000	1.000
103	0.150	0.850	0.900	0.100	0.765	0.164
105	0.300	0.700	0.600	0.400	0.420	0.417
106	0.100	0.900	0.200	0.800	0.180	0.357
109	0.200	0.800	0.500	0.500	0.400	0.333
111	0.000	1.000	0.020	0.980	0.020	0.000
114	0.600	0.400	0.500	0.500	0.200	0.750
119	0.200	0.800	0.500	0.500	0.400	0.333
120	0.020	0.980	0.050	0.950	0.049	0.290
121	0.750	0.250	0.800	0.200	0.200	0.789
126	0.400	0.600	0.300	0.700	0.180	0.690
127	0.370	0.730	0.150	0.850	0.109	0.772
130	0.250	0.750	0.050	0.950	0.037	0.870
133	0.200	0.800	0.450	0.550	0.360	0.357
135	0.050	0.950	0.150	0.850	0.142	0.260
138	0.400	0.600	0.750	0.250	0.450	0.471
146	0.400	0.600	0.200	0.800	0.120	0.769
147	0.000	1.000	0.000	1.000	0.000	0.000
153	0.100	0.900	0.350	0.650	0.315	0.241
155	0.100	0.900	0.400	0.600	0.360	0.217
156	0.650	0.350	0.000	1.000	0.000	1.000
157	0.100	0.900	0.100	0.900	0.090	0.526
159	0.500	0.500	0.900	0.100	0.450	0.526
161	0.500	0.500	0.750	0.250	0.375	0.571

APPENDIX K-1

KROBOCK QUESTIONNAIRE DATA AS STORED IN THE DATA BASE (DATA 3)

```
C>TYPE A:DATA3
100 50 50 30 70 300 30 301 25 302 45
101 85 15 0 100 303 97 304  3
103 15 85 90 10 305 20 306 75 307  5
105 30 70 60 40 310 50 308 25 309 25
106 10 90 20 80 301 90 309  5 311  5
109 20 80 50 50 312 45 313 45 314 10
111 0 100  2 98
114 60 40 50 50 315 60 303 40
119 20 80 50 50 310 50 316  5 301 25 317 10 314 10
120  2 98  5 95 318 100
121 75 25 80 20 319 15 320 15 302 20 321 10 322 10 323 30
   126 40 60 30 70 324 13 325  5 326 20 327 10 328 20 329 10 330 10 304  2 331 5
                332  5
127 37 73 15 85 313 15 333 10 334 25 337 10 335 25 312 15
130 25 75  5 95 336 25 332 50 338 10 335 10 311  5
133 20 80 45 55 335 45 339  5 341 10 313  5 301 25 340 10
135  5 95 15 85 317 20 345 40 300 40
138 40 60 75 25 317 40 316 10 308 10 305 10 342 10 343 10 344 10
  146 40 60 20 80 345 50 336 10 346 10 343  5 347  5 311  5 305  5 344  5 301  5
147 0 100 0 100 348 100
153 10 90 35 65 301 70 309 30
155 10 90 40 60 312 36 301 37 349  5 353  5 348  1 350  1 351  1 352  1 313  5
334  1 333  1 335  1 354  5
156 65 35 0 100 348 100
157 10 90 10 90 355 50 356 50
159 50 50 90 10 303 100
161 50 50 75 25 313 85 334  5 357 10
100 0 30 30 20 10 0 10
   20 30 20 20 10 0 0
   20 20 20 10 10 10 10
101 5 5 50 10 15 10 5
    10 10 30 10 10 15 15
103 20 15 20 10 10 10 15
    20 15 20 10 10 10 15
    20 5 5 25 5 20 20
105 0 50 50 0 0 0 0
    75 0 12.5 12.5 0 0 0
    50 25 12.5 12.5 0 0 0
106 20 30 10 5 5 20 10
    10 20 30 5 5 20 10
    10 30 30 10 10 5 5
109 5 20 30 5 15 10 15
    5 20 20 10 15 15 15
    5 20 20 10 15 15 15
111
114 10 20 30 20 10 5 5
    20 10 50 10 5 6 0
119 15 15 20 10 15 15 10
    5 10 50 5 20 10 0
    5 5 50 10 20 10 0
    20 20 50 0 0 10 0
    25 20 40 0 5 10 0
120 10 45 45 0 0 0 0
121 25 20 20 10 5 10 10
    25 20 20 10 5 10 10
    20 20 20 10 10 10 10
    20 20 20 20 5 10 5
    20 20 20 10 15 5 10
    10 25 20 10 15 10 10
```

126 5 20 30 10 15 5 15
5 30 25 10 10 5 15
5 30 25 10 15 5 10
5 30 25 10 10 5 15
5 30 25 10 10 5 15
5 30 30 10 10 5 10
5 30 30 10 10 5 10
5 20 25 10 10 10 20
20 30 30 5 5 5 5
20 20 20 10 10 10 10
127 0 10 20 20 20 20 10
10 10 20 10 10 30 10
20 20 20 10 10 20 0
10 20 20 20 10 10 10
5 10 25 10 10 30 10
20 10 10 10 10 30 10
130 5 5 25 10 25 20 10
20 20 25 5 10 10 10
10 15 35 10 20 5 5
25 5 50 5 5 5 5
20 25 25 10 10 5 5
133 20 15 20 10 10 15 10
20 15 20 15 10 10 10
10 15 25 10 10 15 15
30 10 15 10 10 20 15
15 20 20 10 10 15 10
25 20 25 10 5 10 5
135 10 20 20 10 10 10 20
20 20 20 15 15 5 5
10 20 10 5 15 10 30
138 0 0 75 0 0 25 0
10 0 70 0 0 20 0
0 0 80 0 0 20 0
0 0 0 0 0 0 0
10 0 70 0 0 20 0
0 0 85 0 0 15 0
10 0 70 0 0 20 0
146 0 25 50 0 0 0 25
35 0 35 0 0 30 0
25 0 50 0 0 25 0
25 0 50 0 0 25 0
35 0 35 0 0 30 0
35 0 35 0 0 30 0
35 0 35 0 0 30 0
35 0 35 0 0 30 0
35 0 35 0 0 30 0
147 50 50 0 0 0 0 0
153 5 25 25 5 10 5 25
5 25 25 5 25 5 10
155 20 30 0 20 20 5 5
30 30 10 10 10 5 5
5 15 20 20 20 10 10
0 0 0 0 0 0 0
15 25 25 20 5 5 5
0 0 0 0 0 0 0
10 10 20 20 20 10 10
0 0 0 0 0 0 0
10 10 20 20 20 10 10
10 10 20 20 20 10 10
10 10 20 20 20 10 10
10 10 20 20 20 10 10
10 10 20 20 20 10 10
156 25 25 25 10 4 10 1
157 25 25 25 0 0 0 25
25 25 25 0 0 0 25
159 25 1 50 10 4 5 5
161 50 50 0 0 0 0 0
0 50 50 0 0 0 0
15 15 15 15 15 15 10

APPENDIX K-2

LISTING OF PROGRAM (P3TL) TO CREATE KROBOCK DATA REDUCTION MATRIX

```
1 CLEAR:NN=25: RN=61        ' NN= # OF PEOPLE; RN= # OF REPORT ESTIMATED
5 TI$="KROBOCK DATA"
10 DIM CODE(NN),ACTNUM(NN)
11 DIM UNIT(NN,7)
20 FOR I=1 TO NN
30 READ ACTNUM(I): NEXT I
40 DATA 3,2,3,3,3, 3,0,2 ,5 ,1
50 DATA 6,10,6 ,5,6 ,3 ,7,9,1
60 DATA 2,13,1,2,1,3
70 OPEN "A:DATA3" FOR INPUT AS #1
80 FOR I=1 TO NN: INPUT #1, KODE,A,B,C,D:CODE(I)=KODE
81 A=A*.01: B=B*.01: C=C*.01: D=D*.01
95 UNIT(I,1)=A
96 UNIT(I,2)=B
97 UNIT(I,3)=C
98 UNIT(I,4)=D
99 UNIT(I,5)=B*C
100 IF (A+(B*C))=0 THEN UNIT(I,6)=0! ELSE UNIT(I,6)=A/(A+(B*C))
101 UNIT(I,7)=A2*.01        'VALUE OF CURRENT INFORMATION
118 FOR J= 1 TO ACTNUM(I)
119 INPUT #1, A1,A2
120 NEXT J
121 NEXT I
122 FOR I=1 TO NN:INPUT #1,DUMKD: FOR J=1 TO ACTNUM(I): INPUT #1,V1,V2,V3,V4,V5,
V6,V7:NEXT J: NEXT I
125 GOSUB 500
130 END
500 REM **** DRAW TABLES ********
501 PRINT TI$
530 PRINT SPC(15) "A" SPC(8) "B" SPC(7) "C" SPC(6) "D" SPC(6) "B*C" SPC(3) "A/(A
+(B*C))"
540 PRINT STRING$(75,45)          'HEADING
550 FOR I=1 TO NN
570 PRINT CODE(I) SPC(6);: FOR M=1 TO 6: PRINT USING"####.###"; UNIT(I,M);: NEXT
 M
580 PRINT
700 NEXT I
800 RETURN
0
```

APPENDIX L

KROBOCK DATA SORTED BY SPECIFIC REPORTS

KROBOCK SORTED REPORT NUMBER

(REPORT # 300)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
100	0.500	0.300	0.1500	0.00	0.30	0.30	0.20	0.10	0.00	0.10
135	0.050	0.400	0.0200	0.10	0.20	0.10	0.05	0.15	0.10	0.30
TOTAL	0.550	0.700	0.1700	0.10	0.50	0.40	0.25	0.25	0.10	0.40
AVERAGE	0.275	0.350	0.0850	0.05	0.25	0.20	0.12	0.12	0.05	0.20

(REPORT # 301)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
100	0.500	0.250	0.1250	0.20	0.30	0.20	0.20	0.10	0.00	0.00
106	0.100	0.900	0.0900	0.20	0.30	0.10	0.05	0.05	0.20	0.10
119	0.200	0.250	0.0500	0.05	0.05	0.50	0.10	0.20	0.10	0.00
133	0.200	0.250	0.0500	0.15	0.20	0.20	0.10	0.10	0.15	0.10
146	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
153	0.100	0.700	0.0700	0.05	0.25	0.25	0.05	0.10	0.05	0.25
155	0.100	0.370	0.0370	0.30	0.30	0.10	0.10	0.10	0.05	0.05
TOTAL	1.600	2.770	0.4420	1.30	1.40	1.70	0.60	0.65	0.85	0.50
AVERAGE	0.229	0.396	0.0631	0.19	0.20	0.24	0.09	0.09	0.12	0.07

(REPORT # 302)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
100	0.500	0.450	0.2250	0.20	0.20	0.20	0.10	0.10	0.10	0.10
121	0.750	0.200	0.1500	0.20	0.20	0.20	0.10	0.10	0.10	0.10
TOTAL	1.250	0.650	0.3750	0.40	0.40	0.40	0.20	0.20	0.20	0.20
AVERAGE	0.625	0.325	0.1875	0.20	0.20	0.20	0.10	0.10	0.10	0.10

(REPORT # 303)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
101	0.850	0.970	0.8245	0.05	0.05	0.50	0.10	0.15	0.10	0.05
114	0.600	0.400	0.2400	0.20	0.10	0.50	0.10	0.05	0.06	0.00
159	0.500	1.000	0.5000	0.25	0.01	0.50	0.10	0.04	0.05	0.05
TOTAL	1.950	2.370	1.5645	0.50	0.16	1.50	0.30	0.24	0.21	0.10
AVERAGE	0.650	0.790	0.5215	0.17	0.05	0.50	0.10	0.08	0.07	0.03

(REPORT # 304)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
101	0.850	0.030	0.0255	0.10	0.10	0.30	0.10	0.10	0.15	0.15
126	0.400	0.020	0.0080	0.05	0.20	0.25	0.10	0.10	0.10	0.20
TOTAL	1.250	0.050	0.0335	0.15	0.30	0.55	0.20	0.20	0.25	0.35
AVERAGE	0.625	0.025	0.0168	0.07	0.15	0.27	0.10	0.10	0.12	0.17

(REPORT # 305)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
103	0.150	0.200	0.0300	0.20	0.15	0.20	0.10	0.10	0.10	0.15
138	0.400	0.100	0.0400	0.00	0.00	0.00	0.00	0.00	0.00	0.00
146	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
TOTAL	0.950	0.350	0.0900	0.55	0.15	0.55	0.10	0.10	0.40	0.15
AVERAGE	0.317	0.117	0.0300	0.18	0.05	0.18	0.03	0.03	0.13	0.05

(REPORT # 306)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
103	0.150	0.750	0.1125	0.20	0.15	0.20	0.10	0.10	0.10	0.15
TOTAL	0.150	0.750	0.1125	0.20	0.15	0.20	0.10	0.10	0.10	0.15
AVERAGE	0.150	0.750	0.1125	0.20	0.15	0.20	0.10	0.10	0.10	0.15

(REPORT # 307)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
103	0.150	0.050	0.0075	0.20	0.05	0.05	0.25	0.05	0.20	0.20
TOTAL	0.150	0.050	0.0075	0.20	0.05	0.05	0.25	0.05	0.20	0.20
AVERAGE	0.150	0.050	0.0075	0.20	0.05	0.05	0.25	0.05	0.20	0.20

(REPORT # 308)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
105	0.300	0.250	0.0750	0.75	0.00	0.13	0.13	0.00	0.00	0.00
138	0.400	0.100	0.0400	0.00	0.00	0.80	0.00	0.00	0.20	0.00
TOTAL	0.700	0.350	0.1150	0.75	0.00	0.93	0.13	0.00	0.20	0.00
AVERAGE	0.350	0.175	0.0575	0.38	0.00	0.46	0.07	0.00	0.10	0.00

(REPORT # 309)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
105	0.300	0.250	0.0750	0.50	0.25	0.13	0.13	0.00	0.00	0.00
106	0.100	0.050	0.0050	0.10	0.20	0.30	0.05	0.05	0.20	0.10
153	0.100	0.300	0.0300	0.05	0.25	0.25	0.05	0.25	0.05	0.10
TOTAL	0.500	0.600	0.1100	0.65	0.70	0.68	0.23	0.30	0.25	0.20
AVERAGE	0.167	0.200	0.0367	0.22	0.23	0.23	0.08	0.10	0.08	0.07

(REPORT # 310)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
105	0.300	0.500	0.1500	0.00	0.50	0.50	0.00	0.00	0.00	0.00
119	0.200	0.500	0.1000	0.15	0.15	0.20	0.10	0.15	0.15	0.10
TOTAL	0.500	1.000	0.2500	0.15	0.65	0.70	0.10	0.15	0.15	0.10
AVERAGE	0.250	0.500	0.1250	0.07	0.33	0.35	0.05	0.07	0.07	0.05

(REPORT # 311)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
106	0.100	0.050	0.0050	0.10	0.30	0.30	0.10	0.10	0.05	0.05
130	0.250	0.050	0.0125	0.20	0.25	0.25	0.10	0.10	0.05	0.05
146	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
TOTAL	0.750	0.150	0.0375	0.65	0.55	0.90	0.20	0.20	0.40	0.10
AVERAGE	0.250	0.050	0.0125	0.22	0.18	0.30	0.07	0.07	0.13	0.03

(REPORT # 312)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
109	0.200	0.450	0.0900	0.05	0.20	0.30	0.05	0.15	0.10	0.15
127	0.370	0.150	0.0555	0.20	0.10	0.10	0.10	0.10	0.30	0.10
155	0.100	0.360	0.0360	0.20	0.30	0.00	0.20	0.20	0.05	0.05
TOTAL	0.670	0.960	0.1815	0.45	0.60	0.40	0.35	0.45	0.45	0.30
AVERAGE	0.223	0.320	0.0605	0.15	0.20	0.13	0.12	0.15	0.15	0.10

(REPORT # 313)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
109	0.200	0.450	0.0900	0.05	0.20	0.20	0.10	0.15	0.15	0.15
127	0.370	0.150	0.0555	0.00	0.10	0.20	0.20	0.20	0.20	0.10
133	0.200	0.050	0.0100	0.30	0.10	0.15	0.10	0.10	0.20	0.15
155	0.100	0.050	0.0050	0.10	0.10	0.20	0.20	0.20	0.10	0.10
161	0.500	0.850	0.4250	0.50	0.50	0.00	0.00	0.00	0.00	0.00
TOTAL	1.370	1.550	0.5855	0.95	1.00	0.75	0.60	0.65	0.65	0.50
AVERAGE	0.274	0.310	0.1171	0.19	0.20	0.15	0.12	0.13	0.13	0.10

(REPORT # 314)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
109	0.200	0.100	0.0200	0.05	0.20	0.20	0.10	0.15	0.15	0.15
119	0.200	0.100	0.0200	0.25	0.20	0.40	0.00	0.05	0.10	0.00
TOTAL	0.400	0.200	0.0400	0.30	0.40	0.60	0.10	0.20	0.25	0.15
AVERAGE	0.200	0.100	0.0200	0.15	0.20	0.30	0.05	0.10	0.12	0.07

(REPORT # 315)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
114	0.600	0.600	0.3600	0.10	0.20	0.30	0.20	0.10	0.05	0.05
TOTAL	0.600	0.600	0.3600	0.10	0.20	0.30	0.20	0.10	0.05	0.05
AVERAGE	0.600	0.600	0.3600	0.10	0.20	0.30	0.20	0.10	0.05	0.05

(REPORT # 316)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
119	0.200	0.050	0.0100	0.05	0.10	0.50	0.05	0.20	0.10	0.00
138	0.400	0.100	0.0400	0.10	0.00	0.70	0.00	0.00	0.20	0.00
TOTAL	0.600	0.150	0.0500	0.15	0.10	1.20	0.05	0.20	0.30	0.00
AVERAGE	0.300	0.075	0.0250	0.07	0.05	0.60	0.02	0.10	0.15	0.00

(REPORT # 317)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
119	0.200	0.100	0.0200	0.20	0.20	0.50	0.00	0.00	0.10	0.00
135	0.050	0.200	0.0100	0.10	0.20	0.20	0.10	0.10	0.10	0.20
138	0.400	0.400	0.1600	0.00	0.00	0.75	0.00	0.00	0.25	0.00
TOTAL	0.650	0.700	0.1900	0.30	0.40	1.45	0.10	0.10	0.45	0.20
AVERAGE	0.217	0.233	0.0633	0.10	0.13	0.48	0.03	0.03	0.15	0.07

(REPORT # 318)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
120	0.020	1.000	0.0200	0.10	0.45	0.45	0.00	0.00	0.00	0.00
TOTAL	0.020	1.000	0.0200	0.10	0.45	0.45	0.00	0.00	0.00	0.00
AVERAGE	0.020	1.000	0.0200	0.10	0.45	0.45	0.00	0.00	0.00	0.00

(REPORT # 319)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
121	0.750	0.150	0.1125	0.25	0.20	0.20	0.10	0.05	0.10	0.10
TOTAL	0.750	0.150	0.1125	0.25	0.20	0.20	0.10	0.05	0.10	0.10
AVERAGE	0.750	0.150	0.1125	0.25	0.20	0.20	0.10	0.05	0.10	0.10

(REPORT # 320)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
121	0.750	0.150	0.1125	0.25	0.20	0.20	0.10	0.05	0.10	0.10
TOTAL	0.750	0.150	0.1125	0.25	0.20	0.20	0.10	0.05	0.10	0.10
AVERAGE	0.750	0.150	0.1125	0.25	0.20	0.20	0.10	0.05	0.10	0.10

(REPORT # 321)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
121	0.750	0.100	0.0750	0.20	0.20	0.20	0.20	0.05	0.10	0.05
TOTAL	0.750	0.100	0.0750	0.20	0.20	0.20	0.20	0.05	0.10	0.05
AVERAGE	0.750	0.100	0.0750	0.20	0.20	0.20	0.20	0.05	0.10	0.05

(REPORT # 322)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
121	0.750	0.100	0.0750	0.20	0.20	0.20	0.10	0.15	0.05	0.10
TOTAL	0.750	0.100	0.0750	0.20	0.20	0.20	0.10	0.15	0.05	0.10
AVERAGE	0.750	0.100	0.0750	0.20	0.20	0.20	0.10	0.15	0.05	0.10

(REPORT # 323)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
121	0.750	0.300	0.2250	0.10	0.25	0.20	0.10	0.15	0.10	0.10
TOTAL	0.750	0.300	0.2250	0.10	0.25	0.20	0.10	0.15	0.10	0.10
AVERAGE	0.750	0.300	0.2250	0.10	0.25	0.20	0.10	0.15	0.10	0.10

(REPORT # 324)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
126	0.400	0.130	0.0520	0.05	0.20	0.30	0.10	0.15	0.05	0.15
TOTAL	0.400	0.130	0.0520	0.05	0.20	0.30	0.10	0.15	0.05	0.15
AVERAGE	0.400	0.130	0.0520	0.05	0.20	0.30	0.10	0.15	0.05	0.15

(REPORT # 325)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
126	0.400	0.050	0.0200	0.05	0.30	0.25	0.10	0.10	0.05	0.15
TOTAL	0.400	0.050	0.0200	0.05	0.30	0.25	0.10	0.10	0.05	0.15
AVERAGE	0.400	0.050	0.0200	0.05	0.30	0.25	0.10	0.10	0.05	0.15

(REPORT # 326)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
126	0.400	0.200	0.0800	0.05	0.30	0.25	0.10	0.15	0.05	0.10
TOTAL	0.400	0.200	0.0800	0.05	0.30	0.25	0.10	0.15	0.05	0.10
AVERAGE	0.400	0.200	0.0800	0.05	0.30	0.25	0.10	0.15	0.05	0.10

(REPORT # 327)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
126	0.400	0.100	0.0400	0.05	0.30	0.25	0.10	0.10	0.05	0.15
TOTAL	0.400	0.100	0.0400	0.05	0.30	0.25	0.10	0.10	0.05	0.15
AVERAGE	0.400	0.100	0.0400	0.05	0.30	0.25	0.10	0.10	0.05	0.15

(REPORT # 328)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
126	0.400	0.200	0.0800	0.05	0.30	0.25	0.10	0.10	0.05	0.15
TOTAL	0.400	0.200	0.0800	0.05	0.30	0.25	0.10	0.10	0.05	0.15
AVERAGE	0.400	0.200	0.0800	0.05	0.30	0.25	0.10	0.10	0.05	0.15

(REPORT # 329)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
126	0.400	0.100	0.0400	0.05	0.30	0.30	0.10	0.10	0.05	0.10
TOTAL	0.400	0.100	0.0400	0.05	0.30	0.30	0.10	0.10	0.05	0.10
AVERAGE	0.400	0.100	0.0400	0.05	0.30	0.30	0.10	0.10	0.05	0.10

(REPORT # 330)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
126	0.400	0.100	0.0400	0.05	0.30	0.30	0.10	0.10	0.05	0.10
TOTAL	0.400	0.100	0.0400	0.05	0.30	0.30	0.10	0.10	0.05	0.10
AVERAGE	0.400	0.100	0.0400	0.05	0.30	0.30	0.10	0.10	0.05	0.10

(REPORT # 331)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
126	0.400	0.050	0.0200	0.20	0.30	0.30	0.05	0.05	0.05	0.05
TOTAL	0.400	0.050	0.0200	0.20	0.30	0.30	0.05	0.05	0.05	0.05
AVERAGE	0.400	0.050	0.0200	0.20	0.30	0.30	0.05	0.05	0.05	0.05

(REPORT # 332)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
126	0.400	0.050	0.0200	0.20	0.20	0.20	0.10	0.10	0.10	0.10
130	0.250	0.500	0.1250	0.20	0.20	0.25	0.05	0.10	0.10	0.10
TOTAL	0.650	0.550	0.1450	0.40	0.40	0.45	0.15	0.20	0.20	0.20

(REPORT # 333)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
127	0.370	0.100	0.0370	0.10	0.10	0.20	0.10	0.10	0.30	0.10
155	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10
TOTAL	0.470	0.110	0.0380	0.20	0.20	0.40	0.30	0.30	0.40	0.20
AVERAGE	0.235	0.055	0.0190	0.10	0.10	0.20	0.15	0.15	0.20	0.10

(REPORT # 334)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
127	0.370	0.250	0.0925	0.20	0.20	0.20	0.10	0.10	0.20	0.00
155	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10
161	0.500	0.050	0.0250	0.00	0.50	0.50	0.00	0.00	0.00	0.00
TOTAL	0.970	0.310	0.1185	0.30	0.80	0.90	0.30	0.30	0.30	0.10
AVERAGE	0.323	0.103	0.0395	0.10	0.27	0.30	0.10	0.10	0.10	0.03

(REPORT # 335)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
127	0.370	0.250	0.0925	0.05	0.10	0.25	0.10	0.10	0.30	0.10
130	0.250	0.100	0.0250	0.25	0.05	0.50	0.05	0.05	0.05	0.05
133	0.200	0.450	0.0900	0.20	0.15	0.20	0.10	0.10	0.15	0.10
155	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10
TOTAL	0.920	0.810	0.2085	0.60	0.40	1.15	0.45	0.45	0.60	0.35
AVERAGE	0.230	0.202	0.0521	0.15	0.10	0.29	0.11	0.11	0.15	0.09

(REPORT # 336)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
130	0.250	0.250	0.0625	0.05	0.05	0.25	0.10	0.25	0.20	0.10
146	0.400	0.100	0.0400	0.35	0.00	0.35	0.00	0.00	0.30	0.00
TOTAL	0.650	0.350	0.1025	0.40	0.05	0.60	0.10	0.25	0.50	0.10
AVERAGE	0.325	0.175	0.0513	0.20	0.02	0.30	0.05	0.13	0.25	0.05

(REPORT # 337)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
127	0.370	0.100	0.0370	0.10	0.20	0.20	0.20	0.10	0.10	0.10
TOTAL	0.370	0.100	0.0370	0.10	0.20	0.20	0.20	0.10	0.10	0.10
AVERAGE	0.370	0.100	0.0370	0.10	0.20	0.20	0.20	0.10	0.10	0.10

(REPORT # 338)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
130	0.250	0.100	0.0250	0.10	0.15	0.35	0.10	0.20	0.05	0.05
TOTAL	0.250	0.100	0.0250	0.10	0.15	0.35	0.10	0.20	0.05	0.05
AVERAGE	0.250	0.100	0.0250	0.10	0.15	0.35	0.10	0.20	0.05	0.05

(REPORT # 339)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
133	0.200	0.050	0.0100	0.20	0.15	0.20	0.15	0.10	0.10	0.10
TOTAL	0.200	0.050	0.0100	0.20	0.15	0.20	0.15	0.10	0.10	0.10
AVERAGE	0.200	0.050	0.0100	0.20	0.15	0.20	0.15	0.10	0.10	0.10

(REPORT # 340)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
133	0.200	0.100	0.0200	0.25	0.20	0.25	0.10	0.05	0.10	0.05
TOTAL	0.200	0.100	0.0200	0.25	0.20	0.25	0.10	0.05	0.10	0.05
AVERAGE	0.200	0.100	0.0200	0.25	0.20	0.25	0.10	0.05	0.10	0.05

(REPORT # 341)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
133	0.200	0.100	0.0200	0.10	0.15	0.25	0.10	0.10	0.15	0.15
TOTAL	0.200	0.100	0.0200	0.10	0.15	0.25	0.10	0.10	0.15	0.15
AVERAGE	0.200	0.100	0.0200	0.10	0.15	0.25	0.10	0.10	0.15	0.15

(REPORT # 342)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
138	0.400	0.100	0.0400	0.10	0.00	0.70	0.00	0.00	0.20	0.00
TOTAL	0.400	0.100	0.0400	0.10	0.00	0.70	0.00	0.00	0.20	0.00
AVERAGE	0.400	0.100	0.0400	0.10	0.00	0.70	0.00	0.00	0.20	0.00

(REPORT # 343)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
138	0.400	0.100	0.0400	0.00	0.00	0.85	0.00	0.00	0.15	0.00
146	0.400	0.050	0.0200	0.25	0.00	0.50	0.00	0.00	0.25	0.00
TOTAL	0.800	0.150	0.0600	0.25	0.00	1.35	0.00	0.00	0.40	0.00
AVERAGE	0.400	0.075	0.0300	0.13	0.00	0.67	0.00	0.00	0.20	0.00

(REPORT # 344)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
138	0.400	0.100	0.0400	0.10	0.00	0.70	0.00	0.00	0.20	0.00
146	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
TOTAL	0.800	0.150	0.0600	0.45	0.00	1.05	0.00	0.00	0.50	0.00
AVERAGE	0.400	0.075	0.0300	0.23	0.00	0.53	0.00	0.00	0.25	0.00

(REPORT # 345)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
135	0.050	0.400	0.0200	0.20	0.20	0.20	0.15	0.15	0.05	0.05
146	0.400	0.500	0.2000	0.00	0.25	0.50	0.00	0.00	0.00	0.25
TOTAL	0.450	0.900	0.2200	0.20	0.45	0.70	0.15	0.15	0.05	0.30
AVERAGE	0.225	0.450	0.1100	0.10	0.23	0.35	0.07	0.07	0.02	0.15

(REPORT # 346)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7

(REPORT # 346)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
146	0.400	0.100	0.0400	0.25	0.00	0.50	0.00	0.00	0.25	0.00
TOTAL	0.400	0.100	0.0400	0.25	0.00	0.50	0.00	0.00	0.25	0.00
AVERAGE	0.400	0.100	0.0400	0.25	0.00	0.50	0.00	0.00	0.25	0.00

(REPORT # 347)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
146	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
TOTAL	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
AVERAGE	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00

(REPORT # 348)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
155	0.100	0.010	0.0010	0.15	0.25	0.25	0.20	0.05	0.05	0.05
156	0.650	1.000	0.6500	0.25	0.25	0.25	0.10	0.04	0.10	0.01
TOTAL	0.750	1.010	0.6510	0.40	0.50	0.50	0.30	0.09	0.15	0.06
AVERAGE	0.375	0.505	0.3255	0.20	0.25	0.25	0.15	0.05	0.07	0.03

(REPORT # 349)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
155	0.100	0.050	0.0050	0.05	0.15	0.20	0.20	0.20	0.10	0.10
TOTAL	0.100	0.050	0.0050	0.05	0.15	0.20	0.20	0.20	0.10	0.10
AVERAGE	0.100	0.050	0.0050	0.05	0.15	0.20	0.20	0.20	0.10	0.10

(REPORT # 350)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
155	0.100	0.010	0.0010	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.100	0.010	0.0010	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVERAGE	0.100	0.010	0.0010	0.00	0.00	0.00	0.00	0.00	0.00	0.00

(REPORT # 351)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
155	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10
TOTAL	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10
AVERAGE	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10

(REPORT # 352)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
155	0.100	0.010	0.0010	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.100	0.010	0.0010	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVERAGE	0.100	0.010	0.0010	0.00	0.00	0.00	0.00	0.00	0.00	0.00

(REPORT # 353)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
155	0.100	0.050	0.0050	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.100	0.050	0.0050	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVERAGE	0.100	0.050	0.0050	0.00	0.00	0.00	0.00	0.00	0.00	0.00

(REPORT # 354)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
155	0.100	0.050	0.0050	0.10	0.10	0.20	0.20	0.20	0.10	0.10
TOTAL	0.100	0.050	0.0050	0.10	0.10	0.20	0.20	0.20	0.10	0.10
AVERAGE	0.100	0.050	0.0050	0.10	0.10	0.20	0.20	0.20	0.10	0.10

(REPORT # 355)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
157	0.100	0.500	0.0500	0.25	0.25	0.25	0.00	0.00	0.00	0.25
TOTAL	0.100	0.500	0.0500	0.25	0.25	0.25	0.00	0.00	0.00	0.25
AVERAGE	0.100	0.500	0.0500	0.25	0.25	0.25	0.00	0.00	0.00	0.25

(REPORT # 356)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
157	0.100	0.500	0.0500	0.25	0.25	0.25	0.00	0.00	0.00	0.25
TOTAL	0.100	0.500	0.0500	0.25	0.25	0.25	0.00	0.00	0.00	0.25
AVERAGE	0.100	0.500	0.0500	0.25	0.25	0.25	0.00	0.00	0.00	0.25

(REPORT # 357)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
161	0.500	0.100	0.0500	0.15	0.15	0.15	0.15	0.15	0.15	0.10
TOTAL	0.500	0.100	0.0500	0.15	0.15	0.15	0.15	0.15	0.15	0.10
AVERAGE	0.500	0.100	0.0500	0.15	0.15	0.15	0.15	0.15	0.15	0.10

APPENDIX L-1

LISTING OF PROGRAM (P3SP) TO CREATE KROBOCK DATA MATRICES SORTED BY SPECIFIC REPORTS

```
1 CLEAR:NN=25: RN=61        ' NN= # OF PEOPLE; RN= # OF REPORT ESTIMATED
5 TI$="KROBOCK SORTED REPORT NUMBER"
10 DIM CODE%(NN),ACTNUM%(NN),A%(NN,20)     ' A MATRIX TRACK THE ACT NUMBER
11 DIM UNIT%(NN,RN,10)
20 FOR I=1 TO NN
30 READ ACTNUM%(I): NEXT I
40 DATA 3,2,3,3,3, 3,0,2 ,5 ,1
50 DATA 6,10,6 ,5,6 ,3 ,7,9,1
60 DATA 2,13,1,2,1,3
70 OPEN "A:DATA3" FOR INPUT AS #1
80 FOR I=1 TO NN: INPUT #1, KODE,A,B,C,D:CODE%(I)=KODE
82 FOR J= 1 TO ACTNUM%(I)
90 INPUT #1, A%(I,J),A2 : A1=A%(I,J)
95 UNIT%(I,A1-299,1)=A          'VALUE A
96 UNIT%(I,A1-299,2)=A2         'VALUE OF CURRENT INFORMATION
97 UNIT%(I,A1-299,3)=A*A2
100 NEXT J: NEXT I
102 FOR I=1 TO NN: INPUT #1, IDK
103 FOR J=1 TO ACTNUM%(I):INPUT #1, V1,V2,V3,V4,V5,V6,V7
104 UNIT%(I,A%(I,J)-299,4)=V1     : UNIT%(I,A%(I,J)-299,5)=V2
106 UNIT%(I,A%(I,J)-299,6)=V3     : UNIT%(I,A%(I,J)-299,7)=V4
108 UNIT%(I,A%(I,J)-299,8)=V5     : UNIT%(I,A%(I,J)-299,9)=V6
110 UNIT%(I,A%(I,J)-299,10)=V7
112 NEXT J: NEXT I
114 CLOSE #1
125 GOSUB 500
130 END
500 REM **** DRAW TABLES *********
501 PRINT TI$
510 FOR J=1 TO RN
511 TNN=0
520 PRINT "(REPORT # ";299+J;")"
530 PRINT SPC(15) "A" SPC(4) "SCORE" SPC(2) "A*SCORE" SPC(3) "1" SPC(5) "2" SPC(
5) "3" SPC(5) "4" SPC(5) "5" SPC(5) "6" SPC(5) "7"
540 PRINT STRING$(75,45)
541 FOR K=1 TO 10: SUBT(K)=0: NEXT K
550 FOR I=1 TO NN
560 IF UNIT%(I,J,1)=0 GOTO 700   'IF NO VALUE STORED, SKIP
561 TNN=TNN+1
570 PRINT CODE%(I) SPC(6);: FOR M=1 TO 2: PRINT USING"###.###"; UNIT%(I,J,M)*.01
;: SUBT(M)=SUBT(M)+UNIT%(I,J,M)*.01
571 NEXT M
572 PRINT USING "###.####";UNIT%(I,J,3)*.0001;
573 SUBT(3)=SUBT(3)+UNIT%(I,J,3)*.0001
574 FOR M=4 TO 10: PRINT USING"###.##"; UNIT%(I,J,M)*.01;:SUBT(M)=SUBT(M)+UNIT%(
I,J,M)*.01: NEXT M
580 PRINT
700 NEXT I
701 IF TNN=0 GOTO 780
750 PRINT STRING$(75,45): PRINT "TOTAL" SPC(6);
751 PRINT USING "###.###"; SUBT(1);:AG(1)=SUBT(1)/TNN: PRINT USING "###.###"; SU
BT(2);:AG(2)=SUBT(2)/TNN
753 PRINT USING "###.####"; SUBT(3);:AG(3)=SUBT(3)/TNN
755 FOR I=4 TO 10: PRINT USING "###.##";SUBT(I);:AG(I)=SUBT(I)/TNN: NEXT I
760 PRINT "AVERAGE" SPC(4)
771 PRINT USING "###.###"; AG(1);:PRINT USING "###.###"; AG(2);
773 PRINT USING "###.####"; AG(3);
775 FOR I=4 TO 10: PRINT USING "###.##";AG(I);: NEXT I
780 PRINT:PRINT:PRINT:NEXT J
800 RETURN
0
```

APPENDIX M

KROBOCK DATA SORTED BY INDIVIDUAL RESPONDENTS

KROBOCK SORTED BY INDIVIDUAL

(INDIVIDUAL # 100)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
300	0.500	0.300	0.1500	0.00	0.30	0.30	0.20	0.10	0.00	0.10
301	0.500	0.250	0.1250	0.20	0.30	0.20	0.20	0.10	0.00	0.00
302	0.500	0.450	0.2250	0.20	0.20	0.20	0.10	0.10	0.10	0.10
TOTAL	1.500	1.000	0.5000	0.40	0.80	0.70	0.50	0.30	0.10	0.20
AVERAGE	0.500	0.333	0.1667	0.13	0.27	0.23	0.17	0.10	0.03	0.07

(INDIVIDUAL # 101)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
303	0.850	0.970	0.8245	0.05	0.05	0.50	0.10	0.15	0.10	0.05
304	0.850	0.030	0.0255	0.10	0.10	0.30	0.10	0.10	0.15	0.15
TOTAL	1.700	1.000	0.8500	0.15	0.15	0.80	0.20	0.25	0.25	0.20
AVERAGE	0.850	0.500	0.4250	0.07	0.07	0.40	0.10	0.12	0.12	0.10

(INDIVIDUAL # 103)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
305	0.150	0.200	0.0300	0.20	0.15	0.20	0.10	0.10	0.10	0.15
306	0.150	0.750	0.1125	0.20	0.15	0.20	0.10	0.10	0.10	0.15
307	0.150	0.050	0.0075	0.20	0.05	0.05	0.25	0.05	0.20	0.20
TOTAL	0.450	1.000	0.1500	0.60	0.35	0.45	0.45	0.25	0.40	0.50
AVERAGE	0.150	0.333	0.0500	0.20	0.12	0.15	0.15	0.08	0.13	0.17

(INDIVIDUAL # 105)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
308	0.300	0.250	0.0750	0.75	0.00	0.13	0.13	0.00	0.00	0.00
309	0.300	0.250	0.0750	0.50	0.25	0.13	0.13	0.00	0.00	0.00
310	0.300	0.500	0.1500	0.00	0.50	0.50	0.00	0.00	0.00	0.00
TOTAL	0.900	1.000	0.3000	1.25	0.75	0.76	0.26	0.00	0.00	0.00
AVERAGE	0.300	0.333	0.1000	0.42	0.25	0.25	0.09	0.00	0.00	0.00

(INDIVIDUAL # 106)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
301	0.100	0.900	0.0900	0.20	0.30	0.10	0.05	0.05	0.20	0.10
309	0.100	0.050	0.0050	0.10	0.20	0.30	0.05	0.05	0.20	0.10
311	0.100	0.050	0.0050	0.10	0.30	0.30	0.10	0.10	0.05	0.05
TOTAL	0.300	1.000	0.1000	0.40	0.80	0.70	0.20	0.20	0.45	0.25
AVERAGE	0.100	0.333	0.0333	0.13	0.27	0.23	0.07	0.07	0.15	0.08

(INDIVIDUAL # 109)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
312	0.200	0.450	0.0900	0.05	0.20	0.30	0.05	0.15	0.10	0.15
313	0.200	0.450	0.0900	0.05	0.20	0.20	0.10	0.15	0.15	0.15
314	0.200	0.100	0.0200	0.05	0.20	0.20	0.10	0.15	0.15	0.15
TOTAL	0.600	1.000	0.2000	0.15	0.60	0.70	0.25	0.45	0.40	0.45
AVERAGE	0.200	0.333	0.0667	0.05	0.20	0.23	0.08	0.15	0.13	0.15

(INDIVIDUAL # 111)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7

(INDIVIDUAL # 114)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
303	0.600	0.400	0.2400	0.20	0.10	0.50	0.10	0.05	0.06	0.00
315	0.600	0.600	0.3600	0.10	0.20	0.30	0.20	0.10	0.05	0.05
TOTAL	1.200	1.000	0.6000	0.30	0.30	0.80	0.30	0.15	0.11	0.05
AVERAGE	0.600	0.500	0.3000	0.15	0.15	0.40	0.15	0.07	0.06	0.02

(INDIVIDUAL # 119)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
301	0.200	0.250	0.0500	0.05	0.05	0.50	0.10	0.20	0.10	0.00
310	0.200	0.500	0.1000	0.15	0.15	0.20	0.10	0.15	0.15	0.10
314	0.200	0.100	0.0200	0.25	0.20	0.40	0.00	0.05	0.10	0.00
316	0.200	0.050	0.0100	0.05	0.10	0.50	0.05	0.20	0.10	0.00
317	0.200	0.100	0.0200	0.20	0.20	0.50	0.00	0.00	0.10	0.00
TOTAL	1.000	1.000	0.2000	0.70	0.70	2.10	0.25	0.60	0.55	0.10
AVERAGE	0.200	0.200	0.0400	0.14	0.14	0.42	0.05	0.12	0.11	0.02

(INDIVIDUAL # 120)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
318	0.020	1.000	0.0200	0.10	0.45	0.45	0.00	0.00	0.00	0.00
TOTAL	0.020	1.000	0.0200	0.10	0.45	0.45	0.00	0.00	0.00	0.00
AVERAGE	0.020	1.000	0.0200	0.10	0.45	0.45	0.00	0.00	0.00	0.00

(INDIVIDUAL # 121)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
302	0.750	0.200	0.1500	0.20	0.20	0.20	0.10	0.10	0.10	0.10
319	0.750	0.150	0.1125	0.25	0.20	0.20	0.10	0.05	0.10	0.10
320	0.750	0.150	0.1125	0.25	0.20	0.20	0.10	0.05	0.10	0.10
321	0.750	0.100	0.0750	0.20	0.20	0.20	0.20	0.05	0.10	0.05
322	0.750	0.100	0.0750	0.20	0.20	0.20	0.10	0.15	0.05	0.10
323	0.750	0.300	0.2250	0.10	0.25	0.20	0.10	0.15	0.10	0.10
TOTAL	4.500	1.000	0.7500	1.20	1.25	1.20	0.70	0.55	0.55	0.55
AVERAGE	0.750	0.167	0.1250	0.20	0.21	0.20	0.12	0.09	0.09	0.09

(INDIVIDUAL # 126)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
304	0.400	0.020	0.0080	0.05	0.20	0.25	0.10	0.10	0.10	0.20
324	0.400	0.130	0.0520	0.05	0.20	0.30	0.10	0.15	0.05	0.15
325	0.400	0.050	0.0200	0.05	0.30	0.25	0.10	0.10	0.05	0.15
326	0.400	0.200	0.0800	0.05	0.30	0.25	0.10	0.15	0.05	0.10
327	0.400	0.100	0.0400	0.05	0.30	0.25	0.10	0.10	0.05	0.15
328	0.400	0.200	0.0800	0.05	0.30	0.25	0.10	0.10	0.05	0.15
329	0.400	0.100	0.0400	0.05	0.30	0.30	0.10	0.10	0.05	0.10
330	0.400	0.100	0.0400	0.05	0.30	0.30	0.10	0.10	0.05	0.10
331	0.400	0.050	0.0200	0.20	0.30	0.30	0.05	0.05	0.05	0.05
332	0.400	0.050	0.0200	0.20	0.20	0.20	0.10	0.10	0.10	0.10
TOTAL	4.000	1.000	0.4000	0.80	2.70	2.65	0.95	1.05	0.60	1.25
AVERAGE	0.400	0.100	0.0400	0.08	0.27	0.26	0.09	0.11	0.06	0.12

(INDIVIDUAL # 127)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
312	0.370	0.150	0.0555	0.20	0.10	0.10	0.10	0.10	0.30	0.10
313	0.370	0.150	0.0555	0.00	0.10	0.20	0.20	0.20	0.20	0.10
333	0.370	0.100	0.0370	0.10	0.10	0.20	0.10	0.10	0.30	0.10
334	0.370	0.250	0.0925	0.20	0.20	0.20	0.10	0.10	0.20	0.00
335	0.370	0.250	0.0925	0.05	0.10	0.25	0.10	0.10	0.30	0.10
337	0.370	0.100	0.0370	0.10	0.20	0.20	0.20	0.10	0.10	0.10
TOTAL	2.220	1.000	0.3700	0.65	0.80	1.15	0.80	0.70	1.40	0.50
AVERAGE	0.370	0.167	0.0617	0.11	0.13	0.19	0.13	0.12	0.23	0.08

(INDIVIDUAL # 130)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
311	0.250	0.050	0.0125	0.20	0.25	0.25	0.10	0.10	0.05	0.05
332	0.250	0.500	0.1250	0.20	0.20	0.25	0.05	0.10	0.10	0.10
335	0.250	0.100	0.0250	0.25	0.05	0.50	0.05	0.05	0.05	0.05
336	0.250	0.250	0.0625	0.05	0.05	0.25	0.10	0.25	0.20	0.10
338	0.250	0.100	0.0250	0.10	0.15	0.35	0.10	0.20	0.05	0.05
TOTAL	1.250	1.000	0.2500	0.80	0.70	1.60	0.40	0.70	0.45	0.35
AVERAGE	0.250	0.200	0.0500	0.16	0.14	0.32	0.08	0.14	0.09	0.07

(INDIVIDUAL # 133)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
301	0.200	0.250	0.0500	0.15	0.20	0.20	0.10	0.10	0.15	0.10
313	0.200	0.050	0.0100	0.30	0.10	0.15	0.10	0.10	0.20	0.15
335	0.200	0.450	0.0900	0.20	0.15	0.20	0.10	0.10	0.15	0.10
339	0.200	0.050	0.0100	0.20	0.15	0.20	0.15	0.10	0.10	0.10
340	0.200	0.100	0.0200	0.25	0.20	0.25	0.10	0.05	0.10	0.05
341	0.200	0.100	0.0200	0.10	0.15	0.25	0.10	0.10	0.15	0.15
TOTAL	1.200	1.000	0.2000	1.20	0.95	1.25	0.65	0.55	0.85	0.65
AVERAGE	0.200	0.167	0.0333	0.20	0.16	0.21	0.11	0.09	0.14	0.11

(INDIVIDUAL # 135)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
300	0.050	0.400	0.0200	0.10	0.20	0.10	0.05	0.15	0.10	0.30
317	0.050	0.200	0.0100	0.10	0.20	0.20	0.10	0.10	0.10	0.20
345	0.050	0.400	0.0200	0.20	0.20	0.20	0.15	0.15	0.05	0.05
TOTAL	0.150	1.000	0.0500	0.40	0.60	0.50	0.30	0.40	0.25	0.55
AVERAGE	0.050	0.333	0.0167	0.13	0.20	0.17	0.10	0.13	0.08	0.18

(INDIVIDUAL # 138)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
305	0.400	0.100	0.0400	0.00	0.00	0.00	0.00	0.00	0.00	0.00
308	0.400	0.100	0.0400	0.00	0.00	0.80	0.00	0.00	0.20	0.00
316	0.400	0.100	0.0400	0.10	0.00	0.70	0.00	0.00	0.20	0.00
317	0.400	0.400	0.1600	0.00	0.00	0.75	0.00	0.00	0.25	0.00
342	0.400	0.100	0.0400	0.10	0.00	0.70	0.00	0.00	0.20	0.00
343	0.400	0.100	0.0400	0.00	0.00	0.85	0.00	0.00	0.15	0.00
344	0.400	0.100	0.0400	0.10	0.00	0.70	0.00	0.00	0.20	0.00
TOTAL	2.800	1.000	0.4000	0.30	0.00	4.50	0.00	0.00	1.20	0.00
AVERAGE	0.400	0.143	0.0571	0.04	0.00	0.64	0.00	0.00	0.17	0.00

(INDIVIDUAL # 146)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
301	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
305	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
311	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
336	0.400	0.100	0.0400	0.35	0.00	0.35	0.00	0.00	0.30	0.00
343	0.400	0.050	0.0200	0.25	0.00	0.50	0.00	0.00	0.25	0.00
344	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
345	0.400	0.500	0.2000	0.00	0.25	0.50	0.00	0.00	0.00	0.25
346	0.400	0.100	0.0400	0.25	0.00	0.50	0.00	0.00	0.25	0.00
347	0.400	0.050	0.0200	0.35	0.00	0.35	0.00	0.00	0.30	0.00
TOTAL	3.600	1.000	0.4000	2.60	0.25	3.60	0.00	0.00	2.30	0.25
AVERAGE	0.400	0.111	0.0444	0.29	0.03	0.40	0.00	0.00	0.26	0.03

(INDIVIDUAL # 147)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7

(INDIVIDUAL # 153)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
301	0.100	0.700	0.0700	0.05	0.25	0.25	0.05	0.10	0.05	0.25
309	0.100	0.300	0.0300	0.05	0.25	0.25	0.05	0.25	0.05	0.10
TOTAL	0.200	1.000	0.1000	0.10	0.50	0.50	0.10	0.35	0.10	0.35
AVERAGE	0.100	0.500	0.0500	0.05	0.25	0.25	0.05	0.18	0.05	0.18

(INDIVIDUAL # 155)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
301	0.100	0.370	0.0370	0.30	0.30	0.10	0.10	0.10	0.05	0.05
312	0.100	0.360	0.0360	0.20	0.30	0.00	0.20	0.20	0.05	0.05
313	0.100	0.050	0.0050	0.10	0.10	0.20	0.20	0.20	0.10	0.10
333	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10
334	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10
335	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10
348	0.100	0.010	0.0010	0.15	0.25	0.25	0.20	0.05	0.05	0.05
349	0.100	0.050	0.0050	0.05	0.15	0.20	0.20	0.20	0.10	0.10
350	0.100	0.010	0.0010	0.00	0.00	0.00	0.00	0.00	0.00	0.00
351	0.100	0.010	0.0010	0.10	0.10	0.20	0.20	0.20	0.10	0.10
352	0.100	0.010	0.0010	0.00	0.00	0.00	0.00	0.00	0.00	0.00
353	0.100	0.050	0.0050	0.00	0.00	0.00	0.00	0.00	0.00	0.00
354	0.100	0.050	0.0050	0.10	0.10	0.20	0.20	0.20	0.10	0.10
TOTAL	1.300	1.000	0.1000	1.30	1.60	1.75	1.90	1.75	0.85	0.85
AVERAGE	0.100	0.077	0.0077	0.10	0.12	0.13	0.15	0.13	0.07	0.07

(INDIVIDUAL # 156)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
348	0.650	1.000	0.6500	0.25	0.25	0.25	0.10	0.04	0.10	0.01
TOTAL	0.650	1.000	0.6500	0.25	0.25	0.25	0.10	0.04	0.10	0.01
AVERAGE	0.650	1.000	0.6500	0.25	0.25	0.25	0.10	0.04	0.10	0.01

(INDIVIDUAL # 157)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
355	0.100	0.500	0.0500	0.25	0.25	0.25	0.00	0.00	0.00	0.25
356	0.100	0.500	0.0500	0.25	0.25	0.25	0.00	0.00	0.00	0.25
TOTAL	0.200	1.000	0.1000	0.50	0.50	0.50	0.00	0.00	0.00	0.50
AVERAGE	0.100	0.500	0.0500	0.25	0.25	0.25	0.00	0.00	0.00	0.25

(INDIVIDUAL # 159)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
303	0.500	1.000	0.5000	0.25	0.01	0.50	0.10	0.04	0.05	0.05
TOTAL	0.500	1.000	0.5000	0.25	0.01	0.50	0.10	0.04	0.05	0.05
AVERAGE	0.500	1.000	0.5000	0.25	0.01	0.50	0.10	0.04	0.05	0.05

(INDIVIDUAL # 161)

	A	SCORE	A*SCORE	1	2	3	4	5	6	7
313	0.500	0.850	0.4250	0.50	0.50	0.00	0.00	0.00	0.00	0.00
334	0.500	0.050	0.0250	0.00	0.50	0.50	0.00	0.00	0.00	0.00
357	0.500	0.100	0.0500	0.15	0.15	0.15	0.15	0.15	0.15	0.10
TOTAL	1.500	1.000	0.5000	0.65	1.15	0.65	0.15	0.15	0.15	0.10
AVERAGE	0.500	0.333	0.1667	0.22	0.38	0.22	0.05	0.05	0.05	0.03

APPENDIX M-1

LISTING OF PROGRAM (P3SI) TO CREATE KROBOCK DATA MATRICES SORTED BY INDIVIDUAL RESPONDENTS

```
1 CLEAR:NN=25: RN=61        ' NN= # OF PEOPLE; RN= # OF REPORT ESTIMATED
5 TI$="KROBOCK SORTED REPORT NUMBER"
10 DIM CODE%(NN),ACTNUM%(NN),A%(NN,20)     ' A MATRIX TRACK THE ACT NUMBER
11 DIM UNIT%(NN,RN,10)
20 FOR I=1 TO NN
30 READ ACTNUM%(I): NEXT I
40 DATA 3,2,3,3,3, 3,0,2 ,5 ,1
50 DATA 6,10,6 ,5,6 ,3 ,7,9,1
60 DATA 2,13,1,2,1,3
70 OPEN "A:DATA3" FOR INPUT AS #1
80 FOR I=1 TO NN: INPUT #1, KODE,A,B,C,D:CODE%(I)=KODE
82 FOR J= 1 TO ACTNUM%(I)
90 INPUT #1, A%(I,J),A2 : A1=A%(I,J)
95 UNIT%(I,A1-299,1)=A          'VALUE A
96 UNIT%(I,A1-299,2)=A2         'VALUE OF CURRENT INFORMATION
97 UNIT%(I,A1-299,3)=A*A2
100 NEXT J: NEXT I
102 FOR I=1 TO NN: INPUT #1, IDK
103 FOR J=1 TO ACTNUM%(I):INPUT #1, V1,V2,V3,V4,V5,V6,V7
104 UNIT%(I,A%(I,J)-299,4)=V1     : UNIT%(I,A%(I,J)-299,5)=V2
106 UNIT%(I,A%(I,J)-299,6)=V3     : UNIT%(I,A%(I,J)-299,7)=V4
108 UNIT%(I,A%(I,J)-299,8)=V5     : UNIT%(I,A%(I,J)-299,9)=V6
110 UNIT%(I,A%(I,J)-299,10)=V7
112 NEXT J: NEXT I
114 CLOSE #1
125 GOSUB 500
130 END
500 REM **** DRAW TABLES *********
501 PRINT TI$
510 FOR J=1 TO RN
511 TNN=0
520 PRINT "(REPORT # ";299+J;")"
530 PRINT SPC(15) "A" SPC(4) "SCORE" SPC(2) "A*SCORE" SPC(3) "1" SPC(5) "2" SPC(
5) "3" SPC(5) "4" SPC(5) "5" SPC(5) "6" SPC(5) "7"
540 PRINT STRING$(75,45)
541 FOR K=1 TO 10: SUBT(K)=0: NEXT K
550 FOR I=1 TO NN
560 IF UNIT%(I,J,1)=0 GOTO 700   'IF NO VALUE STORED, SKIP
561 TNN=TNN+1
570 PRINT CODE%(I) SPC(6);: FOR M=1 TO 2: PRINT USING"###.###"; UNIT%(I,J,M)*.01
;: SUBT(M)=SUBT(M)+UNIT%(I,J,M)*.01
571 NEXT M
572 PRINT USING "###.####";UNIT%(I,J,3)*.0001;
573 SUBT(3)=SUBT(3)+UNIT%(I,J,3)*.0001
574 FOR M=4 TO 10: PRINT USING"###.##"; UNIT%(I,J,M)*.01;:SUBT(M)=SUBT(M)+UNIT%(
I,J,M)*.01: NEXT M
580 PRINT
700 NEXT I
701 IF TNN=0 GOTO 780
750 PRINT STRING$(75,45): PRINT "TOTAL" SPC(6);
751 PRINT USING "###.###"; SUBT(1);:AG(1)=SUBT(1)/TNN: PRINT USING "###.###"; SU
BT(2);:AG(2)=SUBT(2)/TNN
753 PRINT USING "###.####"; SUBT(3);:AG(3)=SUBT(3)/TNN
755 FOR I=4 TO 10: PRINT USING "###.##";SUBT(I);:AG(I)=SUBT(I)/TNN: NEXT I
760 PRINT "AVERAGE" SPC(4)
771 PRINT USING "###.###"; AG(1);:PRINT USING "###.###"; AG(2);
773 PRINT USING "###.####"; AG(3);
775 FOR I=4 TO 10: PRINT USING "###.##";AG(I);: NEXT I
780 PRINT:PRINT:PRINT:NEXT J
800 RETURN
0
```

APPENDIX N

PEARSON NS_i MATRIX

	15	10	14	15	12	10	12	15	15	10
QUES 16	0.000	2.000	3.000	3.000	2.000	1.700	2.000	3.000	1.700	0.000
QUES 19	0.000	2.000	3.000	3.000	2.000	1.700	2.000	2.000	1.700	0.000
QUES 5	0.000	2.000	3.000	0.000	2.500	1.700	3.000	3.000	1.700	1.700
QUES 1	0.000	1.275	1.700	1.400	2.000	3.000	3.000	0.800	2.550	3.000
QUES 8	0.000	3.000	1.700	0.000	2.500	1.700	3.000	1.700	1.700	2.125
QUES 21	0.000	2.000	1.700	3.000	2.000	0.850	3.000	1.700	2.000	-0.275
QUES 6	0.000	2.500	3.000	-1.700	2.000	1.050	2.500	1.700	1.700	1.700
QUES 36	0.000	1.500	3.000	3.000	2.000	1.700	1.700	1.400	2.000	0.000
QUES 17	0.000	2.000	3.000	1.700	2.000	1.700	3.000	1.700	1.700	0.000
QUES 7	0.000	2.000	1.700	-0.425	2.000	1.700	3.000	2.000	2.000	1.700
QUES 18	0.000	2.000	0.000	3.000	2.000	1.700	1.000	2.125	1.275	0.000
QUES 25	0.000	2.000	1.700	1.700	1.500	1.700	2.000	2.125	1.500	0.000
QUES 22	0.000	2.500	1.700	1.700	2.000	1.700	2.000	1.400	1.275	0.000
QUES 14	0.000	2.000	1.700	1.700	2.000	1.700	0.550	2.125	1.700	0.700
QUES 32	0.000	2.000	1.700	3.000	2.000	1.275	1.700	2.125	1.700	0.000
QUES 20	0.000	3.000	-0.500	3.000	2.000	1.275	2.000	1.700	1.275	0.000
QUES 24	0.000	2.000	-0.500	1.700	1.275	1.700	1.275	0.700	1.500	0.000
QUES 13	0.000	2.000	1.700	1.700	2.000	1.700	-1.500	1.700	2.000	0.000
QUES 11	0.000	2.000	0.000	0.000	2.000	-0.425	1.700	1.700	1.275	0.000
QUES 31	0.000	2.500	1.700	1.700	2.000	1.700	0.000	1.275	1.700	0.000
QUES 26	0.000	2.000	3.000	1.700	1.500	1.700	0.000	0.350	0.850	0.000
QUES 3	0.000	2.000	-0.400	0.000	1.275	1.400	1.700	1.700	1.700	0.000
QUES 9	0.000	2.000	1.700	0.000	1.500	1.700	0.000	0.000	1.700	0.000
QUES 15	0.000	2.000	3.000	1.700	2.500	1.700	1.700	2.125	1.700	0.000
QUES 33	0.000	1.700	0.700	0.000	1.500	0.000	1.700	1.700	1.700	0.000
QUES 37	0.000	2.500	0.000	0.000	1.700	1.700	0.000	1.400	1.700	0.000
QUES 29	0.000	2.000	1.700	1.700	1.500	1.700	0.000	1.275	1.700	0.000
QUES 27	0.000	2.500	3.000	0.000	1.000	0.000	-1.000	2.000	0.700	0.000
QUES 39	3.000	2.000	1.700	0.000	1.000	0.000	1.500	0.200	1.700	0.000
QUES 23	0.000	1.000	1.700	1.700	0.000	1.700	0.000	1.275	1.500	0.000
QUES 38	0.000	2.000	1.700	0.000	2.000	1.700	1.700	0.700	1.275	0.000
QUES 4	0.000	0.850	0.000	0.000	0.000	1.400	0.000	0.700	0.800	0.000
QUES 34	0.000	2.000	0.000	0.000	2.000	0.000	1.700	0.825	1.275	0.000
QUES 2	0.000	0.000	1.700	0.000	1.275	0.000	0.425	1.700	1.400	0.000
QUES 28	0.000	2.000	1.700	-0.800	2.000	0.000	1.700	1.700	1.275	0.000
QUES 30	0.000	2.000	1.700	1.700	1.000	0.000	0.000	2.500	1.000	0.000
QUES 12	0.000	2.000	-0.300	0.850	-0.500	0.000	-0.850	0.425	1.500	0.000
QUES 10	0.000	0.500	-0.400	0.000	1.000	0.000	-0.350	1.050	0.850	0.000
QUES 35	0.000	1.000	-0.500	-0.800	-1.500	0.000	0.850	0.700	1.275	0.000
NOR SCORE	1.000	0.635	0.546	0.532	0.531	0.523	0.513	0.511	0.509	0.444
SI VALUE	3.000	74.325	55.700	39.925	60.525	45.525	47.700	58.300	59.550	10.650
# OF ZERO	38	1	5	14	2	10	8	1	0	32

	1	1	1	1	1	1	1	1	1	1
	3	1	3	3	5	6	5	0	0	1
	8	4	0	5	2	1	3	9	1	1
QUES 16	1.700	3.000	0.425	1.000	1.700	2.000	1.700	1.700	1.700	1.700
QUES 19	1.700	2.000	1.700	1.000	1.700	1.700	0.700	1.700	0.700	1.700
QUES 5	3.000	0.850	1.400	0.700	0.000	1.700	3.000	1.700	0.850	0.850
QUES 1	3.000	1.700	1.700	0.850	0.700	2.000	1.400	3.000	1.700	0.000
QUES 8	0.000	2.000	1.700	1.500	1.050	1.700	0.000	1.700	1.050	-0.275
QUES 21	-0.500	2.000	1.700	-0.500	0.700	1.700	1.000	-0.850	0.700	1.700
QUES 6	3.000	2.000	1.700	0.850	0.000	1.100	1.400	0.425	-1.275	-1.275
QUES 36	1.700	0.350	1.700	1.500	0.550	0.000	0.700	0.000	0.000	2.500
QUES 17	1.700	2.000	-0.850	1.000	0.700	1.000	-0.700	0.700	0.700	0.000
QUES 7	3.000	2.000	-0.400	2.000	1.700	1.700	1.400	0.000	0.000	0.000
QUES 18	1.700	1.700	1.700	0.000	0.000	0.000	0.000	0.000	1.700	0.000
QUES 25	-0.500	3.000	1.700	0.700	0.700	1.700	-0.700	1.700	0.700	-1.700
QUES 22	0.700	3.000	1.700	1.000	0.700	0.500	0.000	0.425	0.000	-1.700
QUES 14	1.700	1.700	0.000	0.000	1.700	1.700	0.000	-0.700	0.275	0.000
QUES 32	0.700	1.000	0.000	1.000	0.700	0.000	-0.275	-0.850	0.350	1.700
QUES 20	-0.500	1.700	1.700	-1.000	1.700	1.700	0.000	1.700	0.550	0.000
QUES 24	0.700	2.000	1.700	0.000	1.275	0.000	-0.275	0.350	-0.275	-0.700
QUES 13	1.700	1.700	0.425	1.000	0.000	-0.500	0.000	-1.050	-0.700	-0.700
QUES 11	1.700	0.000	0.700	0.000	0.700	0.700	0.000	1.700	0.550	1.700
QUES 31	-0.500	0.425	-0.350	0.000	1.700	0.850	0.000	0.000	0.700	2.125
QUES 26	0.700	1.000	-0.850	0.000	1.400	-0.425	-0.700	0.000	-0.350	-0.350
QUES 3	-0.275	-0.425	0.000	0.850	1.700	0.000	1.050	0.700	0.550	-0.125
QUES 9	0.700	0.500	0.000	1.000	0.700	0.000	1.400	0.000	0.000	0.000
QUES 15	1.700	-1.000	0.425	1.500	-1.400	1.700	-0.350	-0.850	0.000	-1.275
QUES 33	-0.500	0.000	0.850	1.000	0.000	0.000	0.000	0.700	0.000	0.000
QUES 37	0.000	0.000	0.000	0.000	0.000	0.425	0.000	0.000	0.000	1.275
QUES 29	-0.400	1.275	0.000	1.000	0.000	0.000	-0.550	0.000	-0.350	0.000
QUES 27	0.000	2.000	-0.850	1.000	-1.400	-1.500	-0.425	0.850	0.000	-1.500
QUES 39	0.000	1.275	0.000	0.000	0.700	-2.000	-0.700	-0.700	-0.700	0.000
QUES 23	1.700	1.500	0.850	1.000	0.000	0.275	-0.350	-0.425	-0.425	-2.125
QUES 38	0.000	-1.000	0.850	0.000	0.700	0.850	-1.700	-0.700	-0.350	-1.275
QUES 4	0.000	0.550	0.000	0.000	0.000	0.000	0.000	0.000	0.700	-0.275
QUES 34	-0.500	-0.425	0.000	0.000	0.000	-0.700	0.000	0.700	-0.350	1.700
QUES 2	0.000	-0.425	0.000	-0.350	-0.275	0.000	0.000	-0.700	0.000	0.200
QUES 28	0.700	1.000	0.000	0.000	0.350	-0.350	-0.500	-1.275	0.000	-2.000
QUES 30	-0.500	-1.000	0.850	0.500	0.700	0.700	-0.700	-1.700	-0.700	-1.400
QUES 12	0.000	0.000	0.000	0.000	0.000	0.425	0.000	-1.275	-0.700	-1.700
QUES 10	1.700	-1.000	-0.350	0.000	0.700	0.500	0.275	-0.700	-1.050	0.000
QUES 35	0.700	-1.500	0.850	0.000	-1.700	0.000	0.000	-3.000	-1.400	-0.850
NOR SCORE	0.338	0.328	0.280	0.279	0.240	0.235	0.085	0.053	0.049	-0.022
SI VALUE	31.425	36.450	22.675	20.100	20.150	21.150	6.100	4.975	4.850	-2.075
# OF ZERO	9	4	12	15	11	11	15	9	10	11

	1 2 0	1 3 3	1 0 3	1 4 7	1 1 9	AVERAGE
QUES 16	2.000	1.700	2.000	-0.700	2.000	1.6810
QUES 19	0.850	0.350	1.500	0.000	2.000	1.4680
QUES 5	0.700	1.275	-0.500	0.000	2.000	1.4450
QUES 1	-1.050	1.275	0.000	1.700	-2.500	1.3680
QUES 8	0.000	0.000	1.500	0.000	1.700	1.2420
QUES 21	1.700	-0.350	-1.000	0.000	2.000	1.0390
QUES 6	0.000	0.850	-0.500	0.000	1.000	0.9490
QUES 36	0.000	0.000	0.000	0.000	-2.000	0.9320
QUES 17	-0.850	0.000	2.000	0.000	-1.500	0.9080
QUES 7	0.000	-0.850	-1.000	0.000	-3.000	0.8890
QUES 18	0.700	0.700	-1.000	0.000	1.000	0.8520
QUES 25	0.850	-0.700	1.700	-0.200	-2.000	0.8470
QUES 22	0.000	0.425	-1.000	0.000	0.500	0.8210
QUES 14	0.700	0.000	0.000	0.000	-2.000	0.7700
QUES 32	-0.350	0.700	-0.850	-0.400	-1.000	0.7170
QUES 20	-0.700	-0.850	-1.000	0.000	-3.000	0.6300
QUES 24	0.000	-0.425	1.700	0.000	-0.700	0.6000
QUES 13	0.000	0.425	0.850	0.000	0.500	0.5980
QUES 11	0.000	-0.700	-1.000	0.000	-1.500	0.5120
QUES 31	-0.700	-0.350	-0.850	-0.400	-2.500	0.5090
QUES 26	-0.850	0.000	-0.500	-0.400	2.000	0.4710
QUES 3	0.000	-0.425	-0.850	0.000	-0.500	0.4650
QUES 9	0.000	-0.850	1.000	0.000	-3.000	0.4020
QUES 15	-0.850	-0.425	-2.000	-1.100	-3.000	0.3800
QUES 33	0.000	-0.350	-0.850	0.000	-1.000	0.3540
QUES 37	0.000	-0.350	0.000	0.000	-2.000	0.3340
QUES 29	-0.700	-0.850	0.000	0.000	-3.000	0.3200
QUES 27	-0.850	0.700	0.000	0.000	0.700	0.2770
QUES 39	0.850	0.000	0.000	0.000	-3.000	0.2730
QUES 23	-0.850	0.000	-0.700	0.000	-3.000	0.2530
QUES 38	0.000	-0.850	-0.850	0.000	-2.000	0.1900
QUES 4	0.000	0.000	0.000	0.000	0.000	0.1890
QUES 34	0.000	-0.700	-0.425	-0.250	-3.000	0.1540
QUES 2	0.000	0.000	-0.850	0.000	-0.550	0.1420
QUES 28	-1.275	-0.350	-1.500	0.000	-3.000	0.0550
QUES 30	-0.350	-0.850	-0.850	-0.800	-3.000	0.0320
QUES 12	0.000	0.425	0.000	0.000	0.000	0.0120
QUES 10	0.000	-1.275	-1.000	0.000	-3.000	-0.1020
QUES 35	-1.050	-0.700	-1.700	0.000	-3.000	-0.4930
NOR SCORE	-0.029	-0.035	-0.089	-0.094	-0.382	
SI VALUE	-2.075	-3.375	-8.525	-2.550	-42.350	0.279(NSR AVG)
# OF ZERO	18	9	9	30	2	0.577(COL AVG)

APPENDIX N-1

PEARSON QUESTIONNAIRE DATA AS STORED IN THE DATA BASE (DATA1)

```
C>TYPE A:DATA1
100  1  2 .85 -2  2 .85  2  2 1.0  1  1 .85  2  2 1.0  2  3 1.0  2  2 1.0
     3  3 1.0  2  2 1.0 -1  2 1.0  2  2 1.0  2  2 1.0  2  2 1.0  2  2 1.0
     2  2 1.0  2  2 1.0  2  2 1.0  2  2 1.0  2  2 1.0  3  3 1.0  2  2 1.0
     2  3 1.0  3 -1 1.0  2  2 1.0  2  2 1.0  2  2 1.0  2  3 1.0  2  2 1.0
     2  2 1.0  2  2 1.0  2  3 1.0  2  2 1.0  2  2 .85  2  2 1.0  1  1 1.0
     1  2 1.0  2  3 1.0  2  2 1.0  2  2 1.0
101  2  2 .85  2 -2 .70  1  1 .55  1  1 .70  0  2 .85 -2 -1 .85  1 -1 .85
     1  2 .70  0  0 .55 -2 -1 .70  1  1 .55 -1 -1 .70 -1 -1 .70  1  0 .55
     1 -1 .70  2  2 .85  1  1 .70  2  2 .85  1  1 .70  1  1 .55  1  1 .70
     0  0 .55  0 -1 .85 -1  0 .55  1  1 .70 -1  0 .70  0  0 .55  0  0 .55
    -1  0 .70 -1 -1 .70  1  1 .70  0  1 .70  0  0 .55 -1  0 .70 -2 -2 .70
     1 -1 .55  0  0 .55 -1  0 .70 -1 -1 .70
103  0  0 .55 -2  0 .85 -2  0 .85  0  0 .55  0 -1 1.0 -2  1 1.0 -1 -1 1.0
     1  2 1.0  2  0 1.0 -2  0 1.0 -2  0 1.0  0  0 .55  0  2 .85  2 -2 1.0
    -2 -2 1.0  2  2 1.0  1  3 1.0 -2  0 1.0  2  1 1.0 -1 -1 1.0 -2  0 1.0
    -1 -1 1.0 -1 -1 .70  2  2 .85  2  2 .85 -1  0 1.0  0  0 .40 -2 -1 1.0
    -2  2 .85 -1 -1 .85 -1 -1 .85 -1 -1 .85 -1 -1 .85 -1  0 .85 -2 -2 .85
     0  0 .55  0  0 .55 -1 -1 .85  0  0 .55
105  3  3 1.0 -3  3 1.0  0  0 .55  0  0 .55  2  2 .85  2  2 .85  2  2 .85
     3  2 .85  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  1  1 .70
     0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55 -1  0 .55
     0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55
     0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55
     0  0 .55  0  0 .55  0  0 .55  0  0 .55
106  3  3 1.0  0  0 .55  2  2 .70  2  2 .70  2  2 .85  1  2 .70  2  2 .85
     2  2 .85  2  2 .85  0  0 .55 -1  0 .85  0  0 .55  2  2 .85  2  2 .85
     2  2 .85  2  2 .85  2  2 .85  2  2 .85  2  2 .85  1  2 .85  1  1 .85
     2  2 .85  2  2 .85  2  2 .85  2  2 .85  2  2 .85  0  0 .55  0  0 .55
     2  2 .85  0  0 .55  2  2 .85  1  2 .85  0  0 .55  0  0 .55  0  0 .55
     2  2 .85  2  2 .85  2  2 .85  0  0 .55
109  3  3 1.0 -1 -1 .70  1  1 .70  0  0 .55  2  2 .85  0  1 .85  1 -1 .85
     2  2 .85  0  0 .55 -1 -1 .70  2  2 .85 -2 -1 .85 -2 -1 .70 -1 -1 .70
    -1 -1 .85  2  2 .85  1  1 .70  0  0 .55  2  2 .85  2  2 .85 -1 -1 .85
    -1  2 .85  0 -1 .85  0  1 .70  2  2 .85  0  0 .55  1  1 .85 -3  0 .85
     0  0 .70 -2 -2 .85  0  0 .55 -1 -1 .85  1  1 .70  1  1 .70 -3 -3 1.0
     0  0 .55  0  0 .55 -1 -1 .70 -1 -1 .70
111  1 -1 .25  0  1 .40  0 -1 .25 -1  0 .55  0  2 .85 -2 -1 .85  1 -1 .85
     0 -1 .55  0  0 .55 -1  1 .55  2  2 .85 -2 -2 .85 -1 -1 .70  0  0 .55
    -2 -1 .85  2  2 .85  0  0 .55  0  0 .55  2  2 .85  0  0 .55  2  2 .85
    -2 -2 .85 -2 -3 .85 -1 -1 .70 -2 -2 .85 -2  1 .70 -2 -1 1.0 -2 -2 1.0
     0  0 .55 -2 -2 .70  2  3 .85  2  2 .85 -1  1 .85  2  2 .85 -1 -1 .85
     2  3 1.0  2  1 .85 -2 -1 .85  0  0 .55
114  2  2 .85 -2  1 .85 -1  0 .85  0  2 .55  1  1 .85  2  2 1.0  2  2 1.0
     2  2 1.0 -1  2 1.0 -1 -1 1.0 -1  1 1.0 -1  1 1.0  2  2 .85  2  2 .85
    -1 -1 1.0  3  3 1.0  2  2 1.0  2  2 .85  2  2 1.0  2  2 .85  2  2 1.0
     3  3 1.0  2  1 1.0  2  2 1.0  3  3 1.0  1  1 1.0  2  2 1.0  1  1 1.0
     1  2 .85 -1 -1 1.0  0  1 .85  1  1 1.0  0  0 1.0 -1  0 .85 -2 -1 1.0
     0  1 .70  0  0 .55 -1 -1 1.0  1  2 .85
119 -3 -2 1.0 -2  0 .55 -1  0 1.0  0  0 .55  2  2 1.0  1  1 1.0 -3 -3 1.0
     2  2 .85 -3 -3 1.0 -3 -3 1.0 -3  0 1.0  0  0 1.0  2 -1 1.0 -2 -2 1.0
    -3 -3 1.0  2  2 1.0 -3  0 1.0  1  1 1.0  2  2 1.0 -3 -3 1.0  2  2 1.0
     0  1 1.0 -3 -3 1.0 -2  0 .70 -2 -2 1.0  2  2 1.0  2  0 .70 -3 -3 1.0
    -3 -3 1.0 -3 -3 1.0 -3 -2 1.0 -2  0 1.0 -1 -1 1.0 -3 -3 1.0 -3 -3 1.0
    -2 -2 1.0 -2 -2 1.0 -2 -2 1.0 -3 -3 1.0
120 -2 -1 .70  0  0 .55  0  0 .55  0  0 .55  1  1 .70  0  0 .55  0  0 .55
     0  0 .55  0  0 .55  0  0 .55  0  0 .55  0  0 .55  1 -1 .70  1  1 .70
    -1 -1 .85  2  2 1.0 -1 -1 .85  1  1 .70  1  1 .85 -1 -1 .70  2  2 .85
    -1  1 .85  0 -2 .85  0  0 .70  1  1 .85 -1 -1 .85 -1 -1 .85 -2 -1 .85
    -2  0 .70 -1  0 .70 -1 -1 .70  0 -1 .70  0  0 .55  0  0 .55 -1 -2 .70
     0  0 .55  1 -1 .40  0  0 .55  1  1 .85
```

121	2	2	1.0	1	2	.85	2	1	.85	0	0	.55	3	2	1.0	2	2	1.0	2	2	1.0
	3	2	1.0	1	2	1.0	1	1	1.0	2	2	1.0	-2	1	1.0	2	2	1.0	2	2	1.0
	3	2	1.0	2	2	1.0	2	2	1.0	2	2	1.0	2	2	1.0	2	2	1.0	2	2	1.0
	2	2	1.0	1	-1	1.0	2	1	.85	1	2	1.0	1	2	1.0	1	1	1.0	2	2	1.0
	2	1	1.0	1	1	1.0	2	2	1.0	2	2	1.0	2	1	1.0	2	2	1.0	-1	-2	1.0
	2	2	1.0	2	2	.85	2	2	1.0	1	1	1.0									
127	3	3	1.0	-1	2	.85	2	2	.85	0	0	.10	3	3	1.0	2	3	1.0	3	3	1.0
	3	3	1.0	0	0	.55	-1	0	.70	2	2	.85	-2	0	.85	-1	-2	1.0	2	0	.55
	2	2	.85	2	2	1.0	3	3	1.0	1	1	1.0	2	2	1.0	2	2	1.0	3	3	1.0
	2	2	1.0	0	0	.85	2	1	.85	2	2	1.0	0	0	1.0	-1	-1	1.0	2	2	.85
	0	0	.55	0	0	.55	0	0	.55	2	2	.85	2	2	.85	2	2	.85	1	1	.85
	2	2	.85	0	0	.55	2	2	.85	1	2	1.0									
130	2	2	.85	0	0	.55	0	0	.55	0	0	.55	2	2	.70	2	2	.85	-1	-1	.40
	2	2	.85	0	0	.55	-1	0	.70	1	1	.70	0	0	.55	2	-1	.85	0	0	.55
	2	-1	.85	2	-1	.85	-1	-1	.85	2	2	.85	2	2	.85	2	2	.85	2	2	.85
	2	2	.85	0	2	.85	2	2	.85	2	2	.85	-1	-1	.85	-1	-1	.85	0	0	.55
	0	0	.55	1	1	.85	-1	0	.70	0	0	.55	1	1	.85	0	0	.55	1	1	.85
	2	2	.85	0	0	.55	1	1	.85	0	0	.55									
133	2	1	.85	0	0	.70	0	-1	.85	0	0	.70	1	2	.85	1	1	.85	-1	-1	.85
	0	0	.85	-1	-1	.85	-2	-1	.85	0	-2	.70	1	0	.85	0	1	.85	0	0	.70
	0	-1	.85	2	2	.85	-1	1	.85	1	1	.70	1	0	.70	-1	-1	.85	-1	0	.70
	-1	2	.85	1	-1	.70	-1	0	.85	-1	-1	.70	0	0	.70	1	1	.70	-1	0	.70
	-1	-1	.85	-1	-1	.85	-1	0	.70	1	1	.70	0	-1	.70	-1	-1	.70	-1	-1	.70
	0	0	.70	-1	0	.70	-1	-1	.85	0	0	.70									
135	1	1	.85	-1	0	.70	1	1	.85	0	0	.55	1	1	.70	1	1	.85	2	2	1.0
	2	1	1.0	1	1	1.0	0	0	1.0	0	0	1.0	0	0	1.0	1	1	1.0	0	0	1.0
	2	1	1.0	1	1	1.0	1	1	1.0	0	0	1.0	1	1	1.0	-1	-1	1.0	-1	0	1.0
	1	1	1.0	1	1	1.0	0	0	1.0	1	1	.70	0	0	1.0	1	1	1.0	0	0	1.0
	1	1	1.0	2	-1	1.0	0	0	1.0	1	1	1.0	1	1	1.0	0	0	.70	0	0	.85
	1	2	1.0	0	0	.85	0	0	1.0	0	0	1.0									
138	3	3	1.0	0	0	.55	-1	0	.55	0	0	.55	3	3	1.0	3	3	1.0	3	3	1.0
	0	0	.55	1	1	.70	2	2	.85	2	2	.85	0	0	.55	2	2	.85	2	2	.85
	2	2	.85	2	2	.85	2	2	.85	2	2	.85	2	2	.85	-2	-2	.25	-2	-2	.25
	1	1	.70	2	2	.85	1	1	.70	-2	-2	.25	1	1	.70	0	0	.55	1	1	.70
	-1	-1	.40	-2	-2	.25	-2	-2	.25	1	1	.70	-2	-2	.25	-2	-2	.25	1	1	.70
	2	2	.85	0	0	.55	0	0	.55	0	0	.55									
146	2	2	.85	2	2	.85	-1	-1	.40	0	0	.55	3	3	1.0	3	3	1.0	2	2	.85
	2	2	.85	2	2	.85	-1	-1	.40	0	0	.55	-3	-3	.10	2	2	.85	2	2	.85
	3	3	1.0	3	3	1.0	3	3	1.0	0	0	.55	3	3	1.0	-2	-2	.25	2	2	.85
	2	2	.85	2	2	.85	-2	-2	.25	2	2	.85	3	3	1.0	3	3	1.0	2	2	.85
	2	2	.85	2	2	.85	2	2	.85	2	2	.85	1	1	.70	0	0	.55	-2	-2	.25
	3	3	1.0	0	0	.55	2	2	.85	2	2	.85									
147	2	2	.85	0	0	.25	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55
	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55
	-2	-2	.55	-2	0	.70	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55
	0	0	.25	0	0	.25	0	0	.55	-1	0	.40	-1	-1	.40	0	0	.55	0	0	.25
	0	0	.25	-2	-2	.40	-1	-1	.40	-1	-1	.40	0	0	.25	0	-2	.25	0	0	.25
	0	0	.25	0	0	.25	0	0	.25	0	0	.40									
152	1	1	.70	-1	0	.55	2	2	.85	0	0	.55	0	0	.55	0	0	.55	2	2	.85
	1	2	.70	1	1	.70	1	1	.70	1	1	.70	0	0	.55	0	0	.55	2	2	.85
	-2	-2	.70	2	2	.85	1	1	.70	0	0	.55	2	2	.85	2	2	.85	1	1	.70
	1	1	.70	0	0	.55	1	2	.85	1	1	.70	2	2	.70	-2	-2	.70	1	0	.70
	0	0	.55	1	1	.70	2	2	.85	1	1	.70	0	0	.55	0	0	.55	-2	-2	.85
	1	1	.55	0	0	.55	1	1	.70	1	1	.70									
153	2	2	.70	0	0	.55	2	1	.70	0	0	.55	3	3	1.0	2	2	.70	2	2	.70
	0	0	.55	2	2	.70	0	1	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55
	-1	0	.70	2	2	.85	-1	-1	.70	0	0	.55	1	1	.70	0	0	.55	1	1	1.0
	0	0	.55	1	-2	.70	-1	0	.55	-1	-1	.70	-1	-1	.70	-1	0	.85	-1	0	1.0
	-1	-1	.55	-1	-1	.70	0	0	.55	-1	0	.55	0	0	.55	0	0	.55	0	0	.55
	1	1	.70	0	0	.55	-2	-2	.85	-1	-1	.70									
155	3	3	.85	2	2	.70	2	2	.85	2	2	.40	2	2	.85	2	2	.85	3	1	1.0
	2	2	.85	2	2	.85	1	1	.85	2	1	.85	1	2	1.0	2	2	1.0	2	2	.85
	2	2	.85	2	2	.85	2	2	.85	1	2	.85	2	2	.85	2	1	.85	2	2	1.0
	1	2	.85	2	1	1.0	2	1	1.0	2	1	1.0	1	1	.85	1	1	.70	1	2	.85
	2	2	.85	1	1	1.0	2	2	.85	2	2	.85	2	2	.85	2	1	.85	1	2	.85
	2	2	1.0	2	2	.85	2	1	.85	2	2	.85									

156	2	2	.40	2	2	.85	2	2	.85	0	2	.70	3	3	1.0	2	2	.85	2	2	1.0
	2	2	.85	0	0	.55	1	2	.70	2	2	.85	0	1	.85	2	2	.85	3	2	.85
	2	3	.85	3	3	1.0	2	2	.85	3	2	.85	2	2	1.0	2	2	.85	2	2	.85
	2	2	.70	2	1	.85	1	1	.70	3	2	.85	1	0	.70	2	2	1.0	2	2	.85
	2	1	.85	3	2	1.0	1	2	.85	2	3	.85	2	2	.85	1	2	.55	1	1	.70
	2	2	.70	2	2	.70	1	1	.70	1	0	.40									
157	0	0	1.0	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55
	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55
	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55
	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55
	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55	0	0	.55
	0	0	.55	0	0	.55	0	0	.55	3	3	1.0									
159	2	2	.70	0	0	.55	0	0	.55	0	0	.55	0	0	.55	-2	-2	.85	0	-1	.85
	0	0	.55	0	0	.55	0	0	.55	0	0	.55	2	0	.85	2	2	.85	2	2	.85
	2	2	.85	3	3	1.0	2	2	.85	3	3	1.0	3	3	1.0	3	3	1.0	3	3	1.0
	2	2	.85	2	2	.85	2	2	.85	2	2	.85	2	2	.85	0	0	.55	-2	-2	.40
	2	2	.85	2	2	.85	2	2	.85	3	3	1.0	0	0	.55	0	0	.55	-2	-2	.40
	3	3	1.0	0	0	.55	0	0	.55	0	0	.55									
161	3	1	1.0	-2	2	.85	0	0	.55	0	0	.55	2	2	.85	2	2	.55	2	2	.85
	2	2	.85	-1	1	.85	0	1	1.0	1	1	.70	1	0	.85	0	-1	1.0	2	2	.85
	2	2	.85	2	2	1.0	1	1	1.0	0	0	.55	2	2	.85	2	2	.85	2	2	.85
	-1	2	1.0	2	-1	.55	0	0	.55	2	2	.85	-1	0	.85	-3	0	1.0	-1	0	.70
	0	0	.55	1	1	.70	1	1	.85	0	0	.55	0	0	.55	-1	-1	.70	0	0	.55
	0	0	.55	-1	2	.85	1	1	.85	-2	-2	1.0									

APPENDIX N-2

LISTING OF PROGRAMS (P1S-NS AND P1S-NSAG) TO CREATE PEARSON NS_i MATRIX

```
LIST
10 REM ***********************************************************************
20 REM  ADOT PROJECT DATA ANALYSIS          ARIZONA STATE UNIVERSITY   1984
30 REM ************* FORMULA ***************************************************
40 REM VSUMI=WEIGHTED CALCULATION ON EACH QUESTION OF EACH USER SATISFACTION
50 REM        QUESTIONNAIRE(3 TO -3; 1.00,0.85,0.70,0.55,0.40,0.25,0.10)
60 REM SUM OF VSUMI=Si DEFINED IN THE PAPER
70 REM DELTA = 0 OR 1 DEPENDING THE THE FIRST TWO RESPONSES ON EACH QUESTION
80 REM SUM OF DELTA=Fi DEFINED IN THE PAPER
90 REM NORMAL SCORE(NORSCR)=Si/(Fi*3.0)
  100 REM ***********************************************************************
120 CLEAR: QN=39: NN=25 'TOTAL QUESTIONS ; # OF PEOPLE
121 TI$="GENERATE BY SORTING NORMAL SCORE"
130 DIM MEASURE(QN,3,NN),CODE(NN),TOP$(NN),MC$(NN),BO$(NN),NCZERO(NN),NSCR(NN)
140 DIM VSUMI(NN,QN), DELTA(QN,NN), FSUM(NN) 'WEIGHTED; 1 OR 0; Fi=SUM OF DELTA
150 DIM CSUM(NN),RANK(NN), RSUM(QN),RAVG(QN)    'NORMAL SCORE=CSUM/FSUM*3.0
152 GOSUB 1000
340 END
1000 OPEN "A:DATA1" FOR INPUT AS #1        'READ DATA INTO WORKING AREA
1010 FOR I=1 TO NN: INPUT #1, CODE(I)
1020 FOR J=1 TO QN: FOR K=1 TO 3
1030 INPUT #1, MEASURE(J,K,I)
1040 NEXT K
1041 VSUMI(I,J)=MEASURE(J,3,I)*((MEASURE(J,1,I)+MEASURE(J,2,I))/2)
1050 IF MEASURE(J,1,I)=0 AND MEASURE(J,2,I)=0 THEN DELTA(J,I)=0 ELSE DELTA(J,I)=
1
1052 NEXT J: NEXT I
1060 CLOSE #1
1070 FOR J=1 TO QN: FOR I=1 TO NN          'CALCULATE SOME BASIC  VALUES
1080 RSUM(J)=RSUM(J)+VSUMI(I,J)
1090 NEXT I: RAVG(J)=RSUM(J)/NN: NEXT J
1100 FOR I=1 TO NN :CSUM(I)=0:DEL=0: FOR J=1 TO QN
1110 DEL=DEL+DELTA(J,I)
1120 CSUM(I)=CSUM(I)+VSUMI(I,J)
1130 NEXT J: NSCR(I)=CSUM(I)/(DEL*3!): NEXT I
2000 REM  SORTING PROCEDURES
2010 FOR I=1 TO NN: RANK(I)=I: NEXT I       'RANK(I) REFLECT THE ORIGINAL ORDER
2020 FOR I=1 TO NN-1
2030 MAX=NSCR(I)
2040 FOR J=I+1 TO NN
2050 IF NSCR(J)<=MAX THEN GOTO 2200
2060 MAX=NSCR(J): NSCR(J)=NSCR(I): NSCR(I)=MAX
2070 TEMP=RANK(I):RANK(I)=RANK(J):RANK(J)=TEMP
2200 NEXT J: NEXT I
2210 OPEN "A:DATA101" FOR OUTPUT AS #1        ' WRITE THE SORTING ORDER BACK
2220 FOR I=1 TO NN: PRINT #1, CODE(RANK(I));
2230 FOR J=1 TO QN: FOR K=1 TO 3
2240 PRINT #1, MEASURE(J,K, RANK(I));
2250 NEXT K: NEXT J: PRINT #1," ": NEXT I
2260 CLOSE #1
2500 RETURN
0
```

```
LIST
10 REM ##################################################################
20 REM  ADOT PROJECT DATA ANALYSIS        ARIZONA STATE UNIVERSITY   1984
30 REM ############# FORMULA ##############################################
40 REM VSUMI=WEIGHTED CALCULATION ON EACH QUESTION OF EACH USER SATISFACTION
50 REM        QUESTIONNAIRE(3 TO -3; 1.00,0.85,0.70,0.55,0.40,0.25,0.10)
60 REM SUM OF VSUMI=S1 DEFINED IN THE PAPER
70 REM DELTA = 0 OR 1 DEPENDING THE THE FIRST TWO RESPONSES ON EACH QUESTION
80 REM SUM OF DELTA=F1 DEFINED IN THE PAPER
90 REM NORMAL SCORE(NORSCR)=S1/(F1*3.0)
  100 REM ##########################################################################
120 CLEAR: QN=39: NN=25 'TOTAL QUESTIONS ; # OF PEOPLE
121 TI$="PEARSON SORTED BY NORMALIZED SATISFACTION AND AVERAGE"
130 DIM MEASURE(QN,3,NN),CODE(NN),TOP$(NN),MC$(NN),BO$(NN),NCZERO(NN),NSCR(NN)
140 DIM VSUMI(NN,QN), DELTA(QN,NN), FSUM(NN) 'WEIGHTED; 1 OR 0; F1=SUM OF DELTA
150 DIM CSUM(NN),RANK(QN), RSUM(QN),RAVG(QN)    'NORMAL SCORE=CSUM/FSUM*3.0
152 GOSUB 1000
160 OPEN "A:DATA102" FOR INPUT AS #1
170 FOR I=1 TO NN : FSUM(I)=0                    'FSUM IS FOR COLUMN SUM-UP USE
180 REM SEPERATE CODE INTO TOP, MIDDLE AND BOTTOM PARTS FOR PRINT HEADING
190 INPUT #1, CODE(I): CODE$=STR$(CODE(I)) 'BEWARE CODE$ CONTAIN A SPACE AHEAD
200 TOP$(I)=MID$(CODE$,2,1)
210 MC$(I)=MID$(CODE$,3,1)
220 BO$(I)=RIGHT$(CODE$,1)
230 REM READ 39 X 3 DATA FOR EACH QUESTIONNAIRE
240 FOR J=1 TO QN
250 FOR K=1 TO 3: INPUT #1, MEASURE(J,K,I): NEXT K
260 REM VSUMI=WEIGHT * ONE HALF OF THE SUM OF TWO DATA
270 VSUMI(I,J)=MEASURE(J,3,I)*((MEASURE(J,1,I)+MEASURE(J,2,I))/2)
280 REM DELTA COMPARE THE RESPONSE VALUES; IF SAME , =0, ELSE =1
290 IF MEASURE(J,1,I)=0 AND MEASURE(J,2,I)=0 THEN DELTA(J,I)=0 ELSE DELTA(J,I)=1
300 IF VSUMI(I,J)=0 THEN NCZERO(I)=NCZERO(I)+1
310 NEXT J: NEXT I
320 CLOSE #1
330 GOSUB 350
340 END
350 REM ##########################################################################
360 REM PRINT THE MATRIX OUT
370 PRINT TI$  : FLAG=0
380 S=1: SE=9  'S & SE DEFINE HOW MANY COLUMNS TO BE SHOWN IN A SINGLE PRINTOUT
390 SETAIL=NN-INT(NN/(S+SE))*(S+SE)
400 PGN=INT(NN/(S+SE))+1: FOR PAGE=1 TO PGN 'DEFINE # OF PAGES PRINTOUT
410 PRINT TAB(13);
420 FOR I=S TO S+SE:PRINT TOP$(I) SPC(6);:NEXT I: PRINT
430 PRINT TAB(13);
440 FOR I=S TO S+SE:IF I=NN THEN GOTO 460 ELSE PRINT MC$(I) SPC(6);:NEXT I
450 PRINT:GOTO 470
460 PRINT MC$(I) SPC(6) "AVERAGE";
470 PRINT TAB(13);
480 FOR I=S TO S+SE: PRINT BO$(I) SPC(6);:NEXT I: PRINT
490 PRINT STRING$(80,45)
500 FOR J=1 TO QN: IF RANK(J)<10 THEN GAP$="  " ELSE GAP$=" "
 510 PRINT"QUES";RANK(J);GAP$;:FOR I=S TO S+SE:PRINT USING "###.###";VSUMI(I,J);
520 NEXT I:IF FLAG=1 THEN GOSUB 610  'CALCULATE HORIZONTAL AVERAGE VALUES
530 PRINT: NEXT J
540 GOSUB 660  'CLACULATE NORMAL SCORE
550 IF PAGE=PGN THEN GOTO 600
560 A$=INKEY$: IF A$="Y" THEN GOTO 570 ELSE 560
570 IF PAGE+1<>PGN   THEN S=S+10: GOTO 590
580 IF PAGE+1=PGN    THEN S=S+10  : SE=SETAIL-1: FLAG=1   : GOTO 590
590 NEXT PAGE
600 RETURN
610 RSUM(J)=0: FOR I=1 TO NN
620 RSUM(J)=RSUM(J)+VSUMI(I,J): NEXT I
```

```
630 RAVG(J)=RSUM(J)/NN
640 PRINT USING "####.####"; RAVG(J);
650 RETURN
660 PRINT STRING$(80,45)
670 PRINT"NOR SCORE";:FOR I=S TO S+SE:DEL=0!:CSUM(I)=0: FOR J=1 TO GN
680 DEL=DEL+DELTA(J,I):CSUM(I)=CSUM(I)+VSUMI(I,J): NEXT J
690 NSCR(I)=CSUM(I)/(DEL*3!)
700 PRINT USING "###.###";NSCR(I);
710 NEXT I
711 PRINT:PRINT "SI VALUE ";:FOR I=S TO S+SE
712 PRINT USING "###.###";CSUM(I);
713 NEXT I
720 IF FLAG=1 THEN GOSUB 800                    'FORMAT LAST PAGE USE
730 PRINT"# OF ZERO";:FOR I=S TO S+SE
740 PRINT USING "########";NCZERO(I);: NEXT I
750 IF FLAG=1 THEN GOTO 770
760 GOTO 790
770 FOR J=1 TO GN: AAVG=RAVG(J)+AAVG: NEXT J  'TOTAL AVG OF RAVG
780 PRINT USING " ###.###";AAVG/GN;:PRINT "(CCL AVG)";
790 RETURN
800 FOR I=1 TO NN: TNSCR=TNSCR+NSCR(I): NEXT I
810 PRINT USING " ###.###";TNSCR/NN;: PRINT"(NSR AVG)"
820 RETURN
1000 OPEN "A:DATA101" FOR INPUT AS #1        'READ DATA INTO WORKING AREA
1010 FOR I=1 TO NN: INPUT #1, CODE(I)
1020 FOR J=1 TO GN: FOR K=1 TO 3
1030 INPUT #1, MEASURE(J,K,I)
1040 NEXT K
1041 VSUMI(I,J)=MEASURE(J,3,I)*((MEASURE(J,1,I)+MEASURE(J,2,I))/2)
1050 IF MEASURE(J,1,I)=0 AND MEASURE(J,2,I)=0 THEN DELTA(J,I)=0 ELSE DELTA(J,I)=
1
1052 NEXT J: NEXT I
1060 CLOSE #1
1070 FOR J=1 TO GN: FOR I=1 TO NN          'CALCULATE SOME BASIC  VALUES
1080 RSUM(J)=RSUM(J)+VSUMI(I,J)
1090 NEXT I: RAVG(J)=RSUM(J)/NN: NEXT J
1100 FOR I=1 TO NN :CSUM(I)=0:DEL=0: FOR J=1 TO GN
1110 DEL=DEL+DELTA(J,I)
1120 CSUM(I)=CSUM(I)+VSUMI(I,J)
1130 NEXT J: NSCR(I)=CSUM(I)/(DEL*3!): NEXT I
2000 REM  SORTING PROCEDURES
2010 FOR J=1 TO GN: RANK(J)=J: NEXT J       'RANK(I) REFLECT THE ORIGINAL ORDER
2020 FOR J=1 TO GN-1
2030 MAX=RAVG(J)
2040 FOR I=J+1 TO GN
2050 IF RAVG(I)<=MAX THEN GOTO 2200
2060 MAX=RAVG(I): RAVG(I)=RAVG(J): RAVG(J)=MAX
2070 TEMP=RANK(J):RANK(J)=RANK(I):RANK(I)=TEMP
2200 NEXT I: NEXT J
2210 OPEN "A:DATA102" FOR OUTPUT AS #1        ' WRITE THE SORTING ORDER BACK
2220 FOR I=1 TO NN: PRINT #1, CODE(I);
2230 FOR J=1 TO GN: FOR K=1 TO 3
2240 PRINT #1, MEASURE(RANK(J),K,I);
2250 NEXT K: NEXT J: PRINT #1," ": NEXT I
2260 CLOSE #1
2500 RETURN
0
```

APPENDIX O

PEARSON IMPORTANCE MATRIX

PEARSON SORTED BY IMPORTANCE AND AVERAGE

	10	12	19	35	14	55	03	27	56	16
QUES 16	1.000	1.000	1.000	1.000	1.000	0.850	1.000	1.000	1.000	1.000
QUES 19	1.000	1.000	1.000	1.000	1.000	0.850	1.000	1.000	1.000	0.850
QUES 7	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.850
QUES 15	1.000	1.000	1.000	1.000	1.000	0.850	1.000	0.850	0.850	0.850
QUES 5	1.000	1.000	1.000	0.700	0.850	0.850	1.000	1.000	1.000	0.850
QUES 17	1.000	1.000	1.000	1.000	1.000	0.850	1.000	1.000	0.850	1.000
QUES 21	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.850	0.850
QUES 1	0.850	1.000	1.000	0.850	0.850	0.850	0.550	1.000	0.400	1.000
QUES 6	1.000	1.000	1.000	0.850	1.000	0.850	1.000	1.000	0.850	0.550
QUES 22	1.000	1.000	1.000	1.000	1.000	0.850	1.000	1.000	0.700	1.000
QUES 13	1.000	1.000	1.000	1.000	0.850	1.000	0.850	1.000	0.850	1.000
QUES 26	1.000	1.000	1.000	1.000	1.000	0.850	1.000	1.000	0.700	0.850
QUES 23	1.000	1.000	1.000	1.000	1.000	1.000	0.700	0.850	0.850	0.550
QUES 25	1.000	1.000	1.000	0.700	1.000	1.000	0.850	1.000	0.850	0.850
QUES 8	1.000	1.000	0.850	1.000	1.000	0.850	1.000	1.000	0.850	0.850
QUES 32	1.000	1.000	1.000	1.000	1.000	0.850	0.850	0.850	0.850	0.550
QUES 27	1.000	1.000	0.700	1.000	1.000	0.700	0.400	1.000	1.000	1.000
QUES 14	1.000	1.000	1.000	1.000	0.850	0.850	1.000	0.550	0.850	0.850
QUES 38	1.000	1.000	1.000	1.000	1.000	0.850	0.850	0.850	0.700	0.850
QUES 18	1.000	1.000	1.000	1.000	0.850	0.850	1.000	1.000	0.850	0.550
QUES 28	1.000	1.000	1.000	1.000	1.000	0.850	1.000	0.850	0.850	0.700
QUES 30	1.000	1.000	1.000	1.000	1.000	1.000	0.850	0.550	1.000	0.700
QUES 11	1.000	1.000	1.000	1.000	1.000	0.850	1.000	0.850	0.850	0.700
QUES 20	1.000	1.000	1.000	1.000	0.850	0.850	1.000	1.000	0.850	0.850
QUES 36	1.000	1.000	1.000	1.000	0.700	1.000	0.550	0.850	0.700	0.550
QUES 31	1.000	1.000	1.000	1.000	0.850	0.850	0.850	0.550	0.850	0.850
QUES 24	1.000	0.850	0.700	1.000	1.000	1.000	0.850	0.850	0.700	0.550
QUES 10	1.000	1.000	1.000	1.000	1.000	0.850	1.000	0.700	0.700	1.000
QUES 39	1.000	1.000	1.000	1.000	0.850	0.850	0.550	1.000	0.400	1.000
QUES 9	1.000	1.000	1.000	1.000	1.000	0.850	1.000	0.550	0.550	0.850
QUES 12	1.000	1.000	1.000	1.000	1.000	1.000	0.550	0.850	0.850	0.850
QUES 35	1.000	1.000	1.000	0.850	1.000	0.850	0.850	0.850	0.700	0.550
QUES 29	1.000	1.000	1.000	1.000	0.850	0.850	0.850	0.550	0.650	0.550
QUES 33	0.850	1.000	1.000	1.000	1.000	0.850	0.850	0.850	0.850	0.550
QUES 3	1.000	0.850	1.000	0.850	0.850	0.850	0.850	0.850	0.850	0.550
QUES 2	0.850	0.850	0.550	0.700	0.850	0.700	0.850	0.850	0.850	0.850
QUES 34	1.000	1.000	1.000	0.700	0.850	0.850	0.850	0.850	0.550	0.700
QUES 37	1.000	0.850	1.000	0.850	0.550	0.850	0.550	0.550	0.700	0.850
QUES 4	0.850	0.550	0.550	0.550	0.550	0.400	0.550	0.100	0.700	0.550
AVERAGE	0.995	0.973	0.958	0.938	0.923	0.865	0.858	0.846	0.800	0.781

	13	10	19	14	15	13	11	12	15	10
QUES 16	0.850	0.850	0.850	1.000	1.000	0.850	0.850	1.000	0.850	0.850
QUES 19	0.700	0.850	0.850	1.000	1.000	0.850	0.850	0.850	0.850	0.700
QUES 7	0.850	0.850	0.850	0.850	0.850	0.400	0.850	0.550	0.850	0.850
QUES 15	0.850	0.850	0.850	1.000	0.850	0.850	0.850	0.850	0.700	0.700
QUES 5	0.850	0.850	0.850	1.000	0.550	0.700	0.850	0.700	0.550	0.850
QUES 17	0.850	0.850	0.700	1.000	0.850	0.850	0.550	0.850	0.700	0.700
QUES 21	0.700	0.850	0.850	0.850	1.000	0.850	0.850	0.850	0.700	0.700
QUES 1	0.850	1.000	1.000	0.850	0.700	0.850	0.250	0.700	0.700	0.850
QUES 6	0.850	0.700	0.850	1.000	0.850	0.850	0.850	0.550	0.550	0.850
QUES 22	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.700	0.550
QUES 13	0.850	0.850	0.700	0.850	0.850	0.850	0.700	0.700	0.550	0.700
QUES 26	0.700	0.850	0.550	1.000	0.850	0.850	0.700	0.850	0.700	0.700
QUES 23	0.700	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.550	0.850
QUES 25	0.700	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.700	0.700
QUES 8	0.850	0.850	0.850	0.850	0.550	0.850	0.550	0.550	0.700	0.700
QUES 32	0.700	0.850	0.850	0.850	1.000	0.550	0.850	0.700	0.700	0.700
QUES 27	0.700	0.550	0.850	1.000	0.550	0.850	1.000	0.850	0.700	0.550
QUES 14	0.700	0.850	0.700	0.850	0.850	0.550	0.550	0.700	0.850	0.550
QUES 38	0.850	0.850	0.700	0.850	0.550	0.850	0.850	0.550	0.700	0.700
QUES 18	0.700	0.850	0.550	0.550	1.000	0.850	0.550	0.700	0.550	0.850
QUES 28	0.700	0.550	0.850	0.850	0.400	0.550	1.000	0.850	0.700	0.550
QUES 30	0.850	0.550	0.850	0.850	0.850	0.850	0.700	0.700	0.700	0.700
QUES 11	0.700	0.850	0.850	0.550	0.550	0.700	0.850	0.550	0.700	0.550
QUES 20	0.850	0.850	0.850	0.250	1.000	0.850	0.550	0.700	0.850	0.550
QUES 36	0.700	0.850	0.550	1.000	1.000	0.850	1.000	0.550	0.550	0.550
QUES 31	0.700	0.850	0.550	0.850	0.850	0.700	0.850	0.700	0.850	0.700
QUES 24	0.850	0.850	0.700	0.250	0.850	0.850	0.700	0.700	0.850	0.550
QUES 10	0.850	0.550	0.700	0.400	0.550	0.700	0.550	0.550	0.700	0.700
QUES 39	0.700	0.550	0.700	0.850	0.550	0.550	0.550	0.850	0.700	0.700
QUES 9	0.850	0.850	0.550	0.850	0.550	0.550	0.550	0.550	0.700	0.550
QUES 12	0.850	0.550	0.850	0.100	0.850	0.550	0.850	0.550	0.550	0.700
QUES 35	0.700	0.550	1.000	0.250	0.400	0.850	0.850	0.700	0.850	0.700
QUES 29	0.850	0.850	0.700	0.850	0.850	0.550	0.550	0.700	0.550	0.700
QUES 33	0.700	0.550	0.700	0.700	0.550	0.850	0.850	0.550	0.550	0.550
QUES 3	0.850	0.700	0.700	0.400	0.550	0.550	0.250	0.550	0.850	0.550
QUES 2	0.700	0.550	0.700	0.850	0.550	0.550	0.400	0.550	0.550	0.700
QUES 34	0.700	0.550	0.700	0.550	0.550	0.550	0.850	0.550	0.550	0.700
QUES 37	0.700	0.850	0.550	0.550	0.550	0.550	0.850	0.400	0.550	0.550
QUES 4	0.700	0.700	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.700
AVERAGE	0.773	0.765	0.758	0.754	0.742	0.731	0.727	0.688	0.685	0.681

	153	138	105	157	147	AVERAGE
QUES 16	0.850	0.850	0.550	0.550	0.700	0.8920
QUES 19	0.700	0.850	0.550	0.550	0.550	0.8560
QUES 7	0.700	1.000	0.850	0.550	0.550	0.8500
QUES 15	0.700	0.850	0.550	0.550	0.550	0.8380
QUES 5	1.000	1.000	0.850	0.550	0.550	0.8380
QUES 17	0.700	0.850	0.550	0.550	0.550	0.8320
QUES 21	1.000	0.250	0.550	0.550	0.550	0.8320
QUES 1	0.700	1.000	1.000	1.000	0.850	0.8260
QUES 6	0.700	1.000	0.850	0.550	0.550	0.8260
QUES 22	0.550	0.700	0.550	0.550	0.250	0.8080
QUES 13	0.550	0.850	0.550	0.550	0.550	0.8080
QUES 26	0.700	0.700	0.550	0.550	0.400	0.8020
QUES 23	0.700	0.850	0.550	0.550	0.250	0.7960
QUES 25	0.700	0.250	0.550	0.550	0.400	0.7900
QUES 8	0.550	0.550	0.850	0.550	0.550	0.7900
QUES 32	0.550	0.700	0.550	0.550	0.400	0.7780
QUES 27	0.850	0.550	0.550	0.550	0.550	0.7780
QUES 14	0.550	0.850	0.700	0.550	0.550	0.7720
QUES 38	0.850	0.550	0.550	0.550	0.250	0.7720
QUES 18	0.550	0.850	0.550	0.550	0.550	0.7720
QUES 28	1.000	0.700	0.550	0.550	0.250	0.7720
QUES 30	0.700	0.250	0.550	0.550	0.400	0.7660
QUES 11	0.550	0.850	0.550	0.550	0.550	0.7660
QUES 20	0.550	0.250	0.550	0.550	0.550	0.7660
QUES 36	0.700	0.850	0.550	0.550	0.250	0.7540
QUES 31	0.550	0.250	0.550	0.550	0.400	0.7480
QUES 24	0.550	0.700	0.550	0.550	0.550	0.7420
QUES 10	0.550	0.850	0.550	0.550	0.550	0.7420
QUES 39	0.700	0.550	0.550	1.000	0.400	0.7420
QUES 9	0.700	0.700	0.550	0.550	0.550	0.7360
QUES 12	0.550	0.550	0.550	0.550	0.550	0.7300
QUES 35	0.550	0.700	0.550	0.550	0.250	0.7240
QUES 29	0.550	0.400	0.550	0.550	0.250	0.7180
QUES 33	0.550	0.250	0.550	0.550	0.250	0.7000
QUES 3	0.700	0.550	0.550	0.550	0.550	0.6940
QUES 2	0.550	0.550	1.000	0.550	0.250	0.6760
QUES 34	0.550	0.250	0.550	0.550	0.250	0.6700
QUES 37	0.550	0.550	0.550	0.550	0.250	0.6520
QUES 4	0.550	0.550	0.550	0.550	0.550	0.5620
AVERAGE	0.662	0.650	0.608	0.573	0.454	0.767(HOR AVG) 0.767(COL AVG)

APPENDIX O-1

LISTING OF PROGRAMS (P1IMP2 AND P1IMP3) TO CREATE PEARSON IMPORTANCE MATRIX

```
10 REM ***********************************************************************
20 REM  ADOT PROJECT DATA ANALYSIS          ARIZONA STATE UNIVERSITY   1984
30 REM ************* FORMULA ***************************************************
40 REM VSUMI=WEIGHTED CALCULATION ON EACH QUESTION OF EACH USER SATISFACTION
50 REM        QUESTIONNAIRE(3 TO -3; 1.00,0.85,0.70,0.55,0.40,0.25,0.10)
60 REM SUM OF VSUMI=Si DEFINED IN THE PAPER
70 REM DELTA = 0 OR 1 DEPENDING THE THE FIRST TWO RESPONSES ON EACH QUESTION
80 REM SUM OF DELTA=Fi DEFINED IN THE PAPER
90 REM NORMAL SCORE(NORSCR)=Si/(Fi*3.0)
  100 REM ***********************************************************************
110 CLEAR: QN=39: NN=25 'TOTAL QUESTIONS ; # OF PEOPLE
130 TI$="GENERATE BY IMPORTANT VALUES AND SORTED BY ROW FIRST"
140 DIM MEASURE(QN,3,NN),CODE(NN),TOP$(NN),MC$(NN),BO$(NN),NCZERO(NN),NSCR(NN)
150 DIM VSUMI(NN,QN), DELTA(QN,NN), FSUM(NN) 'WEIGHTED; 1 OR 0; Fi=SUM OF DELTA
160 DIM CSUM(NN),RANK(NN), RSUM(QN),RAVG(QN)    'NORMAL SCORE=CSUM/FSUM*3.0
161 GOSUB 830
340 END
830 OPEN "A:DATA1" FOR INPUT AS #1        'READ DATA INTO WORKING AREA
840 FOR I=1 TO NN: INPUT #1, CODE(I)
850 FOR J=1 TO QN: FOR K=1 TO 3
860 INPUT #1, MEASURE(J,K,I)
870 NEXT K
880 VSUMI(I,J)=MEASURE(J,3,I)
890 IF MEASURE(J,1,I)=0 AND MEASURE(J,2,I)=0 THEN DELTA(J,I)=0 ELSE DELTA(J,I)=1
900 NEXT J: NEXT I
910 CLOSE #1
920 FOR J=1 TO QN: FOR I=1 TO NN          'CALCULATE SOME BASIC  VALUES
930 RSUM(J)=RSUM(J)+VSUMI(I,J)
940 NEXT I: RAVG(J)=RSUM(J)/NN: NEXT J
950 FOR I=1 TO NN :CSUM(I)=0:DEL=0: FOR J=1 TO QN
960 DEL=DEL+DELTA(J,I)
970 CSUM(I)=CSUM(I)+VSUMI(I,J)
980 NEXT J: NSCR(I)=CSUM(I)/QN : NEXT I
990 REM  SORTING PROCEDURES
1000 FOR I=1 TO NN: RANK(I)=I: NEXT I       'RANK(I) REFLECT THE ORIGINAL ORDER
1010 FOR I=1 TO NN-1
1020 MAX=NSCR(I)
1030 FOR J=I+1 TO NN
1040 IF NSCR(J)<=MAX THEN GOTO 1070
1050 MAX=NSCR(J): NSCR(J)=NSCR(I): NSCR(I)=MAX
1060 TEMP=RANK(I):RANK(I)=RANK(J):RANK(J)=TEMP
1070 NEXT J: NEXT I
1080 OPEN "A:DATA201" FOR OUTPUT AS #1        ' WRITE THE SORTING ORDER BACK
1090 FOR I=1 TO NN: PRINT #1, CODE(RANK(I));        ' SORT BY AVERAGE
1100 FOR J=1 TO QN: FOR K=1 TO 3
1110 PRINT #1, MEASURE(J,K,RANK(I));
1120 NEXT K: NEXT J: PRINT #1," ": NEXT I
1130 CLOSE #1
1140 RETURN
0
```

```
10 REM ##################################################################
20 REM  ADOT PROJECT DATA ANALYSIS          ARIZONA STATE UNIVERSITY   1984
30 REM ############# FORMULA ##############################################
40 REM VSUMI=WEIGHTED CALCULATION ON EACH QUESTION OF EACH USER SATISFACTION
50 REM        QUESTIONNAIRE(3 TO -3; 1.00,0.85,0.70,0.55,0.40,0.25,0.10)
60 REM SUM OF VSUMI=Si DEFINED IN THE PAPER
70 REM DELTA = 0 OR 1 DEPENDING THE THE FIRST TWO RESPONSES ON EACH QUESTION
80 REM SUM OF DELTA=Fi DEFINED IN THE PAPER
90 REM NORMAL SCORE(NORSCR)=Si/(Fi*3.0)
 100 REM ##################################################################
110 CLEAR: QN=39: NN=25 'TOTAL QUESTIONS ; # OF PEOPLE
130 TI$="PEARSON SORTED BY IMPORTANCE AND AVERAGE"
140 DIM MEASURE(QN,3,NN),CODE(QN),TOP$(NN),MC$(NN),BO$(NN),NCZERO(NN),NSCR(NN)
150 DIM VSUMI(NN,QN), DELTA(QN,NN), FSUM(NN) 'WEIGHTED; 1 OR 0; Fi=SUM OF DELTA
160 DIM CSUM(NN),RANK(QN), RSUM(QN),RAVG(QN)   'NORMAL SCORE=CSUM/FSUM*3.0
161 GOSUB 830
162 OPEN "A:DATA202" FOR INPUT AS #1
170 FOR I=1 TO NN : FSUM(I)=0                  'FSUM IS FOR COLUMN SUM-UP USE
180 REM SEPERATE CODE INTO TOP, MIDDLE AND BOTTOM PARTS FOR PRINT HEADING
190 INPUT #1, CODE(I): CODE$=STR$(CODE(I)) 'BEWARE CODE$ CONTAIN A SPACE AHEAD
200 TOP$(I)=MID$(CODE$,2,1)
210 MC$(I)=MID$(CODE$,3,1)
220 BO$(I)=RIGHT$(CODE$,1)
230 REM READ 39 X 3 DATA FOR EACH QUESTIONNAIRE
240 FOR J=1 TO QN
250 FOR K=1 TO 3: INPUT #1, MEASURE(J,K,I): NEXT K
260 REM VSUMI=IMPORTANT FACTOR ONLY
270 VSUMI(I,J)=MEASURE(J,3,I)  'JUST WANT IMPORTANT VALUE
280 REM DELTA COMPARE THE RESPONSE VALUES; IF SAME , =0, ELSE =1
290 IF MEASURE(J,1,I)=0 AND MEASURE(J,2,I)=0 THEN DELTA(J,I)=0 ELSE DELTA(J,I)=1
300 IF VSUMI(I,J)=0 THEN NCZERO(I)=NCZERO(I)+1
310 NEXT J: NEXT I
320 CLOSE #1
330 GOSUB 350
340 END
350 REM ##################################################################
360 REM PRINT THE MATRIX OUT
370 PRINT TI$  : FLAG=0
380 S=1: SE=9  'S & SE DEFINE HOW MANY COLUMNS TO BE SHOWN IN A SINGLE PRINTOUT
390 SETAIL=NN-INT(NN/(S+SE))*(S+SE)
400 PGN=INT(NN/(S+SE))+1: FOR PAGE=1 TO PGN 'DEFINE # OF PAGES PRINTOUT
410 PRINT TAB(13);
420 FOR I=S TO S+SE:PRINT TOP$(I) SPC(6):NEXT I: PRINT
430 PRINT TAB(13);
440 FOR I=S TO S+SE:IF I=NN THEN GOTO 460 ELSE PRINT MC$(I) SPC(6):NEXT I
450 PRINT:GOTO 470
460 PRINT MC$(I) SPC(6) "AVERAGE"
470 PRINT TAB(13);
480 FOR I=S TO S+SE: PRINT BO$(I) SPC(6):NEXT I: PRINT
490 PRINT STRING$(80,45)
500 FOR J=1 TO QN: IF RANK(J)<10 THEN GAP$="  " ELSE GAP$=" "
510 PRINT "QUES";RANK(J);GAP$;:FOR I=S TO S+SE:PRINT USING "###.###";VSUMI(I,J);
520 NEXT I:IF FLAG=1 THEN GOSUB 610  'CALCULATE HORIZONTAL AVERAGE VALUES
530 PRINT: NEXT J
540 GOSUB 660  'CLACULATE AVG OF IMPORTANT VALUES
550 IF PAGE=PGN THEN GOTO 600
560 A$=INKEY$: IF A$="Y" OR A$="y" THEN GOTO 570 ELSE 560
570 IF PAGE+1<>PGN   THEN S=S+10: GOTO 590
580 IF PAGE+1=PGN    THEN S=S+10  : SE=SETAIL-1: FLAG=1   : GOTO 590
590 NEXT PAGE
```

```
600 RETURN
610 RSUM(J)=0: FOR I=1 TO NN
620 RSUM(J)=RSUM(J)+VSUMI(I,J): NEXT I
630 RAVG(J)=RSUM(J)/NN
640 PRINT USING "####.####"; RAVG(J);
650 RETURN
660 PRINT STRING$(80,45)
670 PRINT"AVERAGE  ";:FOR I=S TO S+SE:DEL=0!:CSUM(I)=0: FOR J=1 TO GN
680 CSUM(I)=CSUM(I)+VSUMI(I,J): NEXT J
690 NSCR(I)=CSUM(I)/GN
700 PRINT USING "###.###";NSCR(I);
710 NEXT I
720 IF FLAG=1 THEN GOSUB 800                    'FORMAT LAST PAGE USE
730 PRINT"          ";:FOR I=S TO S+SE
740 PRINT"        ";: NEXT I
750 IF FLAG=1 THEN GOTO 770
760 GOTO 790
770 FOR J=1 TO GN: AAVG=RAVG(J)+AAVG: NEXT J  'TOTAL AVG OF RAVG
780 PRINT USING " ###.###";AAVG/GN;:PRINT "(COL AVG)";
790 RETURN
800 FOR I=1 TO NN: TNSCR=TNSCR+NSCR(I): NEXT I
810 PRINT USING " ###.###";TNSCR/NN;: PRINT"(HOR AVG)"
820 RETURN
830 OPEN "A:DATA201" FOR INPUT AS #1        'READ DATA INTO WORKING AREA
840 FOR I=1 TO NN: INPUT #1, CODE(I)
850 FOR J=1 TO GN: FOR K=1 TO 3
860 INPUT #1, MEASURE(J,K,I)
870 NEXT K
880 VSUMI(I,J)=MEASURE(J,3,I)
890 IF MEASURE(J,1,I)=0 AND MEASURE(J,2,I)=0 THEN DELTA(J,I)=0 ELSE DELTA(J,I)=1
900 NEXT J: NEXT I
910 CLOSE #1
920 FOR J=1 TO GN: FOR I=1 TO NN          'CALCULATE SOME BASIC  VALUES
930 RSUM(J)=RSUM(J)+VSUMI(I,J)
940 NEXT I: RAVG(J)=RSUM(J)/NN: NEXT J
950 FOR I=1 TO NN :CSUM(I)=0:DEL=0: FOR J=1 TO GN
960 DEL=DEL+DELTA(J,I)
970 CSUM(I)=CSUM(I)+VSUMI(I,J)
980 NEXT J: NSCR(I)=CSUM(I)/GN : NEXT I
990 REM  SORTING PROCEDURES
1000 FOR J=1 TO GN: RANK(J)=J: NEXT J       'RANK(I) REFLECT THE ORIGINAL ORDER
1010 FOR J=1 TO GN-1
1020 MAX=RAVG(J)
1030 FOR I=J+1 TO GN
1040 IF RAVG(I)<=MAX THEN GOTO 1070
1050 MAX=RAVG(I): RAVG(I)=RAVG(J): RAVG(J)=MAX
1060 TEMP=RANK(J):RANK(J)=RANK(I):RANK(I)=TEMP
1070 NEXT I: NEXT J
1080 OPEN "A:DATA202" FOR OUTPUT AS #1        ' WRITE THE SORTING ORDER BACK
1090 FOR I=1 TO NN: PRINT #1, CODE(I);        ' SORT BY AVERAGE
1100 FOR J=1 TO GN: FOR K=1 TO 3
1110 PRINT #1, MEASURE(RANK(J),K,I);
1120 NEXT K: NEXT J: PRINT #1," ": NEXT I
1130 CLOSE #1
1140 RETURN
0
```