

DESIGN A OUTPUT PROCESSOR FOR A GRADUATE
STUDENT RECORD SYSTEM

by

JOHN JOSEPH OTT

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A MASTER'S REPORT

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requirements for the degree

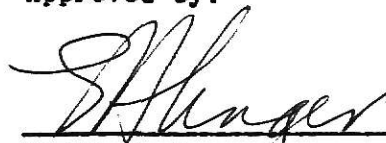
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Approved by:


Major Professor

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ILLEGIBLE DOCUMENT

**THE FOLLOWING
DOCUMENT(S) IS OF
POOR LEGIBILITY IN
THE ORIGINAL**

**THIS IS THE BEST
COPY AVAILABLE**

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CHAPTER I

INTRODUCTION

1.1 Background

This report is an outgrowth of a desire of the Computer Science Department at Kansas State University to more efficiently and effectively monitor and manage its graduate students. This process begins when the Department receives the student's initial inquiry. It continues as the student traverses through the many facets of his/her study and terminates when his/her active file is archived upon graduation.

1.2 Objective

It is the purpose of this report to show the data analysis performed on input and output documents currently used by the Computer Science Department in monitoring and managing its graduate students and to show the design of an Output Processor using the facilities of a data base management system called INGRES.

The results of the above analysis will be compared and, as appropriate, incorporated into the development of the Graduate Student Record Data Base. The totality of these two efforts will provide all the information indicated as being desirable for this design effort.

This data base is a relational data base (third normal form) residing on the Computer Science Department's Perkin Elmer, Model 3220, minicomputer. This information will be used to generate a student summary sheet for use by faculty members when advising a student on his/her program of study.

In addition to the student summary sheet, the system will generate a wide variety of student-oriented departmental correspondence.

1.3 Methods

The initiation of this effort began with the data collection of both input and output documents currently used by the Graduate School and the Computer Science Department in establishing and maintaining the individual graduate student files.

User interviews were conducted in an attempt to establish, as clearly as possible, the users' requirements definition [4].

Next, through the use of WARNIER/ORR diagrams [3,4], a hierarchy of information sets is established for the data base utilized by this system. These diagrams provide additional analysis information for use in the hierarchy of input analysis, documenting of data flow, and design of the output programs.

1.4 Analysis Results

The results of the analysis surfaced several problem areas. The first of the problem areas was syntactic and semantic data redundancy. Next came the problem of security for the data base, in particular, those aspects dealing with the requirements of the Privacy Act of 1974, the Freedom of Information Act and those specific requirements needed by the Computer Science Department itself. The security implications of both these acts and those of the Department had significant impact on

this current design effort, as well as any system enhancements contemplated in the future.

Another problem which surfaced was the gathering of like data from multiple sources. This particular problem required some additional analysis since it is the product of timing (when documents arrive for input into the system) and who has proponency for the various documents (i.e., Graduate School, Computer Science Department, etc.). The analysis clearly identified a need for the Computer Science Department to review and redesign some input and output documents.

1.5 Report Outline

In Chapter III of this report, the problem definition and transitions through the gathering and analysis of the inputs and outputs will be discussed using a technique developed by Warnier and Orr, called structured requirements definition. The outgrowth of this effort is an Output Processor which will satisfy, to the extent possible, the currently desired Computer Science Department reports and letters needed for managing its graduate students.

CHAPTER II

SYSTEM INPUTS

2.1 Collection Process and Interviews

The collection process involved the gathering of twelve input documents (see Appendix A) and ten output documents (see Appendix C) currently used by both the Computer Science Department and the Graduate School.

Interviews were conducted with the primary departmental users--Mrs. Cole, Mrs. Skidmore (secretaries), Dr. Unger (chairperson of the Graduate Studies Committee), Mr. Campbell (Department administrative assistant), and Dr. Wallentine (head of the Department). The primary objectives of these interviews were to more clearly identify:

- Those documents which were used in an input role
- What information was considered as required information and from which document it was gleaned
- The general flow of a student's query/application from the time of application receipt at the University to actual acceptance or rejection of the student
- The output document used and under what conditions
- Any new output requirements

As a result of the interviews and the concurrent document review, it was clearly identified that there were two major categories of students, foreign and U.S. With each category of student came different University acceptance requirements (see Figure 2.1). For example, the failure of a foreign student applicant to meet the financial support requirements disqualified him or her from participating in any of the University graduate programs. No such condition is applied to a U.S. student.

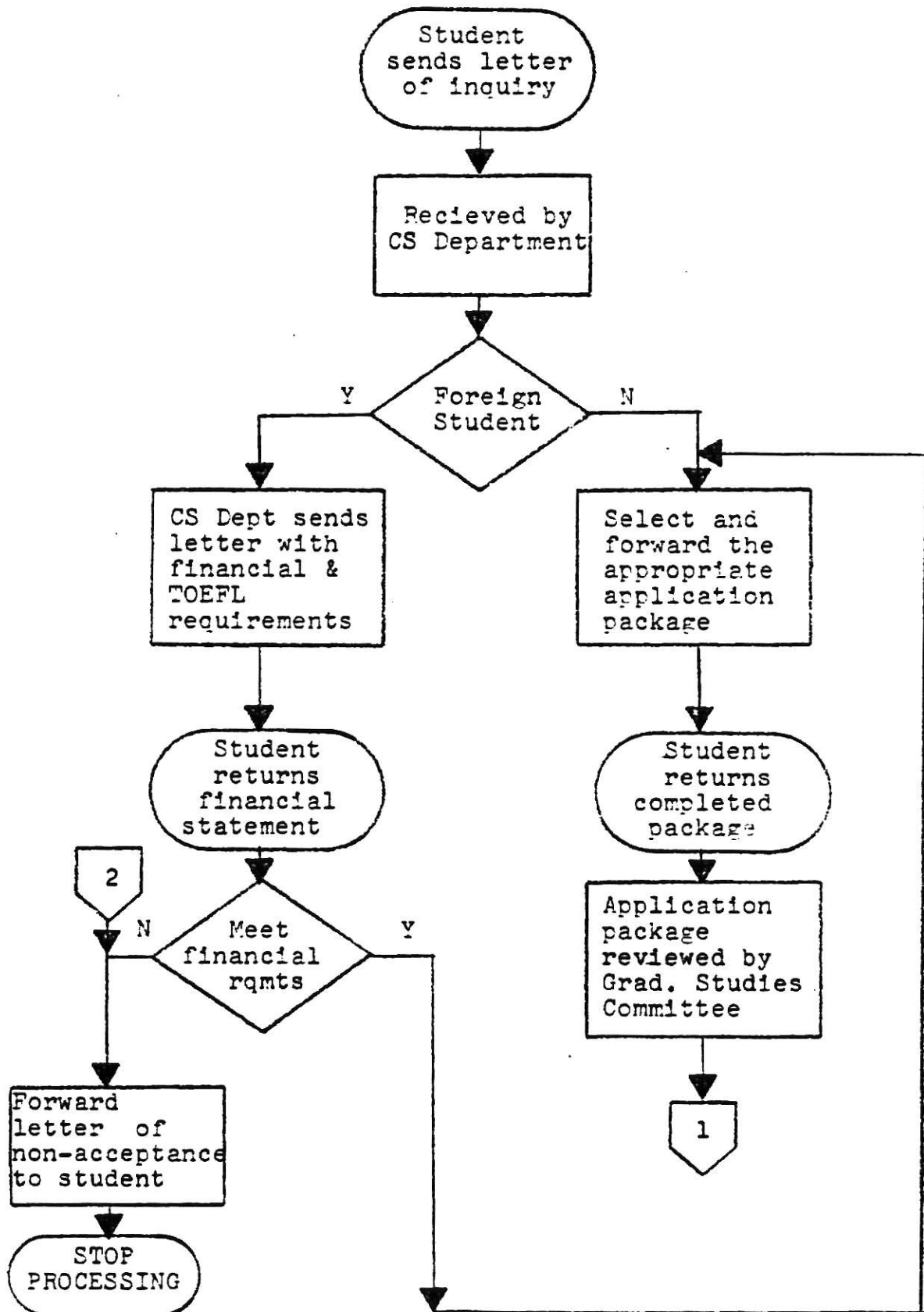


Figure 2.1
Application Process

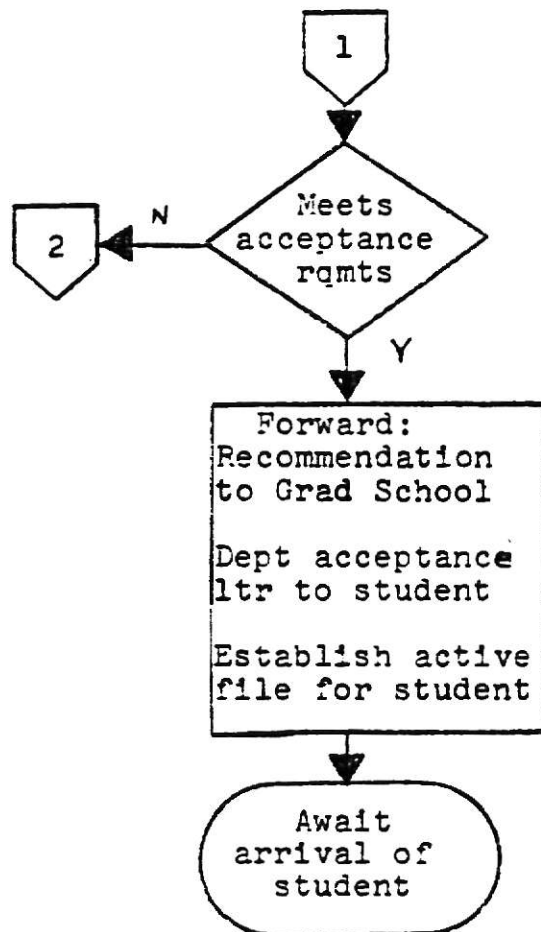


Figure 2.1 cont.
Application Process

When a foreign applicant has failed to meet the financial support requirements, the Computer Science Department does not forward any other application material. This checking mechanism greatly reduces the number of application packages mailed and the number of student applicant files created and processed by the Computer Science Department.

A second round of interviews were conducted with Dr. Unger and Mrs. Skidmore in an effort to more clearly obtain a requirements' definition. During the additional interview with Dr. Unger, she identified five new standard reports which both she and Dr. Wallentine felt were needed by faculty members. The reports were:

- Graduate Student Roster
- Student Graduation Forecast
- Students Without a Major Professor
- Students Not Making "Normal Progress"
- Student Summary Sheet for a given Graduate Student

During the conduct of the second interview with Mrs. Skidmore, she identified the need for an additional standard screen report capability which would aid her in tracking which student applicants had returned all of the required admission documents and whose application package could now be forwarded to the Department's Graduate Studies Committee for their review and recommendations.

2.2 Analysis of Source, Identification of Data Items, and Redundancy

The analysis of the source documents involved the identification of individual data items from each of the documents and an analysis of the redundancies in the identified items.

During the course of this analysis, specific data items were recorded on a data analysis sheet (see Appendix B), classified by their type (input/output) and on which documents they appeared. This analysis and the individual interviews identified over 90 data items needed in the Graduate Student Record Data Base.

Figure 2.2 depicts the input documents with a associated reference key.

Key	Document Title
I1	Graduate School Application
I2	C.S. Department Application
I3	Letters of Recommendation
I4	M.S. Graduate Student Information Sheet
I5	Program of Study
I6	Graduate Record Exam Report of Scores
I7	Official Transcripts
I8	Graduate School Acceptance/Probationary Letter
I9	Semester Grade Reports
I10	Financial Statement
I11	International Student Medical Certificate
I12	Test of English as a Foreign Language (TOEFL) Report of Scores

Figure 2.2
Input Data Sources with Key

The identification of data items categorized by the input document is provided in Figures 2.3 through 2.14.

From the Graduate School Application the following data items were identified:

NAME

SOCIAL SECURITY NUMBER

SEX

ADMISSION REQUESTED FOR:

- FALL
- SPRING
- SUMMER
- YEAR

TYPE OF ADMISSION:

- MASTERS
- PHD
- SPECIAL

MAJOR FIELD

OTHER NAMES UNDER WHICH PREVIOUSLY ENROLLED

PERMANENT ADDRESS

PRESENT ADDRESS

PHONE NUMBER

DATE CURRENT KANSAS RESIDENCY BEGAN

COUNTRY OF CITIZENSHIP

PREVIOUS COLLEGES AND UNIVERSITIES ATTENDED

DATES ATTENDED

DATE OF APPLICATION

Figure 2.3
Data Items on the Graduate School Application

From the Computer Science Department Application the following data items were identified:

NAME
 PRESENT ADDRESS
 SEX
 CITIZENSHIP
 TELEPHONE NUMBER
 SOCIAL SECURITY NUMBER
 DEGREE SOUGHT:
 - MS
 - PHD
 - SPECIAL
 GRADUATE RECORD EXAM (GRE) SCORES:
 - VERBAL
 - QUANTITATIVE
 ADVANCED GRE SCORE AND FIELD
 TOEFL SCORE
 HIGHEST DEGREE ATTAINED
 DEGREE DATE
 SCHOOL
 MAJOR
 OVERALL GRADE POINT AVERAGE (GPA)
 GRADING SCALE
 COURSES QUALIFIED TO TEACH:
 100 200 201 202 203 204 205 206
 300 305 306 340 341 405 410 420
 430 450 460 561 580
 DATE OF APPLICATION

Figure 2.4
 Data Items on the Computer Science Department Application

From the Letter of Recommendation the following data items were identified:

NUMBER OF LETTERS OF RECOMMENDATION RECEIVED

Figure 2.5
 Data Items Pertaining to Letters of Recommendation

From the M.S. Graduate Student Information Form the following data items were identified:

NAME
DATE
ADDRESS
ADVISOR
MAJOR PROFESSOR
TELEPHONE NUMBER
DATE OF ENTRY INTO PROGRAM
EXPECTED GRADUATION DATE
STUDENT STATUS:
- SPECIAL
- GRADUATE (MS/PHD)
- PROVISIONAL
- PROBATIONARY
PREVIOUS DEGREES EARNED
DEGREE DATE
DATES ATTENDED
DEFICIENCY COURSES TAKEN:
- COURSE NAME
- COURSE NUMBER
- GRADE
GRADUATE COURSES TAKEN:
- COURSE NAME
- COURSE NUMBER
- GRADE
- SEMESTER
RESEARCH OPTION:
- MS REPORT
- THESIS
- NON-THESIS REPORT (PAPER)
- TITLE
- PROPOSAL DATE
- PROPOSAL RESULTS
- ORALS DATE
- ORALS RESULTS
ADVISORY COMMITTEE MEMBERSHIP
- MAJOR PROFESSOR
- MEMBER-2
- MEMBER-3

Figure 2.6
Data Items on the M.S. Graduate Student Information Sheet

From the Program of Study the following data items were identified:

NAME
CURRICULUM
TYPE PLAN:
 - MASTER'S THESIS
 - MASTER'S REPORT
 - NON-THESIS REPORT
MAJOR COURSES:
 - COURSE NAME
 - COURSE NUMBER
 - CREDITS
SUPPORTING COURSES:
 - COURSE NAME
 - COURSE NUMBER
 - CREDITS
ADVISORY COMMITTEE:
 - MEMBER-2
 - MEMBER-3
DATE APPROVED

Figure 2.7
Date Items on the Program of Study

From the Official Graduate Record Exam (GRE) Report of Scores the following data items were identified:

NAME
APTITUDE SCORES:
 - VERBAL SCORE
 - QUANTITATIVE SCORE
 - ANALYTICAL SCORE
ADVANCED TEST:
 - ADVANCED GRE SCORE
 - ADVANCED GRE FIELD

Figure 2.8
Data Items on the Official GRE Report of Scores

From the Graduate School Acceptance/Probationary Letter the following data items were identified:

NAME
TYPE OF ADMISSION:
- MASTERS
- PHD
- SPECIAL
CURRICULUM:
- COMPUTER SCIENCE
STUDENT STATUS:
- REGULAR
- PROVISIONAL
- PROBATIONARY
DATE

Figure 2.9
Data Items on the Graduate School Acceptance Letter

From the University's Semester Grade Reports the following data items were identified:

NAME
TERM
COURSE NAME
COURSE NUMBER
CREDITS
GRADE
CUMULATIVE GRADE POINT AVERAGE (GPA)

Figure 2.10
Data Items on the Semester Grade Report

From the Graduate School's Financial Statement the following data items were identified:

NAME
FINANCES AVAILABLE

Figure 2.11
Data Items on the Graduate School's Financial Statement

From the University's International Student Medical Certificate the following data items were identified:

NAME
MEDICAL CERTIFICATION

Figure 2.12
Data Items on the Medical Statement

From the TOEFL Report of Scores the following data items were identified:

NAME
TOEFL TOTAL SCORE
TEST DATE

Figure 2.13
Data Items on the Official TOEFL Report of Scores

During the input analysis, twenty data items were found to have multiple sources (see Figure 2.14).

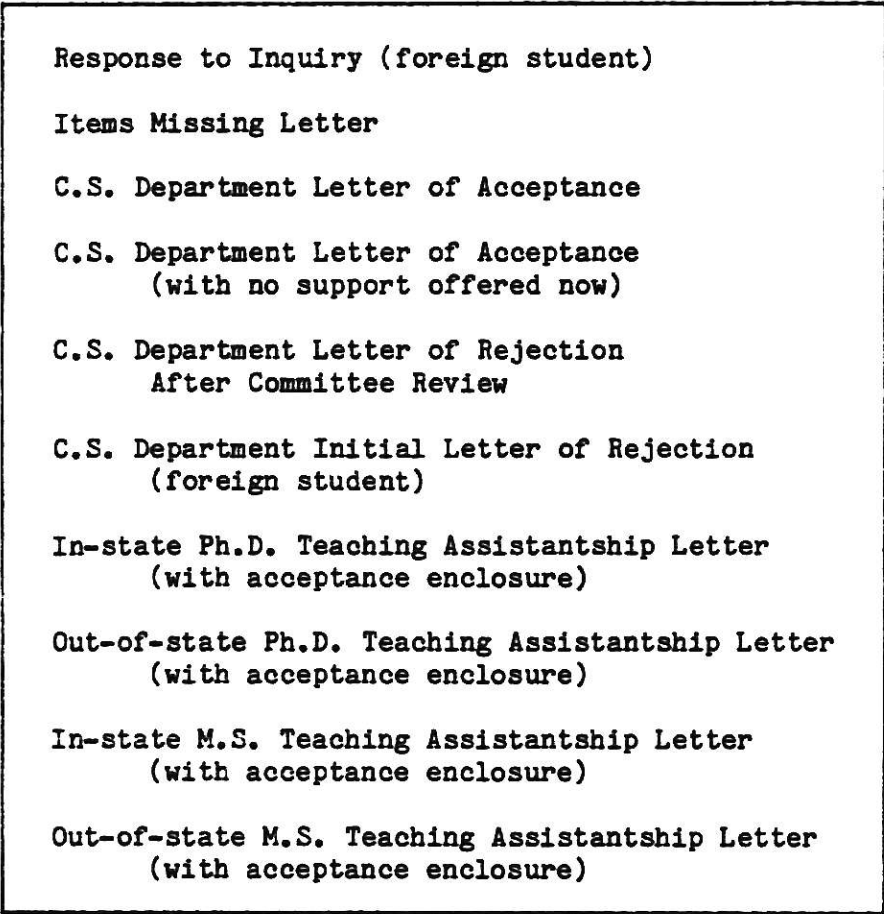
Data Item	Sources
Advanced GRE Score	I2,I6
Course Number	I4,I5
Course Name	I4,I5
Credit	I4,I5
Course Grade	I4,I7,I9
Dates Attended Previous Schools	I1,I4
Previous Degree	I1,I4
Degree Date	I1,I4
GRE Verbal Score	I2,I6
GRE Quantitative Score	I2,I6
GRE Analytical Score	I2,I6
Student Status	I1,I2,I4,I8
Current Address	I1,I2,I3
Current Phone Number	I1,I2,I3
Major Professor	I4,I5
Committee Members	I4,I5
Type of Graduate Work (e.g., Thesis)	I4,I5
Sex	I1,I2
Previous Universities Attended	I1,I2,I4
TOEFL Score	I1,I12

Figure 2.14
Multiple Source Items

2.3 Relationships of Documents

The analysis of the relationship of documents is based primarily on whether they are used as input or output in the processes of establishing and maintaining a student file within the Computer Science Department at Kansas State University.

There are twelve documents (see Figure 2.2) which provide input data to the student's file, and nine normal process output documents which are generated (see Figure 2.15).



Response to Inquiry (foreign student)

Items Missing Letter

C.S. Department Letter of Acceptance

C.S. Department Letter of Acceptance
(with no support offered now)

C.S. Department Letter of Rejection
After Committee Review

C.S. Department Initial Letter of Rejection
(foreign student)

In-state Ph.D. Teaching Assistantship Letter
(with acceptance enclosure)

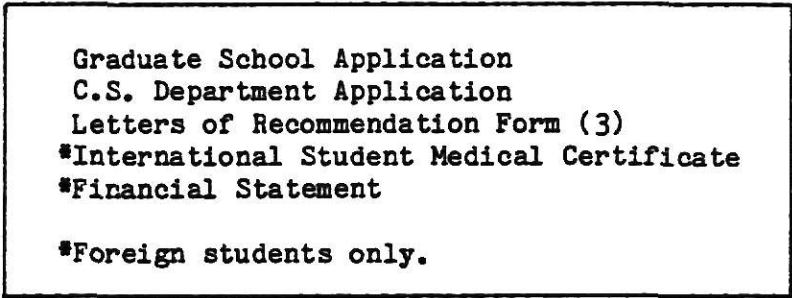
Out-of-state Ph.D. Teaching Assistantship Letter
(with acceptance enclosure)

In-state M.S. Teaching Assistantship Letter
(with acceptance enclosure)

Out-of-state M.S. Teaching Assistantship Letter
(with acceptance enclosure)

Figure 2.15
Output Documents

Figure 2.16 identifies those documents which are a part of the admission package forwarded to the potential student in response to a letter of inquiry.



Graduate School Application
C.S. Department Application
Letters of Recommendation Form (3)
*International Student Medical Certificate
*Financial Statement

*Foreign students only.

Figure 2.16
Documents in an Admission Package

Prior to admission, the student must complete and submit the Graduate School and the Computer Science (C.S.) Department admission applications. He or she is also responsible for soliciting the required letters of recommendation and forwarding official transcripts from all previously attended universities (directly from the university of attendance to the Computer Science Department).

The official GRE scores are an input to the system. In an effort to expedite application evaluations, the student-furnished (unofficial) scores are used initially with an evaluation performed upon receipt of the official scores.

As with the GRE scores, the student-furnished TOEFL score is accepted initially. The official score becomes a part of the student's file when it finally arrives at Kansas State University.

The input documents discussed to this point are needed by the Computer Science Department's Graduate Studies Committee to determine if a potential student has met the requirements deemed necessary to pursue graduate work at Kansas State University.

The Graduate School Acceptance Letter is the input document to the Department which provides the student's acceptance date, his or her status and specified deficiency courses.

The Semester Grade Report is used as a periodic update of input which aids in monitoring a student's progress through his or her program of study. It is an official document provided by the registrar's office which provides information on course name, number and grade achieved, as well as the cumulative grade point average (GPA).

The Program of Study, after approval by both the Computer Science Department and the Graduate School, is an input into the student's file and is used as a monitoring tool to check the student's progress toward degree completion.

Within the relationships of documents, it is necessary to look at those documents which are generated as outputs as a direct result of the evaluation of the selected inputs. This relationship begins, as previously stated, with the receipt of a letter of inquiry. The output document generated is the Response to an Inquiry Letter from a potential student.

Next, a potential student's file is forwarded to the Graduate Studies Committee for evaluation and acceptance recommendations.

The types of output documents generated from the Graduate Studies Committee and the conditions under which they are generated are:

- Response to Inquiry (foreign student)

This letter is produced when the Computer Science Department has received a letter of inquiry from a potential foreign student.

- Items Missing Letter

Sent to the student upon receipt of application and after periodic review or inquiry as to the status of the application.

- C.S. Department Letter of Acceptance

This letter is produced when the student has met the entrance requirements and has not requested financial assistance.

- C.S. Department Letter of Acceptance (with no support offered now)

This letter is produced when the student has met the entrance requirements and has requested financial assistance; however, the Department is not capable of offering any assistance at this time.

- C.S. Department Letter of Rejection After Committee Review

This letter is produced when the Graduate Studies Committee has reviewed the applicant's file and found it to be deficient.

- C.S. Department Initial Letter of Rejection (foreign student)

This letter is produced when the student has not met either the financial requirement, TOEFL score requirement, or the experience or undergraduate requirements. As a result of the deficiency, his file is not sent to the Graduate Studies Committee.

- In-state Ph.D. Teaching Assistantship (with acceptance enclosure)

This letter is produced when the student has met the Ph.D. entrance requirements, has applied for financial assistance, is a qualified resident, and the Department is capable of making a teaching assistantship offer.

- Out-of-state Ph.D. Teaching Assistantship (with acceptance enclosure)

This letter is produced when the student has met the Ph.D. entrance requirements, has applied for financial assistance, is not a qualified resident, and the Department is capable of making a teaching assistantship offer.

- In-state M.S. Teaching Assistantship (with acceptance enclosure)

This letter is produced when the student has met the M.S. entrance requirements, has applied for financial assistance, is a qualified resident, and the Department is capable of making a teaching assistantship offer.

- Out-of-state M.S. Teaching Assistantship (with acceptance enclosure)

This letter is produced when the student has met the M.S. entrance requirements, has applied for financial assistance, is not a qualified resident, and the Department is capable of making a teaching assistantship offer.

2.4 Renaming of Data Items

During the course of the analysis, it became apparent that there were several different data items with the same name (i.e., syntactic redundancy). Some of these data items were used only for manual purposes but others were part of the Graduate Student Record Data Base. To eliminate syntactic redundancy, it was necessary to rename some data items.

The next activity involved checking the data base for completeness and consistency. Figure 2.17 provides a correlation between the data item name on a given source document and the name it was assigned in the data base.

Key	Source Name	Data Base Name
I1	ADMISSION REQ: FALL SPRING SUMMER YEAR TYPE ADMIN REQ: MASTERS PHD SPECIAL MAJOR FIELD SOCIAL SECURITY NO. SEX NAME OTHER NAMES UNDER WHICH ENROLLED PERMANENT ADDRESS PHONE NUMBER CURRENT RESIDENCY BEGAN COUNTRY OF CITIZENSHIP COLLEGE & UNIVERSITIES ATTENDED DATE ATTENDED DATE	FALL SPRING SUMMER YEAR MS PHD I_SPEC CURRICULUM SSAN SEX NAME PREVIOUS_NAME PERMANENT_ADDRESS LOCAL_TEL_NO RESIDENCY_DATE CITIZENSHIP SCHOOL DATE_ATTENDED GRAD_APP_DATE
I2	NAME PRESENT ADDRESS SEX CITIZENSHIP TELEPHONE SOCIAL SECURITY NUMBER	NAME LOCAL_ADDRESS SEX CITIZENSHIP LOCAL_TEL_NO SSAN

Figure 2.17: Continued.

Key	Source Name	Data Base Name
	DEGREE SOUGHT: MS/PHD/SPEC	MS/PHD/I_SPEC
	GRE SCORES: VERBAL QUANTITATIVE ADVANCED FIELD	GRE_VERBAL_SC GRE_QUANT_SC GRE_ANALYTICAL_SC GRE_FIELD
	TOEFL SCORE	TOEFL_SC
	HIGHEST DEGREE ATTAINED	DEGREE
	DEGREE DATE	DEGREE_DATE
	SCHOOL	SCHOOL
	MAJOR	SUBJECT_AREA
	OVERALL GPA	GPA
	GRADING SCALE	SCALE
	COURSES QUALIFIED TO TEACH: 100/200/201/202 203/204/205/206 300/305/306/340 341/405/410/420 430/450/460/561 580	CRS_1/CRS_2/CRS_3/CRS_4 CRS_5/CRS_6/CRS_7/CRS_8 CRS_9/CRS_10/CRS_11/CRS_12 CRS_13/CRS_14/CRS_15/CRS_16 CRS_17/CRS_18/CRS_19/CRS_20 CRS_21
	DATE	CMPSC_APP_DOC_DATE
I3	LETTERS OF RECOMMENDATION	LETTERS_OF_REC
I4	DATE	CS_INTD_DOC_DATE
	NAME	
	ADDRESS	
	ADVISOR	ADVISOR
	MAJOR PROFESSOR	MAJ_PROF
	TELEPHONE NO.	

Figure 2.17: Continued.

Key	Source Name	Data Base Name
	DATE OF ENTRY INTO PROGRAM	PROG_ENTRY_DATE
	EXPECTED GRADUATION DATE	EXP_GRAD_DATE
	STATUS: SPECIAL	I_SPEC
	GRAD	MS/PHD
	PROV	PROV
	PROB	PROV
	PREVIOUS DEGREES EARNED	DEGREE
	DEGREE DATE	DEGREE_DATE
	DATE ATTENDED	DATES_ATTENDED
	DEFICIENCY COURSES	DEF
	COURSE NAME	CRS_NAME
	COURSE NUMBER	CRS_NO
	SEMESTER	SEM_YR
	GRADE	CRS_GRADE
	RESEARCH OPTION:	
	M.S. REPORT	REPORT
	THESIS	THESIS
	NONTHESIS REPORT	PAPER
	TITLE	TITLE
	PROPOSAL DATE	PROPOSAL_DATE
	PROPOSAL RESULTS	PROPOSAL_APPROVED
	ORALS DATE	ORALS_DATE
	ORALS RESULTS	COND_PASS/PASS/FAIL
	ADVISORY COMMITTEE:	
	MAJOR PROFESSOR	MAJ_PROF
	2d MEMBER	MEMBER_2
	3d MEMBER	MEMBER_3
I5	NAME	NAME
	CURRICULUM	CURRICULUM

Figure 2.17: Continued.

Key	Source Name	Data Base Name
	TYPE PLAN: MASTER'S THESIS MASTER'S REPORT NON-THESIS REPORT MAJOR COURSES: COURSE NAME COURSE NUMBER CREDITS SUPPORTING COURSES: COURSE NAME COURSE NUMBER CREDITS ADVISORY COMMITTEE: 2d MEMBER 3d MEMBER DATE APPROVED	THESIS REPORT PAPER MAJOR CRS_NAME CRS_NO CREDIT SUPPORT CRS_NAME CRS_NO CREDIT MEMBER_2 MEMBER_3 PROG_OF_STUDY_APP_DATE
I6	NAME APTITUDE SCORES: VERBAL SCORE QUANTITATIVE SCORE ANALYTICAL SCORE ADVANCED TEST: ADVANCED GRE SCROE ADVANCED GRE FIELD	NAME GRE_VERBAL_SC GRE_QUANT_SC GRE_ANALYTICAL_SC ADV_GRE_SC ADV_GRE_FLD
I7	TRANSCRIPTS	
I8	NAME STUDENT STATUS: REGULAR PROVISIONAL PROBATIONARY	NAME REG PROV PROB

Key	Source Name	Data Base Name
	TYPE ADMISSION: MASTERS PHD SPECIAL CURRICULUM DATE	MS PHD I_SPEC CURRICULUM PROGRAM ENTRY DATE
I9	NAME TERM COURSE NUMBER COURSE NAME CREDITS GRADE CUMULATIVE GPA	NAME SEM_YR CRS_NO CRS_NAME CREDIT CRS_GRD CURRENT GPA
I10	NAME FINANCES AVAILABLE	FINANCE_REQ
I11	NAME MEDICAL CERTIFICATION	MEDICAL_REQ
I12	NAME TOEFL SCORES DOCUMENT TOEFL TOTAL SCORE TEST DATE	TOEFL_OFFICIAL TOEFL_SC TOEFL=DATE

Figure 2.18
Data Item Correlation

CHAPTER III

OUTPUT PROCESSOR

3.1 Design Criteria

The system design criteria evolved as the result of user stated requirements and overall system constraints.

The user stated criteria for the nine letter outputs was that the system allow the input of variable information and the printing of these letters on the Department's spinwriter. An example of a variable field would be the enrollment dates in the Computer Science Department's acceptance letter (see Figure 4.2.4).

Another requirement was that a mechanism exist for making a hard copy of any of the input/formatted screens in the Graduate Student Record Data Base.

Lastly, the output processor must be capable of producing the standard reports previously identified in Chapter II.

System constraints surfaced as the most influential factors on the design criteria. The first of these surfaced while attempting to make the nine letters part of the relational data base. Unlike System 2000, INGRES does not permit the continuous lengthy stringing of characters (INGRES permits only 255 characters). It was based on this information that the decision was made to have the nine letters reside within the system as separate UNIX files.

3.2 Introduction to WARNIER/ORR Diagrams

During the last twenty-five years, several languages have been developed for the specification or definition of algorithmic or data structures. Most recently the "structured revolution" has produced such methods as HIPO charts and structure diagrams. Each has unique features to recommend it.

This report utilizes another tool for definition: the WARNIER/ORR diagrams. WARNIER diagrams first appeared in "The Logical Construction of Programs" by Jean-Dominique Warnier. They were later modified by Kenneth Orr to encompass the major features required of a definition language.

One can think of the WARNIER/ORR diagram growing naturally out of the common formal definition of sets used in mathematics. The hierarchy of relations is represented by the use of the brace. From a static view, the brace means "is defined as." From a dynamic view, the bracket shows the flow of control (in the case of processes), or the flow of access (in the case of data). Sequence is shown by listing elements within a brace, one below another. Repetition is represented by specifying, in parenthesis under the name of the element, the number of times that element is included in the definition.

WARNIER/ORR diagrams are a powerful tool useful in the hierarchical design process. They have proved to be a major new tool in the arsenal of the systems scientist.

3.3 WARNIER/ORR Diagrams

Figures 3.1 to 3.11 depict the WARNIER/ORR diagrams for those input documents and their related data items specified in Chapter II.

Figure 3.1 is the WARNIER/ORR diagram for the Graduate School Application. It depicts the hierarchy of relations and the data access paths when reading from left to right. Recursion (multiple entries) for the Previous Colleges and Universities field is depicted by the (1,S) notation.

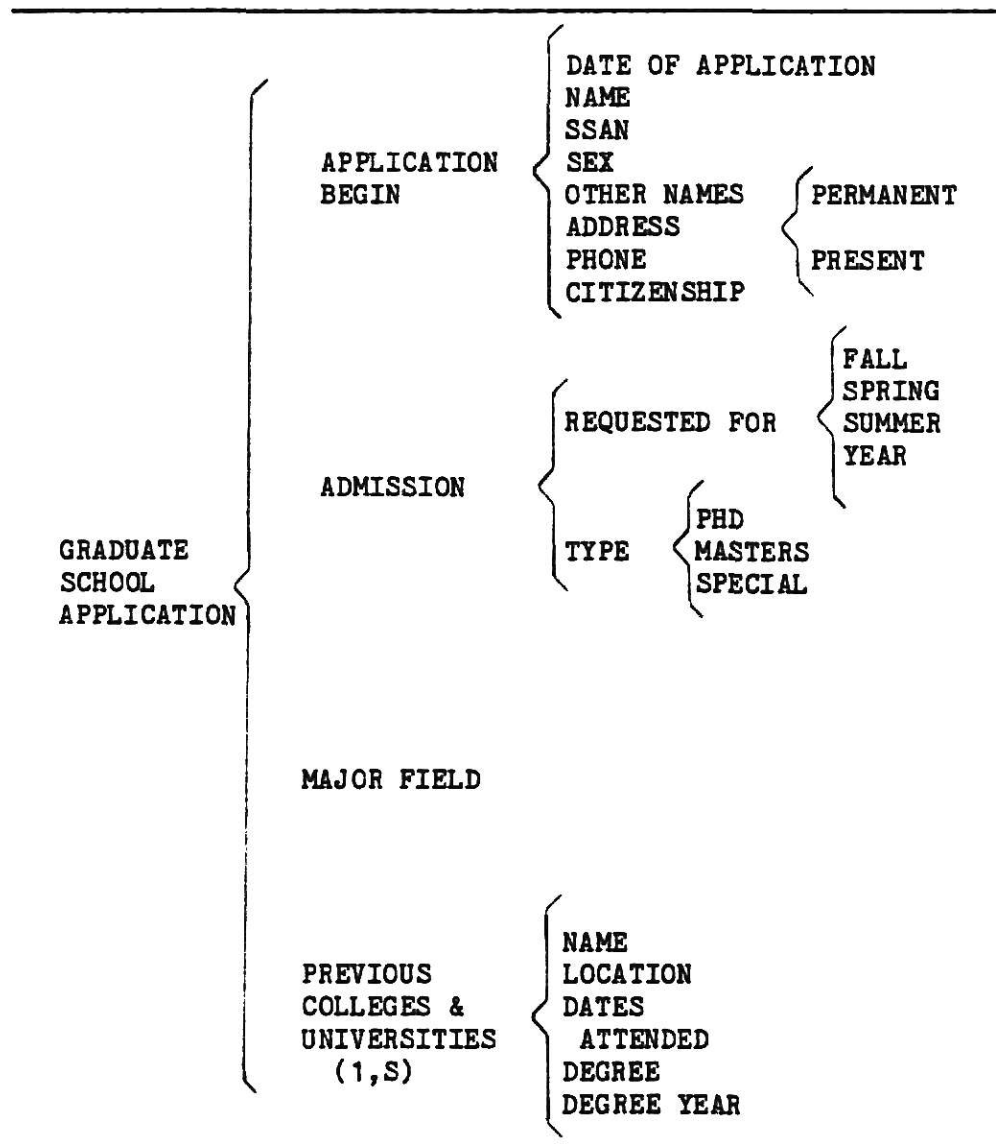


Figure 3.1
WARNIER/ORR Diagram for the Graduate School Application

Figure 3.2 is the WARNIER/ORR diagram for the Computer Science Department Application. It depicts the hierarchy of relations and the data access paths when reading from left to right. Recursion (multiple entries) for the Courses Qualified to Teach field is depicted by the (1,S) notation.

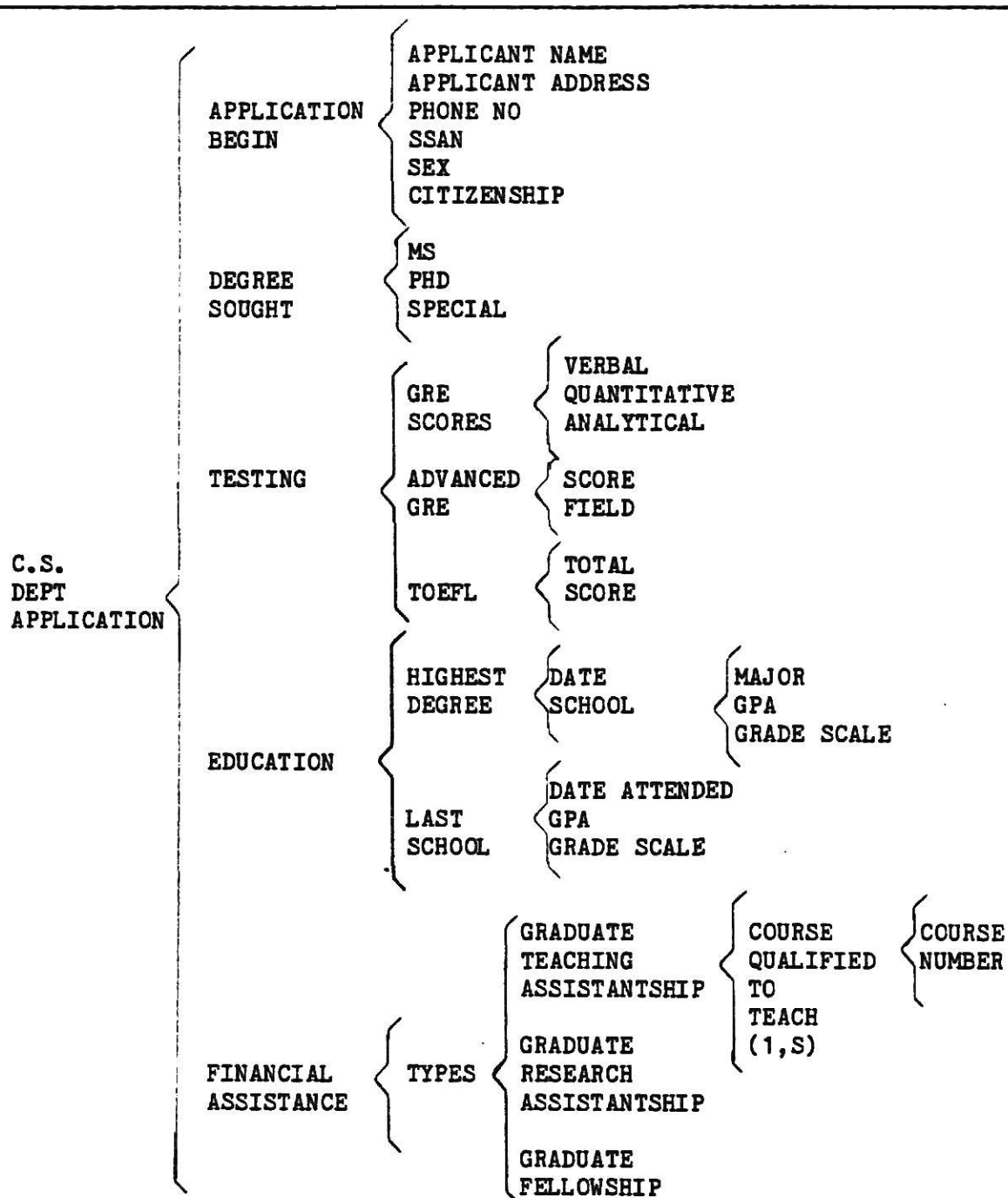


Figure 3.2
WARNIER/ORR Diagram for the Computer Science Department Application

Figure 3.3 is the WARNIER/ORR diagram for the Letters of Recommendation. It depicts only one hierarchy of relations and its associated recursion (multiple entries) for the Number Received field (1,S) notation.

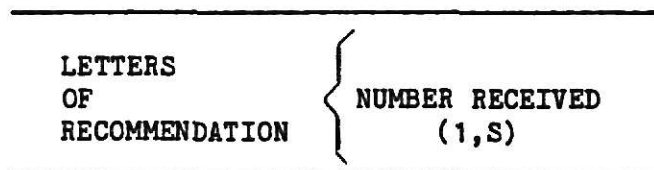


Figure 3.3
WARNIER/ORR Diagram for the Letter
of Recommendation

Figure 3.4 is the WARNIER/ORR diagram for the M.S. Graduate Student Information form. It depicts the hierarchy of relations and the data access paths when reading from left to right. Recursion (multiple entries) for Deficiency and Graduate Courses, and for the members fields are depicted by their associated (1,S) notation.

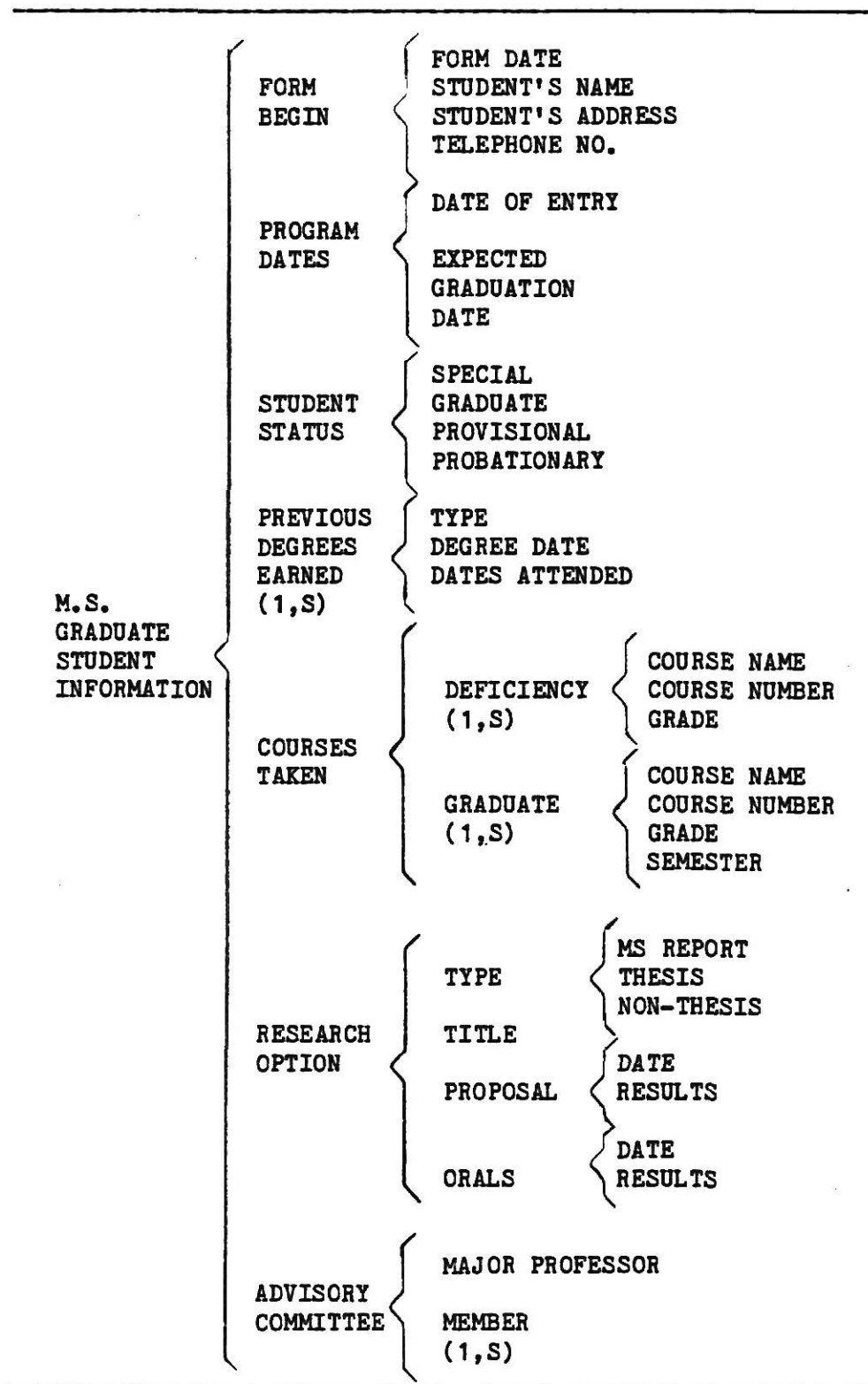


Figure 3.4
WARNIER/ORR Diagram for the M.S. Graduate
Student Information Form

Figure 3.5 is the WARNIER/ORR diagram for the Program of Study. It depicts the hierarchy of relations and the data access paths when reading from left to right. Recursion (multiple entries) for Major and Supporting Courses and the members fields are depicted by their associated (1,S) notation.

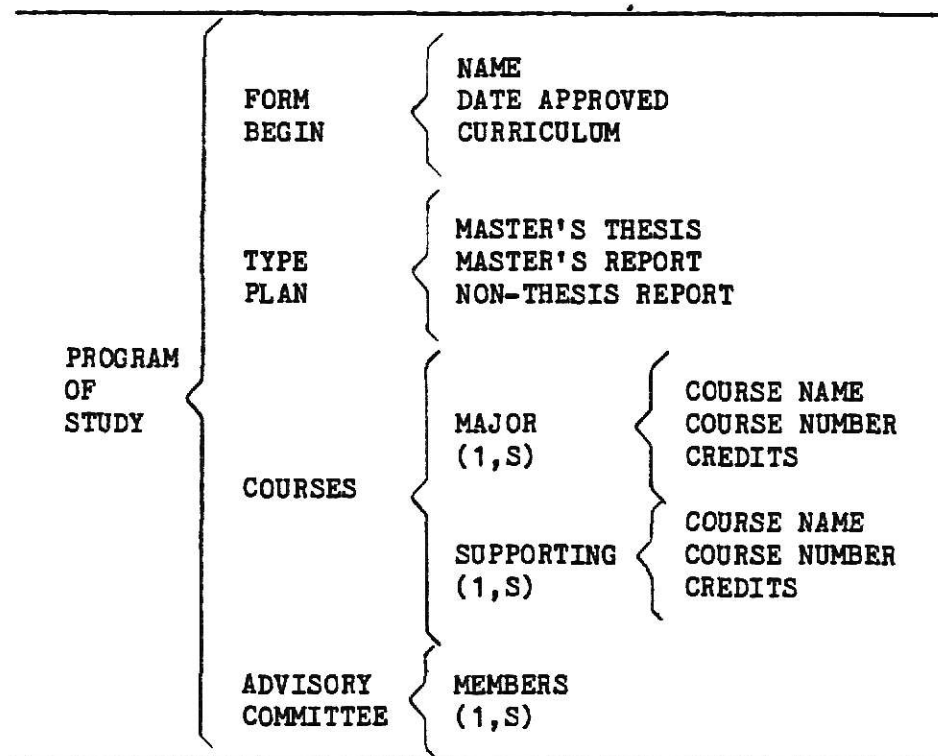


Figure 3.5
WARNIER/ORR Diagram for the Program of Study

Figure 3.6 is the WARNIER/ORR diagram for the Graduate Record Exam. It depicts the hierarchy of relations and data access paths when reading from left to right.

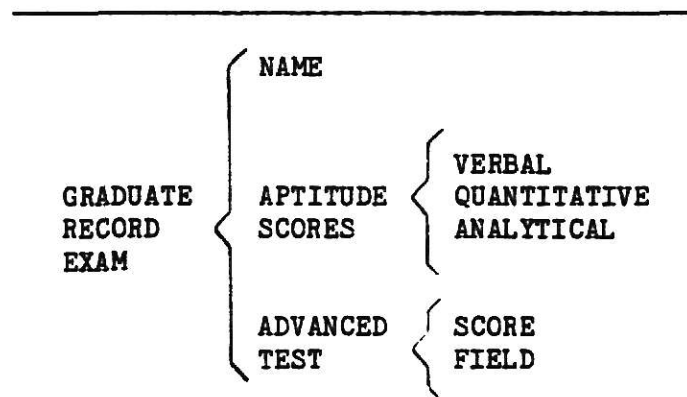


Figure 3.6
WARNIER/ORR Diagram for the Graduate
Record Exam

Figure 3.7 is the WARNIER/ORR diagram for the Graduate School Acceptance/Probationary Letter. It depicts the hierarchy of relations and data access paths when reading from left to right.

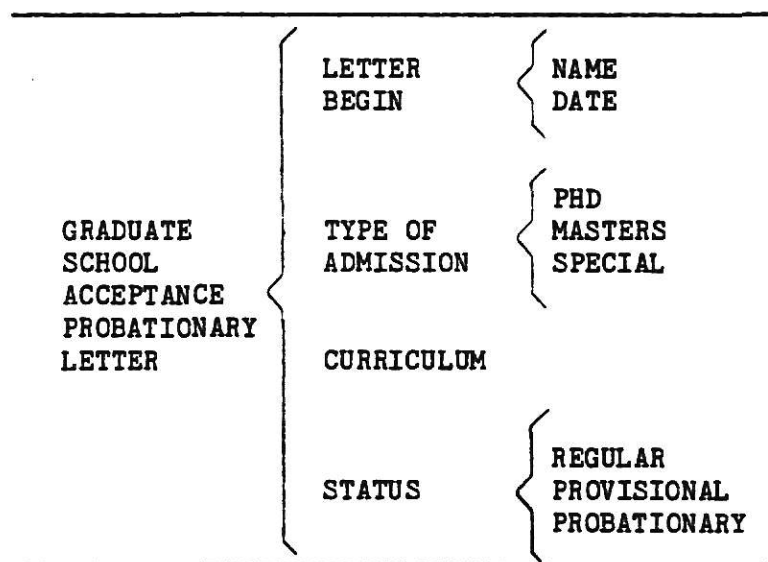


Figure 3.7
WARNIER/ORR Diagram for the Graduate School
Acceptance/Probationary Letter

Figure 3.8 is the WARNIER/ORR diagram for the University Semester Grade Report. It depicts the hierarchy of relations and data access paths when reading from left to right. Recursion (multiple entries) for the courses field is depicted by its associated (1,S) notation.

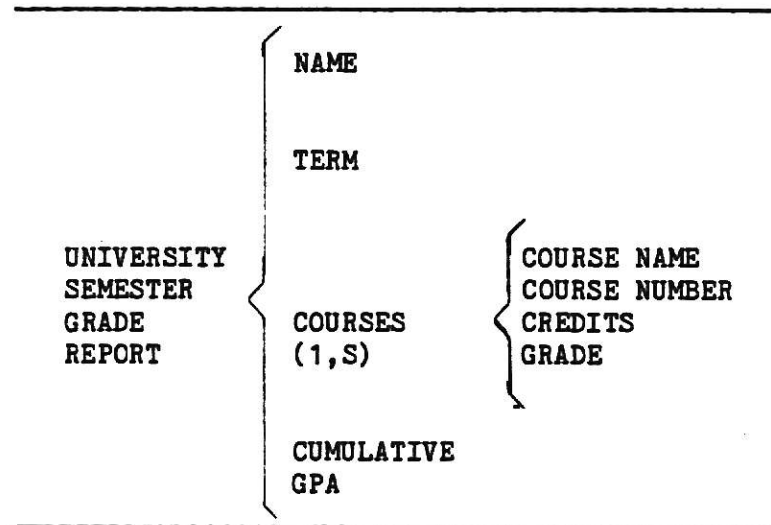


Figure 3.8
WARNIER/ORR Diagram for the University
Semester Grade Report

Figure 3.9 is the WARNIER/ORR diagram for the Graduate School's Financial Statement. It depicts a hierarchy of relations.

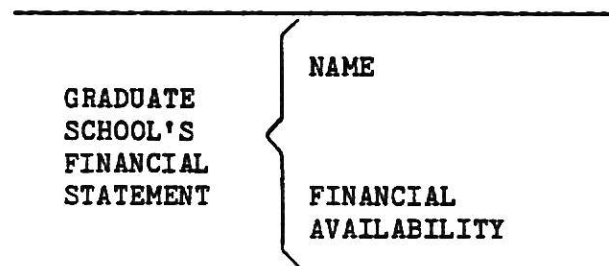


Figure 3.9
WARNIER/ORR Diagram for the Graduate
School's Financial Statement

Figure 3.10 is the WARNIER/ORR diagram for the University's International Medical Certificate. It depicts a hierarchy of relations.

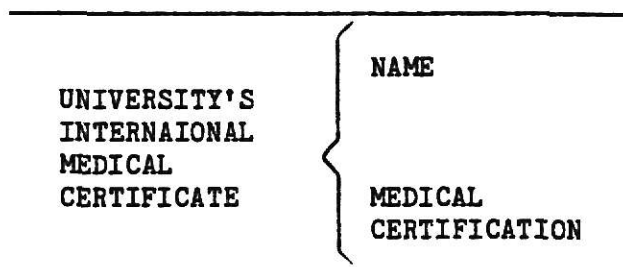


Figure 3.10
WARNIER/ORR Diagram for the University's
International Medical Certificate

Figure 3.11 is the WARNIER/ORR diagram for the TOEFL scores. It depicts a hierarchy of relations.

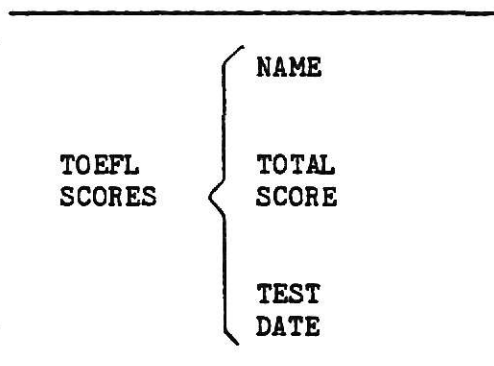


Figure 3.11
WARNIER/ORR Diagram for the
TOEFL Scores

3.4 Implementation on INGRES

The decision to implement the functions of the output processor using the facilities of INGRES was based on:

- The availability of the DBMS
- The ease with which the programs could be coded/maintained

3.5 Availability of Output Results

As of the date of this report, the INGRES data base management system was in place but not fully operational on the Department's Perkin Elmer minicomputer. This was one reason for the lack of system output. Another reason was the fact that in January 1983 the most recent version of INGRES [4.3] should be in place on the Perkin Elmer, providing a great number of enhancements to the overall data base management system and impact on any work implemented at that point.

Based on these two factors, the decision was made by Drs. Unger and Wallentine to place full emphasis into the design of the system with the idea that its full implementation would be a follow-on project.

CHAPTER IV

DESIGNED REPORTING SYSTEM

4.1 Overview

Functional system requirements and the constraints of available hardware and software yielded a reporting system design which would:

- Provide the user with the capability to select and input variable information for the nine departmental letters (see Figures 4.4 to 4.41) residing within the Graduate Student Record Data Base structure (see Figure 4.1).
- Provide the user with the capability to select and execute any of the standard report programs; and to review them at their CRT prior to being printed.

The following sections show the CRT formats to be used in this design and describe user and system actions relative to each of these outputs.

4.2 Functions of the Output Processor

The Output Processor is to be designed to interact with the Transaction Processor, the Graduate Student Record Data Base, and the Unix system files which contain the Letter Format Outputs and the Report Programs.

The mainstay of the processor is a Pascal driver program which will perform the functions outlined in Figure 4.2.

The Output Processor receives the user selected menu code from the Transaction Processor (see Figure 4.3). It determines the type of output desired. If it is a letter, it selects the correct one and then transfers control to the Transaction Processor for its movement to the CRT. If it is a report that was selected, it locates the report program

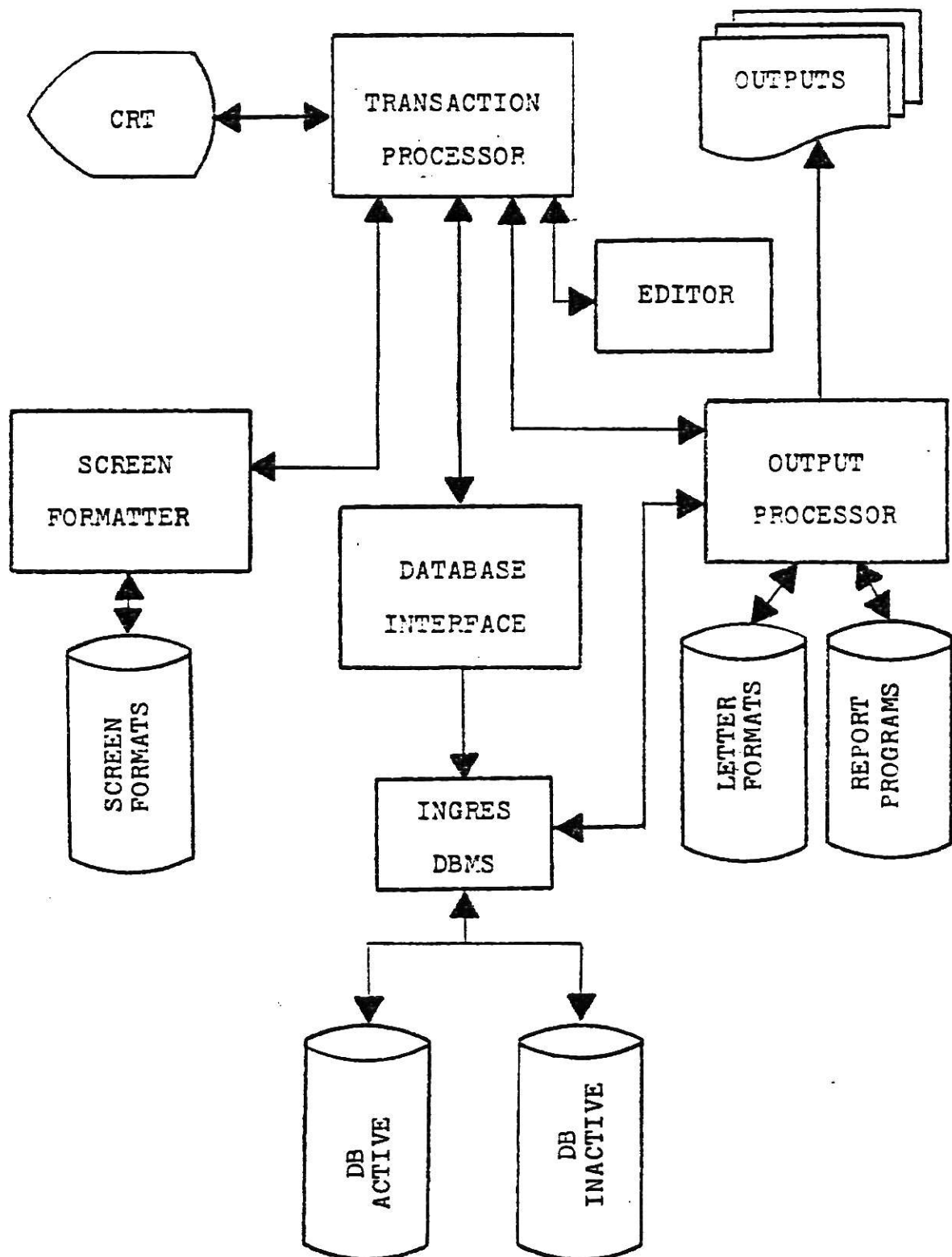


Figure 4.1
Graduate Student Record System

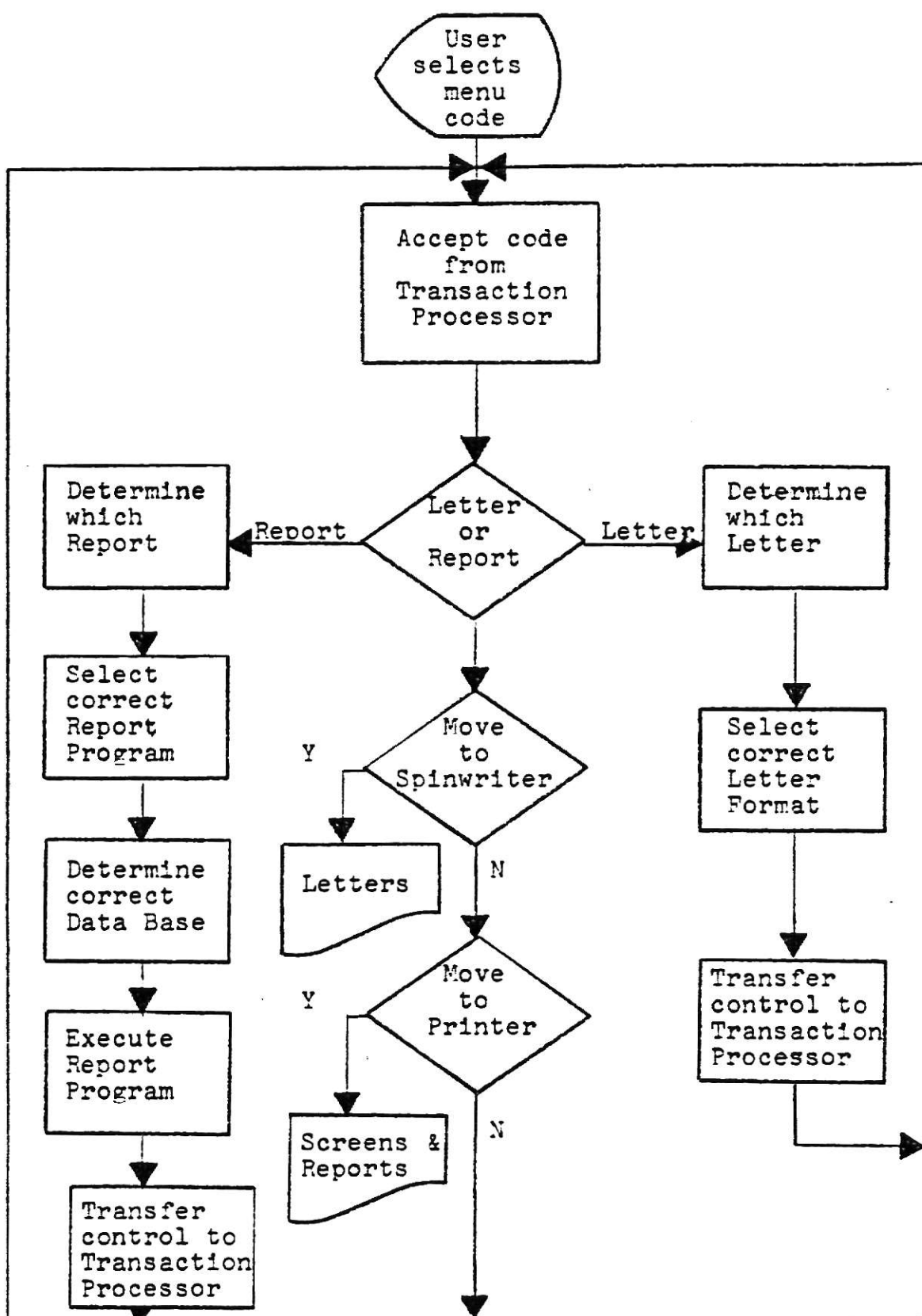


Figure 4.2
Functions of the Output Processor

and executes it, transferring control to the Transaction Processor when the results are complete and ready for movement to the CRT. The report programs will be written in the INGRES query language, QUEL, and called from the Pascal driver program.

When the user has completed his or her review/input and is ready to have his screen information moved to the appropriate output device, he selects the PRINT function code, provided by the Transaction Processor, by placing an 'X' in the space provided.

The Transaction Processor transfers control to the Output Processor which checks the first letter of the type output the user was working with. If it was an 'L', the screen output is sent to the spinwriter. If it was an 'R', the screen output is sent to the printer.

LETTERS

- L01 Response to Inquiry (foreign student)
- L02 Items Missing Letter
- L03 C.S. Department Letter of Acceptance
- L04 C.S. Department Letter of Acceptance
(with no support offered now)
- L05 C.S. Department Letter of Rejection After Committee
Review
- L06 C.S. Department Initial Letter of Rejection (foreign
student)
- L07 In-state Ph.D. Teaching Assistantship Letter
- L08 Out-of-state Ph.D. Teaching Assistantship Letter
- L09 In-state M.S. Teaching Assistantship Letter
- L10 Out-of-state M.S. Teaching Assistantship Letter

REPORTS

- R01 Graduate Student Roster
- R02 Student Graduation Forecast
- R03 Students Without a Major Professor
- R04 Students Not Making "Normal Progress"
- R05 Student Summary Sheet

Figure 4.3
Transaction Processor Output Menus

The remaining sections in this chapter address the letter screen formats and their input specifications, and the report outputs and their formats and data selection criteria.

4.3 Response to Inquiry (foreign student)

To retrieve this letter format, the user selects letter code L01 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output

Processor where the appropriate letter format is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into three screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. Figures 4.4 to 4.6 show the complete letter format as it will appear on the screens. The underscored areas are those fields which the user is to place his input variables. The data specifications for those fields are:

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
DOLLAR AMOUNT	6	N

Figure 4.7
Input Specifications for the Response to Inquiry
Letter (foreign student)

4.4 Items Missing Letter

To retrieve this letter format, the user selects letter code L02 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate letter format is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into three screen appearances. The user can scroll

**** SCREEN 1 FOR RESPONSE TO INQUIRY ****

_____ (Date)

_____ (Name)
_____ (Street Address)
_____ (City, State & Zip)

Dear _____, (Personal Name)

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.4

Screen 1 for Response to Inquiry

** SCREEN 2 FOR RESPONSE TO INQUIRY **

Thank you for recent request for application materials for graduate work in Computer Science at Kansas State University. Before we can further process your request, we need some further information.

The Graduate School requires that foreign applicants supply proof of being able to support themselves while pursuing graduate studies by providing at least \$_____ per year. Unfortunately, current budgetary constraints within the department prevent us from being able to offer assistantships or other types of financial support during the first year of graduate work. Thus, you must be able to provide these funds from your own resources.

If you can provide these funds, please fill out the enclosed form and return to us, along with verification from a bank or other source (for instance, parents) that these funds are available.

Desired Action (x)

View - Print -

Quit - Terminate -

Figure 4.5

Screen 2 for Response to Inquiry

** SCREEN 3 FOR RESPONSE TO INQUIRY **

In addition to proof of financial support, we require a TOEFL score of 575 or better. If you meet our qualifications, we will send you the other materials needed to complete your application.

We look forward to hearing from you.

Sincerely,

Elizabeth A. Unjer,
Chairperson
Graduate Studies Committee

Enclosure

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.6

Screen 3 for Response to Inquiry

forward by placing an 'X' in the space alongside the VIEW command. Figures 4.8 and 4.10 show the complete letter format as it will appear on the screens. The underscored areas are those fields which the user is to place his input variables. The data specifications for these fields are:

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
ITEM IDENTIFIER	1	A
SCHOOL NAME	35	A
NAME (LETTER OF RECOMMENDATION)	35	A

Figure 4.11
Input Specifications for the Items Missing Letter

4.5 C.S. Department Letter of Acceptance

To retrieve this letter format, the user selects letter code L03 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate letter is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into two screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. Figures 4.12 and 4.13 show the complete letter format as it will appear on the screens. The underscored areas are those fields

** SCREEN 1 ITEMS MISSING LETTER **

Your application for Graduate School in the Computer Science Department is being delayed because we have not yet received all of your credentials. Our graduate committee can not review your application until all of your credentials are received.

We show that we still have not received:

--- 2 copies of an official transcript from:

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.8

Screen 1 Items Missing Letter

** SCREEN 2 ITEMS MISSING LETTER **

--- TOEFL score

--- Financial statement

--- Computer Science form

--- Letters of recommendation from:

--- Statement of academic objectives

--- Health form
Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.9
Screen 2 Items Missing Letter

** SCREEN 3 ITEMS MISSING LETTER **

If you still wish your application to be considered for Graduate School, please have these credentials sent as soon as possible. If not, please sign the line below and mail it back to us.

I no longer wish to be considered for Graduate School.

Signature

Sincerely,

Elizabeth A. Unger,
Chairperson
Graduate Studies Committee

Figure 4.10

Screen 3 Items Missing Letter

** SCREEN 1 FOR LETTER OF ACCEPTANCE **

_____ (Date)

_____ (Name)
_____ (Street Address)
_____ (City, State & zip)

Dear _____, (Personal Name)

Welcome to K-State. The Department Graduate Committee has recommended to the Graduate School that your application be accepted. You will receive official notice from the Graduate School.

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.12

Screen 1 for Letter of Acceptance

** SCREEN 2 FOR LETTER OF ACCEPTANCE **

Enrollment for Fall will be held ----- and classes begin
----- There will be general advising sessions for new
graduate students scheduled during the enrollment period.

We are looking forward to having you in the department.

Sincerely,

Elizabeth A. Unger
Chairperson
Graduate Studies Committee

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.13

Screen 2 for Letter of Acceptance

which the user is to place his input variables. The data specifications for these fields are:

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
SESSION NAME	6	A
PERSONAL NAME LINE	15	A N
ENROLLMENT DATES	20	A N
CLASS START DATE	20	A N

Figure 4.14
Input Specifications for the C.S.
Letter of Acceptance

4.6 C.S. Department Letter of Acceptance (no support offered now)

To retrieve this letter format, the user selects letter code L04 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate letter format is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into two screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. Figures 4.15 and 4.16 show the complete letter format as it will appear on the screens. The underscored areas are those fields which the user is to place his input variables. The data specifications for these fields are:

*** SCREEN 1 ACCEPTANCE LETTER (support later) ***

(Date)

(Name)

(Street Address)

(City, State & Zip)

Dear _____, (Personal Name):

Welcome to K-State. The Department Graduate Committee has recommended to the Graduate School that your application be accepted. you will receive official notice from the Graduate School.

Desired Action (x)

[View](#) [Print](#)

Quit Terminate

Figure 4.15

Screen 1 Acceptance Letter (support later)

** SCREEN 2 ACCEPTANCE LETTER (support later) **

Enrollment for _____ will be held _____ and classes begin
_____. There will be general advising sessions for new
graduate students scheduled during the enrollment period.

We are not able to offer you support at this time. However, it is
likely that you will be able to find support after having gained
experience in the Graduate Program.

We are looking forward to having you in the Department.

Sincerely,

Elizabeth A. Unger,
Chairperson
Graduate Studies Committee

Desired Action (x)

View _ Print _

Quit _ Terminate _

Figure 4.16

Screen 2 Acceptance Letter (support later)

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
SESSION NAME	6	A
PERSONAL NAME LINE	15	A N
ENROLLMENT DATES	20	A N
CLASS STATE DATE	20	A N

Figure 4.17
Input Specifications for the C.S. Department Letter
of Acceptance (with no support offered now)

4.7 C.S. Department Letter of Rejection After Committee Review

To retrieve this letter format, the user selects letter code L05 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate letter format is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into three screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. Figures 4.18 to 4.20 show the complete letter format as it will appear on the screens. The underscored areas are those fields which the user is to place his input variables. The data specifications for those fields are:

** SCREEN 1 REJECTION AFTER COMMITTEE REVIEW **

_____ (Date)

_____ (Name)
_____ (Street Address)
_____ (City, State & Zip)

Dear _____,

Desired Action (x)
View _ Print _
Quit _ Terminate _

Figure 4.18

Screen 1 Rejection after Committee Review

** SCREEN 2 REJECTION AFTER COMMITTEE REVIEW **

Thank you for submitting your application for graduate study in Computer Science. The Graduate Studies Committee of this Department has carefully considered your request. Due to the following reason(s), we regret that we will not be able to accept you at this time.

- Financial Need (we require at least \$_____ per year support)
- Scholastic Record (require B+ grade average, 80%-85%)
- TOEFL (require a minimum of 575)
- Lack Computer Science Background (require B.S. in Computer Science or equivalent)
- Other

Please accept our best wishes for success in pursuit of your career.

Sincerely,
Desired Action (x)
View - Print _
Quit - Terminate _

Figure 4.19

Screen 2 Rejection after Committee Review

** SCREEN 3 REJECTION AFTER COMMITTEE REVIEW **

Elizabeth A. Unger,
Chairperson
Graduate Studies Committee

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.20

Screen 3 Rejection after Committee Review

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
ITEM IDENTIFIER	1	A
DOLLAR AMOUNT	6	N
OTHER	48	A N

Figure 4.21
Input Specifications for the C.S. Department Letter
of Rejection After Committee Review

4.8 C.S. Department Letter of Rejection (foreign student)

To retrieve this letter format, the user selects letter code L06 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate letter format is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into three screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. Figures 4.22 to 4.24 show the complete letter format as it will appear on the screens. The underscored areas are those fields which the user is to place his input variables. The data specifications for those fields are:

** SCREEN 1 INITIAL REJECTION (foreign student) **

----- (Date)

----- (Name)
----- (Street Address)
----- (City, State & Zip)

Dear -----, (Personal Name)

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.22

Screen 1 Initial Rejection (foreign student)

** SCREEN 2 INITIAL REJECTION (foreign student) **

We have recieved your inquiry about graduate study in Computer Science.

Among our requirements for graduate work in Computer Science are that we require a TOEFL of 575 or better, a B.S. in Computer Science or equivalent experience, and at least a B+ grade average (80%-85%). Furthermore, the applicant must demonstrate support of at least \$_____ per year. After viewing your inquiry, we find that you have not met these requirements.

Because of limitations of size and resources of our department, we can not admit you.

Please accept our best wishes for success in your pursuit of graduate studies.

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.23

Screen 2 Initial Rejection (foreign student)

** SCREEN 3 INITIAL REJECTION (foreign student) **

Sincerely,

Elizabeth A. Unger,
Chairperson
Graduate Studies Committee

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.24

Screen 3 Initial Rejection (foreign student)

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
DOLLAR AMOUNT	6	N

Figure 4.25
Input Specifications for C.S. Department Initial
Letter of Rejection (foreign student)

4.9 In-state Ph.D. Teaching Assistantship Letter (with acceptance enclosure)

To retrieve this letter format, the user selects letter code L07 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate letter format is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into three screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. Figures 4.26 to 4.28 show the complete letter format as it will appear on the screens.

The underscored areas are those fields which the user is to place his input variables. The data specifications for those fields are:

** SCREEN 1 IN-STATE PhD TEACHING ASSISTANTSHIPS **

_____ (Date)

_____ (Name)
_____ (Street Address)
_____ (City, State & Zip)

Dear _____, (Personal Name)

Welcome to K-State. The Department Graduate Committee has recommended to the Graduate School that your application be accepted. You will receive official notice form the Graduate School.

Desired Action (x)
View _ Print _
Quit _ Terminate _

Figure 4.26

Screen 1 In-State PhD Teaching Assistantship

** SCREEN 2 IN-STATE PhD TEACHING ASSISTANTSHIP **

Enrollment for _____ will be held _____ and classes begin
_____. There will be general advising sessions for new
graduate students scheduled during the enrollment period.

The Department is pleased to offer you a Graduate Teaching
Assistantship. Your salary will be \$_____ per month for nine months
(_____ thru _____) paid at the end of each month.
Also, the salary will be adjusted upon your passing both the doctoral
preliminary examinations and presentation of your research proposal.
Your duties will be: to teach two programming language classes (each
class will be 2 hrs. lecture, 3 hrs. lab per week) under direction of
the course director; attend a weekly T.A. meeting; and maintain office
hours of 4 hours per week. General organization, assignments, and
common examination for the language classes are prepared by the course
director.

Desired Action (x)
View _ Print _
Quit _ Terminate _

Figure 4.27

Screen 2 In-State PhD Teaching Assistantship

** SCREEN 3 IN-STATE PhD TEACHING ASSISTANTSHIP **

As a graduate assistant, you will be expected to: carry nominally nine (9) hours of credit courses each semester; to make satisfactory progress towards your degree, and to attend Department seminars. Later there may be opportunity to teach other courses or to move to a research position.

If you accept the offer, please sign the attached form and return it to me as soon as possible, but no later than _____. If you have any questions, please call. We are looking forward to having you in the Department.

Sincerely,

Elizabeth A. Unger,
Chairperson
Graduate Studies Committee

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.28

Screen 3 In-State PhD Teaching Assistantship

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
PERSONAL NAME LINE	15	A N
ENROLLMENT DATES	20	A N
CLASS STATE DATE	20	A N
DOLLAR AMOUNT	6	N
ASSISTANTSHIP PERIOD	40	A N
RESPONSE DUE DATE	14	A N

Figure 4.29
Input Specifications for In-state Ph.D. Teaching
Assistantship Letter (with acceptance enclosure)

4.10 Out-state Ph.D. Teaching Assistantship Letter (with acceptance enclosure)

To retrieve this letter format, the user selects letter code L08 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate letter format is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into three screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. Figures 4.30 to 4.32 show the complete letter format as it will appear on the screens. The underscored areas are those fields which the user is to place his input variables. The data specifications for those fields are:

** SCREEN 2 OUT-OF-STATE PhD TEACHING ASSISTANTSHIP **

Enrollment for _____ will be held _____ and classes begin
_____. There will be general advising sessions for new
graduate students scheduled during the enrollment period.

The Department is pleased to offer you a Graduate Teaching
Assistantship. Your salary will be \$_____ per month for nine months. In
(_____ thru _____) paid at the end of each month. In
addition, you will receive staff privileges, including waiver of
out-of-state tuition fees. Also, the salary will be adjusted upon your
passing both the doctoral preliminary examinations and presentation of
your research proposal. Your duties will be: to teach two programming
language classes (each class will be 2 hrs. lecture, 3 hrs. lab per
week) under direction of the course director; attend a weekly T.A.
meeting; and maintain office hours of 4 hours per week. General
organization, assignments and common examinations for the language
classes are prepared by the course director.

Desired Action (x)
View _ Print _
Quit _ Terminate _

Figure 4.31

Screen 2 Out-of-State PhD Teaching Assistantship

** SCREEN 3 OUT-OF-STATE PhD TEACHING ASSISTANTSHIP **

As a graduate assistant, you will be expected to: carry nominally nine (9) hours of credit courses each semester; to make satisfactory progress towards your degree, and to attend department seminars. Later there may be opportunity to teach other courses or to move to a research position.

If you accept the offer, please sign the attached form and return it to me as soon as possible, but no later than _____. If you have any questions, please call. We are looking forward to having you in the Department.

Sincerely,

Elizabeth A. Unger,
Chairperson
Graduate Studies Committee

Desired Action (x)
View - Print _
Quit - Terminate _

Figure 4.32

Screen 3 Out-of-State PhD Teaching Assistantship

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
PERSONAL NAME LINE	15	A N
ENROLLMENT DATES	20	A N
CLASS STATE DATE	20	A N
DOLLAR AMOUNT	6	N
ASSISTANTSHIP PERIOD	40	A N
RESPONSE DUE DATE	14	A N

Figure 4.33
Input Specifications for Out-of-state Ph.D. Teaching
Assistantship Letter (with acceptance enclosure)

4.11 In-state M.S. Teaching Assistantship Letter (with acceptance enclosure)

To retrieve this letter format, the user selects letter code L09 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate letter format is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into three screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. Figures 4.34 to 4.36 show the complete letter format as it will appear on the screens. The underscored areas are those fields which the user is to place his input variables. The data specifications for those fields are:

** SCREEN 1 IN-STATE MS TEACHING ASSISTANTSHIPS **

_____ (Date)

_____ (Name)
_____ (Street Address)
_____ (City, State & Zip)

Dear _____, (Personal Name)

Welcome to K-State. The Department Graduate Committee has recommended to the Graduate School that your application be accepted. You will receive official notice from the Graduate School.

Desired Action (x)
View _ Print _
Quit _ Terminate _

Figure 4.34

Screen 1 In-State MS Teaching Assistantship

** SCREEN 2 IN-STATE MS TEACHING ASSISTANTSHIP **

Enrollment for _____ will be held _____ and classes begin
_____. There will be general advising sessions for new
graduate students scheduled during the enrollment period.

The Department is pleased to offer you a Graduate Teaching
Assistantship. Your salary will be \$_____ per month for nine months
(_____ thru _____) paid at the end of each month.
Salaries are reviewed annually. Your duties will be: to teach two
programming language classes (each class will be 2 hrs. lecture, 3 hrs.
lab per week). General organization, assignments and common
examinations for the language classes are prepared by the course
director.

Desired Action (x)
View _ Print _
Quit _ Terminate _

Figure 4.35

Screen 2 In-State MS Teaching Assistantship

** SCREEN 3 IN-STATE MS TEACHING ASSISTANTSHIP **

As a graduate assistant, you will be expected to: carry nominally nine (9) hours of credit courses each semester; to make satisfactory progress towards your degree, and to attend Department seminars. Later there may be opportunity to teach other courses or to move to a research position.

If you accept the offer, please sign the attached form and return it to me as soon as possible, but no later than _____. If you have any questions, please call. We are looking forward to having you in the Department.

Sincerely,

Elizabeth A. Unger,
Chairperson
Graduate Studies Committee

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.36

Screen 3 In-State MS Teaching Assistantship

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
PERSONAL NAME LINE	15	A N
ENROLLMENT DATES	20	A N
CLASS STATE DATE	20	A N
DOLLAR AMOUNT	6	N
ASSISTANTSHIP PERIOD	40	A N
RESPONSE DUE DATE	14	A N

Figure 4.37
Input Specifications for In-state M.S. Teaching
Assistantship Letter (with acceptance enclosure)

4.12 Out-state M.S. Teaching Assistantship Letter (with acceptance enclosure)

To retrieve this letter format, the user selects letter code L10 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate letter format is retrieved and sent to the CRT for display and input.

Due to the CRT screen limitations, 24 lines and 80 columns, this letter will be split into three screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. Figures 4.38 to 4.40 show the complete letter format as it will appear on the screens. The underscored areas are those fields which the user is to place his input variables. The data specifications for those fields are:

** SCREEN 1 OUT-OF-STATE MS TEACHING ASSISTANTSHIPS **

_____ (Date)

_____ (Name)
_____ (Street Address)
_____ (City, State & Zip)

Dear _____, (Personal Name)

Welcome to K-State. The Department Graduate Committee has recommended to the Graduate School that your application be accepted. You will receive official notice from the Graduate School.

Desired Action (x)
View - Print -
Quit - Terminate -

Figure 4.38

Screen 1 Out-of-State MS Teaching Assistantship

** SCREEN 2 OUT-OF-STATE MS TEACHING ASSISTANTSHIP**

Enrollment for _____ will be held _____ and classes begin
_____. There will be general advising sessions for new
graduate students scheduled during the enrollment period.

The Department is pleased to offer you a Graduate Teaching
Assistantship. Your salary will be \$_____ per month for nine months.
(_____ thru _____) paid at the end of each month. In
addition, you will receive staff privileges, including waiver of
out-of-state tuition fees. Salaries are reviewed annually. Your duties
will be: to teach two programming language classes (each class will be 2
hrs. lecture, 3 hrs. lab per week) under direction of the course
director; attend a weekly T.A. meeting; and maintain office hours of 4
hours per week. General organization, assignments, and common
examinations for the language classes are prepared by the course
director.

Desired Action (x)
View _ Print _
Quit _ Terminate _

Figure 4.39

Screen 2 Out-of-State MS Teaching Assistantship

** SCREEN 3 OUT-OF-STATE MS TEACHING ASSISTANTSHIP **

As a graduate assistant, you will be expected to: carry nominally nine (9) hours of credit courses each semester; to make satisfactory progress towards your degree, and to attend Department seminars. Later there may be opportunity to teach other courses or to move to a research position.

If you accept the offer, please sign the attached form and return it to me as soon as possible, but no later than -----. If you have any questions, please call. We are looking forward to having you in the Department.

Sincerely,

Elizabeth A. Unger,
Chairperson
Graduate Studies Committee

Desired Action (x)
View _ Print _
Quit _ Terminate _

Figure 4.40

Screen 3 Out-of-State MS Teaching Assistantship

Description	Char.	A/N
DATE	15	A N
NAME	35	A
STREET ADDRESS	25	A N
CITY, STATE & ZIP	22	A N
PERSONAL NAME LINE	15	A N
ENROLLMENT DATES	20	A N
CLASS STATE DATE	20	A N
DOLLAR AMOUNT	6	N
ASSISTANTSHIP PERIOD	40	A N
RESPONSE DUE DATE	14	A N

Figure 4.41
Input Specifications for Out-of-state M.S. Teaching
Assistantship Letter (with acceptance enclosure)

4.13 Graduate Student Roster

To retrieve this report, the user selects report code R01 from the menu furnished by the Transaction Processor (see Figure 4.2). The Transaction Processor sends the selected code to the Output Processor where the appropriate report program is called and executed.

Due to the CRT screen limitations, the report will be split into multiple screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. When he wishes to discontinue his scrolling, he places an 'X' in the space provided alongside the QUIT command. When he is prepared to send the report to the printer, he places an 'X' in the space provided alongside the QUIT command.

Figure 4.42 depicts the general format for this report. The report headings indicate the selection criteria and sort order to be used in producing this report.

** <u>GRADUATE STUDENT ROSTER</u> **		
(SORTED ALPHABETICALLY BY STUDENT/MAJOR PROFESSOR)		
DATE PRODUCED: _____		
<u>NO</u>	<u>STUDENT NAME</u>	<u>STATUS</u>
		<u>MAJOR PROFESSOR</u>

Figure 4.42
Format for the Graduate Student Roster

4.14 Student Graduation Forecast

To retrieve this report, the user selects report code R02 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate report program is called and executed.

Due to the CRT screen limitations, the report will be split into multiple screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. When he wishes to discontinue his scrolling, he places an 'X' in the space provided alongside the QUIT command. When he is prepared to send the report to the printer, he places an 'X' in the space provided alongside the QUIT command.

Figure 4.43 depicts the general format for this report. The report headings indicate the selection criteria and type of sort to be used in producing this report.

** <u>STUDENT GRADUATION FORECAST</u> **		
(SORTED BY EXPECTED GRADUATION DATE)		
DATE PRODUCED: _____		
<u>NAME</u>	<u>STATUS</u>	<u>EXPECTED GRAD. DATE</u>

Figure 4.43
Format for the Student Graduation Forecast

4.15 Students Without a Major Professor

To retrieve this report, the user selects report code R03 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate report program is called and executed.

Due to the CRT screen limitations, the report will be split into multiple screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. When he wishes to discontinue his scrolling, he places an 'X' in the space provided alongside the QUIT command. When he is prepared to send the report to the printer, he places an 'X' in the space provided alongside the QUIT command.

Figure 4.44 depicts the general format for this report. The report headings indicate the selection criteria and type of sort to be used in producing this report.

** <u>STUDENTS WITHOUT A MAJOR PROFESSOR</u> **			
(SORTED BY DATE ENROLLED THEN STUDENT NAME)			
DATE PRODUCED: _____			
<u>NAME</u>	<u>STATUS</u>	<u>DATE ENROLLED</u>	<u>EXPECTED GRAD. DATE</u>

Figure 4.44
Format for the Students Without a Major Professor

4.16 Students Not Making "Normal Progress"

To retrieve this report, the user selects report code R04 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate report program is called and executed.

Due to the report format, one student per page, the complete report will be split into multiple screen appearances. The user can scroll forward by placing an 'X' in the space provided alongside the VIEW command. When he wishes to discontinue scrolling, he places an 'X' in the space provided alongside the QUIT command. When he is prepared to send the report to the printer, he places an 'X' in the space provided alongside the PRINT command.

Figure 4.45 depicts the general format for this report. The selection criteria used to produce this report is:

- Student GPA $\geq$ 3.0
- Student has major professor by end of second semester
- Student class load $\geq$ 9 credits/semester

- Student completed the 5 core courses by end of second semester after regular admission
- Student to complete required courses within 2 years (5 years for Western Electric personnel) after regular admission

```

      ** STUDENT NOT MAKING "NORMAL PROGRESS" **

(SORTED BY _____)

      DATE PRODUCED: _____

      NAME                STATUS                GPA                MAJOR
                                     PROFESSOR

      NINE                CORE COURSES                COMPLETE
HRS/SEM.                BY 2ND SEM.                ON TIME

DESIRED ACTION (X)
VIEW _____ PRINT _____
QUIT _____  TERMINATE _____

```

Figure 4.45
Format for Student Not Making "Normal Progress"

4.17 Student Summary Sheet for a Given Student

To retrieve this report, the user selects report code R05 from the menu furnished by the Transaction Processor (see Figure 4.3). The Transaction Processor sends the selected code to the Output Processor where the appropriate report program is called and executed.

Due to the report format, one student per page, the complete report will be split into multiple screen appearances. The user can scroll

forward by placing an 'X' in the space provided alongside the VIEW command. When he wishes to discontinue scrolling, he places an 'X' in the space alongside the QUIT command. When he is prepared to send the report to the printer, he places an 'X' in the space provided alongside the PRINT command.

Figure 4.46 depicts the general format and selection criteria for this report.

**** STUDENT SUMMARY SHEET ****

DATE PRODUCED: _____

<u>NAME</u>	<u>ADVISOR</u>	<u>MAJOR PROFESSOR</u>
<u>DATE OF ENTRY INTO PROGRAM</u>		<u>EXPECTED GRAD. DATE</u>
<u>STATUS</u>		<u>TOEFL SCORE/DATE</u>

PREVIOUS DEGREES EARNED:

<u>SCHOOL</u>	<u>SUBJECT</u>	<u>DATE</u>	<u>GPA</u>	<u>GRADE SCALE</u>
---------------	----------------	-------------	------------	------------------------

COURSES:

<u>COURSE NUMBER</u>	<u>COURSE NAME</u>	<u>GRAD</u>	<u>DEF</u>	<u>SEM</u>	<u>GRADE</u>	<u>REPEAT</u>
--------------------------	------------------------	-------------	------------	------------	--------------	---------------

GPA

PROGRAM OF STUDY:

RESEARCH OPTION:

A. PROPOSAL: DATE: _____ RESULTS: _____

B. ORALS: DATE: _____ RESULTS: _____

ADVISORY COMMITTEE: MEMBER #2 _____ MEMBER #3 _____

Figure 4.46
Format for Student Summary Sheet for a Given Student

CHAPTER V

CONCLUSIONS

5.1 Summary

This report has covered the basic aspects of the data analysis performed on the input and output documents currently used in managing the Computer Science Department's graduate students and the conduct of interviews with current users. It has employed the development of WARNIER/ORR diagrams to provide information on the hierarchy of information sets and documentation on data flow which can be used in the design of future output programs. It has provided for the design of an Output Processor which produces selected output formats for both the CRT and hardcopy.

5.2 Future Work

A review of the overall system and receipt of additional user requirements have provided a basis for system enhancements. These enhancements range from office procedural changes to data base and output program changes.

The data item collection redundancies identify the need for a review and revision of the Computer Science Department's data collection documents and/or the establishment of office procedures which identify only one source document for redundant data items.

Additionally, for those inputs (e.g., repeated courses, processing fees, and status change dates) which no current method of data capture exists, input documents or automated methods should be developed as

early as possible. A method needs to be developed which will automatically transfer the inactive records from the active data base to the inactive data base.

In order to better support the Computer Science Department, the current data base schema will require some modifications/expansion incorporating some of the following:

- A method of identifying teaching assistants (TA's) via a single field.
- A method of collecting data on an individual's changes to his or her program of study and incorporating this data into the data base, particularly if the program of study has been approved or disapproved.
- A method of identifying when a student has had a change of committee and allowing for more than one occurrence.

In addition to the data capture and data base modifications, some consideration should be given to increasing the standard reports produced by the Output Processor. Well after the cut-off date for input criteria, users identified the need to retrieve and review a student's program of study, identifying any changes made to the original document and when those changes were made. Another desired output was a major advisee list, for review at the CRT, which would provide information on a professor's advisee, by name and when they became an advisee.

Lastly, users stated that the current system incorporate some, if not all, of the following departmental admissions tracking information:

- A method of identifying, through the use of a single field, when a student has been rejected by the Graduate Studies Committee.
- A method of identifying, via a single field, the type of program a student is in (e.g., KSU, Western Electric, Ft. Leavenworth)
- A method of identifying when (date received) the items listed below arrived:

- Graduate School Application
- C.S. Department Application
- Each letter of recommendation
- Each transcript for all colleges and universities attended
- GRE scores
- TOEFL scores
- Health statement
- Financial statement

The tracking of admission information also requires that a current status of an application be readily available. To meet this requirement, the users desired the addition of a status relation to the data base which would provide the dates when an application was forwarded to

- The Graduate Studies Committee
- The Graduate School

and when a status letter was forwarded to the potential student.

The incorporation of some of these desired enhancements could be accomplished during the implementation phase of this system. However, the selection should be done carefully, for the attempt to do it all could yield either a totally unsatisfactory system or one which would not be completed on schedule.

BIBLIOGRAPHY

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3. Warnier, J., Logical Construction of Programs (LCP), 3rd Edition, H. E. Stenfert Kroese B. V., Leiden, Paris, 1974, pp. 1-43.
4. Orr, K., Structured Requirements Definition, Orr and Associates, Inc., 715 E. eight Street, Topeka, Kansas, 1981, pp. 65-102, pp. 202-222.
5. Date, C., An Introduction to Database Systems, Publishing Co., Reading, Massachusetts, 1975.

APPENDIX A
INPUT DOCUMENTS

INPUT DOCUMENTS

- Graduate School Application
- C.S. Department Application
- Letters of Recommendation (3)
- M.S. Graduate Student Information Sheet
- Program of Study
- GRE Scores
- Official Transcripts
- Graduate School Acceptance/Probationary Letter
- Semester Grade Reports
- Financial Statement
- International Student Medical Certificate
- TOEFL Scores



THE GRADUATE SCHOOL
KANSAS STATE UNIVERSITY
Application and Information Blank

Type or print in BLACK ink

					County	
D.O.B.	D.O.E.	B Class	Res.	N. Curr.		
Alpha. Curr.	College	ZZ H.S.	Cit.	Ver.	Sex	
RAC/ETH	ODOE	R	MR	RR	NRR	

1. Admission Requested for Fall ☐ Spring ☐ Summer ☐ 19____
2. Type of admission requested:
a) Degree student working toward Masters ☐ PhD ☐ b) Special student (non-degree) ☐ (See Item 20)
3. Major field in which you wish to work _____
4. Social Security Number _____ Male ☐ Female ☐ Phone Number _____
5. _____
Last Name First Name Middle Name
6. Give any other names under which you have previously enrolled at Kansas State University or at any other college or university. _____
7. Permanent address (where mail will always reach you)
_____ Street City Country State Zip Code
8. Present address
_____ Street City State Zip Code
9. If your home is now in Kansas, give date on which current residency began _____
10. Place of birth _____ Date of birth _____
11. Country of citizenship: U.S. ☐; other ☐ _____ Visa type _____
Name of Country
12. Person to contact in an emergency _____
Last Name First Name Middle Name
_____ (Phone) _____
Street City State Zip
13. Give the names and addresses of all colleges and universities attended including KSU.
- | Institution | Location | Dates Attended | Degree Received | Year |
|-------------|----------|----------------|-----------------|-------|
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
14. Employment Record: List current position and two previous.
- | Nature of Position | Company or Institution | Location | Inclusive Dates |
|--------------------|------------------------|----------|-----------------|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
15. Dates of service in the Armed Forces if you have served more than 90 days _____
16. List of names of three instructors whom you have asked to submit letters regarding your qualifications for graduate study. (Letters should be sent directly to the department chairman.)
- | Name | Position | Address |
|-------|----------|---------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
17. I waive my right of access to letters of reference ☐ Yes ☐ No.
18. What scholarships, honors, prizes, or academic awards have you received? _____
19. Ethnic/Racial Status (required for federal and state accounting purposes only): ☐ Asian/American
☐ Black American ☐ Mexican/American ☐ White ☐ American Indian ☐ Hispanic/American
☐ Non-resident Alien

Applicant's Signature

Date _____

Special students see back of page

APPLICATION FOR GRADUATE STUDY
DEPARTMENT OF COMPUTER SCIENCE - KANSAS STATE UNIVERSITY - MANHATTAN, KANSAS 66506

Name:	_____	Date:	_____
	Last First Middle		
Present Address:	_____	Sex:	Female Male
	_____	Citizenship:	_____
	_____ Zip _____	Birth Date:	_____
Telephone: Area Code _____ Number _____ - _____		Birth Place:	_____
Social Security Number _____ - _____ - _____		Marital Status:	_____
Degree Sought: M.S. Ph.D. Special		Number of Children:	_____
GRE Scores: _____ Verbal; _____ Quantitative		TOEFL Score: _____ (for students whose native language is not English)	
(If available) _____ Advanced GRE in _____ field			

EDUCATION

Highest Degree Attained: _____ Date: _____ School: _____
Major _____ Overall Grade Point Average: _____; Grading Scale A = _____
Last School Attended: _____ Date Attended: _____
Grade Point Average: _____; Grading Scale A = _____

FINANCIAL ASSISTANCE (For on campus applicants only)

Do you wish financial assistance? (Circle One) Yes No

If you do not wish financial assistance, you may ignore the remainder of this section.

Strike out those forms of assistance listed below for which you do not wish to be considered:

Graduate Teaching Assistantship
Graduate Research Assistantship
Graduate Fellowship

In the event you are not awarded financial assistance, do you still wish to be considered for admittance? (Circle One) Yes No

Circle courses in Computer Science at Kansas State University which you feel qualified to teach.

200	201	202	203	204	205	206	300	305
306	405	410	420	430	450	560	580	

An applicant for financial assistance should fill out these application materials and forward them to the head of the department as soon as convenient but not later than March 1.

Kansas State University in cooperation with other colleges and universities has approved the following resolution: "In every case in which a graduate assistantship, scholarship, or fellowship for the next academic year is offered to an actual or prospective graduate student, the student, if he indicated his acceptance before April 15, will have complete freedom through April 15 to submit in writing a resignation of his appointment in order to accept another graduate assistantship, scholarship, or fellowship. However, an acceptance given or left in force after April 15 commits him not to accept another appointment without first obtaining formal release for the purpose." It is assumed that by your signature below that you agree to this policy.

Data

Signature _____

DEPARTMENT OF COMPUTER SCIENCE
KANSAS STATE UNIVERSITY
Manhattan, Kansas 66506

Please complete the rating scale below and provide a statement concerning the qualifications of _____
(name)

for graduate study in computer science. Students are guaranteed access to their education records by the Family Educations Rights and Privacy Act of 1974, unless the right is waived by the student. This statement will be included in the student's permanent record.

	Outstanding	Above Average	Average	Below Average	Weak	Unknown	Optional Comment
PROBLEM SOLVING ABILITY							
ANALYTICAL ABILITY							
WORKS WELL IN GROUPS							
INITIATIVE							
LEADERSHIP							
WORK PERFORMANCE							
CAPACITY FOR FUTURE DEVELOPMENT							
DEGREE OF TEACHING ABILITY							
WRITING ABILITY							

Written Statement: (Please supplement the rating scale above with additional information concerning concrete examples of performance, conduct, etc., and by identifying areas of weaknesses and strengths.)

NAME _____ SIGNATURE _____

POSITION _____ ORGANIZATION _____

DATE _____ ADDRESS _____

M.S. GRAD. STUDENT INFORMATION FORM

DATE _____

1. NAME _____ ADDRESS _____
2. ADVISOR _____ MAJOR PROFESSOR _____
3. TELEPHONE #s HOME _____ OFFICE _____
4. DATE OF ENTRY INTO PROGRAM _____ EXPECTED GRADUATION DATE _____
5. STATUS - Special GRAD. PROV. PROB.
6. PREVIOUS DEGREES EARNED (give school, subject, area and date)

7. COURSES a. Deficiency courses taken: _____ Course _____ Grade _____
- _____ Course _____ Grade _____
- _____ Course _____ Grade _____
- _____ Course _____ Grade _____

b. Grad courses taken/sem	Grade	Cumm. Grd.Pt.
670	_____	_____
700	_____	_____
720	_____	_____
740	_____	_____
761	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

10. Program of Study approved YES NO

11. MS Report or Thesis (dates/title)

- a. Proposal
- Date _____
- Results _____
- b. Orals
- Date _____
- Results _____

12. Supervisory Committee

13. Employment at Graduation:

14. Comments by Major Professor/Advisor/Instructors: OVER

SUBMIT ORIGINAL AND 5 COPIES

KANSAS STATE UNIVERSITY
THE GRADUATE SCHOOL
 PROGRAM OF STUDY FOR THE MASTER'S DEGREE

Indicate Plan: _____
 Master's Thesis _____
 Master's Report _____
 Non Thesis-Report _____

Last Name	First	Middle	Social Security Number
Department Name	Course Number	Course Name	Credits

MAJOR COURSES

Total
Credits

SUPPORTING COURSES

Total
Credits

Advisory Committee

Major Professor — Name Typed

Signature

Committee Member — Name Typed

Signature

Committee Member — Name Typed

Signature

Approved by Head of Department

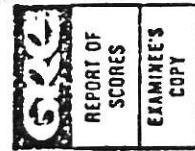
Date

Dean of Graduate School

Date

Typed copies of the program signed by major professor, at least two other committee members and the department head are forwarded to the Dean of Graduate School. (Head of department signs twice if he is a committee member.) Transfer of credits should be indicated and the name of the school given.

Rev 7-71



THIS REPORT IS NOT VALID FOR
TRANSMISSION OF SCORES TO AN
INSTITUTION.

ADVANCED TEST							
TEST DATE		CODE	TOTAL SCORE	%	SUBSCORES		
MO.	YR.				SS1	SS2	SS3

SPECIAL NOTE: Effective October 1981, the maximum obtainable Aptitude Test score is 800. Any score of 800 or higher is a maximum score and should be reported as being equivalent to the 800 maximum.

APTITUDE TEST						
TEST DATE		VERBAL	%	QUANTITATIVE	%	ANALYTICAL
MO.	YR.					
12	81	230	13	690	88	430
BATCH = 03770002						

* Analytical measure revised October 1981. Analytical scores earned before October 1981 cannot be compared with scores earned on later dates.

Graduate school score recipients from registration form only.
Additional score report requests will be acknowledged separately.

CODE SCORES REQUESTED
 1-All Scores
 2-Aptitude Test only
 3-Advanced Test only

If the code for SCORES REQUESTED shows a "1" and no Aptitude Test scores appear on this report or a "2" and no Advanced Test scores appear, your score report HAS NOT BEEN SENT to the institution whose code appears on that line. If a delay in ETS processing has caused this situation, your report will be sent to the affected institution as soon as the delayed score(s) are available. If, however, this situation reflects your error in designating which scores should be sent, you may correct it by submitting an Additional Score Report Request Form to ETS.

See reverse side for Advanced Test codes, subscores names, and information regarding interpretive materials.

B.A. Conferred: Dec. 15, 1974 SUMMA CUM LAUDE
 Major Field: ECONOMICS
 Minor Field: 1st Business Administration 2nd History
 Total Semester Hours: 127 GPA: 3.842 Class Rank:

5909 Brockview Drive
 Parkville, Missouri 64152

Soc. Sec. No.: 120-34-0749

Born: 2-22-45 Reno, Nevada

Admitted: 6-6-73 Status: JUNIOR

DEGREE COMPLETION PROGRAM FOR MILITARY PERSONNEL

as of 6-11-73:

Build 3513 Personnel Management 3 A

SUMMER - 1973

Hust 401 Intellectual Foundations of Western World 6 B 18
 Hist 314 20th Century Russia 3 A 12

SEM: 9 9 30 3.333
 CUM: 75 9 30 3.333

(CONTINUED ON PAGE TWO)

Sharon L. [Signature]
 REGISTRAR

PARSONS COLLEGE

Kansas City, Missouri 64152

Academic Record of Student

Requirements for Graduation: A minimum of 120 credit hours with a minimum grade point average of 2.0.

UNIVERSITY

CLEP # 1 6
 CLEP # 2 6
 CLEP # 3 6
 CLEP # 4 6
 CLEP # 5 6
 With 507 Healthful Living 3

GERMIGNON TEXAS COLLEGE

Build 135 Intro to Mgmt 3 A
 Build 131 Bus Mgmt 3 A

MCNAUL VALLEY COMMUNITY COLLEGE

Social Sciences I 2 C
 Mathematics 21 2 C
 Materials 3 C

SERVICE SCHOOL

Business Organ & Mgmt 6

CRANFORD COLLEGE

Build 3613 Bus Statistics 3 A

MILITARY SERVICE

01 Basic Sports 1
 02 Co-Ed Sports 1
 03 Adult Sports 1
 04 Recreational Sports 1
 215 Safety Ed & First Aid 2
 301 Kinesiology 2

(CONTINUED FROM PAGE ONE)

Page 2 of 2

**PARK COLLEGE**

Kansas City, Missouri 64132

Academic Record of Student

Name _____ Soc. Sec. No. _____

FALL - 1973

Econ 103-A	Principles of Econ I	3	A	12
Econ 104-A	Principles of Econ II	3	A	12
Econ 253-N	Accounting I	3	A	12
Hist 355	Economic History U.S.	3	A	12
Hist 308	16th Century Europe	3	B	9
SEM:		15	15	57
CUM:		90	24	87
				3.800
				3.625

DEAN'S HONOR LIST

JANUARY - 1974

MID-YEAR VENTURE # 7		1	CR	0
CUM:	91	24	87	3.625

SPRING 1974

Econ 301	B Macroeconomics	3	A	12
Econ 490	A Public Finance	3	A	12
Econ 490	C Econ Sumulation	3	A	12
Econ 254	N Accounting II	3	A	12
Hist 202	20th Century Europe	3	A	12
SEM:		15	15	60
CUM:		106	39	147
				4.000
				3.769

DEAN'S HONOR LIST
PRESIDENTIAL SCHOLARSUMMER - 1974

Econ 300	Microeconomics	3	A	12
Hist 382	Refl. Great War I	3	A	12
Dram 102	Voice & Diction	3	A	12
SEM:		9	9	36
CUM:		115	48	283
				4.000
				3.813

PRESIDENTIAL SCHOLAR

FALL - 1974

SoSc 300	Intell Forces/20th C Society	3	CR	0
Econ 309	Economic Development	3	A	12
Econ 451	Sr. Seminar in Economics	3	A	12
SoSc 400	Future of Indust Society	3	A	12
SEM:		12	9	36
CUM:		127	57	219
				4.000
				3.812

PRESIDENTIAL SCHOLAR

Edwin J. [Signature]
REGISTRAR

KANSAS STATE UNIVERSITY
GRADUATE SCHOOL
MANHATTAN, KANSAS 66506

March 9, 1982

627-3 McClellan Ave.
Ft. Leavenworth, KS 66027

I am pleased to inform you that your admission to Graduate School at Kansas State University to work for the Masters degree in Computer Science has been approved. You should keep this letter as the official acknowledgment of your acceptance to do advanced work and be prepared to present it at the time of registration which will be _____ for on-campus students.

Your status is as follows: (applicable as checked)

- ☒ a) Regular admission.
- ☐ b) Provisional (see below).
- ☐ 1) Pending receipt of transcript showing award of bachelor's degree.
 - ☐ 2) Unable to interpret transcript.
 - ☐ 3) Must remove following deficiencies: (Note: Deficiency courses are in addition to normal degree requirements.)
- ☐ c) Probationary—grades in prior work are below normal standards. Students admitted on probation are removed from that status upon completion of nine (9) graduate credits in course work (other than independent study) if all grades are B or better. Receiving a grade lower than B may be cause for denying continued enrollment.

Additional Information: (applicable as checked)

- ☐ d) Please note enclosed material and contact Student Health before enrolling.
- ☐ e) You must take a physical examination on the day of registration.
- ☐ f) You must attend the Foreign Student Orientation on _____

This admission does not guarantee acceptance for candidacy for a graduate degree, nor does it assure admission for a date other than the one noted above. Upon arrival for registration you should contact an advisor in your major department to assist in planning your program.

I am confident that you will find your graduate work at Kansas State University both challenging and rewarding. Do not hesitate to contact me if you have questions or if I can assist in any way.

JPN/dr
cc: Computer Science

Sincerely yours,

John P. Noonan
JOHN P. NOONAN
Associate Dean

STUDENT GRADE REPORT
KANSAS STATE UNIVERSITY
OFFICE OF THE UNIVERSITY REGISTRAR
118 ANDERSON HALL

							CLASS CM	TERM SUM	62
ID	CURRIC.		CMPSC	COLL CR		FINAL			
	COURSE	COURSE NAME	CR HRS	CM LEV	GRADE	REPORT TYPE	GRADE POINTS		
	CMPSC 700	TRANSLATOR DESIGN I	3	G	B		5		
	CMPSC 720	OPERATING SYSTEMS 2	3	G	B		9		
	CMPSC 897	SLM/GRAU COMPUTER SC	1	G	A		4		
7	22	3.143	10	52	3.250				
SEM HRS	SEM POINTS	SEM GPA	HRS P	HRS CR	CUM HRS ATTEND	CUM PTS EARNED	CUMULATIVE G.P.A.	TOTAL TRANS PTS	HONORS-PROBATION DISMISSAL

KANSAS STATE UNIVERSITY

Graduate School

NAME: _____

I have at least \$8000 U.S. per year available for my living expenses in the U.S. The money will be provided by:

(name)

(address)

Signed: _____

Date: _____



KANSAS STATE UNIVERSITY

Lafene Student Health Center
University Hospital
Manhattan, Kansas 66506

KANSAS STATE UNIVERSITY
INTERNATIONAL STUDENT MEDICAL CERTIFICATE

Kansas State University requires that all entering students not have contagious or communicable diseases. Therefore, you are required to have a medical examination before you may be admitted to Kansas State University, and a doctor must complete Part I of this form. This form must be mailed with your application for admission to Kansas State University.

MEDICAL STATEMENT

PART I: FOR DOCTOR

I have examined _____ (patient)
Name (PRINT)
with the following results

	Yes	No
Tuberculosis	_____	_____
Malaria	_____	_____
Parasite Infection	_____	_____
Other contagious or communicable disease	_____	_____

If the patient does have a contagious or communicable disease,
what disease _____,
present condition _____,
current medication or treatment _____.

Doctor_____
Date

PART II: TO BE COMPLETED BY THE STUDENT

Check One

Graduate _____

Undergraduate _____

Field of Study _____

I understand that, in addition to the physical examination reported above, I will be subject to further physical examination at the Student Health Center of Kansas State University prior to my enrollment. I understand further that I may be refused admission if I am found to have a contagious or communicable disease.

Student Signature_____
PRINT--last name only



Test of English as a Foreign Language
Box 899, Princeton, NJ 08541, USA

EXAMINEE'S SCORE CONFIRMATION RECORD

9151107
APPLICATION NUMBER

NAME (LAST OR FAMILY, FIRST, MIDDLE)	

CHINA	CHINESE	02/18/55	M
NATIVE COUNTRY	NATIVE LANGUAGE	MO. / DAY / YEAR DATE OF BIRTH	SEX

INFORMATION FOR THE EXAMINEE

REQUESTS TO REPORT OFFICIAL TOEFL
SCORES TO NEW YORK INSTITUTIONS WILL
NOW BE HONORED FOR ALL TEST DATES

NOTE FOR INSTITUTIONS: This score record has been supplied by the examinee. Official score reports are sent directly to institutions only by ETS. Institutions and agencies are urged to verify this score record by calling toll free 800-257-9547. Officials from Alaska, Hawaii, New Jersey, or Canada should call collect 609 892-8601. Remember, scores more than two years old cannot be verified. Photostat copies should not be accepted.

SECTION 1	SECTION 2	SECTION 3	TOTAL SCORE
56	57	53	553

SCALED SCORES

2	1	1	L609	MAR 81
REASON FOR FAILING ITEMS	DEGREE	TOEFL SCORE BEFORE	CENTER NUMBER	MONTH YEAR TEST DATE

XXXX XX	XXXX XX	XXXX XX	XXXX XX	XXXX XX
INSTITUTION CODE	DEPT. CODE	INSTITUTION CODE	DEPT. CODE	INSTITUTION CODE

SEE OTHER SIDE FOR EXPLANATIONS.

APPENDIX B
DATA ANALYSIS SHEET

APPENDIX C
OUTPUT DOCUMENTS

OUTPUT DOCUMENTS

- Response to Inquiry (foreign student)
- Items Missing Letter
- C.S. Department Letter of Acceptance
- C.S. Department Letter of Acceptance
(with no support offered now)
- C.S. Department Letter of Rejection
After Committee Review
- C.S. Department Initial Letter of Rejection
(foreign student)
- In-state Ph.D. Teaching Assistantship Letter
(with acceptance enclosure)
- Out-of-state Ph.D. Teaching Assistantship Letter
(with acceptance enclosure)
- In-state M.S. Teaching Assistantship Letter
(with acceptance enclosure)
- Out-of-state M.S. Teaching Assistantship Letter
(with acceptance enclosure)

DATE

ADDRESS
ADDRESS
ADDRESS
ADDRESS

Dear

Thank you for your recent request for application materials for graduate work in Computer Science at Kansas State University. Before we can further process your request, we need some further information.

The Graduate School requires that foreign applicants supply proof of being able to support themselves while pursuing graduate studies by providing at least \$8000 per year. Unfortunately, current budgetary constraints within the Department prevent us from being able to offer assistantships or other types of financial support during the first year of graduate work. Thus, you must be able to provide these funds from your own resources.

If you can provide these funds, please fill out the enclosed form and return to us, along with verification from a bank or other source (for instance, parents) that these funds are available.

In addition to proof of financial support, we require a TOEFL score of 575 or better. If you meet our qualifications, we will send you the other materials needed to complete your application.

We look forward to hearing from you.

Sincerely,

Virg Wallentine, Chairman
Graduate Studies Committee

VW:mbc

Enclosure

DATE

ADDRESS
ADDRESS
ADDRESS

Dear

Your application for Graduate School in the Computer Science Department is being delayed because we have not yet received all of your credentials. Our Graduate Committee cannot review your application until all of your credentials are received.

We show that we still have not received:

____ 2 copies of an official transcript from:

____ TOEFL score
____ Financial statement
____ Computer Science form
____ Letters of recommendation from:

____ Statement of academic objectives
____ Health form

If you still wish your application to be considered for Graduate School, please have these credentials sent as soon as possible. If not, please sign the line below and mail it back to us.

I no longer wish to be considered for Graduate School.

Signature

Sincerely,

Virg Wallentine, Chairman
Graduate Studies Committee

DATE

ADDRESS
ADDRESS
ADDRESS

Dear

Welcome to K-State. The Department Graduate Committee has recommended to the Graduate School that your application be accepted. You will receive official notice from the Graduate School.

Enrollment for Spring will be held January 10-11, 1983 and classes begin January 12, 1983. There will be general advising sessions for new graduate students scheduled during the enrollment period.

We are looking forward to having you in the Department

Sincerely,

William J. Hankley
Grad. Studies Committee

WJH:mbc

DATE

ADDRESS
ADDRESS
ADDRESS

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Enrollment for Spring will be held January 10-11, 1983 and classes begin January 12, 1983. There will be general advising sessions for new graduate students scheduled during the enrollment period.

We are not able to offer you support at this time. However, it is likely that you will be able to find support after having gained experience in the Graduate Program.

We are looking forward to having you in the Department.

Sincerely,

William J. Hankley
Grad. Studies Committee

WJH:mbc

DATE

ADDRESS

ADDRESS

ADDRESS

Dear

Thank you for submitting your application for graduate study in Computer Science. The Graduate Studies Committee of this Department has carefully considered your request. Due to the following reason(s), we regret that we will not be able to accept you at this time.

- _____ Financial need (we require at least \$8000 per year support)
- _____ Scholastic record (require B+ grade average, 80%-85%)
- _____ TOEFL (require a minimum of 575)
- _____ Lack Computer Science background (require B.S. in Computer Science or equivalent)
- _____ Other

Please accept our best wishes for success in pursuit of your career.

Sincerely,

Virg Wallentine, Chairman
Graduate Studies Committee

VW:mbc

DATE

ADDRESS
ADDRESS
ADDRESS

Dear

We have received your inquiry about graduate study in Computer Science.

Among our requirements for graduate work in Computer Science are that we require a TOEFL of 575 or better, a B.S. in Computer Science or equivalent experience, and at least a B+ grade average (80%-85%). Furthermore, the applicant must demonstrate support of at least \$8000 per year. After viewing your inquiry, we find that you have not met these requirements.

Because of limitations of size and resources of our Department, we cannot admit you.

Please accept our best wishes for success in your pursuit of graduate studies.

Sincerely,

Virg Wallentine, Chairman
Graduate Studies Committee

VW:mbc

DATE

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ADDRESS
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The Department is pleased to offer you a Graduate Teaching Assistantship. Your salary will be \$0000 per month for four and a half months (January 16, 1983 thru May 31, 1983) paid at the end of each month. Also, the salary will be adjusted upon your passing both the doctoral preliminary examinations and presentation of your research proposal. Your duties will be: to teach two programming language classes (each class will be 2 hrs. lecture, 3 hrs. lab per week) under direction of the course director; attend a weekly T.A. meeting; and maintain office hours of 4 hours per week. General organization, assignments, and common examinations for the language classes are prepared by the course director.

As a graduate assistant, you will be expected to: carry nominally nine (9) hours of credit courses each semester; to make satisfactory progress towards your degree; and to attend Department seminars. Later there may be opportunity to teach other courses or to move to a research position.

If you accept the offer, please sign the attached form and return it to me as soon as possible, but no later than November 30, 1982. If you have any question, please call. We are looking forward to having you in the Department.

Sincerely,

William J. Hankley
Grad. Student Committee

WJH:mbc

DATE

ADDRESS
ADDRESS
ADDRESS

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Grad. Student Committee

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WJH:mbc

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Sincerely,

William J. Hankley
Grad. Student Committee

WJH:mbc

THE DESIGN OF A OUTPUT PROCESSOR
FOR A GRADUATE STUDENT RECORD
SYSTEM

by

JOHN JOSEPH OTT

BGS, University of Nebraska at Omaha, 1976

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the
requirements for the degree

MASTER OF SCIENCE

Department of Computer Science

KANSAS STATE UNIVERSITY
Manhattan, Kansas

The purpose of this paper is to describe the design of a Output Processor using the facilities of the Data Base Management System called INGRES and the Graduate Student Record System's relational data base.

The objective of this design is to provide the faculty members of the Computer Science Department with viable tools with which they might more efficiently and effectively monitor and manage their graduate students. The primary design tools used in this process included input/resident/output data analysis, and the WARNIER/ORR diagrams.

Among the tools provided the faculty are a Student Summary Sheet which will outline a student's current status in terms of the courses taken (deficiency, core, supporting and other) including credit hours, a grade for each course and current grade point average for completed courses. Additionally, this system provides five standard reports and facilities for ad hoc queries allowing the monitoring of a graduate student's progression through his or her program of study.

The system is on-line so that each faculty member will have immediate access to a student's record for counselling purposes.