DESIGN A OUTPUT PROCESSOR FOR A GRADUATE
STUDENT RECORD SYSTEM

by

JOHN JOSEPH OTT

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Approved by:

[Signature]

Major Professor
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ACKNOWLEDGEMENTS

I wish to express my most grateful and sincere appreciation to my major professor, Dr. Elizabeth A. Unger, for her time, guidance and direction in completion of this report. I would also like to thank Dr. Thomas Gallagher and Dr. Kenneth Conroe for their kindness and assistance. Lastly, I would like to thank Rhonda Terry, without whom I would never have completed this report on time.
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 database 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 Methoda

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.

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

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).

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

*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.
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**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.
C.S. DEPT APPLICATION

APPLICATION
APPLICATION NAME
APPLICATION ADDRESS

BEGIN
PHONE NO
SSAN
SEX
CITIZENSHIP

DEGREE SOUGHT
MS
PHD
SPECIAL

TESTING
GRE SCORES
VERBAL
QUANTITATIVE
ANALYTICAL

ADVANCED GRE FIELD
SCORE
TOTAL
SCORE

TOEFL
HIGHEST DEGREE
DATE
DATE ATTENDED
DATE
SCHOOL
MAJOR GPA
GRADE SCALE

EDUCATION
LAST GPA
SCHOOL GRADE SCALE

FINANCIAL ASSISTANCE

GRADUATE TEACHING ASSISTANTSHIP
GRADUATE RESEARCH ASSISTANTSHIP
GRADUATE FELLOWSHIP

GRADUATE Course QUALIFIED TO TEACH
COURSE NUMBER (1,5)

Figure 3.2
WARNIER/OMR 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.

\[\text{LETTERS OF RECOMMENDATION} \begin{cases} \text{NUMBER RECEIVED} \\ (1,S) \end{cases}\]

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.

![Diagram of University Semester Grade Report]

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.

![Diagram of Graduate School's Financial Statement]

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.

\[
\begin{align*}
\text{UNIVERSITY'S INTERNAIONAL MEDICAL CERTIFICATE} & \quad \text{NAME} \\
& \quad \text{MEDICAL CERTIFICATION}
\end{align*}
\]

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.

\[
\begin{align*}
\text{NAME} & \\
\text{TOEFL SCORES} & \quad \text{TOTAL SCORE} \\
& \quad \text{TEST DATE}
\end{align*}
\]

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

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

### REPORTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R01</td>
<td>Graduate Student Roster</td>
</tr>
<tr>
<td>R02</td>
<td>Student Graduation Forecast</td>
</tr>
<tr>
<td>R03</td>
<td>Students Without a Major Professor</td>
</tr>
<tr>
<td>R04</td>
<td>Students Not Making &quot;Normal Progress&quot;</td>
</tr>
<tr>
<td>R05</td>
<td>Student Summary Sheet</td>
</tr>
</tbody>
</table>

**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:

<table>
<thead>
<tr>
<th>Description</th>
<th>Char.</th>
<th>A/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>15</td>
<td>A N</td>
</tr>
<tr>
<td>NAME</td>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>STREET ADDRESS</td>
<td>25</td>
<td>A N</td>
</tr>
<tr>
<td>CITY, STATE &amp; ZIP</td>
<td>22</td>
<td>A N</td>
</tr>
<tr>
<td>DOLLAR AMOUNT</td>
<td>6</td>
<td>N</td>
</tr>
</tbody>
</table>

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
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 $5,000 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. Unger,
Chairperson
Graduate Studies Committee

Enclosure

** Desired Action **
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:

<table>
<thead>
<tr>
<th>Description</th>
<th>Char.</th>
<th>A/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>15</td>
<td>A N</td>
</tr>
<tr>
<td>NAME</td>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>STREET ADDRESS</td>
<td>25</td>
<td>A N</td>
</tr>
<tr>
<td>CITY, STATE &amp; ZIP</td>
<td>22</td>
<td>A N</td>
</tr>
<tr>
<td>ITEM IDENTIFIER</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>SCHOOL NAME</td>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>NAME (LETTER OF RECOMMENDATION)</td>
<td>35</td>
<td>A</td>
</tr>
</tbody>
</table>

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 and '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 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:

----------------------------------------------------

----------------------------------------------------

----------------------------------------------------

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
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.

Sincerely,

Elizabeth A. Unger,
Chairperson
Graduate Studies Committee

Signature
** 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:

<table>
<thead>
<tr>
<th>Description</th>
<th>Char.</th>
<th>A/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>15</td>
<td>A N</td>
</tr>
<tr>
<td>NAME</td>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>STREET ADDRESS</td>
<td>25</td>
<td>A N</td>
</tr>
<tr>
<td>CITY, STATE &amp; ZIP</td>
<td>22</td>
<td>A N</td>
</tr>
<tr>
<td>SESSION NAME</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>PERSONAL NAME LINE</td>
<td>15</td>
<td>A N</td>
</tr>
<tr>
<td>ENROLLMENT DATES</td>
<td>20</td>
<td>A N</td>
</tr>
<tr>
<td>CLASS START DATE</td>
<td>20</td>
<td>A N</td>
</tr>
</tbody>
</table>

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)
<table>
<thead>
<tr>
<th>Description</th>
<th>Char.</th>
<th>A/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>15</td>
<td>A/N</td>
</tr>
<tr>
<td>NAME</td>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>STREET ADDRESS</td>
<td>25</td>
<td>A/N</td>
</tr>
<tr>
<td>CITY, STATE &amp; ZIP</td>
<td>22</td>
<td>A/N</td>
</tr>
<tr>
<td>SESSION NAME</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>PERSONAL NAME LINE</td>
<td>15</td>
<td>A/N</td>
</tr>
<tr>
<td>ENROLLMENT DATES</td>
<td>20</td>
<td>A/N</td>
</tr>
<tr>
<td>CLASS STATE DATE</td>
<td>20</td>
<td>A/N</td>
</tr>
</tbody>
</table>

**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 of 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
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)  

(National 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 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 $____ 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.

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)
<table>
<thead>
<tr>
<th>Description</th>
<th>Char.</th>
<th>A/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>15</td>
<td>A/N</td>
</tr>
<tr>
<td>NAME</td>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>STREET ADDRESS</td>
<td>25</td>
<td>A/N</td>
</tr>
<tr>
<td>CITY, STATE &amp; ZIP</td>
<td>22</td>
<td>A/N</td>
</tr>
<tr>
<td>DOLLAR AMOUNT</td>
<td>6</td>
<td>N</td>
</tr>
</tbody>
</table>

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 5 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 4.26

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
<table>
<thead>
<tr>
<th>Description</th>
<th>Char.</th>
<th>A/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>15</td>
<td>A/N</td>
</tr>
<tr>
<td>NAME</td>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>STREET ADDRESS</td>
<td>25</td>
<td>A/N</td>
</tr>
<tr>
<td>CITY, STATE &amp; ZIP</td>
<td>22</td>
<td>A/N</td>
</tr>
<tr>
<td>PERSONAL NAME LINE</td>
<td>15</td>
<td>A/N</td>
</tr>
<tr>
<td>ENROLLMENT DATES</td>
<td>20</td>
<td>A/N</td>
</tr>
<tr>
<td>CLASS STATE DATE</td>
<td>20</td>
<td>A/N</td>
</tr>
<tr>
<td>DOLLAR AMOUNT</td>
<td>6</td>
<td>N</td>
</tr>
<tr>
<td>ASSISTANTSHIP PERIOD</td>
<td>40</td>
<td>A/N</td>
</tr>
<tr>
<td>RESPONSE DUE DATE</td>
<td>14</td>
<td>A/N</td>
</tr>
</tbody>
</table>

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 1 OUT-OF-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 from the Graduate School.

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

Figure 4.30
Screen 1 Out-of-State PhD Teaching Assistantships
** 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
(________________ 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 _
** 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
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
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 _
<table>
<thead>
<tr>
<th>Description</th>
<th>Char.</th>
<th>A/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>15</td>
<td>A/N</td>
</tr>
<tr>
<td>NAME</td>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>STREET ADDRESS</td>
<td>25</td>
<td>A/N</td>
</tr>
<tr>
<td>CITY, STATE &amp; ZIP</td>
<td>22</td>
<td>A/N</td>
</tr>
<tr>
<td>PERSONAL NAME LINE</td>
<td>15</td>
<td>A/N</td>
</tr>
<tr>
<td>ENROLLMENT DATES</td>
<td>20</td>
<td>A/N</td>
</tr>
<tr>
<td>CLASS STATE DATE</td>
<td>20</td>
<td>A/N</td>
</tr>
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<td>DOLLAR AMOUNT</td>
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<td>N</td>
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<tr>
<td>ASSISTANTSHIP PERIOD</td>
<td>40</td>
<td>A/N</td>
</tr>
<tr>
<td>RESPONSE DUE DATE</td>
<td>14</td>
<td>A/N</td>
</tr>
</tbody>
</table>

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:
Dear [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
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 an 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 of Input Specifications for Out-of-state M.S. Teaching Assistantship Letter (with acceptance enclosure)

<table>
<thead>
<tr>
<th>Description</th>
<th>Char.</th>
<th>A/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>15</td>
<td>A/N</td>
</tr>
<tr>
<td>NAME</td>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>STREET ADDRESS</td>
<td>25</td>
<td>A/N</td>
</tr>
<tr>
<td>CITY, STATE &amp; ZIP</td>
<td>22</td>
<td>A/N</td>
</tr>
<tr>
<td>PERSONAL NAME LINE</td>
<td>15</td>
<td>A/N</td>
</tr>
<tr>
<td>ENROLLMENT DATES</td>
<td>20</td>
<td>A/N</td>
</tr>
<tr>
<td>CLASS STATE DATE</td>
<td>20</td>
<td>A/N</td>
</tr>
<tr>
<td>DOLLAR AMOUNT</td>
<td>6</td>
<td>N</td>
</tr>
<tr>
<td>ASSISTANTSHIP PERIOD</td>
<td>40</td>
<td>A/N</td>
</tr>
<tr>
<td>RESPONSE DUE DATE</td>
<td>14</td>
<td>A/N</td>
</tr>
</tbody>
</table>

#### 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.
** GRADUATE STUDENT ROSTER **

(SORTED ALPHABETICALLY BY STUDENT/MAJOR PROFESSOR)

DATE PRODUCED: __________________

<table>
<thead>
<tr>
<th>NO</th>
<th>STUDENT NAME</th>
<th>STATUS</th>
<th>MAJOR PROFESSOR</th>
</tr>
</thead>
</table>

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.
4.15 **Students Without a Major Professor**

To retrieve this report, the user selects report code RO3 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.
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 ≥ 3.0
- Student has major professor by end of second semester
- Student class load ≥ 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: __________

<table>
<thead>
<tr>
<th>NAME</th>
<th>STATUS</th>
<th>GPA</th>
<th>MAJOR PROFESSOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>NINE</td>
<td>CORE COURSES</td>
<td></td>
<td>COMPLETE</td>
</tr>
<tr>
<td>HRS/SEM.</td>
<td>BY 2ND SEM.</td>
<td></td>
<td>ON TIME</td>
</tr>
</tbody>
</table>

**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: ________________

<table>
<thead>
<tr>
<th>NAME</th>
<th>ADVISOR</th>
<th>MAJOR</th>
<th>PROFESSOR</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>DATE OF ENTRY INTO PROGRAM</th>
<th>EXPECTED GRAD. DATE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>STATUS</th>
<th>TOEFL SCORE/DATE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>PREVIOUS DEGREES EARNED:</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCHOOL</td>
<td>SUBJECT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COURSES:</th>
<th>COURSE NUMBER</th>
<th>COURSE NAME</th>
<th>GRADE</th>
<th>DEF</th>
<th>SEM</th>
<th>GRADE</th>
<th>REPEAT</th>
</tr>
</thead>
</table>

| GPA |

<table>
<thead>
<tr>
<th>PROGRAM OF STUDY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESEARCH OPTION:</td>
</tr>
<tr>
<td>A. PROPOSAL: DATE: ___________ RESULTS: ___________</td>
</tr>
<tr>
<td>B. ORALS: DATE: ___________ RESULTS: ___________</td>
</tr>
</tbody>
</table>
| 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 database 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


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
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)

<table>
<thead>
<tr>
<th>Street</th>
<th>City</th>
<th>State</th>
<th>Zip Code</th>
</tr>
</thead>
</table>

8. Present address

<table>
<thead>
<tr>
<th>Street</th>
<th>City</th>
<th>State</th>
<th>Zip Code</th>
</tr>
</thead>
</table>

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 ☐ Name of Country ________________ Visa type ________________

12. Person to contact in an emergency

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Middle Name</th>
<th>Phone</th>
</tr>
</thead>
</table>

13. Give the names and addresses of all colleges and universities attended including KSU.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Address</th>
<th>Dates Attended</th>
<th>Degree Received</th>
<th>Year</th>
</tr>
</thead>
</table>

14. Employment Record. List current position and two previous.

<table>
<thead>
<tr>
<th>Position</th>
<th>Company or Institution</th>
<th>Dates</th>
<th>Inclusive Dates</th>
</tr>
</thead>
</table>

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.)

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Address</th>
</tr>
</thead>
</table>

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: ___________________________ Last First Middle ___________________________ Date: ________________

Present Address: ___________________________ Zip ___________________________ Sex: Female Male

Telephone: Area Code ______ Number ______ Citizenship: ___________________________ Birth Date: ____________

Social Security Number ________ Degree Sought: M.S. Ph.D. Special

GRE Scores: Verbal: ________ Quantitative ________ (If available) Advanced GRE in Field: ________

EDUCATION

Highest Degree Attained: ________ Date: ____________ School: ___________________________

Major: ___________________________ Overall Grade Point Average: ________ Grading Scale: A = ________

Last School Attended: ________ Grade Point Average: ________ Date Attended: ____________ 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 admission? (Circle One) Yes No

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


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 indicates 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.

Date ___________________________ 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 Education 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.

<table>
<thead>
<tr>
<th></th>
<th>Outstanding</th>
<th>Above Average</th>
<th>Average</th>
<th>Below Average</th>
<th>Weak</th>
<th>Unknown</th>
<th>Optional Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBLEM SOLVING ABILITY</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANALYTICAL ABILITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WORKS WELL IN GROUPS</td>
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<td></td>
<td></td>
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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
      ___________________ ___________________ ___________________ ___________________
      ___________________ ___________________ ___________________ ___________________
      ___________________ ___________________ ___________________ ___________________
      ___________________ ___________________ ___________________ ___________________

      670 ___________________ ___________________ ___________________
      700 ___________________ ___________________ ___________________
      720 ___________________ ___________________ ___________________
      740 ___________________ ___________________ ___________________
      761 ___________________ ___________________ ___________________
      ___________________ ___________________ ___________________
      ___________________ ___________________ ___________________
      ___________________ ___________________ ___________________
      ___________________ ___________________ ___________________
      ___________________ ___________________ ___________________
      ___________________ ___________________ ___________________

10. Program of Study approved YES NO

11. M.S 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
<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
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**Department Name**

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**Total Credits**

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**Advisory Committee**

- Major Professor: Name typed  
  Signature

- Committee Member: Name typed  
  Signature

- Committee Member: Name typed  
  Signature

*Approved by Head of Department:*

Date

(Head of Graduate School)

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 1-71
**Test Date**

<table>
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<th>Test</th>
<th>Month</th>
<th>Day</th>
<th>Year</th>
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<th>Analytical</th>
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<th>Subscores</th>
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<td>31</td>
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<td>330</td>
<td>13</td>
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**Advanced Test**

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<th>Subscores</th>
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<tbody>
<tr>
<td>Month</td>
<td>Day</td>
<td>Yr</td>
<td>551</td>
</tr>
</tbody>
</table>

**Special Note:** Effective October 1981, the maximum obtainable Aptitude Test score is 800. Any verbal or quantitative scores higher than 600 earned before October 1981 should be interpreted as being equivalent to the 800 maximum.

**Graduate School Score Recipients from Registration Form Only.** Additional score report requests will be acknowledged separately.

**Code**

- 1 = All Scores
- 2 = Aptitude Test Only
- 3 = Advanced Test Only

See reverse side for Advanced Test codes, subscores names, and information regarding interpretative materials.
PARK COLLEGE
Kansas City, Missouri 64132
Academic Record of Student
Requirements for Graduation: A minimum of 120 credit hours with a minimum grade point average of 2.0.

B.A. Conferral: Dec. 15, 1974 SUMMA CUM LAUDE

Major Field: ECONOMICS

1st Minor Field: Business Administration
2nd Minor Field: History

Total Semester Hours: 127 GPA: 3.842 Class Rank:

5309 Brookview Drive
Parkville, Missouri 64152

SS No.: 120-24-49744

Born: 2-22-45 Reno, Nevada

Admitted: 8-4-73 Status: REGISTERED

DEGREE COMPLETION PROGRAM FOR MILITARY PERSONNEL

as of 6-11-73:

SOCIAL SCIENCE

GEO 21

MATERIALS

3 0

BUSINESS SCHOOL

Bus Org & Mgmt 6

COLUMBIA COLLEGE

2d 3613 Bus Statistics 3 A

MILITARY SERVICE

01 Basic Sports 1
02 201 Science
05 201 Science
06 Recreational Sports 1
15 215 Safety Ed & First Aid 2
20 201 Kinesiology 2

(Continued on Page Two)
## PARK COLLEGE
Kansas City, Missouri 64110
Academic Record of Student

### FALL - 1973

<table>
<thead>
<tr>
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<td>Econ 104-A</td>
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<td>Econ 253-N</td>
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<td>Hist 355</td>
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**Total Credits:** 36

### CUMULATIVE GPA: 3.625

### DEAN'S HONOR LIST

### JANUARY - 1974

**Mid-Year Venture # 7**

<table>
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<tbody>
<tr>
<td>Soc 300</td>
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<td>3</td>
<td>CR</td>
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<tr>
<td>Econ 309</td>
<td>Economic Development</td>
<td>3</td>
<td>A</td>
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<td>Econ 451</td>
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<td>A</td>
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**Total Credits:** 12

### CUMULATIVE GPA: 3.625

### SPRING 1974

<table>
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<td>Econ 490</td>
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**Total Credits:** 4.000

### CUMULATIVE GPA: 3.769

### DEAN'S HONOR LIST

**PRESIDENTIAL SCHOLAR**

### SUMMER - 1974

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<td>Dram 102</td>
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**Total Credits:** 18

### CUMULATIVE GPA: 3.813

### FALL - 1974

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<td>Econ 309</td>
<td>Economic Development</td>
<td>3</td>
<td>A</td>
<td>12</td>
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<td>Econ 451</td>
<td>Sr. Seminar in Economics</td>
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<tr>
<td>Soc 400</td>
<td>Future of Indust Society</td>
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</table>

**Total Credits:** 12

### CUMULATIVE GPA: 3.812

### DEAN'S HONOR LIST

**PRESIDENTIAL SCHOLAR**

### REGISTRAR

Signature
March 9, 1982

KANSAS STATE UNIVERSITY
GRADUATE SCHOOL
MANHATTAN, KANSAS 66506

h27-3 McClellan Ave.
Pt. 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 acknowledgement 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 the 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.

Sincerely yours,

John P. Noonan
Associate Dean

JPN/Dr.
cc: Computer Science

[Signature]
<table>
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<tr>
<th>COURSE</th>
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STUDENT GRADE REPORT
KANSAS STATE UNIVERSITY
OFFICE OF THE UNIVERSITY REGISTRAR
118 ANDERSON HALL
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

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. 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) with the following results

__________________________ ____________________________

Name (PRINT) ____________________________

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

Graduates ____________________________

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.

__________________________ ____________________________

Submit Signature ____________________________ PRINT—last name only
APPENDIX B

DATA ANALYSIS SHEET
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<td>STATE OF RESIDENCY</td>
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Figure B.1
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)
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
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
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

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 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
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
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

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.

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
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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

-1982-
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/ORB 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.