

THE DESIGN FOR AN AUTOMATED OFFICE INFORMATION SYSTEM  
FOR THE COMPUTER SCIENCE DEPARTMENT  
TO AID IN TRACKING GRADUATE STUDENTS

by

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# CHAPTER 1

## INTRODUCTION

### 1.1 Objective

It is the purpose of this report to detail the design of an office information system (OIS) for the Computer Science Department to use in monitoring the progress of its graduate students. This office information system consists of a transaction processor coupled with a relational database and report generator. The system is called 'Kool Records for Graduate Students'. The name 'KOOL RECORDS' was chosen arbitrarily from the set of nontechnical names, with the purpose of making it easy to remember.

### 1.2 Background

In the fall semester of 1982, Dave Schottel, John Cook and John Ott completed master's reports describing the design of a transaction processor, database, and output processor for managing the graduate students in Computer Science. They called their effort 'GRASTURS' (Graduate Student Record System).{1,2,3}

It was the original intent of this report to analyze GRASTURS and proceed with a detailed design and implementation of it. However, an investigation of the Computer Science Department's information needs and an analysis of the current implementation constraints revealed that major design changes were necessary for an implementation of GRASTURS. Several considerations that contributed to this decision were: the fact that the Ingres database system for which GRASTURS was designed was unavailable; the fact that the screens designed for GRASTURS were incompatible with Computer Science Department terminals; and the discovery of Computer Science Department information needs which were not met by GRASTURS. Therefore, it was determined, with the guidance of Dr. Unger, that a totally new

design effort be initiated. The result of this new design effort is the 'Kool Records' system.

Even though the final design of Kool Records bears little resemblance to the design of GRASTURS, the research work and guidance provided by Mr. Schottel, Mr. Cook and Mr. Ott proved to be very helpful in the formulation of the entire Kool Records project.

### 1.3 Report Synopsis and Methodology

This report will cover all phases of the OIS development from the initial investigation of the Computer Science Department Office to the final design.

The investigation of the Computer Science Office information needs and procedures is addressed in Chapter 2 of this report. As a part of this investigation, a series of interviews were conducted with members of the office staff and Computer Science faculty who used and updated graduate student information. These interviews helped establish the Computer Science Department's information requirements.

As a next step, an office modeling technique called an Information Control Net (ICN) diagram was formulated to clarify graphically the flow of information and procedure through the Computer Science Office. ICN diagrams were chosen for this purpose over several other alternatives because they are easy to read, and they demonstrate the information requirements of each office procedure.{4}

Chapter 3 deals with the requirements specification and analysis for the KOOL RECORDS system.

The investigation of the Computer Science Department Office revealed that there are four principal functions which involve the management of graduate students:



1. Applicant Management
2. Faculty Advising
3. Annual Evaluation
4. GTA and GRA Administration

The requirements specifications for the automated OIS are presented in terms of these four functions and their particular information requirements.

The actual system design is detailed in Chapter 4. This includes the design of the input and perusal screens, the design of the database and the design of the report generator. Also addressed in this chapter will be the major considerations and decisions which lead to the final design of each component.

The design emphasis on the transaction processing screens was 'user-friendliness'. The author worked closely with users of the system to develop screens that met their criteria for both ease and efficiency in data entry, data-update, and perusal.

The actual database was designed as a relational model. The relations themselves are designed to adhere to the requirements of the fifth normal form (projection-join normal form). The emphasis in designing the database was on efficiency and conservation of space.

The report generator was designed to produce automatically the standard documents of the Computer Science office. These documents include form letters to applicants and students as well as hard copies of the information contained in the database.

In Chapter 5, the impact of the KOOL RECORDS automated OIS on departmental procedure is assessed. Included in this assessment is an ICN diagram which depicts office procedures as they should exist after the

automated system has been implemented. The chapter ends with an overview of changes that should occur with the move to an automated environment.

Chapter six summarizes this report and points out some considerations for future enhancements to the system.

## CHAPTER 2

## INVESTIGATION AND MODELING OF THE OFFICE

2.1 Overview

The investigation of the Computer Science Department Office proved to be the most time consuming and challenging part of this project. The investigation itself consisted of a series of interviews with members of Computer Science faculty and staff to determine office procedures, as well as an analysis of all current input and output documents relating to masters student's information. The interview process began on December 4, 1982 and ended on March 10, 1983.

The principal challenge of this investigation was to develop a formalized picture of the office procedure connected with processing information about master's students on which to base the design of an automated information system. However, implicit in this process was the obligation to analyze the existing procedures for consistency and efficiency before considering the task of automation. The results of this analysis are that several office procedures and their accompanying information requirements have been altered to provide what the author feels is a more efficient and consistent information system. Details of these suggested changes will be discussed as a part of the requirement specifications and system design chapters.

Problems encountered during the investigation centered on two areas. The first problem area was the author's own lack of experience in conducting this type of investigation. This resulted in several follow up interviews that may not have been necessary otherwise. The second problem area had to do with the fact that several of the office procedures had been developed in an informal and undocumented manner. This made it difficult to identify and classify certain procedures.

Once the investigation itself was complete, it was determined that the information could most easily be understood through a formalized graphic representation. Information Control Network (ICN) diagrams were selected to serve this purpose.

The selection process which resulted in the choice of the ICN modeling technique is discussed in the next section.

## 2.2 Office Modeling Techniques

Formal office modeling techniques come in several varieties: procedural models, which document the flow of procedure; information driven models, which document the flow of information through the office; and mathematical models. Several specific modeling techniques were considered for the purposes of this report.

Petri-nets and Evaluation nets, both of which are mathematically based models were considered for this project, but discarded because they don't represent information flow in sufficient detail and are difficult to read.{5,6}

Another consideration was the BDL (Business Definition Language) Document Flow Component Diagram. These diagrams are information-driven and show the information-flow through the office very well. However, it was decided that BDL diagrams didn't show the flow of procedure clearly enough to be easily understood.{7}

The SCOOP (System for Computerization of Office Procedure) model was another consideration. SCOOP is a procedural modeling technique which is based on the Petri-net mathematical model. Though it is more explicit than the straight Petri-net, its strict adherence to the Petri-net model made it too inflexible to suit this application.{4}

Information Control Net (ICN) diagrams were the ultimate choice to model the Computer Science office for several reasons. Primarily, as a procedural modeling technique, the ICN diagram demonstrates clearly the flow of procedure through the office. However, equally importantly, the ICN diagram also explicitly depicts the specific information requirements for each procedure. Other considerations were that the ICN is more flexible than the mathematical models and, in the opinion of the author, easier to read. The following section is a brief introduction to the ICN modeling technique.

### 2.3 The Information Control Net Diagram

ICN diagrams are based on a small number of simple constructs. The flow of procedure is represented by a set of numbered circles connected by arrows. Each circle represents an activity or group of activities. The arrows go from one activity to the next to show an ordering of activities. Information repositories are represented by numbered rectangular boxes. A repository can represent a single item of information, a form or document containing several items of information, or an entire database or filing cabinet containing many items of information. These repositories are connected to activity circles by dashed arrows. When a repository is connected to an activity it means that that particular activity needs access to information contained in that repository. A dashed arrow pointing toward the activity circle indicates reading access, while a dashed arrow pointing toward the repository indicates writing access. Predictably, an arrow pointing both ways indicates read/write access. The following is a list of the constructs which make up the ICN modeling language:

- A circle which represents an activity.
- A solid arrow which connects and orders the various activities.
- A box representing an information repository. (can represent a single information item or grouping of information items).
- A dashed arrow to connect an information repository to an activity circle. This represents access to information.
- A small circle with a "d" in it represents a decision point. This is an instance which is an exclusive 'or gate'. This means that information from the preceding activity is used to decide to go in one direction or another. In the actual ICN diagram, the arrows representing the two alternatives are marked with the two choices available (i.e. domestic or alien, left or right, male or female, etc.). As the diagram is executed, only one path maybe followed at a time.
- 'or join' - this means that two paths converge and execution of activities from either of the incoming paths simply continue on the single resulting path.
- A triangular box represents a temporary repository for information.

The ICN diagrams on pages 9, 10 and 11 (see Figure 2.1) depict the Computer Science Department Office procedures and information sources that were discovered and analyzed during the office investigation. Following the diagrams are detailed explanations of each activity and repository represented in Tables 2.1 and 2.2.{4}

Figure 2.1

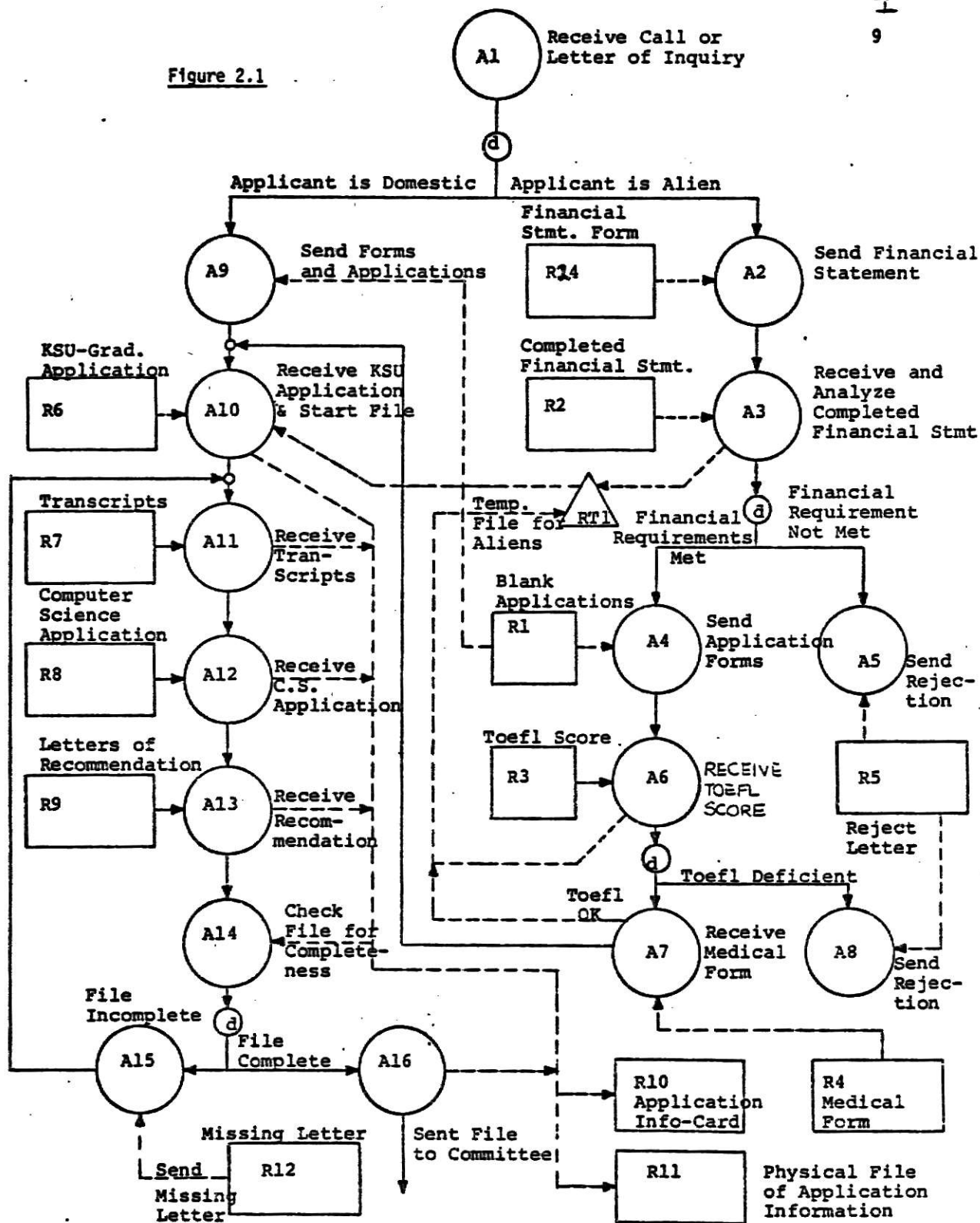


Figure 2.1

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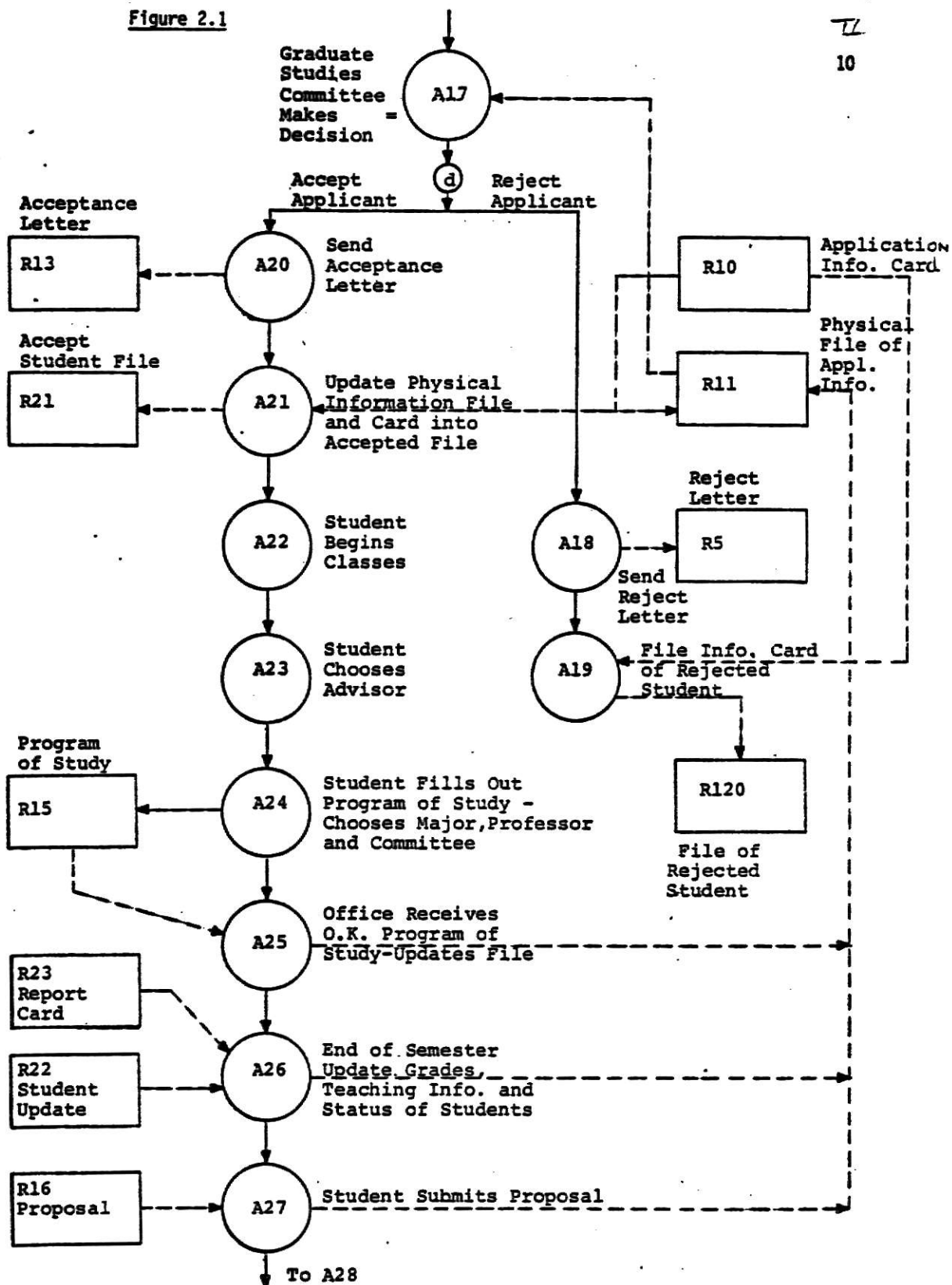




Figure 2.1

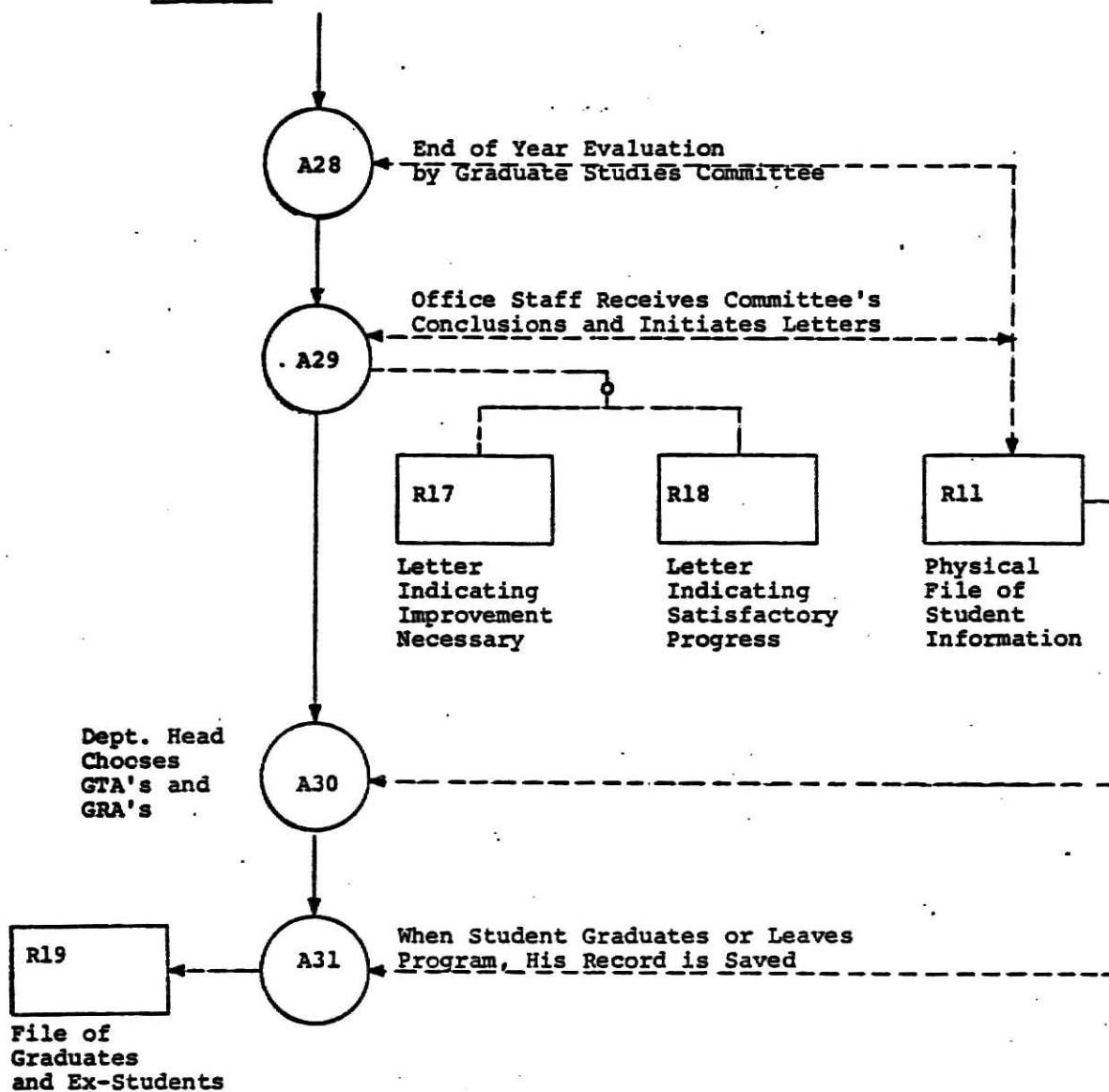


TABLE 2.1

List of Activities for Figure 2.1

- A1 - The initial inquiry from a prospective applicant is received.  
The staff checks nationality of the applicant.
- A2 - If the applicant is foreign, only a financial statement is sent. (R14)
- A3 - Foreign applicant's financial statement is received and checked, (R2) and filed (RT1) temporarily.
- A4 - If financial requirements are met, the applications packet (R1) is sent to the applicant.
- A5 - If financial requirements are not met, a rejection letter is sent. (R5)
- A6 - The Foreign applicant's TOEFL score is received and checked, (R3) and filed temporarily.
- A7 - If TOEFL score was satisfactory, then the next step is to receive and file foreign student's medical records. (R4)
- A8 - If the TOEFL score is deficient, a rejection letter is sent.
- A9 - If applicant is domestic, the first activity is to send an applications packet. (R1)
- A10 - (For foreign or domestic) A file is started when the KSU Graduate application arrives. (R6) The application is put in the physical file of applications information. (R11) Also, an applicant information card is initiated (R10) to keep track of the applicant's progress.
- A11 - When each transcript is received, it is marked on the information card (R10) and stored in the physical file. (R11)
- A12 - When the Computer Science Department Application is received, it is marked on (R10) and filed in (R11).

- A13 - When the recommendations are received they are marked on (R10) and filed in (R11).
- A14 - The staff checks the applicant's card (R10) for completeness.
- A15 - If no information has been received for a period of more than 1 month, then a 'missing letter' (R12) is sent to the applicant detailing what materials are missing from the applicant's file.
- A16 - The complete applicant file (R11) is sent to the Graduate Studies Committee for a review leading to an acceptance or rejection.
- A17 - The Graduate Studies Committee delivers a decision.
- A18 - If the applicant is rejected, then the office staff sends a rejection letter. (R5)
- A19 - The rejected applicant's information card (R10) is filed in a reject file. (R20)
- A20 - If the applicant is accepted, an acceptance letter is sent. (R13)
- A21 - Accepted student's file is updated and the card (R10) is put in accepted file. (R21)
- A22 - Student enrolls in classes.
- A23 - Student chooses advisor from among faculty.
- A24 - Student chooses major professor, fills out Program of Study (R15), and chooses committee.
- A25 - Program of Study is put in physical file (R11) when it is returned from graduate school with O.K.
- A26 - At the end of each semester, the student's physical file is updated with student's grades, teaching history and new status from report card (R23) and student update sheet. (R22)
- A27 - Student submits a project proposal, it is put in his file. (R11)

- A28 - At calendar year end, the Graduate Studies Committee evaluates all active master's students. Both progress and performance are evaluated using the student's file. (R11)
- A29 - When evaluations are received by office staff, one of two form letters are sent to students. One letter indicates that good progress is being made (R18), and another indicates that improvement in progress is necessary. (R17)
- A30 - The department head with help from his administrative assistant, choose GTA's. The students background is evaluated by checking his physical file. (R11)
- A31 - When a student graduates or leaves the program his information is put in an historic file. (R19)

TABLE 2.2

List of Information Repositories for Figure 2.1

- R1 - This is the application package which contains: KSU Graduate Application, Computer Science Department Application, 3 recommendation forms.
- R2 - Completed foreign student financial statement.
- R3 - TOEFL Score - foreign students must score at least 5.75 to be accepted into program.
- R4 - Foreign student medical form.
- R5 - Applicant rejection letter.
- R6 - KSU Graduate Application
- R7 - Transcripts from schools previously attended.
- R8 - Computer Science Department Application.
- R9 - Letters of Recommendation. There must be at least three of these.
- R10 - Applicant information card.

- R11 - Physical file of student information - all completed forms go into this file in the Computer Science Office.
- R12 - Missing letter. This is a letter sent to the Applicant telling him what is missing from his application file.
- R13 - Acceptance letter.
- R14 - Foreign student financial form (not filled out).
- R15 - Program of study.
- R16 - Proposal of master's report.
- R17 - Letter indicating improvement necessary (from evaluation).
- R18 - Letter indicating satisfactory progress (from evaluation).
- R19 - Historical file of graduates and those who left the program.
- R20 - File of rejected applicants. Contains information card. (R10)
- R21 - File of accepted students. Contains information card. (R10)
- R22 - Student semester update sheet.
- R23 - Report card.

## 2.4 The Office Functions

While interviewing members of departmental faculty and staff, it became clear that the office procedures which pertain to graduate students fall into four functional areas:

1. Applicant Management
2. Faculty Advising
3. Annual Evaluation
4. GTA-GRA Administration

The following sections will analyze the procedures that are depicted in the ICN diagram in terms of these four distinct functions.

### 2.4.1 Applicant Management

The applicant management function is carried out by the Computer Science office staff. In terms of the student's lifecycle, this function

begins with a letter of inquiry or a phone call from a student and lasts until that student has been considered for enrollment and either accepted or rejected.

On the ICN diagram, applicant management activities include activities A1 through A21. These activities are mainly the responsibility of the staff. The exception is, of course, activity A17 which is the Graduate Studies Committee making its decision.

The information repositories which are necessary for the applicant management function are R1 through R13 and R20 and R21. These include:

- KSU Graduate School Application
- Computer Science Department Application
- 3 reference letters
- Foreign Student Medical Form
- TOEFL Score
- Rejection letter
- Acceptance letter
- Transcripts
- Applicant Information Card
- Missing letter
- File of rejected applicants
- File of accepted applicants

The main activity of applicants management revolves around the Applicant Information Card (R10). This card is not a primary source of information but rather a management tool used to track the progress of the applicant. A card is started for an applicant as soon as application information starts arriving at the office. Each time an item of information arrives, it is noted on the card. The card is checked periodically, and if more than a month passes without new materials arriving, a 'missing letter' is sent out informing the student which application materials are still needed before his application can be considered.

When the Application Information card is completed, this signals that the applicant's file is complete and ready for review by the Graduate

Studies Committee. On a regular basis, the Graduate Studies Committee meets and reviews all completed application files.

In the event that a student is rejected by the Graduate Studies Committee, a rejection letter is initiated to the student, and his Application Information Card is filed in a reject file for at least one year. (R20)

If applicant is accepted into the program, then a recommendation is sent to the Graduate School which results in their sending a letter of acceptance to the applicant. The student's Information Card is then filed in an 'accepted student' file. (R21) The materials in an accepted student's application file (R11) remains there and the file becomes his student information file during the time he is enrolled.

Points of interest in the applicant management portion of the ICN diagram include several decision points.

The first decision point is the determination of whether an applicant is domestic or foreign (Alien). The important consideration here is that a domestic student is automatically sent an application packet, while a foreign student is sent only a financial form (R14) to determine whether he meets the minimum financial requirements.

The next decision point takes place when the financial statement is received. If financial requirements are met, then the admissions package is sent, and the regular admissions procedure begins, however, if the requirements are not met, the applicant is immediately rejected.

A similar situation exists with the TOEFL (R3) score requirement: if the applicant scores satisfactorily, the application process continues, and if the applicant doesn't score well enough he is rejected without further consideration.

Overall, the applicant management portion of the Computer Science office proved to be well defined and systematic.

#### 2.4.2 Faculty Advising

The faculty advisory function is performed by members of the faculty in the capacity of both student advisor and Major Professor.

In the role of student advisor, the faculty member guides the new student through early stages of the program. It is assumed that a student will pick a faculty member to advise him during his first semester as a graduate student. As the student progresses through the curriculum, he is assisted by his advisor in matters pertaining to school and departmental policies, class scheduling and prerequisite requirements.

The faculty member's role as a student advisor is very informal. There are no specific rules or policies. As such, many graduate students never officially designate an advisor. It is expected, however, that a student will be under the guidance of an advisor until he has progressed far enough through the program to choose an area of study for research, at which time he chooses a major professor. This should happen after approximately two semesters of graduate work.

The role of Major professor is better defined than that of advisor. As a major professor, the faculty member assists the student in planning his remaining course work and initiating and completing a master's report. The major professor also insures that the student meets all requirements for graduation from the program.

On the ICN diagram, faculty advisory activities include A23, A24, and A27. As the advisor role is not formally defined, it plays no actual role in the ICN diagram except to note on A23 that an advisor is chosen. Activities A24, and A27 depict the preparing of the program



of study, (R15) choosing 2 other committee members and proposal of the master's research. (R16)

The lack of detail on the ICN diagram in this area reflects the fact that there is no formalized system for faculty members to access student information necessary to carry out this advisory function.

When an advisor or major professor needs information regarding a student's status, background or current standing in the program, he or she simply walks down to the office and checks into the student's information file (R11). This was seen as an important opportunity for automated information access.

#### 2.4.3 Annual Evaluation

The annual evaluation of graduate students is conducted by the Graduate Studies Committee which consists of three members of the Computer Science faculty. The evaluation is conducted every January following the reporting of the fall semester grades.

The graduate student is evaluated in two areas. The first area is performance: are his grades satisfactory? The second area is progress: is the student progressing through the program at an acceptable pace? In this area, there are several milestones used for measurement: completion of core courses during the first year of graduate study, choice of major professor and submission of a project proposal during the student's third semester, and completion of a program of study during the third semester.

On the ICN diagram, activities A28 and A29 represent the annual evaluation function. The information used in this evaluation comes from the student's information file (R11), and specifically from the student's update sheet (R22).

The result of the annual evaluation is a letter sent to the student informing him of either satisfactory achievement (R18) or improvement necessary in some specific area (R17).

#### 2.4.4 GTA-GRA Administration

The administrative function of choosing who will be offered GTA and GRA positions is performed by the department head. Whenever a student applies for an assistantship, the department head surveys pertinent information from the student's file (R11) and makes a decision based on that information. This activity is represented by A30 on the ICN diagram. (This activities' position at the end of the ICN diagram doesn't necessarily represent an ordering. This activity can take place at any time in a student's career depending on if and when he would apply for the GTA or GRA position.)

The specific information used to make this decision includes courses the student has taken and taught in the past, as well as languages and specific equipment the student has used professionally.

The department head is assisted in this function by his administrative assistant. However, the administrative assistant's exact role in this function was not specified during the investigation by either himself or the department head.

## CHAPTER 3

### REQUIREMENTS ANALYSIS AND SPECIFICATIONS

#### 3.1 Overview

This chapter will detail the development of design specifications for the automated office information system. These specifications will be analyzed in terms of the four office functions outlined in Chapter 2.

For each office function, the first step in the specification process was to examine in detail the information sources and sinks of the currently running manual system. The next step was to analyze the current information usage for efficiency and consistency. The final step was, of course to detail the information requirements of the proposed automated information system.

The result of this process was that, in some cases, the information requirements of the automated system are nearly identical to those of the current manual system, and in other cases the information requirements were altered either to make the system more efficient or to meet an information need that was not being met in the manual system.

#### 3.2 Applicant Management

The principal activity of the applicant management function is recording each applicant's progress on the applicant information card (R10). The input information items that are used to perform this function are the information items contained on the applicant information card. The resulting output documents include: the missing letter (R12), acceptance letter (R13), rejection letter (R5), file of rejected applicants (R20), and the file of accepted applicants (R21).

The primary goal in automating this function was to create a screen image of the applicant information card which would be supported by a

database. As decisions were reached regarding the applicant, an appropriate output document would be produced by the system. (i.e. If a student was rejected a rejection letter would be produced by the output processor.)

### 3.2.1 Analysis

The analysis of input information requirements suggested that several changes be made concerning input information.

The first change was the information item which concerned the foreign student financial requirement. This is denoted on the applicant information card by '\$8000.' This information item was seen as being unnecessary due to the fact that the \$8000 financial requirement must be met by foreign students before the applicant information card is initiated. Therefore, it can be assumed that this requirement has been met and this information item may be deleted from the system.

Other changes in input information include the addition of several new items to serve specific administrative purposes. In the near future, a processing fee will be attached to all applications. To accomodate this change, an information item will be added to record that this fee has or has not been paid by the applicant.

The department head proposed the addition of three more information items. One item concerned the undergraduate degree area of each applicant. The other two items he proposed concern whether the applicant is a resident of Kansas and whether the applicant is a resident of the United States. These last two items were included for statistical purposes rather than for specific application management purposes. All three of the items requested by the department head originate on the K.S.U. Graduate Application form (R6).

### 3.2.2 Specification for Input Requirements

After the applicant information card was analyzed, and several alterations were considered, the following list of input information items emerged as the final input requirement specification:

- Applicant name
- Permanent address
- Social security no.
- level (MS, PhD, Special)
- \*Resident of Kansas Y/N
- \*Citizen of U.S.A. Y/N
- Need assistance Y/N
- TOEFL Score
- \*BA/BS area
- \*Processing fee paid Y/N
- Received KSU form Y/N
- Received CS form Y/N
- Received recommendations (3) Name, Date
- Received transcripts
- Missing letter sent
- Has information been sent to:
  - 1) graduate studies committee - Y/N, Date
  - 2) copy - Y/N, Date
  - 3) Graduate school - Y/N, Date
- Has graduate school status letter been sent?
- Has GRE score been received?
- Recommendation from Graduate studies committee:
  - Accept, provisional, probation, reject, or special
- Date of recommendation
- Date of expected entry into program

\*Additions which are suggested by this report

### 3.2.3 Specification for Output Requirements

After considering implementation constraints of the proposed Kool Records OIS and discussing alternatives with users of the applicants management system, it was decided that the standard output documents of this system would remain unchanged.

The only proposed enhancement to the current system of output production is that the standard outputs of the applicants management system would be produced automatically by the system.

The standard output documents of this system are:

1. Missing Letter (R12)
2. Rejection Letter (R5)
3. Acceptance Letter (R13)
4. File of Rejected Students (R20)
5. File of Accepted Students (R21)

The letters (acceptance, rejection and missing) are specified to be identical to those currently in use by the department. They will be kept on machine files and produced whenever necessary. Whenever one of these letters is generated, information from the applicant's file will automatically provide both name and address of the addressee.

For the file of rejected students, when a student is rejected a hard copy of the application information database will be produced to be kept in a physical file for one year, at which time it is purged. The file of accepted students will contain the same information that is on the applicant information database. In this case, the applicant information file will remain on line between the time when a student is accepted and when he either begins school or declines his acceptance in favor of an alternative. At the time a student begins study at Kansas State, specific information items will be transferred from his applicant information database to an active student data base by a triggered automated function. Once this information is transferred, the students application information file is purged from the applicant information database.

### 3.3.1 Faculty Advising

The faculty advising function, which includes both student advisors and major professors, is currently administered using information from

various physical documents in the students file.

With the guidance of Dr. Unger, it was determined that the best approach to automating this function would be to develop a set of screens supported by a database which would provide the specific information items to faculty advisors at their terminals.

The task of automating the advisory function differed from the task of automating the applicants management function in one significant respect. In automating the applicant management function, the task was essentially to automate an existing document, while with the advisory function, the task was to create a document that didn't currently exist and then put it on line. The added challenge in automating the faculty advisory function was in having to define a set of information requirements which had not been previously defined in a formal manner.

### 3.3.2 Information Requirement Specification for the Faculty Advisory Function

Dr. Unger, drawing on her experience as a student advisor and major professor, assisted in assembling the following list of information requirements for an automated faculty advisory system:

- Student name, SSN
- BS/BA area
- MS Option (Report, Project, Thesis)
- Current GPA
- Expected Graduation Date
- TOEFL Score
- Major Professor
- Advisor
- 2 Committee Members
- Proposal Title
- Date Proposal Approved
- Status History - Special, Provisional, Probationary
- Regular - (This is a history of a student's status from his entry into the program until the current time.)

Phone Number  
 Course Information:  
     Course Number  
         Grade  
         Date Taken  
         Is it on program of study?  
         Credit Hours  
         Department which offered it  
         Is it a deficiency course?  
         Is it equivalent credit for a course  
         Taken at another institution?  
 Courses scheduled to be taken in the future

### 3.3.3 Output Documents of the Faculty Advisory System

The output documents which can be seen as products of the faculty advisory system are the student's program of study and proposal of a master's research. It was decided that both of these reports be produced manually, exactly as they have been in the current system. The reason for this decision is that both documents are created by the student, and are solely the student's responsibility.

### 3.4.1 The Annual Evaluation

The annual evaluation is performed every January by the Graduate Studies Committee. In the current manual system, the information necessary to perform this function originates in the student's physical information file. As it was with the faculty advisory function, there is no existing document which fulfills the information requirements of the annual evaluation function.

With the advice of two members of the faculty, both of whom are on the Graduate Studies Committee, it was determined that an online document be produced, backed by a database, which contained the information items necessary to support the annual evaluation of graduate students.



### **3.4.2 Information Requirement Specifications for Student Evaluation**

The following list contains the information items that faculty members deemed to be necessary for the evaluation of graduate students:

Student Name  
Social Security No.  
Current GPA  
MS Option (Report, Project, Thesis)  
Expected Date of Graduation  
TOEFL Score  
Advisor  
Major Professor and Committee  
Proposal Title, Date Approved  
Status History - Regular, Provisional, Probationary,  
Special - Accompanied by Dates for  
total time spent in program  
Course Information:  
    Course Number  
    Grade  
    Credit  
    Date  
Has program of study been filled out? Y/N, Date  
Student's Current Address

### 3.4.3 Output Specifications of the Evaluation Function

The student's annual evaluation results in the generation of an evaluation letter. This letter will be one of two evaluation form letters: one form letter indicates satisfactory progress, and the other one indicates improvement is necessary.

Under the proposed automated system, these two letters would be generated by the system in the following manner. When the evaluation has been completed, a list of all masters student's will be submitted to the system along with their corresponding evaluation results. (Students finishing their work in the preceding semester will be excluded from this list.) This will trigger the system to output a copy of the appropriate evaluation letter to each student. A copy of each of the two form letters

will exist in a file and letters will be automatically addressed with information from the student's evaluation information database.

### 3.5.1 GTA and GRA Administrative Function

Whenever a student applies for a GTA, the department head checks through the student's information file to assess the student's qualifications for the job. This might take place at any particular point in the student's academic career in the Computer Science Department. (Some students apply for such a position at the time they apply for admission into the graduate program, and others apply at later stages of their academic career.)

Since no existing document currently in use by the Computer Science Department contains all of the information necessary to assess a student's qualifications for an assistantship, it was suggested that a particular screen format be created to contain the necessary information.

### 3.5.2 GTA and GRA Administration Information Requirements

The following list is made up of the specific information items suggested by the faculty to aid in the selection of graduate teaching assistants and graduate research assistants:

- Courses consulted on
- Courses taken, grades and dates
- Courses taught or consulted on, and dates
- Courses student feels qualified to teach
- Courses the department feels student is qualified to teach
- Instructor rating on courses taught
- Has student done advising work?
- List of specific equipment and languages
- Student has used professionally and how long student has used them

These information items originate on the student's Computer Science application form and student update sheet.

### 3.5.3 GTA and GRA Administrative Output Documents

The selection process for assistantships results in the generation of a letter of acceptance or rejection for each student that applies for such a position. In the current system, these letters are drafted manually at the request of the department head.

In the proposed automated system, it was decided to have the letters remain a manual process. There are two reasons for this decision. One reason is that different students get differing types of offers and therefore, it was seen as impractical to try to standardize the process. A second and more influential reason is that the department didn't want any salary information included in this system due to the data security implications of having such personal information in an on-line data base.

## CHAPTER 4

## OFFICE INFORMATION SYSTEM DESIGN

4.1 Overview

This chapter will outline the actual design of the 'KOOL RECORDS' Office Information System. Included will be the design of the various transaction processing screens, the databases and the report generators.

4.2 OIS Design Configuration: The System View

The final OIS design consists of: A group of three input screens supported by a relational database and report generator to support the applicant management function; a group of four screens supported by a database and report generator to support the faculty advising, student evaluation and GTA-GRA administration functions; a menu-driven, user-friendly interface for selection of the proper function and accompanying screens.

The hardware/software configuration on which this system will reside is the Computer Science Department's Perkin-Elmer 3220 system with a UNIX operating system. The databases, screens, and report generators will be implemented using the 'C' language and will incorporate UNIX library software for screen manipulation and data storage.

This automated system is augmented by two physical databases: one which contains rejected applicant's files, and one which contains the files of those who have graduated or left the masters program.

The next sections will detail the designs of each individual component of the KOOL RECORDS OIS. Included will be an analysis of the decisions that led to the ultimate design specifications.

### 4.3 The Menu-Driven User-Friendly Interface

When a user wants to use the KOOL RECORDS OIS, the first thing he will do is log into the UNIX system on the Computer Science Department's Perkin-Elmer 3220 system. This consists of entering his name and password. The next step is to request the KOOL RECORDS file on UNIX. If the user has access rights he will then gain access to the KOOL RECORDS OIS. (Access rights will be allotted as follows: faculty members will have read-only access, and designated staff members will be given read-write access.)

Once access is gained, the user will be presented with a menu depicting the various functions that are available. This is screen 1. (See Appendix B) With one key-stroke, the user may proceed with his intended function. In the design of this interface, user-friendliness was the key consideration. The term 'user-friendly' as it applies to this system, is defined in the following section.

#### 4.3.1 User-Friendliness

The term 'user-friendly' is a current buzz-word in the computer science community, i.e., overused and ill-defined. User-friendliness has different meanings to different people and different applications in different situations. In a general sense, user-friendliness means making the system interface with the user as easily accessible as possible. Considerations in determining user-friendliness are: ease of understanding, ease of use, speed, efficiency and screen familiarity.

In the specific case of the KOOL RECORDS interface, the development of user-friendliness involved several trade-offs:

1. Ease of Understanding vs. Speed: In a system in which many novice users will be learning to use it, the emphasis must be on understandability. However, on a system in which a small group of users will learn, and then use it for a long period of time as experts, speed becomes the prominent issue.
2. Screen 'busyness' vs. Efficiency: If a number of system users are unfamiliar with screen formats, then the less information that is on each screen, the friendlier it is considered. This approach, however, calls for a greater number of screens to do the same amount of work. Veteran users of a system tend to want to do their work with a minimum of screen switching.
3. Familiarity vs. Efficiency: For the novice user, familiarity is a key issue, and if a system is used by many novices, it is considered 'friendlier' to pattern screens after familiar existing forms. On the contrary, once a user is a veteran, a format geared toward speed (with changes from the familiar, if necessary) is applicable.

In designing the KOOL RECORDS interface, the designer tended towards making the system 'friendly' to the expert or veteran user. This decision was based on the reasoning that this system most likely will be used by a small number of people who will learn it once and then use it for a long period of time as experts. Being experts, their emphasis will be on efficiency and speed as criteria for 'user-friendliness'.

Having taken this firm philosophic stand, the author then hedged his bet by working closely with users of this system and trying to give them exactly what they asked for.

#### 4.3.2 The Menu-Driven Interface

The menu-drive approach is favored in transaction processing for several reasons. It meets the criterion of 'ease of use' in that the user doesn't have to learn or memorize anything because the options are always right in front of him. As for speed and efficiency, the user need only hit one key-stroke to move into the system. Short menus at the bottom of each screen inform the user of his options from any screen he may be using.

A further advantage of the menu-driven approach is that it supports a hierarchical structuring of the system. The general menu (see Appendix B) leads to more specific menus, which in turn lead to specific functions (such as applicant file update, or production of a 'missing letter'). The various screens and functions are designed to allow the user to navigate through the system in a logical manner or to pop back out to the main menu to pursue a different function.

Further screen design considerations will be discussed as the specific screens are presented.

#### 4.4 The Applicant Management System Design: Screens, Database, and Report Generator

As was pointed out in Chapter 3, the applicant management function is based on the information repository called the applicant information card (R11). Therefore, the design of this function in the automated OIS focused on creating a screen version of the applicant information card and on incorporating the changes suggested in the requirement specifications. The second step was to specify an output processor to generate the necessary documents. The third step was the creation of a database to store the data items necessary to support the input and output information. In this report, the term 'information items' refers to items that appear either on the input screens or as a part of an output report. The term 'data items' refers to items of data that appear in the database.

##### 4.4.1 The Screens for Applicant Information

The first screen in the applicant management function is a menu containing the user's alternatives. By hitting the appropriate key, the

user can either create an output document or move to one of the input and perusal screens.

The information requirements were put on three successive screens. The information contained on these screens follows directly from the requirement specifications in Chapter 3. The format for information entry is based on that of the original applicant information card.

Each input screen also serves as a perusal screen. Once an information item has been input in the proper blank, each time that applicant's screen is called forth from the data base the information item value will appear in the appropriate space on the screen.

The screen images in Appendix B are distortions of the screen. The vertical lines appear closer together than they do on the actual screen.

The implementation allows single stroke movement from one screen to the next or back to the menu and automatic cursor movement from one blank to the next by using the carriage return. The cursor starts on the menu at the bottom of each screen. So if the user wants to pass the current screen and view the next one, there is no necessity to navigate through the entire current screen. One key stroke determines the choice of screens.

#### 4.4.2 Report Generator

The output requirements for the applicant management function include: the 'missing letter', the 'letter of acceptance', the 'letter of rejection' and a hard copy of the information input screens.

The three letters will exist on UNIX files. To produce a letter, the user simply chooses the proper letter from the menu and enters the



student's name. The letter in the UNIX file is then updated with the applicant's name and address and produced in hard copy.

To produce a printed copy of an applicant's information file, the user chooses that alternative from the menu and then enters the applicant's name.

#### 4.4.3 The Applicant Management Database

The data items necessary to support the input and output specifications are stored in a relational database. The relations in this database are in third normal form as verified by Bernstein's Algorithm two. The relations are also in the strictly stronger fourth normal form as well as the projection-join or fifth normal form. The normalization process is discussed in the next section.

##### 4.4.3.A Normalization

The normalization method used in the development of the database relations consisted of: defining the relations in terms of Bernstein's algorithm II to insure that they were in third normal form; and then checking the relations against the more stringent requirements of the Boyce-Codd normal form, the fourth normal form and finally the 'projection-join' or fifth normal form.

These six normal forms (1NF, 2NF, 3NF, BCNF, 4NF, 5NF) are defined in terms of: functional dependencies, transitive dependencies, multi-valued dependencies and join dependencies.

For a better understanding of the normalization process, the definition of these dependencies are included, followed by definitions of each normal form.

Functional dependency (FD) - "Let  $R(A_1, A_2, A_3, \dots, A_n)$  be a relation scheme, and let  $X$  and  $Y$  be subsets of  $\{A_1, A_2, \dots, A_n\}$ . We say that  $X$  'functionally determines'  $Y$  if whenever relation  $r$  is the current value for  $R$ , it is not possible that  $r$  has two tuples that agree in the components for all attributes in the set  $X$  yet disagree in 1 or more components for attributes in set  $Y$ ."{8}

Multivalued dependency (MVD) - "Let  $R(X_1, \dots, X_m, Y_1, \dots, Y_n, Z_1, \dots, Z_r)$  be a relation (i.e., a set of tuples) with  $m+n+r$  column names (thus no column name appears twice). For notational convenience, we write capital  $X$  for  $\{X_1 \dots X_m\}$ ;  $Y$  and  $Z$  are defined analogously. Whenever we write, say  $R(X, Y, Z)$ , we assume automatically that  $X$ ,  $Y$  and  $Z$  are pairwise disjoint as above. If  $x_1, \dots, x_m$  are entries that appear under columns  $X_1 \dots X_m$ , then we write  $x$  for  $(x_1, \dots, x_m)$ ;  $y$  and  $z$  are defined analogously. Define  $Yxz$  to be  $\{y : (x, y, z) \text{ is a member of } R\}$ . Of course  $Yxz$  is nonempty if  $x$  and  $z$  appear together in a tuple of  $R$  (with  $x_1$  in column  $X_1$ , etc.). The multivalued dependency  $X \twoheadrightarrow Y$  is said to hold for  $R(X, Y, Z)$  if  $Yxz$  depends only on  $x$ ; that is, if  $Yxz = Yxz'$  for each  $x, y, z'$  such that  $Yxz$  and  $Yxz'$  are nonempty."{9}

Trivial MVD - If in a relation schema  $R(X, Y)$  where  $X$  and  $Y$  represent 1 or more attributes,  $X$  multidetermines  $Y$ , and  $X$  and  $Y$  make up all attributes in the relation, then  $X$  multidetermines  $Y$  is a 'trivial' multivalued dependency.{9}

Transitive dependency - If a prime attribute functionally determines a nonprime attribute and that nonprime attribute functionally determines another nonprime attribute, this is called a transitive dependency.{8}

Prime - a 'Key' attribute.{8}

Join dependency - A relation  $R$  satisfied the  $JD^*(X, Y, \dots, Z)$  if and only if it is the join of its projections on  $X, Y, \dots, Z$ . Where  $X, Y, \dots, Z$  are subsets of the attributes of  $R$ .{10}

1NF: A relation is in first normal form if:

1. no attribute is actually a relation.
2. no attribute is a repeating group.{8}

2NF: A relation is in second normal form if:

1. it is in 1NF.
2. each nonprime attribute is fully dependent on every candidate key.{8}

3NF: A relation is in third normal form if:

1. it is in 2NF
2. no nonprime attributes are transitively dependent on any candidate key.{8}

BCNF: A relation is in Boyce-Codd normal form if:

1. it is in 1NF
2. all functional dependencies are the result of candidate keys.{8}

4NF: "A relation schema R is in 4NF if, whenever a non-trivial MVD  $X \twoheadrightarrow Y$  holds for R, then so does the functional dependency  $X \rightarrow Y$  for every column A and R. Intuitively, all dependencies are the result of keys. In particular, a 4NF schema can have no nontrivial MVD's that are not FD's."{9}

5NF: A 1NF relation schema R is in projection-join NF if and only if every JD in R is implied by the candidate keys of R.{10}

Bernsteins Algorithm II:

1. Eliminate extraneous attributes.
2. Find a nonredundant cover.
3. Partition
4. Merge equivalent keys.
5. Eliminate Transitive dependencies
6. Construct Relations {11}

#### 4.4.3.B Additional Database Design Considerations

All data items are in the alpha-numeric domain, and since filling in of data items will be done in several installments, the data items will have blanks as acceptable field values. Hence, the database will be complete and useable regardless of whether all information on a particular applicant has been collected or not.

Early in the design process, there was some consideration given to using the applicant's social security number as a key to the relations. It was decided, however, to use the applicant's name as a key in order to increase user-friendliness. This decision introduces the slight risk of a syntactic redundancy in the case where two applicants have duplicate names.

## DATA DICTIONARY FOR APPLICANT INFORMATION DATABASE

| Data Item           | Field Length | Domain        | Value              | Semantic Definition                      |
|---------------------|--------------|---------------|--------------------|------------------------------------------|
| (1) NAME            | 35           | alpha-numeric | -                  | student name                             |
| (2) ADDRESS         | 47           | alpha-numeric | ST,CTY,ST,ZIP,CD   | student address                          |
| (3) SSN             | 11           | alpha-numeric | XXX-XX-XXXX        | student SSN                              |
| (4) LEVEL           | 4            | alpha-numeric | MS,PhD,SPEC        | degree level applied for                 |
| (5) LOCATION        | 4            | alpha-numeric | KSU,KC,LEAV,WE,NCR | which campus                             |
| (6) STARTING DATE   | 9            | alpha-numeric | (FALL,SP,SU) 19XX  | date of requested admission              |
| (7) PROC.FEE.PAID   | 3            | alpha-numeric | Y/N                | processing fee paid                      |
| (8) FIN.ASSIST.     | 3            | alpha-numeric | Y/N                | financial assist. needed                 |
| (9) KSU.FORM        | 8            | alpha-numeric | Y/N DATE           | KSU-form received                        |
| (10) CS FORM        | 8            | alpha-numeric | Y/N DATE           | CS form received                         |
| (11) REC.NAME       | 35           | alpha-numeric | -                  | name of recommendation                   |
| (12) REC.DATE       | 8            | alpha-numeric | XX-XX-XX           | date of recommendation received          |
| (13) SCHOOL NAME    | 25           | alpha-numeric | -                  | name of school of transcript             |
| (14) DATE REC.T.    | 8            | alpha-numeric | XX-XX-XX           | date transcript arrived                  |
| (15) NO.OF TRAN.    | 2            | alpha-numeric | XX                 | # of transcripts expected                |
| (16) MISSING LETTER | 8            | alpha-numeric | XX-XX-XX/ND        | date missing letter sent or not needed   |
| (17) TO COMMITTEE   | 8            | alpha-numeric | XX-XX-XX           | date to committee                        |
| (18) TO COPY        | 8            | alpha-numeric | XX-XX-XX           | date to xerox                            |
| (19) TO GRAD.SCH.   | 8            | alpha-numeric | XX-XX-XX           | date to Graduate School                  |
| (20) STATUS LETTER  | 8            | alpha-numeric | XX-XX-XX           | date status letter sent                  |
| (21) NOTIFY DATE    | 8            | alpha-numeric | XX-XX-XX           | date status was given Rej Res            |
| (22) LAST CORRESP.  | 8            | alpha-numeric | XX-XX-XX           | date of last correspondence              |
| (23) REJECT         | 3            | alpha-numeric | yes/no             | student rejected                         |
| (24) REG            | 3            | alpha-numeric | yes/no             | regular status Boolean                   |
| (25) PROB           | 3            | alpha-numeric | yes/no             | probation status Boolean                 |
| (26) SPEC           | 3            | alpha-numeric | yes/no             | special status Boolean                   |
| (27) PROV           | 3            | alpha-numeric | yes/no             | provisional status Boolean               |
| (28) TA             | 3            | alpha-numeric | yes/no             | student given GTA?                       |
| (29) RA             | 3            | alpha-numeric | yes/no             | student given GRA?                       |
| (30) GRE DATE       | 8            | alpha-numeric | XX-XX-XX/not taken | date GRE scores received or if not taken |
| (31) BA/BS AREA     | 35           | alpha-numeric |                    | area of undergraduate degree             |
| (32) U.S.RESIDENT   | 3            | alpha-numeric | Y/N                | U.S. resident                            |
| (33) KS.RESIDENT    | 3            | alpha-numeric | Y/N                | Kansas resident                          |

## DATA BASE RELATIONS: APPLICANT INFORMATION

STUDENT\_ADMIT\_INFO (NAME, SSN, GRE\_DATE, CS\_FORM, KSU\_FORM, FIN\_ASSIST,  
PRO\_FEE\_PAID, LAST\_CORRESP, LOCATION, LEVEL,  
STARTING\_DATE, BA/BS\_AREA, NO\_OF\_TRANSCRIPTS,  
MISSING\_LETTER, TO\_COMMITTEE, TO\_COPY, TO\_G\_  
SCHOOL, STAT\_LETTER, NOTIFY\_DATE, KS\_RESIDENT,  
REG, PROV, SPEC, PROB, REJECT, ADDRESS)

CIT (NAME, U.S.CITIZEN)

TRANSCRIPT (NAME, SCHOOL\_NAME, DATE\_REC\_T)

LETTERS\_OF\_REC (NAME, REC\_NAME, REC\_DATE)

#### 4.5 Active Student Information System Design (To Support Student Advising, Student Evaluation, and GTA-GRA Administration)

The office investigation, as detailed in chapter 2, identified student advising, student evaluation and GTA-GRA administration as three separate and distinct functions of the Computer Science faculty and staff. However, an evaluation of the requirement specifications for each of these functions and further interviews with members of the faculty supported the idea that these three functions could be administered using a common database with a common set of input and perusal screens. The approach also appeared to be the most economic in terms of reducing redundancy and optimizing space usage. The design methodology used here is quite similar to that used for the applicant management information system: a set of input and perusal screens were developed; an output processor was specified; and a database was designed to support the various information requirements.

##### 4.5.1 The Screens for Active Student Information

When the system user enters the active student information system, he is first presented with a menu specifying the alternatives. The next screen presents a brief explanation of the data entry process and a space to fill in the student's name. After entering the student's name (for either data entry or perusal) he can pick any one of the three data screens.

The first screen contains course information. There are two separate course information formats because courses offered in the department need only be identified by their number, while courses in other departments are more easily recognized by course names. If an 'E' appears along side a course number, that designates that equivalent credit

is being given for a course taken at another institution, a 'D' appearing alongside the course number designates that it is a deficiency course which the student must take to attain regular enrollment status.

The second screen contains other necessary academic information. This screen, along with the first screen is designed for use by both faculty advisors and the Graduate Studies Committee.

The third screen was designed specifically to meet the department's specifications for GTA-GRA administration. The reader will notice that it contains information on courses taken that is also contained in the first screen. This was the result of a specific request of the faculty, who, in the interest of efficiency, wanted all relevant information on one screen.

Mechanically, these screens work just as the applicant management screens work. Both feature 'one-stroke' screen selection and automatic cursor movement from one data entry point to the next.

#### 4.5.2 The Report Generator For Active Students

The output requirements, as detailed in chapter three, include: a list of currently enrolled students to aid in the annual evaluation of students; and output of the evaluation letters.

The output of the student list is a built in function triggered by the office staff at the appropriate time.

When the list is returned to the office staff with the evaluation results, the staff then enters the results into the system and an appropriate letter is generated.

The two different evaluation letters are stored in UNIX files. When the student's name is entered, information from his file is used to automatically address the letter. In the case of the satisfactory letter, a



signature is all that is necessary. In the case of the 'improvement needed' letter, the specific area of improvement is hand marked on the letter as it is signed.

#### 4.5.3 Active Student Database Design

The data items necessary to support the information requirements of the active student information system are stored in a relational database. This database, like the applicant information database, has been normalized to meet the requirements of 1NF, 2NF, 3NF, BCNF, 4NF and 5NF.

For this database, it was determined that, in the interest of user-friendliness, the student's name rather than the social security number should be used as the key. Because this database handles only approximately 150 students at a time, the chance of a syntactic redundancy occurring was considered to be insignificant and if it occurs will be handled manually by modifying the form of the student's name.

In forming the data dictionary, one trade-off that was considered was whether to designate each separate C.S. course as an individual data attribute or to have one attribute in which the domain included all courses offered. In the interest of saving space, the second option was selected as being more practical for this application. The attribute 'CRS\_NO' serves this purpose.

This decision resulted in the necessity of making the relation 'course\_info' a repeating relation. Even though repeating relations cause a certain amount of redundancy (the student's name must be repeated for each repetition of the relation), it was still seen to be more conservative in a practical sense.

# DATA DICTIONARY FOR ACTIVE STUDENT'S DATABASE

| Data Item     | Field Length | Domain        | Value                 | Semantic Definition                                          |
|---------------|--------------|---------------|-----------------------|--------------------------------------------------------------|
| NAME          | 35           | alpha-numeric | -                     | Student's name                                               |
| PHONE         | 12           | alpha-numeric | XXX-XXX-XXXX          | home phone no.                                               |
| PRES.ADDR.    | 47           | alpha-numeric | STR,CITY,ST,ZIP       | students present address                                     |
| SSN           | 11           | alpha-numeric | XXX-XX-XXXX           | Social Security No.                                          |
| KS.RES.       | 3            | alpha-numeric | Yes/No                | is student a Kansas resident                                 |
| CITIZEN.U.S.  | 3            | alpha-numeric | Yes/No                | is student U.S. Citizen                                      |
| BA.BS.AREA    | 35           | alpha-numeric | -                     | Undergraduate major                                          |
| MS. OPTION    | 7            | alpha-numeric | THESIS,REPORT,PROJECT | which variety of masters research                            |
| CUR.GPA       | 4            | alpha-numeric | X.XX                  | student's current GPA                                        |
| GRAD.DATE     | 4            | alpha-numeric | SP82,FA83,SU84        | expected graduation date                                     |
| TOEFL         | 4            | alpha-numeric | X.XX                  | score on TOEFL exam                                          |
| MAJ.PROF.     | 35           | alpha-numeric | -                     | name of major professor                                      |
| ADVISOR       | 35           | alpha-numeric | -                     | name of advisor                                              |
| COM.MEM.I     | 35           | alpha-numeric | -                     | name of committee member                                     |
| COM.MEM.II    | 35           | alpha-numeric | -                     | name of committee member                                     |
| PROP.TITLE    | 100          | alpha-numeric | -                     | title of proposed masters project                            |
| DATE.PROP.AP. | 8            | alpha-numeric | XX-XX-XX              | date proposal was approved                                   |
| CRS.NO.       | 3            | alpha-numeric | XXX                   | C.S. course number                                           |
| CRS.DATE      | 4            | alpha-numeric | SP82,SU84,FA85        | date which course was or is being taken                      |
| CRS.GR.       | 1            | alpha-numeric | A,B,C,D,F             | course grade                                                 |
| CRS.DEF       | 1            | alpha-numeric | 'D'                   | is it a deficiency course                                    |
| CRS.PS        | 1            | alpha-numeric | Y/N *                 | is the course on the program of study credit hours           |
| CRS.HRS.      | 2            | alpha-numeric | 03,03,01              | is this equivalent credit for a class at another institution |
| CRS.EQUIV.    | 1            | alpha-numeric | 'E'                   | number and name of course taken in another department        |
| O.D.CRS.NA    | 50           | alpha-numeric | (NUMBER-NAME)         | students status in graduate school                           |
| STATUS        | 4            | alpha-numeric | SPEC,PROV.REG         | is student on probation                                      |
| PROBATION     | 1            | alpha-numeric | Y/N '*'               | period in which student held a particular status             |
| ST. DATE      | 4            | alpha-numeric | SP83, ETC             | has student been an advisor                                  |
| ADVISED       | 1            | alpha-numeric | Y/N                   | students effectiveness rating as a TA                        |
| EFFECTIVENESS | 4            | alpha-numeric | X.XX                  |                                                              |

| Data Item  | Field Length | Domain        | Value                       | Semantic Definition                                                                                                      |
|------------|--------------|---------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|
| T.CRS.     | 3            | alpha-numeric | XXX                         | course no. of course taught                                                                                              |
| T.CRS.DATE | 4            | alpha-numeric | SP83, ETC/                  | date a course was taught by TA                                                                                           |
| T.CRS.CON. | 1            | alpha-numeric | C                           | course student has consulted on                                                                                          |
| THECT.CRS. | 3            | alpha-numeric | XXX                         | course no. of course student thinks he can teach                                                                         |
| QUAL. CRS. | 3            | alpha-numeric | XXX                         | course no. of course student is qualified to teach                                                                       |
| EXPER      | 12           | alpha-numeric | (PASCAL...B)<br>(UNIX...2Y) | name of language or machine student has had experience with, and rating (no. of years or advanced intermediate beginner) |

## DATABASE RELATIONS FOR ACTIVE STUDENTS

COURSE\_INFO (NAME, CRS\_NO, CRS\_DATE, CRS\_GR, CRS\_DEF, CRS\_PS, CRS\_EQUIV)

CIT (NAME, U.S.CITIZEN)

COURSE\_O\_DEPT (NAME, O\_D\_CRS\_NA, CRS\_GR, CRS\_DATE, CRS\_PS, CRS\_EQUIV)

ACADEMIC\_INFO (NAME, PHONE, PRES\_ADDR, SSN, KS\_RES, BA\_BS\_AREA, MS\_  
OPTION, CUR\_GPA, GRAD\_DATE, TOEFL, MAJ\_PROF, ADVISOR,  
COM\_MEM\_1, COM\_MEM\_2, PROP\_TITLE, DATE\_PROP\_AP)

STATUS\_INFO (NAME, STATUS, PROBATION, ST\_DATE)

TA\_INFO (NAME, ADVISED, EFFECTIVENESS)

COURSES\_TAUGHT (NAME, T\_CRS, T\_CRS\_DATE, T\_CRS\_CON)

THINKS\_HE\_CAN\_TEACH (NAME, THECT\_CRS)

QUALIFIED\_TO\_TEACH (NAME, QUAL\_CRS)

WORK\_EXP (NAME, EXPER)

CLASS\_INFO (CRS\_NO, CRS\_HRS)

#### 4.6 The Physical Databases

The Computer Science Department keeps historic files on applicant's who were rejected, and on students who have graduated or quit the masters program.

Since these two files are rarely accessed, there was no need to create online access to these records. The office procedures relating to these two files will remain exactly as they were before the automated OIS was proposed.

## CHAPTER 5

### ENVIRONMENTAL IMPACT REPORT

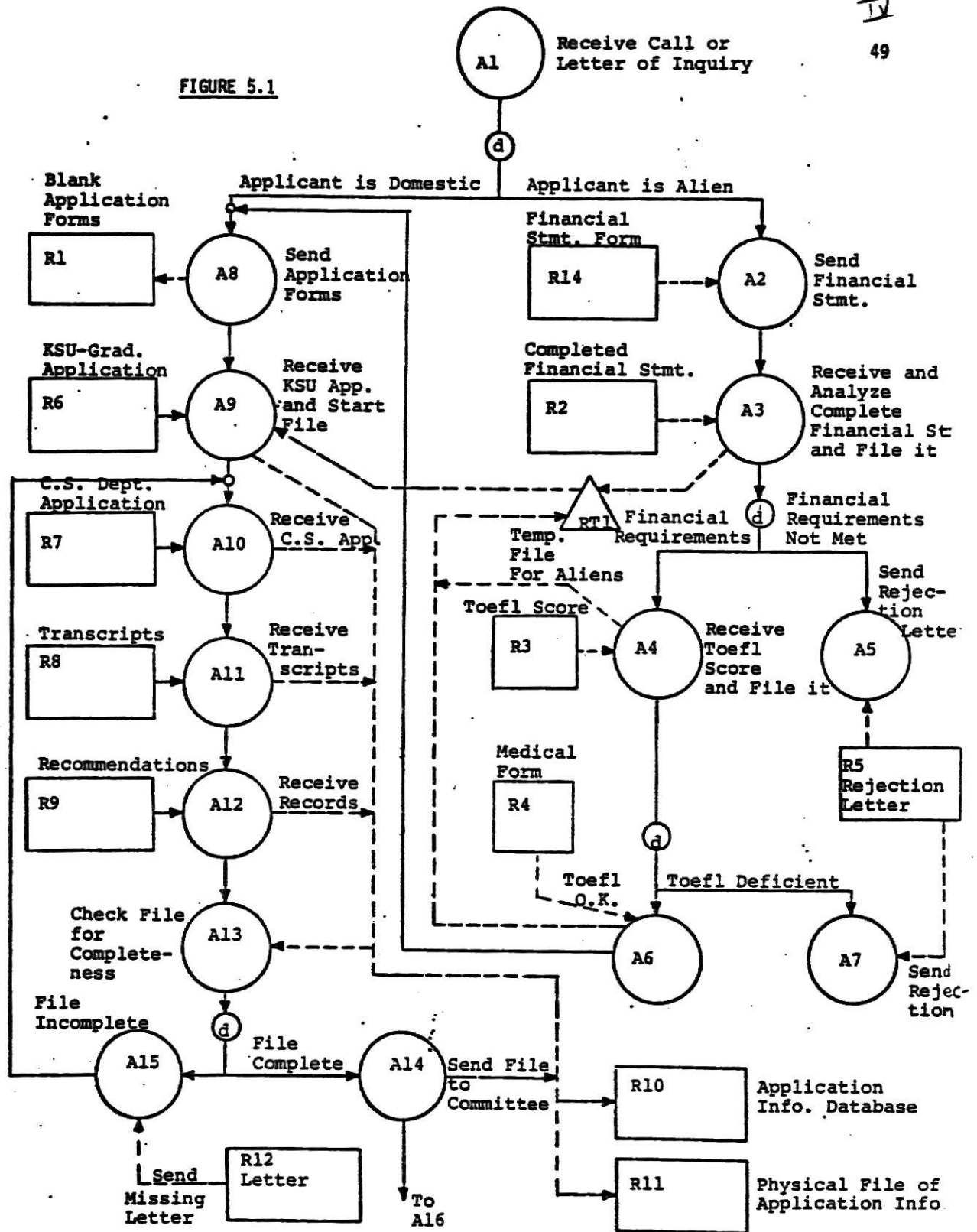
#### 5.1 Overview

In this chapter, the author will try to gauge the effects of the 'KOOL RECORDS' OIS on office procedures and information usage.

To aid in the assessment, an ICN diagram (see Figure 5.1) has been formulated to demonstrate graphically the office procedures after the implementation of the automated OIS. This will differ from the ICN diagram presented in chapter 2 in that this ICN is not based on actual observed office behavior, but on what the author feels will be the resultant office procedure.

Following the ICN diagram, the office procedures will be discussed in terms of the four principal functions outlined in chapter two.

FIGURE 5.1



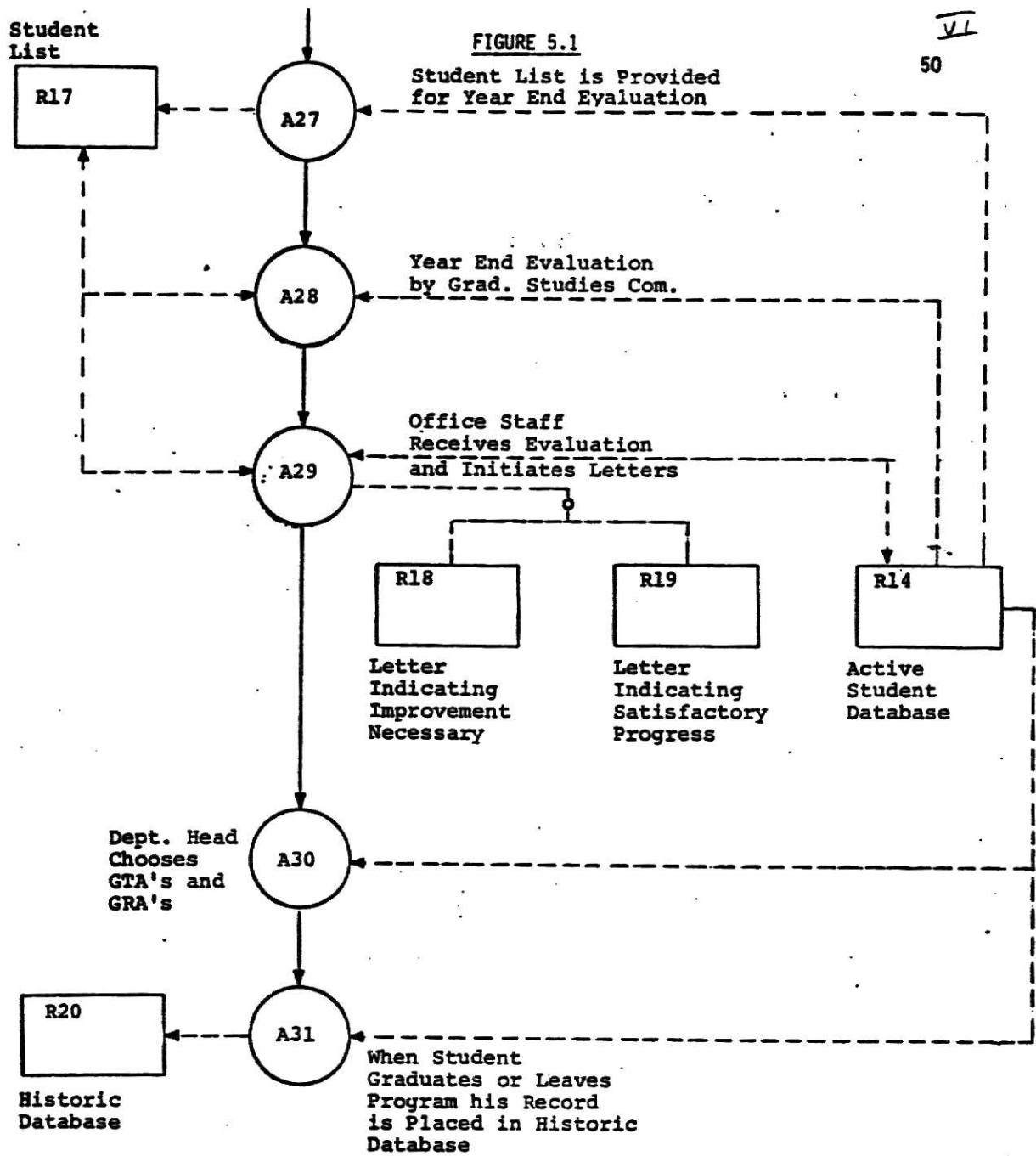




FIGURE 5.1

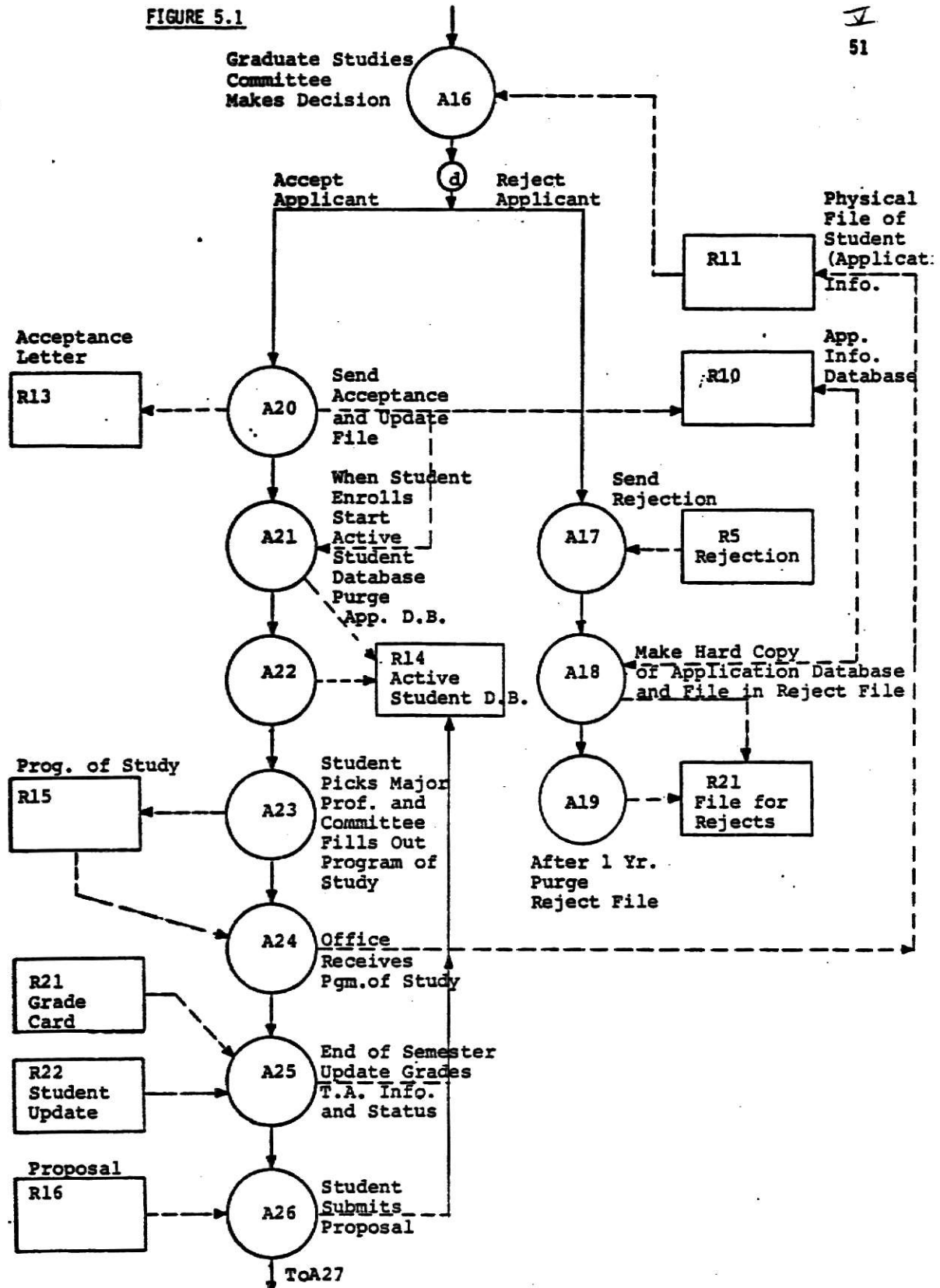


TABLE 5.1

List of Activities for Figure 5.1

- A1 - The initial inquiry from a prospective applicant is received. The applicant's nationality is checked.
- A2 - If applicant is foreign, only a financial statement is sent. (R14)
- A3 - Foreign applicant's financial statement is received, checked and filed temporarily. (RT1)
- A4 - If financial requirements are met, the next step is to receive and analyze the applicants TOEFL score. (R3) This too is filed temporarily (RT1).
- A5 - If financial requirements are not met, a rejection letter (R5) is sent.
- A6 - The next form received would be to student medical form (R4), if the student meets TOEFL requirements.
- A7 - If TOEFL requirements are not met a rejection letter is sent.
- A8 - For both domestic applicants and foreigners who have met TOEFL and financial requirements the application package is sent.
- A9 - When the KSU application is received, it is placed in a physical file, and a file is started in the applicant information database.
- A10 - When the Computer Science Department application is received, it is noted in the applicant information (R10) database and filed in the physical file (R11).
- A11 - As the transcripts are received, they are filed physically (R11) and noted in the applicant database (R10).
- A12 - As the three recommendations are received they are filed physically (R11) and noted in the applicant database (R10).
- A13 - Periodically, the applicant database (R10) is checked for completeness.
- A14 - When the applicant database is complete, the applicant's file is sent to the Graduate Studies Committee for review (R11).

- A15 - If the applicant database indicates information hasn't been received for more than one month, a 'missing letter (R12) is sent.
- A16 - The Graduate Studies Committee decides to accept or reject the applicant.
- A17 - If the applicant is rejected, a rejection (R5) letter is sent.
- A18 - A hard copy is made of the applicant's database record when he is rejected (R10). It is filed in a physical file for rejected applicants (R21).
- A19 - After one year, the rejected applicant's file is purged. (R21)
- A20 - If the applicant is accepted, an acceptance letter is sent (R13) and the applicant database is updated (R10).
- A21 - When the applicant enrolls, an active student (R14) database is started with information in the applicant database (R10). The applicant database is then purged of his file.
- A22 - During his first semester, the student chooses an advisor, and this is entered in the active student database(R14).
- A23 - During his third semester, the student picks his major professor and committee. At this time, the student also usually fills out his program of study. These events are noted on the active student database. (R14)
- A24 - When the program of study has been approved by the graduate school, a copy is sent to the office and put in the physical file. (R11)
- A25 - At the end of each semester, the student's (R11) physical file and database (R14) are updated with course, grade and teaching information from the report card and student update sheet (R22).
- A26 - Student submits proposal, this is noted in the active student database (R14).
- A27 - At year end, a student list is generated by the automated system (triggered by staff member) (R17).

- A28 - At year end, the graduate studies committee conducts the annual evaluation using the active student database (R14) and the student list (R17).
- A29 - The office staff receives the evaluation results and initiates evaluation letters using the automated report generator (R18)(R19) (R17).
- A30 - Department Head with help from administrative assistant chooses GTA-GRA's. They use the active student database (R14).
- A31 - When a student graduates or leaves the program his active files (R11 and R14) are purged and placed in an historic database (which is a physical file) (R20).

TABLE 5.2

List of Repositories for Figure 5.1

- R1 - This is the application package which contains: KSU Graduate application, C.S. department application, 3 recommendation forms.
- R2 - Completed foreign student financial statement.
- R3 - TOEFL score for foreign students.
- R4 - Foreign student medical form.
- R5 - Rejection letter.
- R6 - KSU Graduate Application.
- R7 - C.S. department application.
- R8 - Transcripts from other schools.
- R9 - 3 recommendations.
- R10 - The on-line application information database.
- R11 - Physical file of student information -- all completed forms go into this file.
- R12 - Missing letter - sent to applicants who have items missing from their applicant file.

- R13 - Letter of acceptance.
- R14 - Financial statement form for foreign students.
- R15 - Program of Study.
- R16 - Student's research project proposal.
- R17 - Student list to aid in annual evaluation.
- R18 - Evaluation letter which indicates that improvement is necessary.
- R19 - Evaluation letter indicating satisfactory progress.
- R20 - Historic database for graduates and students who have left the program.
- R21 - Student grade card.
- R22 - Student update form, submitted every semester.
- R24 - Database for active students.

## 5.2 New Office Procedure

The ICN diagrams in section 5.2 demonstrated several changes in office procedure which are expected to take place with the implementation of the 'KOOL RECORDS' automated OIS. Not all of these changes are a direct result of the automation of the Computer Science office. Certain changes in procedure were brought about by the demands of running an automated system (i.e. data-entry, and data-update). Other changes which appear are simply the author's suggestion of a more efficient process. Further changes reflect the Computer Science department's recent commitment to a more structured and active role in monitoring the progress of graduate students through the masters program.

In comparing the ICN diagram in section 5.2 with the one in chapter 2, it becomes apparent that the actual changes in procedure are few, and those that were made are of a subtle nature. The less noticeable but more important changes that occurred between the old system and the new

automated system concern the content of the information repositories. The next sections will examine, in detail the expected changes in both procedure and information usage under the automated OIS.

### 5.3 The Applicant Management Function

The applicant management function under the automated system includes several changes in procedure. The principal change is that the application information card has been replaced by an on-line database. In terms of office procedure, this means that the office staff will enter applicant data into a terminal rather than onto a physical card. The actual data entry will not be much different except for the fact that the sorting and searching for individual file 'cards' will be done automatically.

As noted in the requirement specification (Chapter 3) there are several differences in the information listed on the card and information kept in the applicant database. These changes are minor and should make the database more responsive to the department's information needs without adding a significant clerical load.

Particularly noteworthy, however, are the additions suggested by the department head. These are: BA/BS AREA, U.S. CITIZEN and KANSAS RESIDENCY. These data items were added to meet office information needs which were not previously being met in a systematic way. These items are now to be kept and made available during the time between when a student is accepted and when he starts school. They were put in this database because student records will remain in this database for accepted students until the student begins classes.

Another procedural change concerns foreign applicants and was suggested by the author. There are two circumstances in which foreign students are rejected without a review by the Graduate Committee: one circumstance is

if the financial requirement is not met, another is if the TOEFL score is substandard. As the system is currently run, applications packages are not sent out until a foreign returns his financial statement. This is to keep from wasting applications. However, applications are sent out before the TOEFL score is known. This results in applications packages being sent to students who will be immediately dismissed from consideration due to their TOEFL score. The author's suggested procedure is that applications packages not be sent to foreign applicants until both the TOEFL and the financial requirements have been met. This would save applications and seemingly be a more consistent policy.

There are several housekeeping activities associated with the automated system. When an applicant is rejected, a hard copy of his database file is produced and added to his physical file which is then stored for one year in the rejected applicant file. When an applicant is accepted, his database file is updated to reflect the committee's decision (regular, provisional, probational). His file will remain online until the applicant actually begins classes. Certain information contained in the database is used during this period between acceptance and enrollment (including the additions suggested by Dr. Wallentine).

At the time a student enrolls, a function triggered by a staff member automatically shifts relevant data from the applicant database to the active student database. At this time, the student's applicant file is purged from the applicant database.

#### 5.4 The Student Advisory Function

The actual procedures relating to the student advisory and major professor function don't change drastically with the introduction of the automated OIS. What does change, however, is the availability of information for faculty advisors and major professors.

In the current system, if an advisor wanted up-to-date information on a student, he would have to walk down to the office and rummage through the student's physical documents to find what he is after. Under the automated OIS, however, the faculty member has all relevant information at his fingertips. The faculty member simply logs in, chooses a menu, and enters the student's name.

This should have the effect of helping the advisory system become much more responsive to the student. Advisors will be encouraged to study each student's file more thoroughly than he might have done in the past. Therefore, decisions made on behalf of the student might be more thoughtfully researched.

In terms of the office staff, the creation of an active student database adds some clerical overhead. A member of the office staff must create and update all student files. Unlike the applicant information database, this active student database does not replace an existing document. Therefore, the maintenance of this database requires the addition of new office procedures rather than the redefinition of old ones. (In the applicant information database, existing clerical duties, such as updating the applicant information card, were redefined to become the updating of the applicant information database. This was seen to create little if any additional clerical workload.)

### 5.5 Student Evaluation

The introduction of the online database for active students caused several changes in procedure for student evaluation. The annual evaluation of students can be done, on the automated OIS without the use of each student's physical records. All necessary information is available in the active student database.



This function begins with a member of the staff triggering the automatic OIS function which produces the student list. As the Graduate Studies Committee examines each student's database record, the student's evaluation is noted on the list. When the evaluations are complete, the list is returned to the staff. The staff then enters the list of names into the terminal and the report generator produces the evaluation letters.

Several methods for handling this situation were considered before this procedure was selected.

One option that was considered was to have the Graduate studies committee enter the evaluation of each student's database record as they examined it. This would take little time and eliminate the necessity of the list. The list would not have to be produced and the staff would not have to enter the list in order to trigger the evaluation letters. Once the evaluation had taken place, the letters could be produced by an automatic function which checked each student file for the evaluation result and produced the proper letter.

This suggested procedural method was considered but discarded due to security considerations. One of the foremost security specifications was that only staff members be given read/write access to this database. Therefore, a possibly more efficient procedural method was replaced by a more secure one.

This automated student evaluation function, by making information more easily accessible, should aid the Graduate Studies Committee in their renewed commitment to playing a more active role in monitoring student progress. Several information items which are made easily accessible by the automated OIS provide milestones in the student's academic career. Examples are: has the student chosen an advisor during his first semester?

has he completed the core courses in his first two semesters? has he filed out a program of study in his third semester? The quick availability of these information items should add significantly to the faculty's ability to effectively monitor the progress of graduate students.

#### 5.6 GTA and GRA Administration

At any point in his career, a student might apply for a GTA or GRA. In the current system, the department head and his administrative assistant would look through the student's physical file to come up with the necessary information with which to make a decision.

Under the automated OIS, the necessary information for active students is placed on a single screen which the faculty scans whenever necessary. Since this information is kept in the active student database, it is only available for students already enrolled in the program. If a student applies for a GTA or GRA at the time he is applying for admission to the program, the automated system is not capable of meeting this information need.

In designing the system this way, several factors were taken into consideration. One important factor was clerical overhead. The relevant teaching information could have been added to the applicant information database, in which case the information would be available on-line at all points in the student's lifespan as an applicant and student. It was decided that, with up to 800 applicants in the system at one time, this would place an unnecessary burden on the office staff.

. Another consideration in the decision to leave this information out of the applicant's information database was that since the applicant's physical file is used in the evaluation of applicants, it would not be an extended burden for the department to use that same opportunity to examine the physical files of applicants to evaluate their GTA or GRA qualifications.

In weighing these considerations, the most efficient alternative seemed to be to use physical records to evaluate applicants being considered for GTA and GRA positions, and then use an online method to evaluate currently enrolled students.

Another interesting aspect of the GTA-GRA administration function is the handling of the student's experience information. On the physical document (the C.S. department application) an entire line of information is used to detail each item of experience a student has had. Such items include languages a student has used and machines he is familiar with, along with the student's level of experience with those languages and machines. In order to fit this information on the GTA-GRA information screen, each item of experience was given a ten-character slot. It will be interesting to assess how effectively this ten-character-long data item will be for expressing an 8-inch line of textual information. On the physical C.S. department application, the description of computing experience might read:

|           |                                             |      |                           |
|-----------|---------------------------------------------|------|---------------------------|
| LANGUAGE, | WHEN, WHERE, NATURE AND EXTENT OF KNOWLEDGE |      |                           |
| PASCAL    | 1980                                        | K.U. | 10 credit hrs. of classes |

This same information might appear on the GTA-GRA information screen in this manner:

{PASCAL . . . . I}

The 'I' means intermediate here. Obviously, the screen version is not nearly as expressive as the written version. The adequacy of screen version will become clear only as the system is used.

## 5.7 An Overall System View

After analyzing the ICN diagram of office procedure assuming the

implementation of the KOOL RECORDS OIS, it might be useful to make a pragmatic speculation of how the office staff and faculty will be affected by the OIS.

From a general standpoint, it appears the office staff will be increasing their work load in order to make things easier on faculty members. For example the staff will have the added responsibility of data-entry for the active student database. This will enable faculty members to access information without traveling to the Computer Science office to view physical documents.

Balancing out this added clerical workload, however, will be several features of the OIS which should reduce the workload attached to other clerical functions. The report generator should streamline the clerical function of producing form letters thereby reducing the workload. The automated applicant management system should also result in an easier more efficient clerical environment. These considerations indicate that the clerical workload of the office staff will increase in some areas and decrease in others, with the end result that the overall work load should be no heavier and possibly significantly lighter than it was under the manual system.

How will information usage be affected by the automated environment? It has generally been true in offices that, as information becomes more accessible, information usage increases. This should hold true for the C.S. department office as well. It is likely that faculty members, when acting as advisors will be prone to check student records on their terminals more often than they would have walked down to the office and scanned through the student's physical records. If this proves to be the case, the result should be a more responsive and informed advisory system.

A similar situation should exist with the department head's GTA information screen. Having an easily accessible, organized collection of information is likely not only to save him trouble (i.e. walking into the office to check physical files), but also keep him more fully informed.

If these assessments prove to be correct, and efficiency is added to office information procedures and information accessibility is improved, then this automated information system will be a successful addition to the Computer Science Office.

## CHAPTER 6

### CONCLUSION

#### 6.1 Summary

This report has examined the entire design process for an automated office information system. It has detailed the initial investigation into the office environment. It has presented a graphic representation of office procedures using an Information Control Net diagram. It has isolated the four major office functions relating to graduate students, and analyzed the information requirements of each of these functions. It has translated these information requirements into a workable OIS design which consists of user-friendly screens, a report generator and two fully normalized relational databases. And, finally, it has assessed the office environment as it will exist after the implementation of this automated OIS. To conclude this report, the next section will address several areas for future enhancement of the KOOL RECORDS OIS.

#### 6.2 Future Enhancements

The KOOL RECORDS OIS, as it is designed, is a skeletal, working prototype OIS. Therefore great opportunity exists for extending its capabilities.

In the author's view, the most obvious area for enhancing this system's capabilities is the development of query functions. The scope of such an endeavor would depend on the final implementation of the system design. The lack of a database software package will add greatly to the workload necessary to provide query capabilities.

The system should eventually be able to provide list generation functions also. Examples would be:

1. List of students graduating this fall.
2. List of students without a major professor.
3. List of students with a particular advisor.

This list generation function could eventually be used in forecasting course offerings by checking the student's programs of study:

List students who plan to take 761 in Fall 84.

One functional consideration is system security. The security measures built into the KOOL RECORDS design consist only of UNIX file protection measures, which are by no means fail-safe. This is an area that needs to be examined. One possible suggestion is to store all records in an encrypted form, which would render them unreadable to persons seeking unauthorized access.

Another functional consideration is data-integrity. All data-items are in the alpha-numeric domain. The only constraint built into the system currently is the length of the field. An enhancement to this system that should be considered would be a program that checked each data item entered to insure that it was a valid entry into the field.

Other areas for system enhancement will become clear only after the system has been implemented. The changes in office procedure brought on by automation might create the need for new information items or a differing screen presentation of existing information items. The response time for data transactions must be evaluated to determine its effect on planned office procedures. It is also likely that the changes in information usage and office procedure will stimulate the staff and faculty's desire for additional functions to be added to the system.

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## APPENDIX A

### COMPUTER SCIENCE DEPARTMENTAL DOCUMENTS



Type or print in BLACK ink

|              |         |            |      |          |     |
|--------------|---------|------------|------|----------|-----|
|              |         |            |      | County   |     |
| D.O.B.       | D.O.E.  | 8<br>Class | Res. | N. Curr. |     |
| Alpha. Curr. | College | XX<br>H.S. | Cit. | Vet.     | Sex |
| RAC/ETH      | ODOE    | R          | NR   | RR       | NR  |

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

Applicant's Signature \_\_\_\_\_ Date \_\_\_\_\_  
Special students see back of page

**Special students see back of page**

**20. Special Students: Read and sign the following:**

I understand that acceptance of my enrollment as a special student does not constitute full admission to the Graduate School and that the Graduate Faculty reserves the right to decide on what credit up to nine (9) hours, earned by a special student, may be applied toward an advanced degree.

| Signature                                                                                                                                                                                                                                                                                                                                                     | Date                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>DO NOT WRITE BELOW THIS LINE</b>                                                                                                                                                                                                                                                                                                                           |                               |
| <b>Departmental Recommendation to Graduate School</b>                                                                                                                                                                                                                                                                                                         | <b>Graduate School Action</b> |
| <b>Degree Student:</b> Masters <input type="checkbox"/> PhD <input type="checkbox"/>                                                                                                                                                                                                                                                                          |                               |
| <input type="checkbox"/> a) Regular admission.                                                                                                                                                                                                                                                                                                                | a) <input type="checkbox"/>   |
| <input type="checkbox"/> b) Provisional (see below).                                                                                                                                                                                                                                                                                                          | b) <input type="checkbox"/>   |
| <input type="checkbox"/> 1) Pending receipt of transcript showing award of bachelor's degree.                                                                                                                                                                                                                                                                 |                               |
| <input type="checkbox"/> 2) Unable to interpret transcript.                                                                                                                                                                                                                                                                                                   |                               |
| <input type="checkbox"/> 3) Must remove following deficiencies: (Note: Deficiency courses are in addition to normal degree requirements.)                                                                                                                                                                                                                     |                               |
| <br>                                                                                                                                                                                                                                                                                                                                                          |                               |
| <input type="checkbox"/> 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. | d) <input type="checkbox"/>   |
| <br>                                                                                                                                                                                                                                                                                                                                                          |                               |
| <b>Special Student</b>                                                                                                                                                                                                                                                                                                                                        |                               |
| <input type="checkbox"/> d) Admitted as non-degree student                                                                                                                                                                                                                                                                                                    | d) <input type="checkbox"/>   |
| <input type="checkbox"/> e) Admitted as non-degree student on probation                                                                                                                                                                                                                                                                                       | e) <input type="checkbox"/>   |
| <br>                                                                                                                                                                                                                                                                                                                                                          |                               |
| <b>FOREIGN STUDENTS—Source of Support</b>                                                                                                                                                                                                                                                                                                                     |                               |
| 1. Scholarship/grant/assistantship from KSU                                                                                                                                                                                                                                                                                                                   |                               |
| as \$_____ per _____ until _____ \$_____                                                                                                                                                                                                                                                                                                                      |                               |
| 2. Scholarship/grant/loan (_____)                                                                                                                                                                                                                                                                                                                             |                               |
| source                                                                                                                                                                                                                                                                                                                                                        |                               |
| as \$_____ per _____ until _____ \$_____                                                                                                                                                                                                                                                                                                                      |                               |
| 3. Personal or family funds                                                                                                                                                                                                                                                                                                                                   | \$_____                       |
| 4. Summer or other non-academic year                                                                                                                                                                                                                                                                                                                          |                               |
| expenses met by _____                                                                                                                                                                                                                                                                                                                                         | \$_____                       |
| TOTAL (for in-state fees)                                                                                                                                                                                                                                                                                                                                     | \$_____                       |
| TOTAL (for out-of-state fees)                                                                                                                                                                                                                                                                                                                                 | \$_____                       |
| <br>                                                                                                                                                                                                                                                                                                                                                          |                               |
| Signature _____                                                                                                                                                                                                                                                                                                                                               | Date _____                    |
| Department or Interdepartmental Program _____                                                                                                                                                                                                                                                                                                                 |                               |
|                                                                                                                                                                                                                                                                                                                                                               | For the Graduate School _____ |
|                                                                                                                                                                                                                                                                                                                                                               | _____                         |
|                                                                                                                                                                                                                                                                                                                                                               | _____                         |
|                                                                                                                                                                                                                                                                                                                                                               | Date _____                    |



**COURSES IN COMPUTER SCIENCE AND RELATED AREAS:**

**List the Basic Computer Science Courses (comparable to Computer Science 200, 300, 305, 405, 420, 560 and 580) below.**

| School | Year | Level (Soph., Jr., Senior, Grad.)<br>and Title of Course | Text: Author, Title | Grade |
|--------|------|----------------------------------------------------------|---------------------|-------|
|--------|------|----------------------------------------------------------|---------------------|-------|

**List below the Basic Mathematics Courses (Calculus and two additional Courses) taken.**

| School | Year | Level and Title of Course | Text: Author, Title | Grade |
|--------|------|---------------------------|---------------------|-------|
|--------|------|---------------------------|---------------------|-------|

**Plot Other Courses (Including Computer Science and Computer Science Related Areas)**

| School | Year | Level and Title of Course | Text: Author, Title | Grade |
|--------|------|---------------------------|---------------------|-------|
|--------|------|---------------------------|---------------------|-------|

DESCRIPTION OF COMPUTING EXPERIENCE:

List Computer Languages of which you have some detailed knowledge:

| Language | When | Where | Nature and Extent of Knowledge |
|----------|------|-------|--------------------------------|
|          |      |       |                                |
|          |      |       |                                |
|          |      |       |                                |
|          |      |       |                                |
|          |      |       |                                |
|          |      |       |                                |
|          |      |       |                                |

Computing Machines of which you have some detailed knowledge:

| Machine | When | Where | Nature and Extent of Knowledge |
|---------|------|-------|--------------------------------|
|         |      |       |                                |
|         |      |       |                                |
|         |      |       |                                |
|         |      |       |                                |
|         |      |       |                                |
|         |      |       |                                |
|         |      |       |                                |

Other Experience which would contribute to your studies (include teaching and industrial experience and publications):

| Type | When | Where | Nature and Extent of Duties |
|------|------|-------|-----------------------------|
|      |      |       |                             |
|      |      |       |                             |
|      |      |       |                             |
|      |      |       |                             |
|      |      |       |                             |
|      |      |       |                             |
|      |      |       |                             |

Please turn page for Statement of Objectives.

Additional information may be listed below.



KANSAS STATE UNIVERSITY

*will have to  
show student  
this & must  
have a page #*

Leflore Student Health Center  
University Hospital  
Manhattan, Kansas 66506

KANSAS STATE UNIVERSITY  
INTERNATIONAL STUDENT MEDICAL CERTIFICATE

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

MEDICAL STATEMENT

PART I: FOR DOCTOR

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

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

If the patient does have a contagious or communicable disease  
what disease \_\_\_\_\_  
present condition \_\_\_\_\_  
current medication or treatment \_\_\_\_\_

\_\_\_\_\_  
Doctor

\_\_\_\_\_  
Date

PART II: TO BE COMPLETED BY THE STUDENT

Field of Study \_\_\_\_\_

Check One  
Graduate \_\_\_\_\_  
Undergraduate \_\_\_\_\_

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

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
PRINT--last name only



Department of Computer Science

Fairchild Hall  
Manhattan, Kansas 66506  
913-532-6350

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

We show that we still have not received:

\_\_\_\_\_ 2 copies of an official transcript from:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_ 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

A-7 MISSING LETTER



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 Educational Rights and Privacy Act of 1974, unless the right is waived by the student. This statement will be included in the student's permanent record.

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

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

NAME \_\_\_\_\_ SIGNATURE \_\_\_\_\_  
POSITION \_\_\_\_\_ ORGANIZATION \_\_\_\_\_  
DATE \_\_\_\_\_ ADDRESS \_\_\_\_\_

A-8 REFERENCE FORM



**Department of Computer Science**

Fairchild Hall  
Manhattan, Kansas 66506  
913-532-6350

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 can not admit you.

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

Sincerely,

Virg Wallentine, Chairman  
Graduate Studies Committee

---

A-9 REJECTION LETTER



**Department of Computer Science**

Fairchild Hall  
Manhattan, Kansas 66506  
913-532-6350

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 of equivalent)
- ☐ Other

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

Sincerely,

*Virg Wallentine*

Virg Wallentine, Chariman  
Graduate Studies Committee

A-10 REJECTION LETTER

# M.S. GRAD. STUDENT INFORMATION FORM

DATE \_\_\_\_\_

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

7. COURSES
- a. Deficiency courses taken: \_\_\_\_\_ Course \_\_\_\_\_ Grade \_\_\_\_\_
  - \_\_\_\_\_ Course \_\_\_\_\_ Grade \_\_\_\_\_
  - \_\_\_\_\_ Course \_\_\_\_\_ Grade \_\_\_\_\_
  - \_\_\_\_\_ Course \_\_\_\_\_ Grade \_\_\_\_\_

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

10. Program of Study approved YES NO

11. MS Report or Thesis (dates/title)

- a. Proposal
  - Date \_\_\_\_\_
  - Results \_\_\_\_\_
- b. Orals
  - Date \_\_\_\_\_
  - Results \_\_\_\_\_

12. Supervisory Committee

13. Employment at Graduation:

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

A-11 STUDENT INFORMATION FORM

January 17, 1983

[REDACTED]  
[REDACTED]  
[REDACTED]

Dear [REDACTED]

The Graduate Studies Committee, consisting of Drs. Wallentine, Unger and Hankley, has reviewed your progress as a Master's Degree student. You need to accomplish the following to bring your performance to a level commensurate with normal progress toward the degree:

- ☒ Need to file a Student Information form
- ☒ Need to select an advisor
- ☐ Need to select a major advisor
- ☐ Need to file a Program of Study
- ☐ Need to propose a research project

For a definition of normal progress see the "Guidelines for Master's Degree in the Department of Computer Science".

The faculty has re-committed itself to excellence in teaching and research. Your record indicates that you are capable of achieving excellence. We urge you to continue striving for excellence in all your academic pursuits, especially in your Master's research project.

Sincerely,

E. A. Unger, Chairperson  
Graduate Studies Committee

EAU:mbc

cc: file

A-12 EVALUATION LETTER

SUBMIT ORIGINAL AND 5 COPIES

Computer Science  
CURRICULUM

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

Indicate Plan:  
Master's Thesis ☐  
Master's Report ☒  
Non Thesis-Report ☐

| Terry,           |               | Michael                     | S.     | 488-58-3322            |
|------------------|---------------|-----------------------------|--------|------------------------|
| Last Name        |               | First                       | Middle | Social Security Number |
| Department Name  | Course Number | Course Name                 |        | Credits                |
| Computer Science | CMPSC 670     | Discrete Comp Structures    |        | 03                     |
| Computer Science | CMPSC 700     | Translator Design I         |        | 03                     |
| Computer Science | CMPSC 720     | Operating Systems II        |        | 03                     |
| Computer Science | CMPSC 740     | Software Engineering        |        | 03                     |
| Computer Science | CMPSC 761     | Database Management Systems |        | 03                     |
| Computer Science | CMPSC 791     | Intensive CS Concepts       |        | 03                     |
| Computer Science | CMPSC 765     | EDP Systems Analysis        |        | 03                     |
| Computer Science | CMPSC 830     | Artificial Intelligence     |        | 03                     |
| Computer Science | CMPSC 890     | Office Automation           |        | 03                     |
| Computer Science | CMPSC 897     | Sem/Grad Computer Science   |        | 01                     |
| Computer Science | CMPSC 898     | MS Report                   |        | 02                     |
|                  |               |                             |        | Total Credits 30       |

MAJOR COURSES

|                               |           |                  |
|-------------------------------|-----------|------------------|
|                               |           | Total Credits 30 |
| SUPPORTING COURSES            |           |                  |
| Advisory Committee            |           |                  |
| Dr. Elizabeth A. Unger        | Signature |                  |
| Major Professor — Name Typed  | Signature |                  |
| Dr. Rodney M. Bates           | Signature |                  |
| Committee Member — Name Typed | Signature |                  |
| Dr. Roger T. Hartley          | Signature |                  |
| Committee Member — Name Typed | Signature |                  |

Approved by Head of Department \_\_\_\_\_ Date \_\_\_\_\_ Dean of Graduate School \_\_\_\_\_ Date \_\_\_\_\_

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

Rev 7-71

A-13 PROGRAM OF STUDY

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Need Assistance YES NO  
KSU FORM \_\_\_\_\_  
CS FORM \_\_\_\_\_  
TRANSCRIPT (2 copies) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
RECOMMENDATIONS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Acceptance letter \_\_\_\_\_  
Rejection letter \_\_\_\_\_

LOCATION: KSU KC LEAV NCR WE  
LEVEL : MS PhD Special  
STARTING: Fall SP SU 19\_\_  
STATUS : Missing letter sent \_\_\_\_\_  
To Committee \_\_\_\_\_  
To Xerox \_\_\_\_\_  
To Grad. Sch. \_\_\_\_\_  
Status letter \_\_\_\_\_  
TOEFL \_\_\_\_\_ ( ) HEALTH \_\_\_\_\_ ( )  
\$8000 \_\_\_\_\_ ( )  
Recommendation: ACCEPT REJECT  
PROBATION SPECIAL  
PROVISIONAL TA RA  
DATE RECEIVED \_\_\_\_\_  
EXPERIENCE \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

A-14 APPLICANT INFORMATION CARD

APPENDIX B  
TRANSACTION PROCESSING SCREENS



APR 13 10:32 1983 staffmenu Page 1 - MAIN MENU

\*\*\*\*\* WELCOME TO THE FRIENDLY 'KOOL RECORD SYSTEM' \*\*\*\*\*

This system allows the staff to keep and maintain records on MS applicants and students. A variety of reports and letters can be printed, also. So, please choose what you want to do by entering the desired option letter.

YOUR CHOICES ARE:

- > KOOL RECORDS FOR MS APPLICANTS ( a )
- > KOOL RECORDS FOR MS STUDENTS ( s )
- > KOOL RECORDS FOR LETTER WRITING ( 1 )
- > TAKE A BREAK ( \$ )

PLEASE ENTER YOUR CHOICE HERE ==> ( )

APR 13 10:31 1983 apfmenu Page 1 - APPLICANT MENU

\*\*\*\*\* WELCOME TO KOOL RECORDS FOR MS APPLICANTS \*\*\*\*\*

This feature allows you to track an MS applicant's progress through the applicant system. You can add a new applicant record to the MS applicant file drawer and you can also update an applicant's current record. You can also have the option to delete an applicant's file. Just choose an option and follow the directions from there.

- HERE ARE YOUR OPTIONS:

- > START NEW APPLICANT'S FILE ( s )
- > ADD TO APPLICANT'S RECORD ( a )
- > DESTROY APPLICANT'S RECORD ( d )
- > RETURN TO MAIN MENU ( m )

PLEASE ENTER YOUR CHOICE HERE ==> ( )

APR 11 16:04 1983    stwo Page 1-APPLICANT INFORMATION I

NAME > {

}

RECEIVED KSU FORM ( YES NO ) > {

}

DATE > {

}

RECEIVED CS FORM ( YES NO ) > {

}

DATE > {

}

### RECOMMENDATIONS

NAME > {

} DATE > {

}

NAME > {

} DATE > {

}

NAME > {

} DATE > {

}

### TRANSCRIPTS ( TWO COPIES )

SCHOOL NAME > {

}

DATE > {

}

SCHOOL NAME > {

}

DATE > {

}

SCHOOL NAME > {

}

DATE > {

}

SCHOOL NAME > {

}

DATE > {

}

SCHOOL NAME > {

}

DATE > {

}

NUMBER OF TRANSCRIPTS EXPECTED > {

}

ALL TRANSCRIPTS RECEIVED ( YES NO ) > {

}

CURRENT SCREEN ( C ), MENU ( M ), OR TOUCH RETURN FOR NEXT SCREEN ==> {..}

NAME > {

}

STATUS ( DATE ) > MISSING LETTER SENT > { }

TO COMMITTEE > { }

TO XEROX > { }

TO GRAD SCHOOL > { }

STATUS LETTER > { }

GRE RECEIVED ( YES NO ) > { } DATE > { }

RECOMMENDATION : ACCEPT > { } REJECT > { }

PROVISIONAL > { } SPECIAL > { }

PROBATION > { }

DATE RECOMMENDATION RECEIVED > { }

ENTRY DATE ( F-YR SP-YR SU-YR ) > { - }

CURRENT SCREEN ( C ) OR MENU ( M ) ==> {..}



APR 13 10:31 1983 studmenu Page 1 *ACTIVE STUDENT MENU*

\*\*\*\*\* WELCOME TO KOOL RECORDS FOR MS STUDENTS \*\*\*\*\*

This feature allows you to transfer students from the applicant  
file drawer to the student file drawer. You can also add to a student's  
record or delete a student's record. Just choose an option and then follow  
the directions from there.

HERE ARE YOUR OPTIONS:

- > KOOL RECORD TRANSFER ( t )
- > ADD TO STUDENT'S RECORD ( a )
- > DESTROY STUDENT RECORD ( d )
- > RETURN TO MAIN MENU ( m )

PLEASE ENTER YOUR CHOICE HERE ==> { }

NAME &amp; T

| COURSE | GRADE | CREDIT | DATE   | PROG * | * COURSE | GRADE | CREDIT | DATE   | PROG  |
|--------|-------|--------|--------|--------|----------|-------|--------|--------|-------|
| {670E} | {A}   | {03}   | { F81} | {YES}* | {830 }   | {A}   | {03}   | { F82} | {YES} |
| {700 } | {A}   | {03}   | {SP82} | {YES}* | {891 }   | {A}   | {03}   | {SP83} | {YES} |
| {720 } | {A}   | {03}   | {SU82} | {YES}* | {926 }   | { }   | { }    | {SP83} | {YES} |
| {740 } | {A}   | {03}   | { F82} | {YES}* | { }      | { }   | { }    | { }    | { }   |
| {761 } | {A}   | {03}   | { F82} | {YES}* | { }      | { }   | { }    | { }    | { }   |
| {897 } | { }   | { }    | {SP83} | {YES}* | { }      | { }   | { }    | { }    | { }   |
| {305D} | { }   | { }    | {SP83} | { }*   | { }      | { }   | { }    | { }    | { }   |
| { }    | { }   | { }    | { }    | { }*   | { }      | { }   | { }    | { }    | { }   |
| { }    | { }   | { }    | { }    | { }*   | { }      | { }   | { }    | { }    | { }   |
| { }    | { }   | { }    | { }    | { }*   | { }      | { }   | { }    | { }    | { }   |

**OTHER COURSES :**

[illegible]

ENTER 'M' FOR MENU, 'A' FOR OTHER ACADEMIC INFO, OR 'T' FOR TEACHING INFO =>{..}

APR 13 12:14 1983 sfive Page 1 - STUDENT UPDATE SCREEN II.

NAME > {

} PHONE > {

SSN > {

RESIDENT OF KS ( YES NO ) > { } CITIZEN OF USA ( YES NO ) > { }

BA/BS AREA > {

} MS OPTION > { }

CURRENT GPA > { } EXPECTED DATE OF GRADUATION > { } TOEFL SCORE > {

MAJOR PROFESSOR OR ADVISOR > {

COMMITTEE MEMBER > {  
COMMITTEE MEMBER > {

}  
}

PROPOSAL TITLE > {

{

}  
}

DATE APPROVED > { }

STATUS HISTORY >

{SPEC}

PROBATION

DATE

{SPEC}

{ }

{SF81}

{PROV}

{ }

{SUB81}

{PROV}

{ }

{F82}

{REG}

{\*}

{SP83}

ENTER 'M' FOR MENU, 'C' FOR COURSE INFO, OR 'T' FOR TEACHING INFO =>{ }

B-00



ENTER 'M' FOR MENU, 'C' FOR COURSE INFO, OR 'A' FOR OTHER ACADEMIC INFO =>{--}

APR 13 10:59 1983 destroy Page 1 - STUDENT UPDATE SCREEN IV

\*\*\*\*\*

THE OPTION YOU HAVE CHOSEN ALLOWS YOU TO DESTROY A STUDENT'S OR  
APPLICANT'S RECORD. PLEASE RECONSIDER YOUR CHOICE. IF YOU WISH TO RETURN  
BACK TO THE SUB MENU PLEASE ENTER AN ' m ' HERE ==> { } . IF NOT, THEN  
TOUCH RETURN AND PROCEED AT YOUR OWN RISK!

B-10

\*\*\*\*\*

PLEASE ENTER THE NAMES OF THE PEOPLE WHOSE RECORDS YOU WANT TO DESTROY

[illegible]

У У У У У У У У У У У У У

B-11

Apr 13 11:46 1983 letter Page 1 *REPORT GENERATOR MENU*

\*\*\*\*\* WELCOME TO KOOL RECORDS FOR WRITING LETTERS \*\*\*\*\*

This feature allows you to print a letter to be sent to the student(s) or applicant(s) of your choice. Just choose which letter you want to print and then enter the person's name when asked and that's all there is to it.

You can also print out an evaluation list for the Graduate Studies Committee to review. You can also print a copy of the applicant card for your files.

HERE ARE YOUR CHOICES:

- > YEARLY EVALUATION LETTER ( the good one ) ( g )
  - > YEARLY EVALUATION LETTER ( the fair one ) ( f )
  - > MISSING LETTER FOR APPLICANT ( m )
  - > ACCEPTANCE LETTER FOR APPLICANT ( a )
  - > REJECTION LETTER FOR APPLICANT ( r )
  - > GSC EVALUATION LIST OF MS STUDENTS ( e ) (autoPrint)
  - > COPY OF APPLICANT CARD FOR OFFICE ( c ) (autoPrint)
- PLEASE ENTER YOUR CHOICE HERE ==> ( )

PLEASE ENTER THE NAMES OF THE PERSONS WHO YOU WOULD LIKE TO SEND THIS LETTER TO.

NAMES

PLACE A 'P' HERE  
TO PRINT ==> { }

B-13

\*\*\*\*\* WELCOME TO KOOL RECORDS FOR FACULTY PERUSAL \*\*\*\*\*

Hello! This is the faculty peruse facility. This function allows you, the faculty member, to look at a student's course information, teaching information, or other specific academic information, each held on a separate screen. Any screen that you have chosen will allow you access to another screen or to this menu. By the way, if you see an 'E' next to the course number on the course screen, it means that equivalent credit was received for that course. Also, a 'D' next to the course number denotes that that course is a deficiency course. A 'YES' under the 'PROG' column means that that course is on the student's Program of Study. You'll see what I mean. Everything else should be self-explanatory.

PLEASE ENTER THE STUDENT'S NAME => { \_

}

NOW, ENTER 'C' FOR COURSE INFORMATION, 'A' FOR SPECIFIC ACADEMIC INFORMATION,  
OR 'T' FOR TEACHING INFORMATION ==> { \_ }



Apr 13 10:37 1983 facper2 Page 1 PERUSPL SCREEN II

```

NAME > {                               } PHONE > { - }
RESIDENT OF KS ( YES NO ) > { } CITIZEN OF USA ( YES NO ) > { }
BA/BS AREA > {                               } MS OPTION > { }
CURRENT GPA > { } EXPECTED DATE OF GRADUATION > { } TOEFL SCORE > { }
MAJOR PROFESSOR OR ADVISOR > { }
COMMITTEE MEMBER > { }
COMMITTEE MEMBER > { }
PROPOSAL TITLE > { }
DATE APPROVED > { }

STATUS HISTORY > STATUS PROBATION DATE
{SPEC} { } {SP81}
{PROV} { } {SUB1}
{PROV} { } {F82}
{REG} {*} {SP83}

ENTER 'M' FOR MENU, 'C' FOR COURSE INFO, OR 'T' FOR TEACHING INFO =>{ }

```

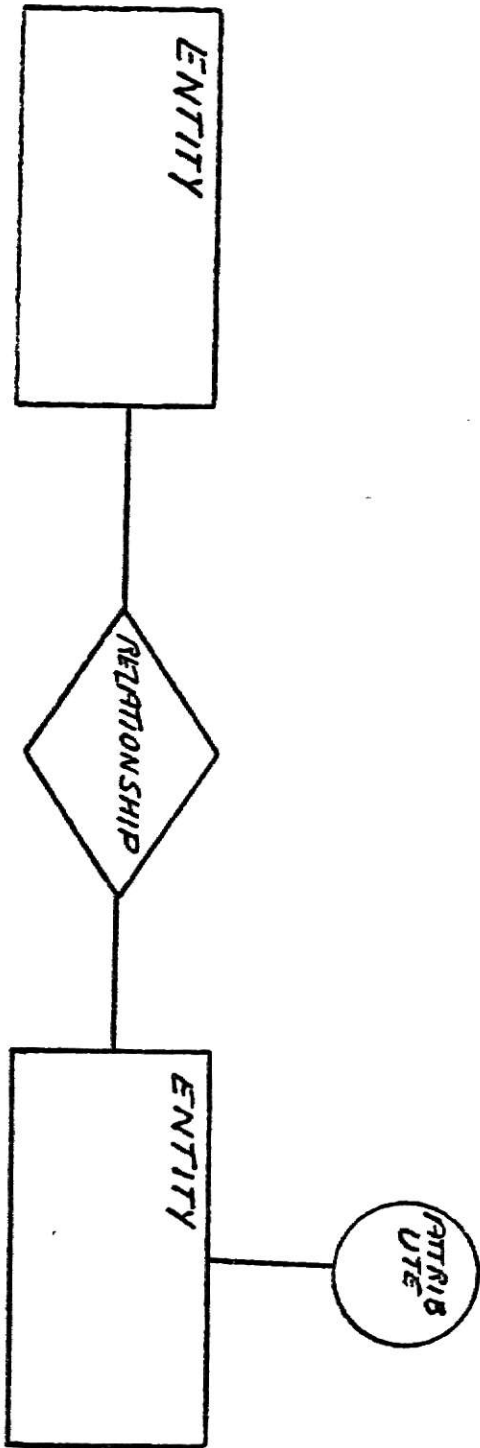


NAME &amp; C

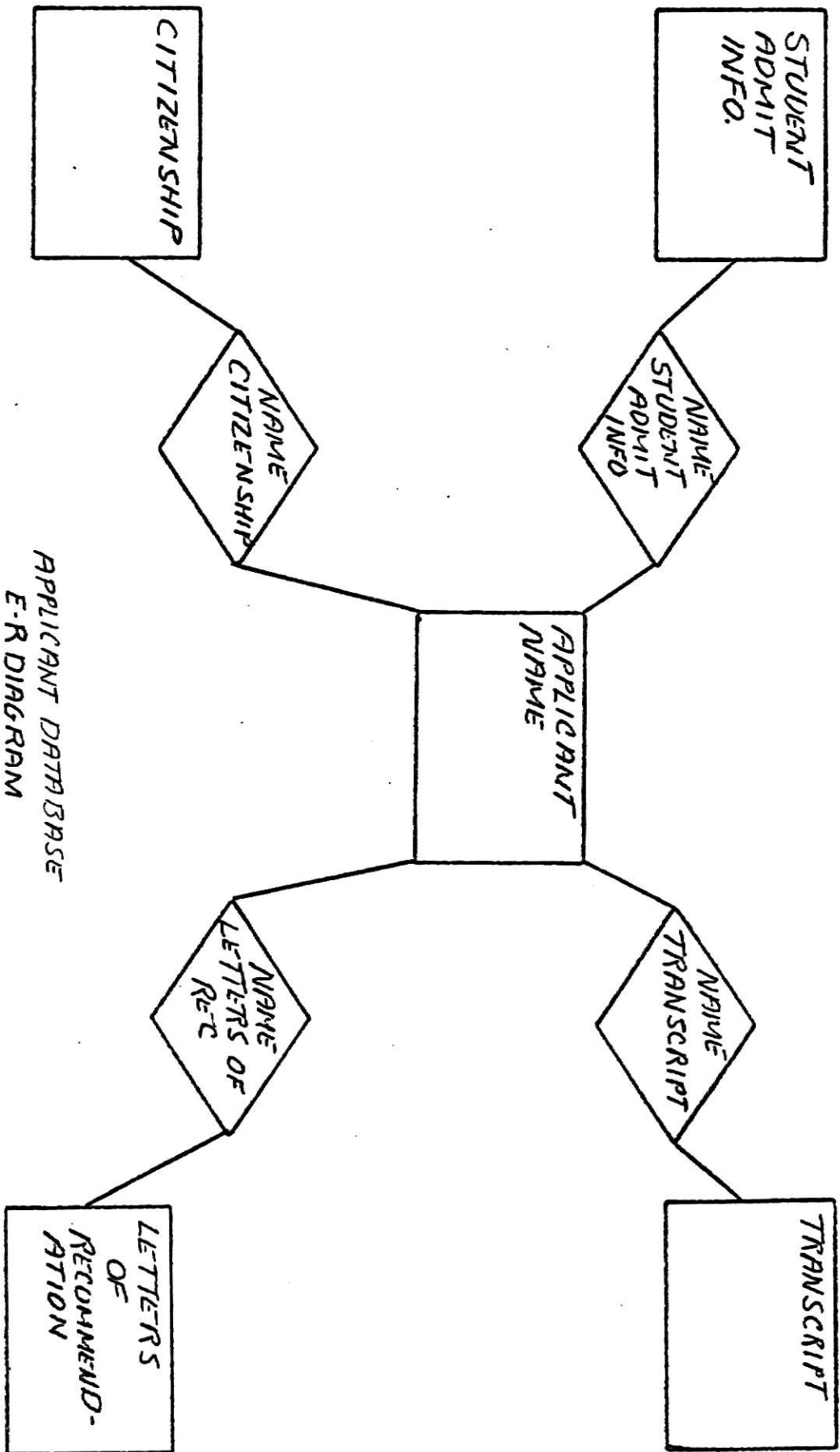
ENTER 'M' FOR MENU, 'C' FOR COURSE INFO, OR 'A' FOR OTHER ACADEMIC INFO =>{--}

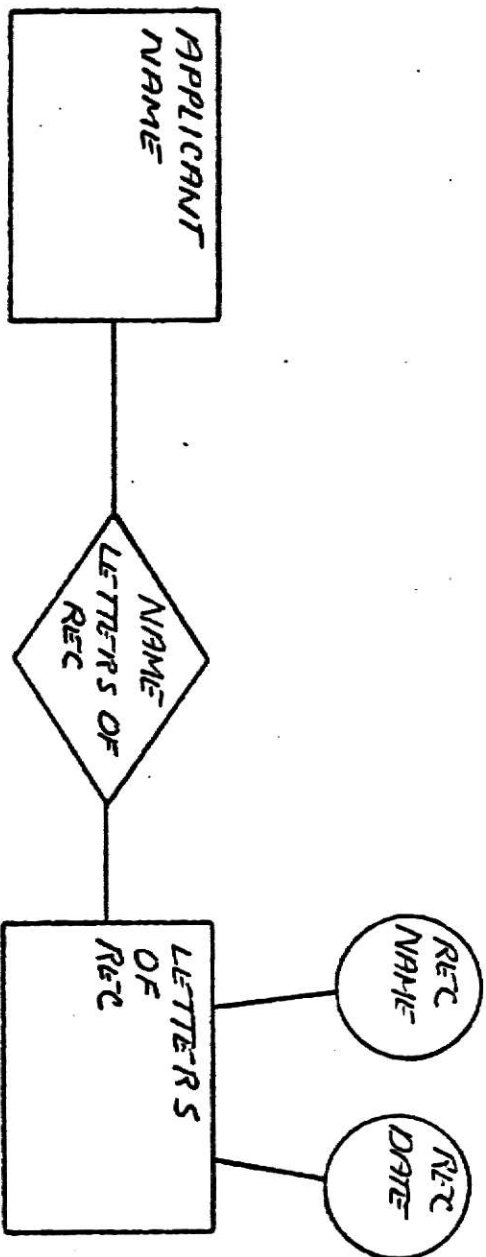
## APPENDIX C

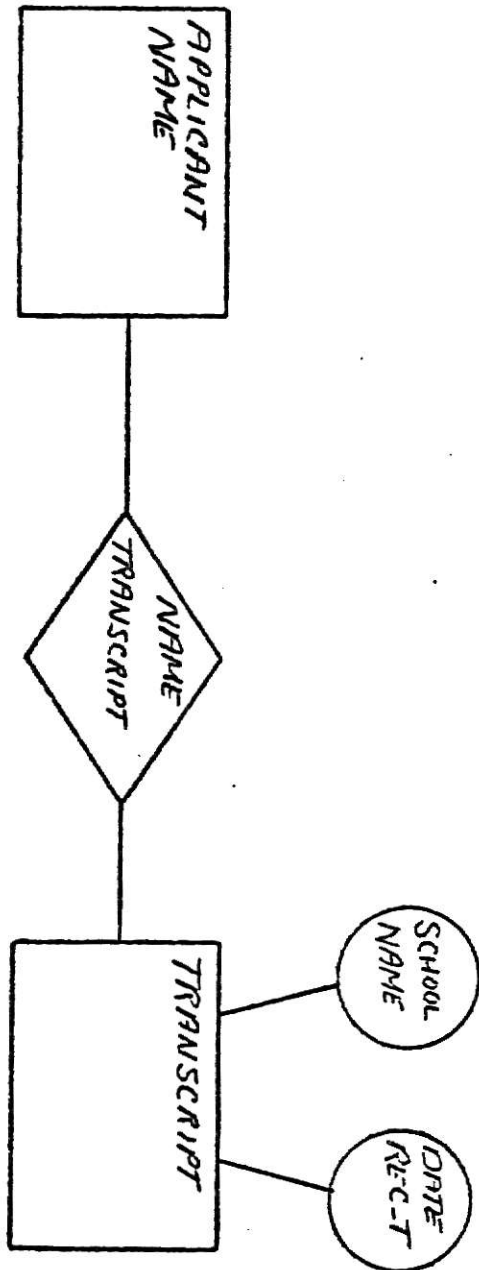
### ENTITY-RELATIONSHIP DIAGRAMS OF DATABASE RELATIONS

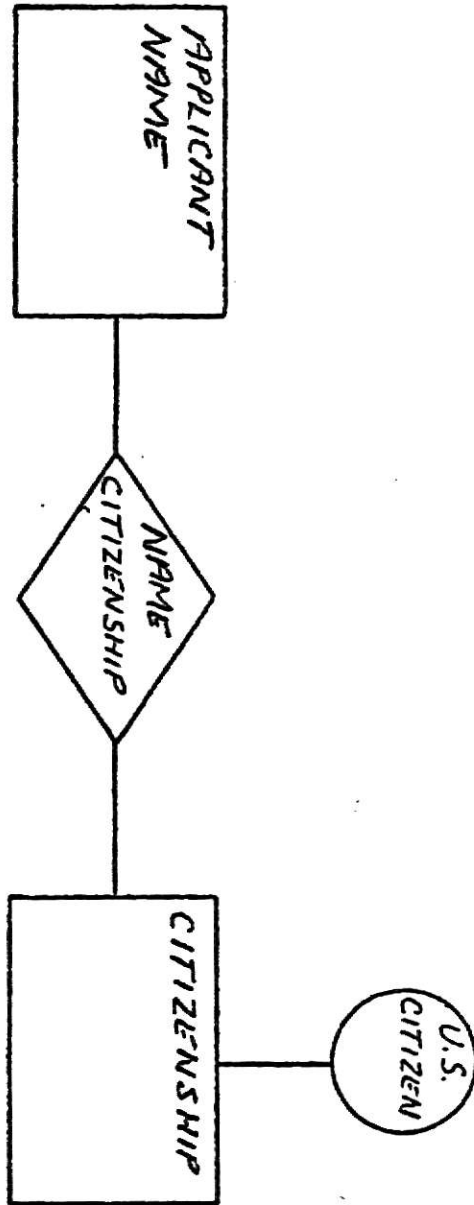


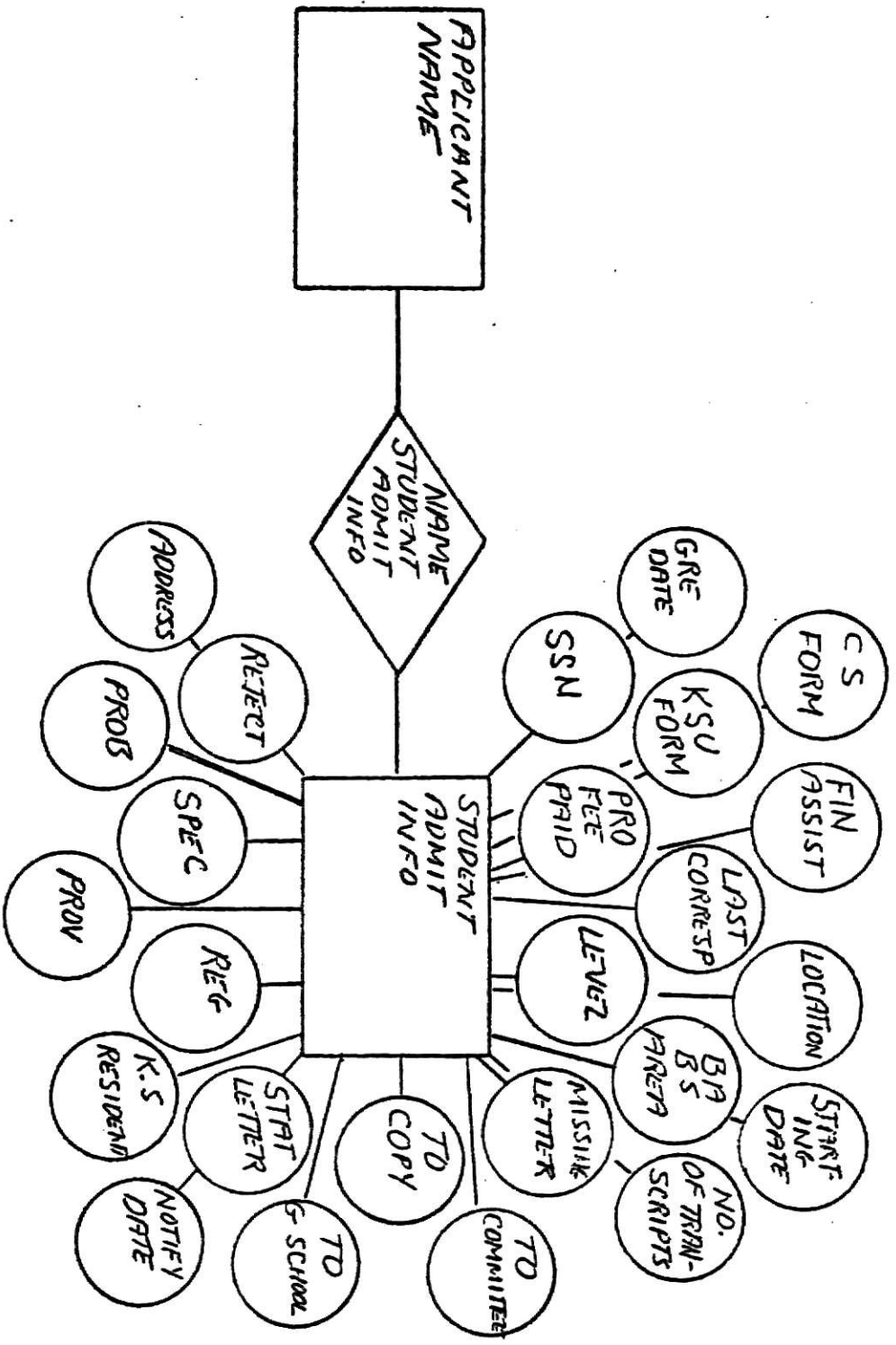
E-R KEY





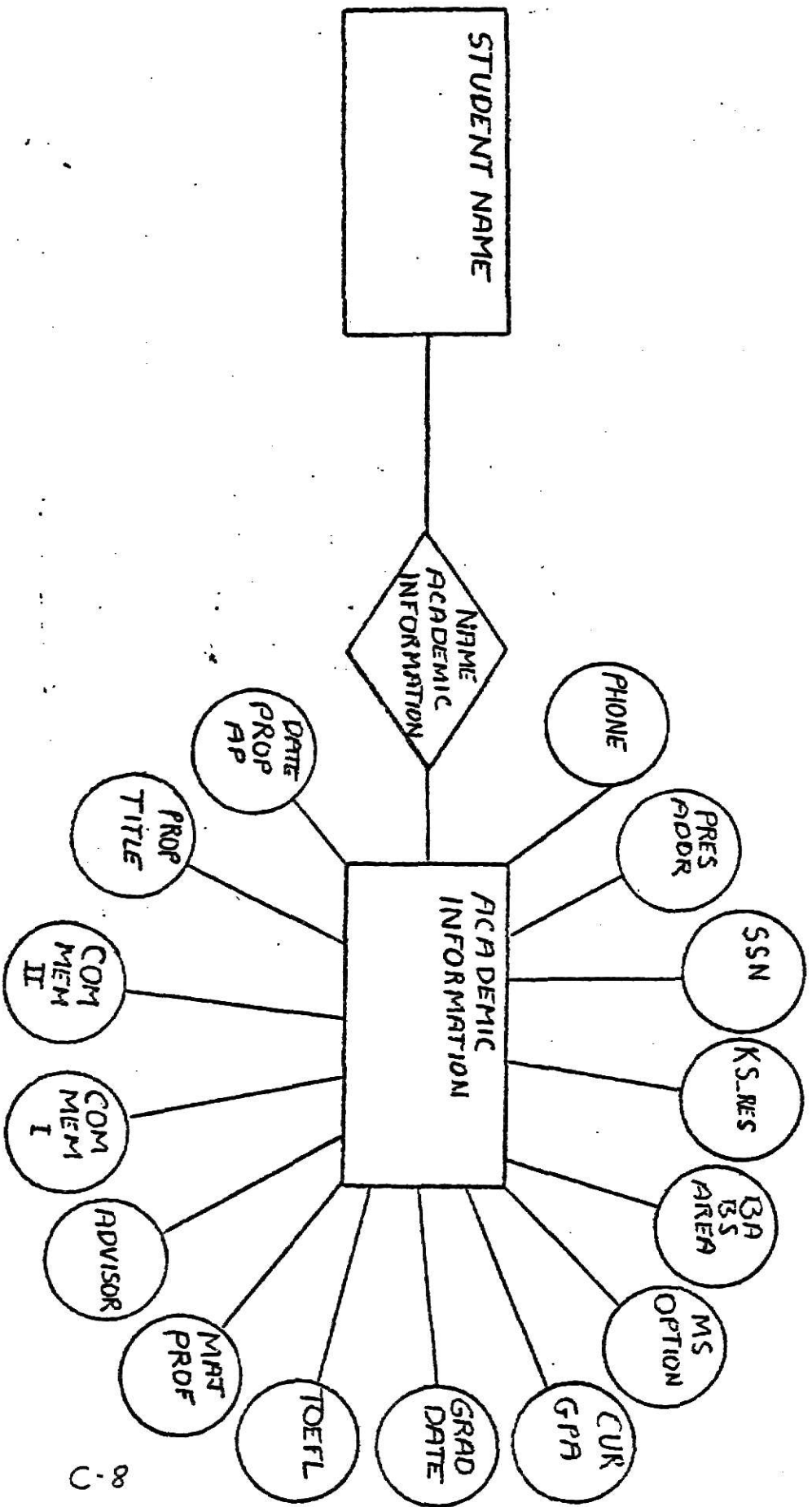


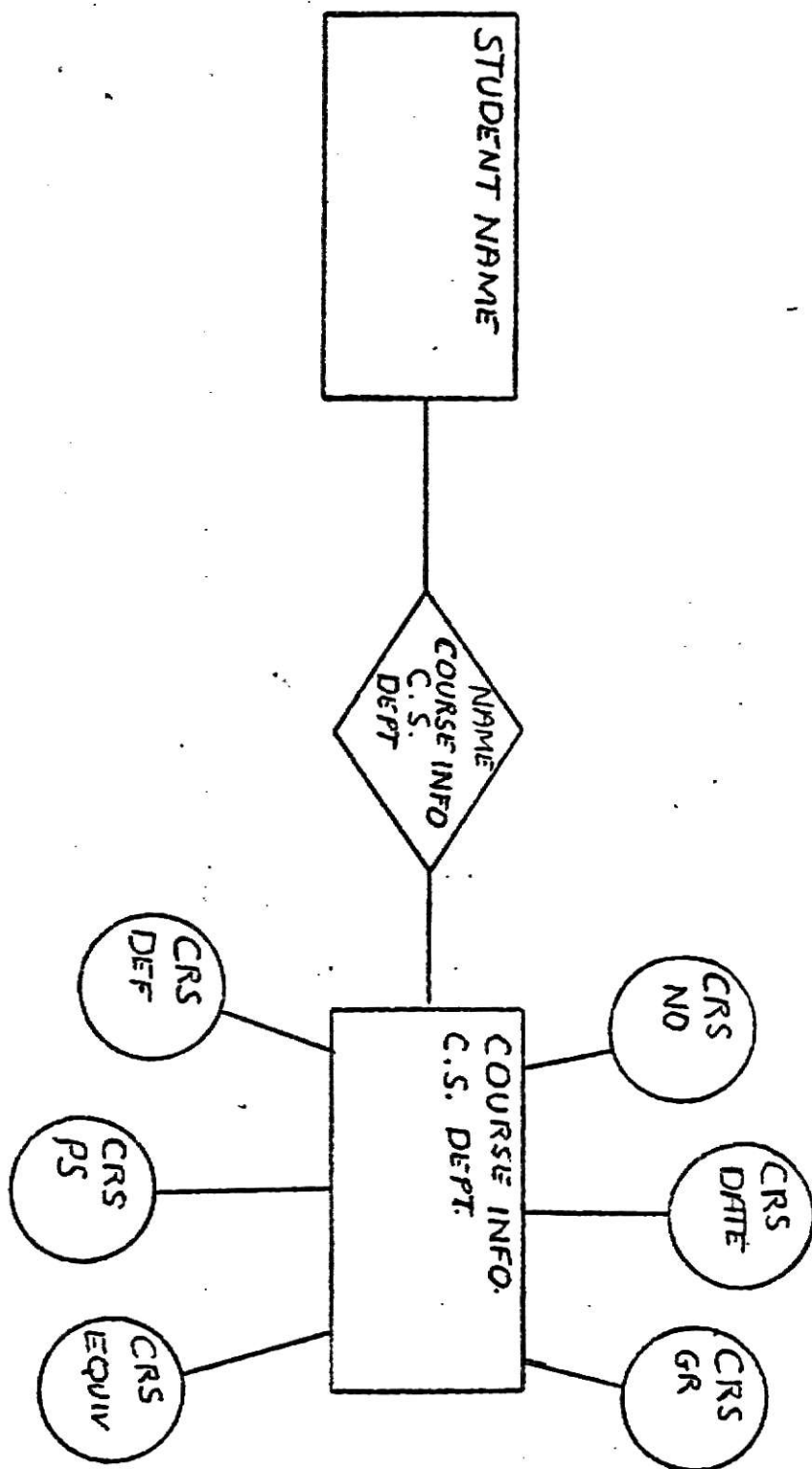


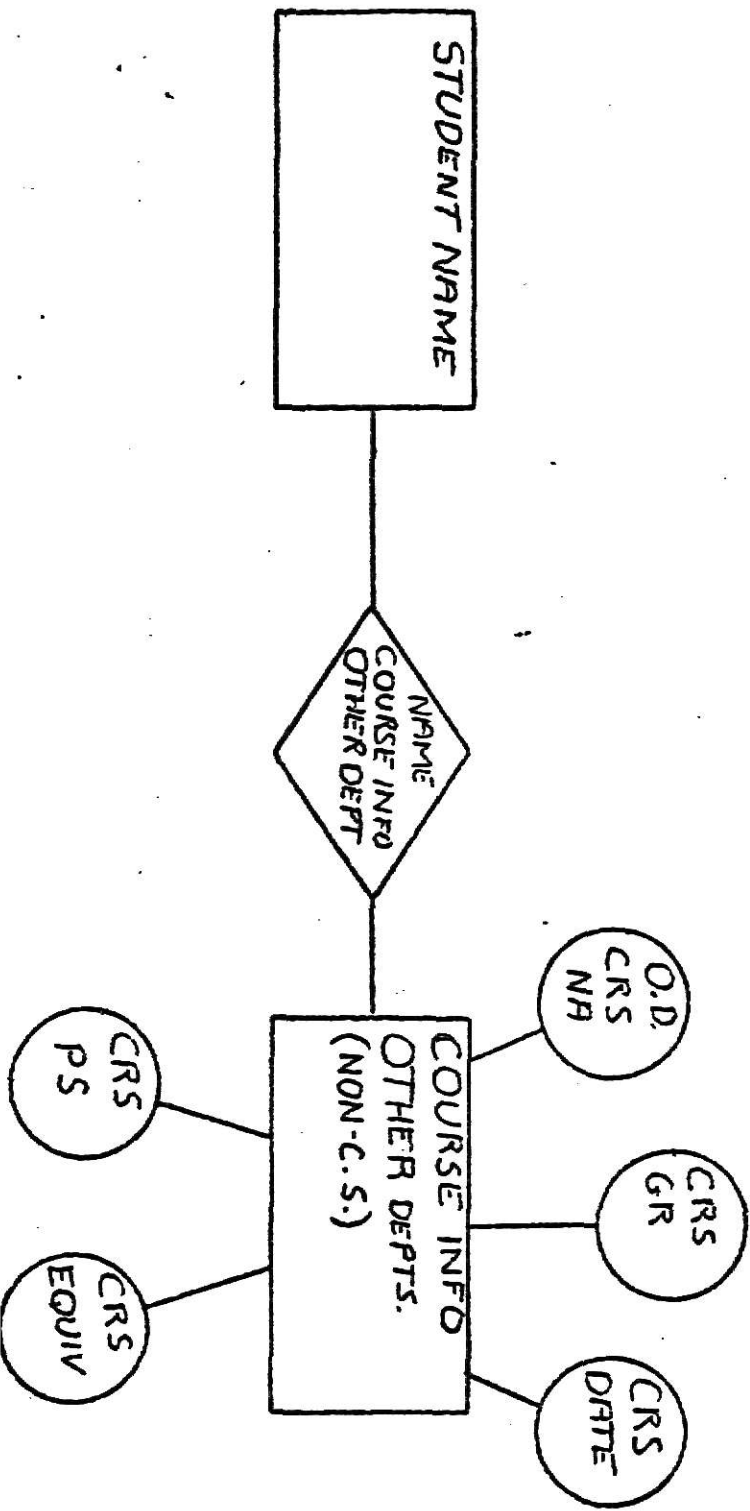


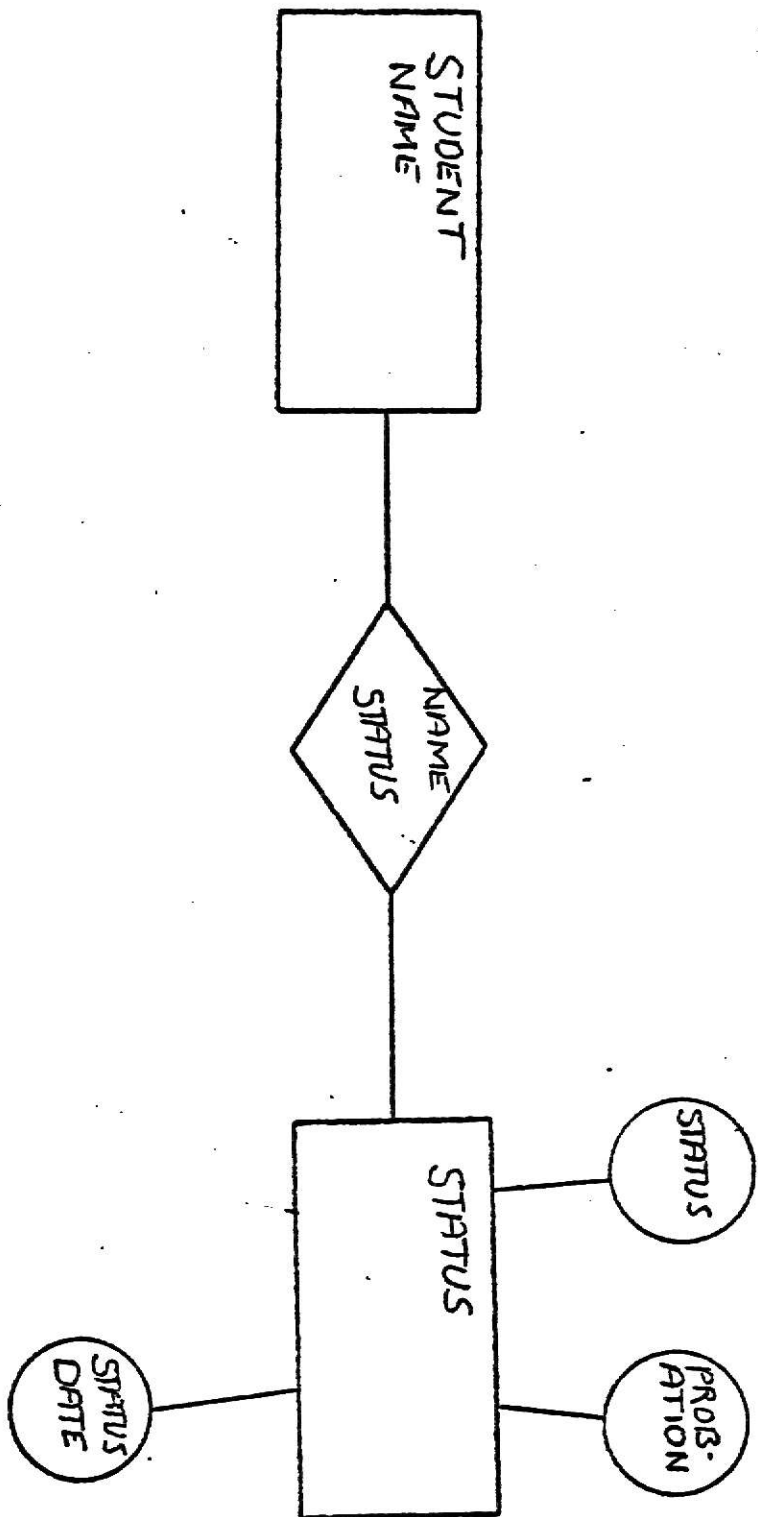


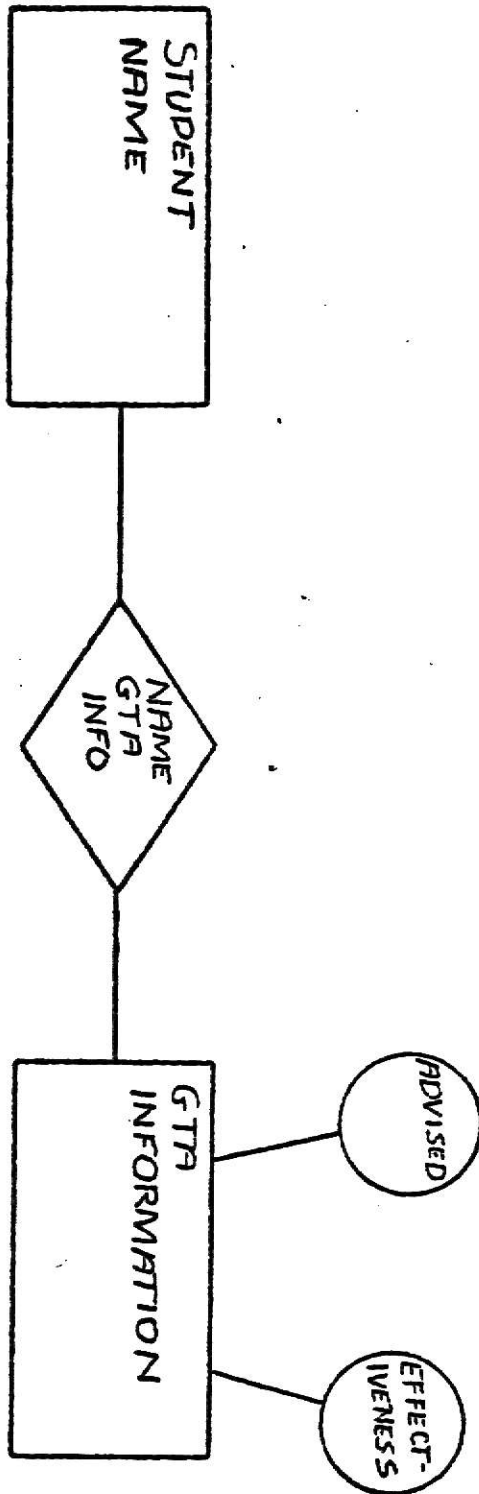


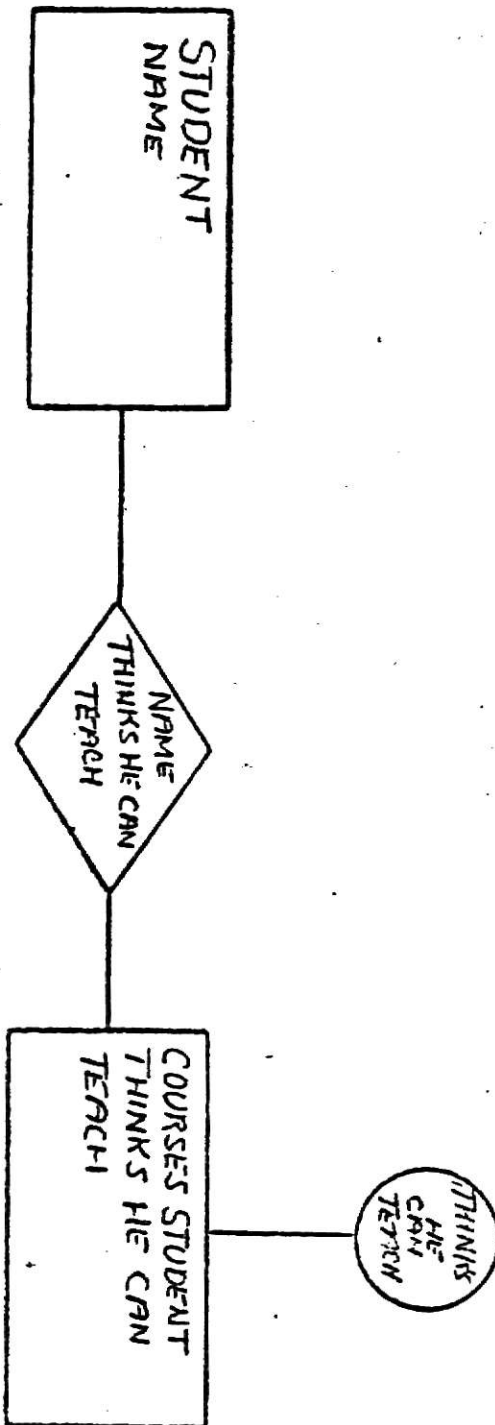


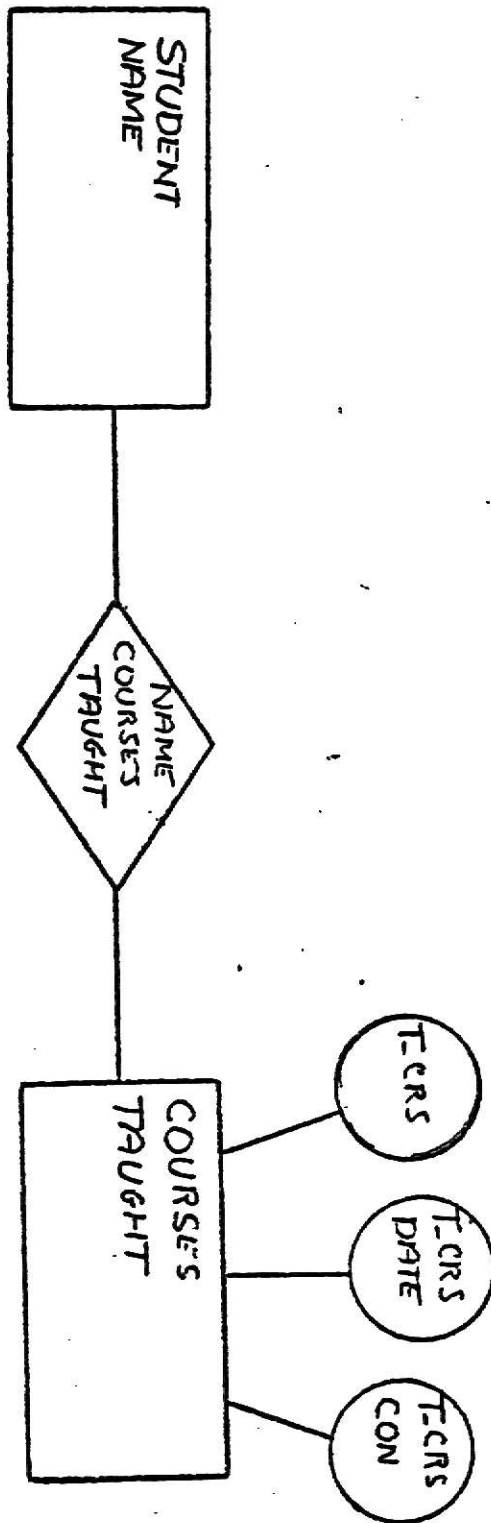




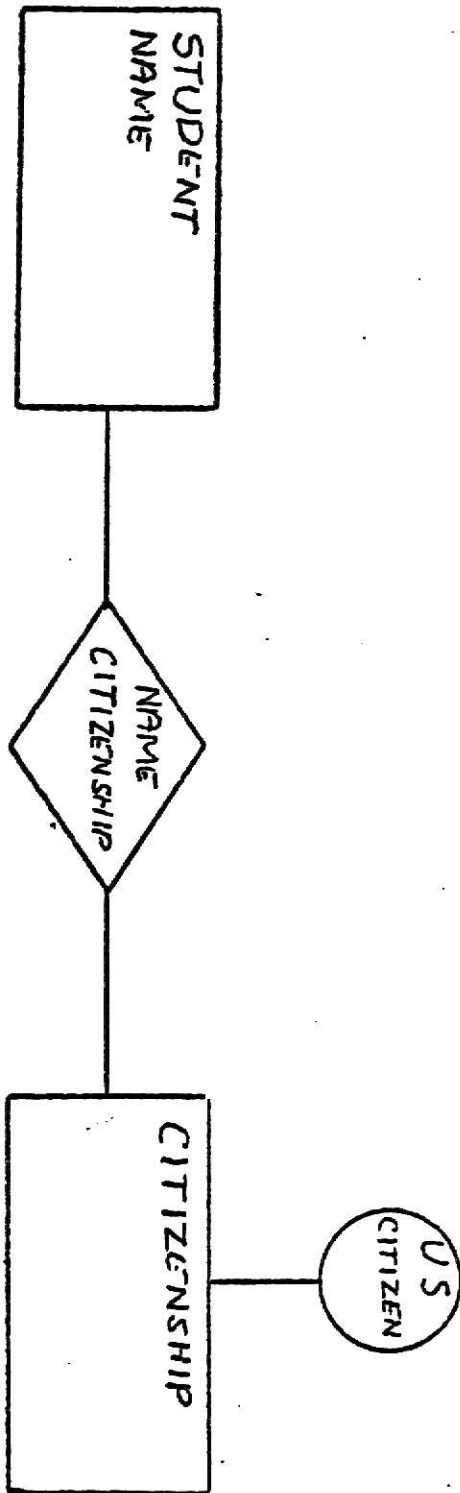


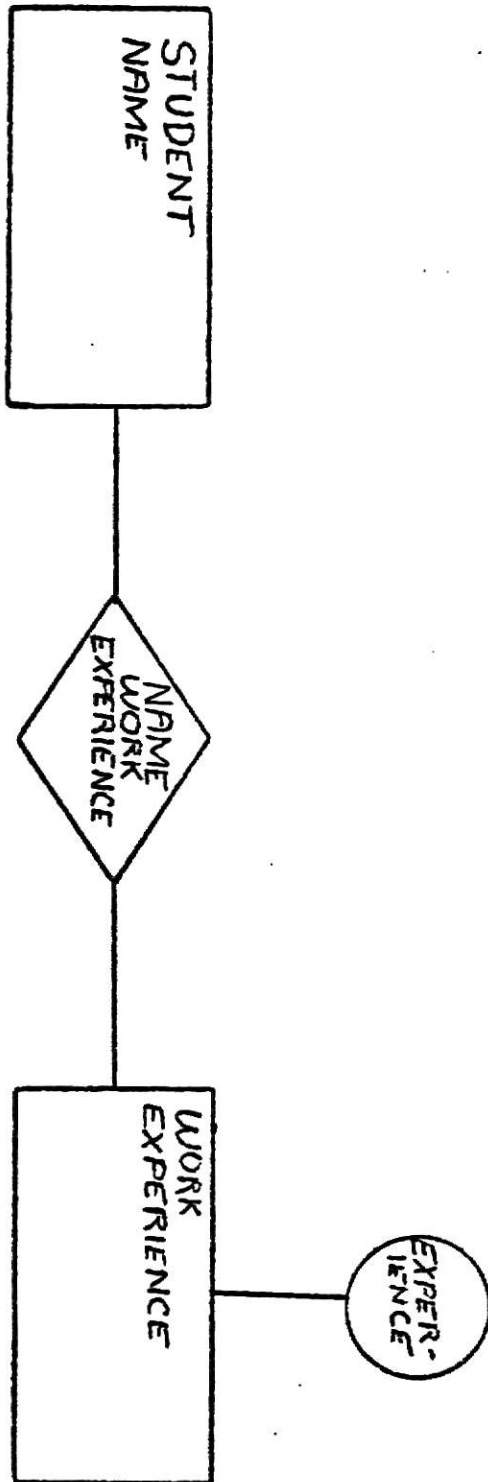


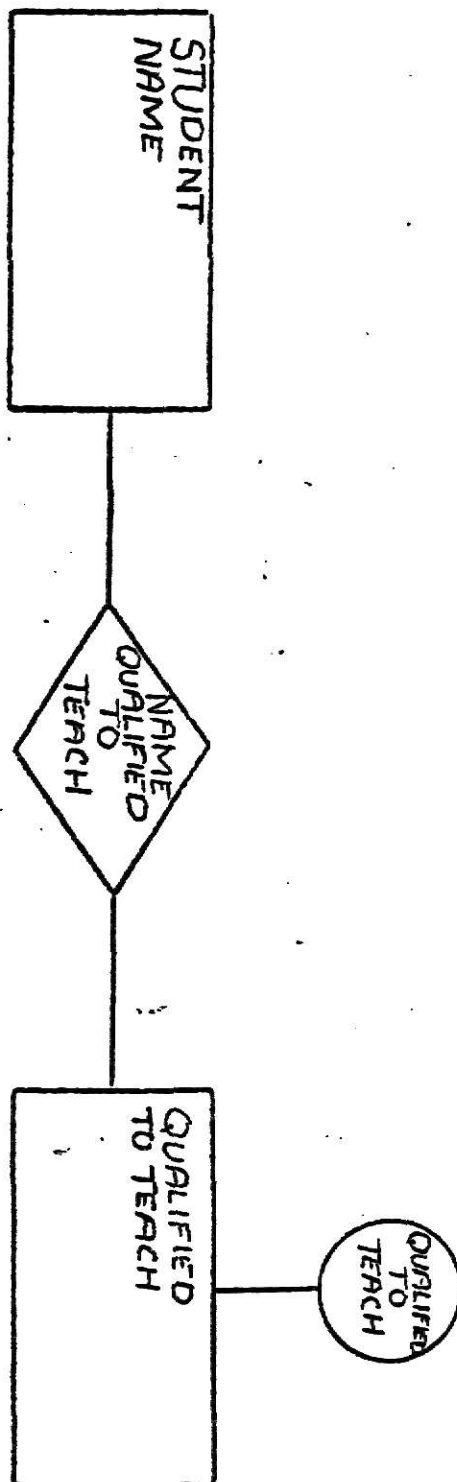


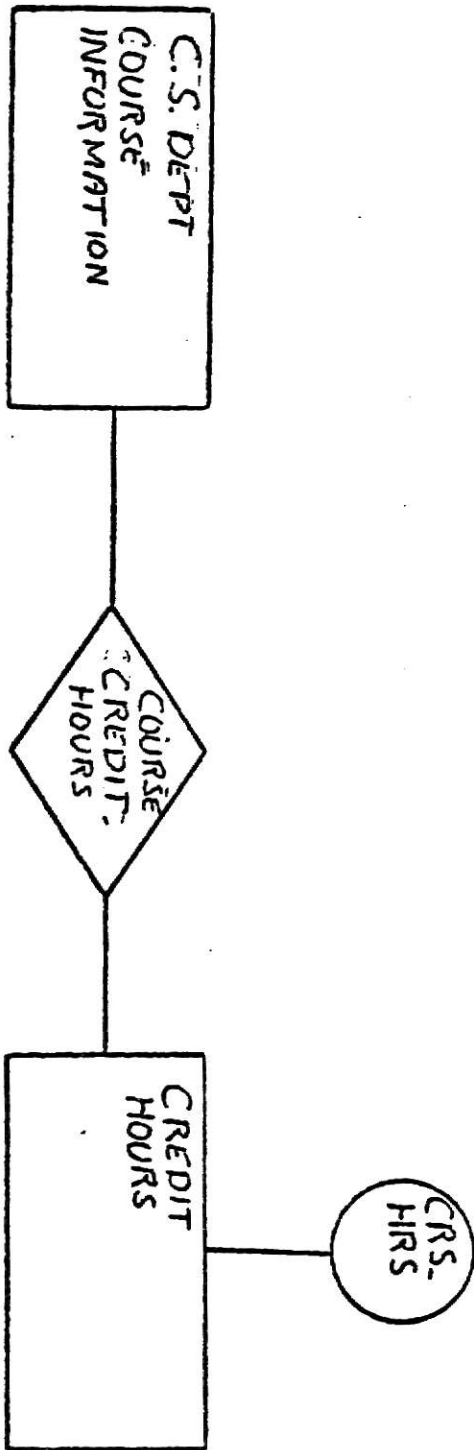












THE DESIGN FOR AN AUTOMATED OFFICE INFORMATION SYSTEM  
FOR THE COMPUTER SCIENCE DEPARTMENT  
TO AID IN TRACKING GRADUATE STUDENTS

by

MICHAEL S. TERRY

B.S., Southwest Missouri State University, 1977

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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

1983

## ABSTRACT

This report details of the design of an automated office information system for the Computer Science Department to aid in tracking graduate students.

This automated office information system consists of: a menu-driven transaction processing system, a relational database and a report generator.

This report includes all aspects of the development process that resulted in the final system design. Included are: the investigation of the Computer Science Office; the modeling of the Computer Science Office using an Information Control Net diagram; the development of a set of transaction processing screens; the compilation of a data dictionary and a fully normalized relational database (in Projection-join normal form); and the specification of a report generator.

Also contained in this report is an analysis of how this automated office information system should affect the Computer Science Office environment.