AN ON-LINE SYSTEM FOR MAINTAINING GRADES FOR BASIC COMPUTER SCIENCE CLASSES

by

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B.I.E., Auburn University, 1971

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

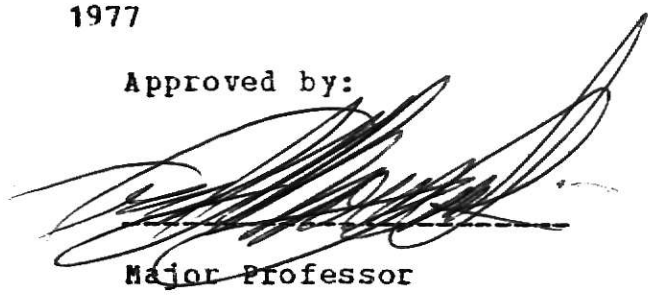
Department of Computer Science

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1977

Approved by:



Major Professor

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INTRODUCTION

1.1 BACKGROUND

In the past, grades for the Computer Science 200 lecture classes and corresponding laboratories have been maintained on the IBM S/370 using the University Computing Center's Roster program. Although this program provides a good way of maintaining the grades it was often costly and time-consuming for both the lecture and lab instructors. In addition, the grade reports were not always timely because of various due dates for assignments and because of the complexity involved in obtaining grade cards from each instructor and running them through the computer in a single batch.

The author of this report developed the concept of an on-line system that would allow the instructors to update grades and receive grade reports in a timely manner. After discussions with Elizabeth Unger, the current CS 200 instructor, it was decided to proceed with the design and implementation of such a system. It was also decided that a Database Management System (DBMS) should be used to maintain the grades in a direct-access file since its use would simplify design of the database and allow for easy future expansion.

The on-line system should provide protection for the information in the database. A password scheme was devised

that would allow lab instructors access to only their students' records while the lecture instructor could access all records in the database.

The on-line system runs on the IBM S/370 under the Conversational Monitoring System (CMS). The Integrated Database Management System (IDMS) developed by Cullinane Corporation was selected to maintain the database. IBM's PL/I was selected as the implementation language because of its structured programming facilities which are not readily available in other languages available on the S/370.

1.2. OBJECTIVE

This report will show the design and implementation of the on-line system for maintaining class grades. The report will include design of the database, design of a program to load and maintain the database, and design of a program to produce the grade reports. In addition, a User's Guide will be included to explain the use of the system and recommendations will be made for further enhancements to the system.

1.3. INTEGRATED DATABASE MANAGEMENT SYSTEM

Cullinane Corporation's Integrated Database Management System is available on the IBM S/370 under OS and provides facilities for PL/I or COBOL programs or any other language that has CALL capabilities.

To use IDMS for a single database application three separate steps must be completed: a description of the database must be developed (SCHEMA), a description of the

portions of the database to be used by the application programs must be developed (SUBSCHEMA), and a description of the physical file must be given (DMCL).

The Data Description Language (DDL) is used to describe the database in the SCHEMA, SUBSCHEMA and DMCL. The Data Manipulation Language (DML) is used in application programs to invoke the IDMS routines that manipulate the database. DML statements can be used any place in the application programs where input or output of information in the database is desired.

1.4. IDMS DEFINITIONS

The SCHEMA uses the DDL language to define the logical description of the database. It describes in detail each of the records in the database and establishes set relationships between the records.

The SUBSCHEMA uses DDL statements to describe to IDMS the portions of the database to be made available to an application program. It consists of record and set descriptions as indicated in the SCHEMA and is really the application programmer's view of the database.

The DEVICE-MEDIA CONTROL LANGUAGE is used to describe the physical layout of the database including buffering and paging. The logical database described in the SCHEMA is mapped into this physical layout by the IDMS software.

A DATA-ITEM is the smallest unit of named data.

A RECORD is a named collection of data-items. The record description specifies the data items contained within