INTRODUCTION

The Management of Upward/College Bound and Outward Bound Programs requires a high degree of versatility, user-friendliness and customization in the software. The software presented here is an interactive PC-based facility manager and performance evaluator that provides for these idiosyncrasies of the Upward/College bound program. The package reported here was developed in consultation with the director and other personnel of the Upward Bound program. It was decided to develop in-house a software package customized to current needs as no comparable commercial package was available.

Upward Bound Programs are conducted in a number of universities to help the economically and academically weak high school students attain the academic edge required to succeed in college education. As the primary purpose of the program is to provide academic services to the students, there is an inherent software flexibility requirement. The software takes care of this distinctive attribute and facilitates easy accommodation of future needs. Although the package is customized to print various reports and forms typical of the Upward Bound Program at the University of Maryland Eastern Shore, it can be easily modified to be applicable at other academic institutions.

The package encapsulates modules for Student Records Management, Performance Evaluation, Teaching Resources Management, College Placement & Planning and Financial Accounting. The software was developed using dBASE IV (V. 1.5) for DOS for the IBM PC, PS/2 or compatible. The use of dBASE IV [1] as the database environment was intentional; the foremost reason being the flexibility of application development tools it extends - including relational database capabilities of IBM's SAA-compliant Structured Query Language (SQL), data catalogs and Dot Prompt interactive language interface which offers a library of commands available for data manipulation and querying by the end user. In addition to the programming language, the dBASE IV Control Center also provides for design tools such as queries, forms, reports and label generators. The package is modular, portable and permits entry into the standard 'Query by Example' (QBE) menu offered by dBASE IV. The software attempts to exploit all advanced features offered by dBASE to the maximum extent.

SALIENT FEATURES

Some of the main features of this package are summarized here:

- extensive rule base for data validation.
- database maintenance utilities for backup, restoration and archiving of data.
• mailing label print utility with the choice of 3 different label sizes.
• utility to export data to spreadsheets (Quattro Pro [3], Lotus 1-2-3 and Symphony) and
  word processors (WordPerfect 5.1, Microsoft Word, etc.).
• extensive querying and reporting on database.
• provision of templates to customize queries for this database.
• facility to access and print program reports required to be sent from the Upward Bound
  programs to the federal government.
• wide choice of report styles (including columnar, form and mail-merge) for regularly
  required reports such as attendance lists, stipend lists, course reports, master roster,
  status reports, performance reports etc.
• flexibility of implementation on either a single-user system or a multi-user system
  operating on a (LAN) Local Area Network. A LAN implementation would require the
  main database to be resident in the file server node.

DESCRIPTION OF MODULES

1. Student Records Manager : This module is the main driver for the student database
   featuring routines for Addition, Editing, Viewing or Deletion of records. All the student files
   or tables exist under this menu option and each has a set of above mentioned file handling
   routines. The field types and lengths are standard across the database. Comprehensive security
   features are provided in the 'Delete Records' routine. Extensive rule base is provided for data
   validations, in case a wrong data type or an invalid value is entered for any fields, an error
   is displayed and the field is cleared for re-entry. Names of component files are standard and
   self-descriptive; providing the year and the session of Upward Bound Program involved.
   Facility to archive data based on the age of the records is also provided. Reports can be made
   on-screen or printed using unique option menu which appears before each run. Although most
   of the reports are formatted for laser printers by default, they can be printed equally well on
   standard dot matrix or daisy wheel printers, requiring no re-formatting.

   A brief description of each component of Student File Manager is given:

   Student Master file maintains all invariant student details such as social security number,
   name, address, contact person, various classifications (viz. income criteria, payroll etc.), birth
   date, expected date of graduation/termination date (as applicable) etc. Guardian Master file
   maintains the guardian's details. Component Master file maintains student’s yearly details;
   such as grades, GPA, current status in the program, PIC classification etc.

   The Add Records form serves tables/files described above and codes description tables.
   The screen (I) shows the first page of a sample form when it is used to add records to the
   Student Master file. The error handling routines include a duplication check. All indexes
   involved are rebuilt at the end of an Add/Edit/Delete Records session or on abnormal
   termination of a file handling routine.

   Whenever a new social security number is entered, a lookup into the Master table
   determines whether it is a duplicate or a new entry. If a duplicate is entered, an error message
   appears on the screen and the user is prompted to repeat last entry. Addition of records can
   be done individually into the Student Master, Guardian Master and Component Master files
   or option for concurrent entry can be used. Concurrent entry is a very convenient method of
   loading data into various files. It improves efficiency of data entry with considerable saving
   in time. Moreover, it is more practical to enter entire data on a student at one instant instead
   of switching amongst the files to do so. For example, when a new social security number is
SCREEN I

encountered during the entry to the Component Master file, a region on the form opens automatically to accept new data and updates Student Master and Guardian Master file.

The screen (II) shows a sample form to add records to the Component Master file.

2. **Performance Evaluator**: This module incorporates a unique system of performance indexing to aid the decision making process concerning the retention and termination of the students in the Upward Bound program. These indexes are based on improvement in the high school grades and evaluation of student’s extent of participation in the program. The entire database regarding past and present courses taken by the students and his/her performance therein is taken into account while calculating the indexes.

This module also provides for the evaluation of Upward Bound program as a whole. Such evaluation is required for constant monitoring of the program and to assist in improvement of the program. Two-Tailed test for matched pairs is used by the software to perform statistical analysis. User can either retrieve data from dBASE tables or enter new data at the prompt. This part of the software is written in TURBO PASCAL[5] and called from dBASE using system level command utility provided by the dBASE. Data is retrieved from the dBASE tables and subjected to extensive statistical analysis. A sample output of the program for a test data is shown in Screen (III). Output indicates average pre- and post-test scores and/or GPA of the students, t-statistic for the difference, confidence interval for the mean difference and the two-tailed test probability. Such statistical analysis is also carried out on students performances in subject tests. Further, the deficiencies in the program are brought out by these tests.

3. **Resources Manager**: Staff (Full time and Part time) selection, class assignment and after-school class scheduling are taken care of by this module. Also the required reports for various programs held under the aegis of Upward Bound program are scheduled by the Resource
SCREEN II

T - TEST RESULTS

VARIABLE X: PRE TEST SCORES    VARIABLE Y: POST TEST SCORES

MEAN OF X = 46.3333    MEAN OF Y = 53
S.D. OF X = 5.73492    S.D. OF Y = 6.0012
S.E. OF MEAN = 2.56473  S.E. OF MEAN = 2.68334

NUMBER OF PAIRS (N) = 6
CORRELATION OF X WITH Y = 0.906

DIFFERENCE (MEAN X - MEAN Y) = -6.66667
DEGREES OF FREEDOM (DF) = 5

T-RATIO FOR THE DIFFERENCE = -5.82939
PROBABILITY (2 TAILED TEST) = 0.001

SCREEN III

Manager module. These reports are easy to modify and they are essential to the day-to-day business of Upward/College Bound programs. These reports require little or no customization to be used in other such programs.
4. **Career Planner**: Guiding and counseling senior students in the selection of majors and placement in Universities for college education is an integral part of any Upward Bound program. This module provides the counselors with college listings, background information and financial assistance information. This module can be used either in stand-alone mode or interfaced with other modules of this package. It also provides some sample PSAT (Preliminary Scholastic Aptitude Test) and WRAT-MATH (Wide Range Aptitude Test) papers to help students score higher on these standardized tests.

5. **Financial Manager**: This module maintains all financial details such as Financial Accounting System (FAS) number, budget number, budget amount, account heads, codes, subcodes, requisitions and purchase orders etc. The budget reports are on monthly and yearly basis. Accounts are maintained under various heads such as Purchasing, Payroll, Travel, Admissions, Equipments, Fees, Fringe, Graduate Counselors etc. Though the budget heads are very extensive, user is provided the flexibility of addition or deletion of any budget head. Thus this module requires little or no customization to be used as a Financial Accounting System elsewhere.

Students payroll during an academic year consists of after-school tutoring and saturday sessions accounts, while during summer it has PIC (Private Industry Council) and regular Upward Bound accounts. Thus PIC and Upward Bound Accounts are maintained separately. At the start of a new budget period a program can be executed by the user which creates all database files required for accounting purposes. This module is capable of functioning in Stand-Alone mode.

**CONCLUSIONS**

In this paper, I have presented a PC-based Facility Manager cum Performance Evaluator for the Upward/College Bound programs. The software incorporates various features which facilitate Upward Bound record management, book keeping and performance evaluation. It is very user friendly package and offers pop-up menus, option menus, help screens, and mouse compatibility. Most of the modules can be customized to be used in any academic program of similar kind. The software is menu-driven, portable, modular and offers networking capabilities. Users can learn it hands-on within a short span of time. It is been successfully implemented in the Upward Bound Office at the University of Maryland Eastern Shore, a part of University of Maryland System.

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**REFERENCES**

1. dBASE IV (V. 1.5); Ashton-Tate, Borland International, 20101 Hamilton Avenue, Torrance, CA 90502-1319.
2. FINANCIAL ACCOUNTING System; Information Associates Incorporated.
3. QUATTRO PRO; Borland International, 1800 Green Hills Road, Scotts Valley, CA 95067-0001.
4. OFFICE ACCESS; Instant Information Inc., Lake Oswego, OR 97034.22
5. TURBO PASCAL (V. 6.0); Borland International, 1800 Greens Hills Road, Scotts Valley, CA 95067-0001.