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Data Base Creation of Counselor Profile for The Small Business Administration

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DATA BASE CREATION OF COUNSELOR PROFILE FOR THE SMALL BUSINESS ADMINISTRATION

by

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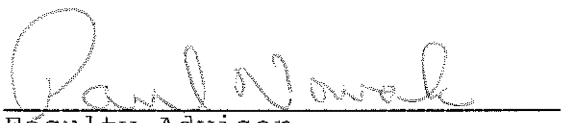
APPROVAL

This independent study submitted by Jonathan K. Titus in partial fulfillment of the requirements for the Degree of Master of Business Administration from the University of North Dakota is hereby approved by the Faculty Advisor under whom the work has been done. This independent study meets the standards for appearance and conforms to the style and format requirements of the Graduate School of the University of North Dakota.



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Degree Master of Business Administration

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Signature Jonathan K Titus

Date 23 April 1985

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ACKNOWLEDGEMENTS

I wish to acknowledge to my wife, my sincere gratitude for putting up with the long hours and my short temper while I worked on this paper. Additionally, I would like to thank her for her help in putting this paper together.

ABSTRACT

This study analyzes the Small Business Administration procedures for the assigning of business counselors to a small firm needing assistance. The present system is done manually and is somewhat inefficient. The proposed system would automate to a large extent the present system, thus increasing efficiency and reducing the number of hours required to assign counselors and maintain the system.

The study is divided into two parts. The first part concerns itself with reviewing literature on data bases, in general, and the current data base programs on the market. These programs were compared for applicability to the proposed system. The second phase of the project looked at what was required for changing from a manual to a automated counselor selection system.

More specifically, in the second phase of the project the present system was reviewed for input and output requirements. From these requirements, the data base files needed were defined and the proposed system specifications were created. Finally, the new system's advantages over the old system were discussed.

CHAPTER I

INTRODUCTION TO RESEARCH

PURPOSE/OBJECTIVES

In August of 1984, the author was approached to undertake a study for the Small Business Administration (SBA) of North Dakota. The study involved revamping the present system of assigning small business counselors to small business by hand. The purpose of this study was to increase the efficiency in the assigning of the counselors by automating the present system.

Through the automation of the counselor selection process, the SBA hoped to achieve four objectives:

1. Increase management control over the counselor assignment process.
2. Increase the utilization of all counselors.
3. Provide better tracking of counselors' cases.
4. Identify trends so that they can be studied and analyzed.

To achieve these objectives the SBA envisioned creating an electronic data base or file of the counselors assigned to North Dakota. A separate data base would be created for the small businesses needing help. These two data bases would then be merged together and a counselor would be selected to

assist a given small business and its problem(s).

STATEMENT OF THE PROBLEM

Since the present system is being done by hand and appears to be slow and prone to errors (e.g., assigning one counselor too many cases), this paper will attempt to provide a more efficient and less error prone counselor selection system. More specifically, it will investigate the possibility of automating the present counselor assignment system and provide the systems design work for the creation of an electronic data base management system.

JUSTIFICATION OF THE PROBLEM

That the present system is inefficient, is indicated from a discussion with Mr. Jim Stai, Assistant District Director for Management Assistance from the Small Business Administration. According to Mr. Stai, the counselor assignment process involves keeping track of about 150 small business counselors. As a small business request for counseling is received, an SBA representative selects a counselor to assist the business. Unfortunately, the SBA representative is also kept busy with other duties and is sometimes unable to fully track the progress of the counselors in their case assignments. Mr. Stai perceives that the selection process may not be as efficient as possible. For instance, he finds that from time-to-time, he has assigned a

counselor to a case that already has a full case load, that some of his counselors are underutilized, or that counselors may not be properly reimbursed for their expenses. He also feels that there must be a better way to track client requests for assistance.

Along the same line, Mr. Stai believes that through the use of a data base, he can utilize his counselors more efficiently and provide necessary assistance to them by monitoring their progress. With the electronic data base, he hopes to alleviate having some counselors work too many cases, be better able to depict counselors' area(s) of expertise, restrict counselor assignments that can cause conflicts of interest, assign the closest counselor to the business that needs assistance, and track counselors that are no longer in the area where they are needed.

SCOPE

This paper will study the present system and search for ways of automating the counselor selection system. To accomplish this goal, this study will first focus on the present system. From this system, information will be obtained to aid in the design of a new automated system.

In doing this study, consideration will be given to the use of microcomputers only in the data base creation and maintenance. Likewise, the study will consider only those data base management programs that are widely used and that

are available to the Air Force Institute of Technology Minuteman Education Program at Minot.

The proposed system will focus on the North Dakota Active Core of Executives/Service Core Of Retired Executives (ACE/SCORE) only. It will seek to increase counselor utilization efficiency through the automation of parts of the decision making process. Finally, cost estimates will not be included in this study since the cost of software, programming, computers, and computer supplies can vary widely.

LIMITATIONS OF THE STUDY

As with all studies there are constraints that keep the objectives of the study in sharp focus. This study is no exception. Various assumptions have been made regarding the information and its processing. These assumptions are:

1. The counselor data base is fairly constant.

2. The user is capable of fully using the data bases created efficiently.

3. The source documents presently in the system will be used to the maximum extent possible and with as little as possible modification.

4. Imperfect information will exist and must be dealt with by the user. In essence, he/she will have the final say in how the system is run.

Along more general lines, efforts were made to find a data base that was compatible with the IBM PC and IBM PC

compatible computers only. The reasoning behind this is that the IBM PC is in wide use in the business world and there is more software created for it to use than with other microcomputers.

Finally, cost justifications were not included in this study because it was felt that they may be biased towards one computer and also that there is a lack of information readily available concerning governmental buying practices in regards to computer products.

METHODOLOGY

The methodology involved in analyzing the present systems draws heavily on systems analysis methods as is outlined in the United States Army Management Engineering Training Activity course book, entitled ADP Systems Analysis and Design, and in the book by Jerry W. Atwood, entitled The Systems Analyst. In this book, Mr Atwood states that "systems analysis is the investigation of a system with the objective of improving it. The investigation is the analysis of the system, and the design is the improvement of the system."[1] Towards achieving the objective mentioned above, this paper will conduct its investigation along the following lines:

1. Determine input/output information requirements by reviewing the present system.

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[1]Jerry W. Atwood, The Systems Analyst, (Rochelle Park, New Jersey: Hayden Book Company, Inc., 1977): p. 5.

2. Study available data base programs for applicability.

3. Study system specifications.

4. Discuss proposed system benefits.

5. Select a data base for use.

The project information requirements study will attempt to answer three questions: 1) What are the user's needs? 2) Can the proposed system meet those needs? 3) Can it be feasibly operated? Towards answering these questions, a review of the present system will be conducted to investigate the needs of the users and determine the information requirements that will be placed on the proposed system. It will also list the benefits to be derived by implementing the new system.

The study of data base programs will be conducted in the next chapter and will investigate the data bases available to the author. Current literature will be reviewed to see what these data bases can do, what features they possess, their ease of use, and their applicability to the proposed project.

The system specifications will constitute the major bulk of this paper. These specifications will determine the requirements of the system, the tasks that need to be performed, the best way of accomplishing these tasks, and will establish how the information will flow through the proposed system.

The remaining phase of the paper will look at the pro-

posed system benefits, select a data base for use with the system, and discuss several areas beyond the scope of this paper that warrant further study.

SUMMARY

As can be seen from the introduction, this project involves the creation of an electronic data base to aid the SBA manager in the controlling and more efficient utilization of his counselors. It also involves the creation of a system that better tracks both small business requests for assistance and counselor case assignments.

In the next chapter, basic terminology about data bases is discussed. The question of what is a data base is answered and the data base programs that will be considered for the proposed systems are reviewed.

CHAPTER II

LITERATURE REVIEW

INTRODUCTION

In order to proceed with this project, certain definitions have to be established to facilitate easier understanding of what is trying to be accomplished. For instance, what is a data base? Are there different types of data bases? Finally, why was one data base chosen over the others? All these questions will be discussed in this chapter as current literature is reviewed on data bases.

WHAT IS A DATA BASE ?

A data base in its most simple form is just a collection of data. To some people there is a difference between a data base (two words) and a database (a single word). To them, the former involves an underlying collection of data in the real world whereas, the latter is a coherent collection of data entered into a computer.[2] The definition that this paper will use is a data base is "....a single collection of information interfaced to the user through a collection of programs. Any file that can be accessed by a

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[2]"Project Database," PC: The Independent Guide to IBM Personal Computers 3 (June 12, 1984): 159.

key other than its ordering key."[3] Further, a data base management system is "....a group or collection of programs that interfaces the user to a collection of information."[4]

The basic unit of information storage is the field which is nothing but a single item of information about something. The fields are grouped together into entity sets known as records. Records and the information they contain are treated as a single unit. These units are grouped or arranged in some way to create a file about a single item. The data base system proposed will use two files: one containing information about small businesses and the other about small business counselors.

In a data base system, information is generally stored on a mass storage device, such as a floppy disk. This information can then be arranged into any type of sequence by some type of ordering system. This feature is what makes a data base so powerful and thus so useful. This feature is an evolutionary outgrowth of the sequential and random access methods of information accessing.

In most high-level languages, there are two methods of accessing processing information: sequential and random. The sequential method is used for accessing and processing information linearly. It was the first method deve-

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[3]Carl Townsend, CP/M Database Management Systems (Beaverton, Oregon: dilithium Press, 1983): p. 293.

[4]Ibid., p.293.

loped for use in information management. Information is processed in the order in which it is stored. If a person needs to use the fifteenth record, he/she must go through the first fourteen records to get to it. The advantages of the sequential method are that it is orderly, allows records of varying length, and is easy to program. The disadvantage of the method is it is slow in getting a record since on the average half the file has to be read in order to locate a given record.

The random access method, on the other hand, allows much faster record access. It is used when a need exists for nonlinear information processing, such as hotel registrations. Files used with random accessing can be handled either sequentially or randomly. The key to random accessing is that the file is ordered in some fashion around an ordering key and is usually one of the fields used in the record. The advantages of random accessing are its faster access time, ease of deletions/additions of records, its randomness. It disadvantages are that it is more complex to program and it does not work well when the file contains several items with the same number in the field used as the ordering key.

Data base languages are an outgrowth of the problems associated with sequential and random access methods. Generally, they use some type of indexed sequential or hashed type access method. Index sequential accessing methods use a

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Data base languages are an outgrowth of the problems associated with sequential and random access methods. Generally, they use some type of indexed sequential or hashed type access method. Index sequential accessing methods use a

pointer in place of an internal record's field to identify a particular record. The pointers are stored in a separate file and are used whenever a particular record is desired. Hashed access methods use a formula to find a given record. Thus, in order to find a record under the hashed method, a calculation is performed on the file key. The result of the calculation is a pointer to a particular record. Through the use of either of these two access methods, data base languages allow for more sophisticated file ordering and consequently, greater information control and manipulation.

TYPES OF DATA BASES AVAILABLE

There are three types of data base management systems currently available: hierarchical, network and relational. In a hierarchical system, records are arranged in a "tree like" structure, with some records subordinate to others. For any given record, there is only one owner. In the network data base system, records are arranged so that subordinate records can have one or more superior records pointing to them. In the relational system, files are two dimensional and are viewed as a single unit. By treating the various files as a single unit, the relational data base system can combine different data file elements based on relational criteria.

Of the three systems, the easiest to use and program are the relational systems. Generally, someone without much

programming or computer experience can use this type of system without having to undergo much training.[5] An additional advantage of this type of system is that information contained in the various data base system files can be combined based on any selection criteria.

DATA BASE SELECTION CRITERIA

Comparing data base management systems is like comparing apples and oranges. Each system is designed to serve different purposes. To assist in the task of comparing the systems available to the Air Force Institute of Technology Minuteman Education Program (AFIT MMEP) here at Minot, pertinent data base specifications were derived from a book by Carl Townsend entitled CP/M Database Management Systems, a series of articles in PC Magazine: The Independent Guide to IBM Personal Computers entitled "Project Database", and an article in Byte Magazine entitled "Update on Six Data Base Managers".

The procedure used by all three to test the data base systems were: first, create a test file, and then use the file to accomplish some common applications such as sorting, addition, and deletion of records. The data base systems were then compared by their performances in handling the various applications.

While there are probably over 150 different types of

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[5]Ibid, p. 51.

data base systems available, the choice was made to narrow the selection process down to four of the most popular data bases: Lotus 123, Friday!, dBase II, and dBase III. Note of caution: All four systems are proprietary. Any applications software use of these systems should have some sort of royalty or licensing arrangement with the company selling the data base prior to being used in applications software. Further, the four systems are the most widely use and are compatible with non-IBM machines.[6]

Eight areas were looked at in regards to the above data bases: the functional specifications, input specifications, searching, indexing, sorting, file processing capability, report generator specifications, and ease of use.

The functional specifications comprise such sub-areas as: the operating system supported, host language required, minimum memory required, database type, security control, maximum number of records, maximum number of fields, maximum characters per field, and type of field data supported.

Input specifications comprise such sub-areas as: user designed input screens, input type checking, default values on field permitted, fields derived by calculation, input verify modes, and input range check.

Searching comprises how specific records are selected from the data base. It includes: Boolean Operations on

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[6]"Data-Base Management Software," List: The Business Software Magazine 2 (July 1984): pp.80-81; "Integrated Software," Ibid., pp. 66-67.

search conditions, complex nested searches, search based on field ranges, searches on subfield/multifield conditions, and searches on null or empty fields. Boolean Operations involve determining whether a condition(s) is interpreted as "true" or "false" through the use of logical quantifiers (i.e., <,>,=) combined with the operations "AND, OR, NOT". Complex nested searches go a step further and combine logical quantifiers and "AND, OR, NOT" in a complicated series of statements, some of which may be "nested" inside another statement, to determine whether a condition or conditions is "true" or "false" .

Indexing concerns itself with how records are kept for rapid access and is analogous to the index table one would find in the back of a book. It comprises a unique primary key search with sometimes secondary key support. Further, some data bases also allow indexing to be done on any portion of a text field. Sorting, on the other hand, is concerned with arranging the records in some sort of order. There are many types of sorts available and each can be done either on partial fields or on multiple fields within a record. The primary difference between indexing and sorting is that the indexing is usually done once when the data base is initially created, whereas sorting is done as particular information is needed in some type of order.

File processing capability is the ability by the data base to process the data in an efficient manner. It includes

the maximum number of files opened at any one time, maximum number of index files on a single data file, whether a data base can be restructured easily without losing data, whether data base files can be merged, and whether audit trails can be created.

Report generator specifications comprise such areas as whether the data base has a report generator, header/footer capability, text insert capability, multi-line record printing, logic control of record printing, and whether report form formats can be saved.

Ease of use refers to the author's own experiences in using the data base to create a file, manipulate it, and to print it.

COMPARISON OF THE DATA BASES

Lotus 123

Lotus 123 is usually considered an "integrated software" type program, i.e., it is a program that combines a spreedsheet, data base, and graphics into one package. While its primary use is as a spread sheet analysis program, it does have a data-management capability.[7] The data records are stored in the same rows-and-column structure as are all other entries.

Lotus 123 can run on either of the two most popular

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[7]John Posner et al.,Lotus 123tm User's Manual, (Bedford, MA: CSA Press, 1983), p. 189.

operating systems:[8] Control Program for Microcomputers - 86 (CP/M-86) or Disk Operating System (DOS). The minimum configuration requirements are 128K memory and one disk drive. The Lotus system diskette is copy protected. However, Lotus Development Corporation does provide a back-up of the system diskette when you purchase Lotus 123. It has no password protection. The maximum number of records Lotus 123 can handle is primarily based on the amount of memory the computer has. Generally, it can handle over 2000 records. It can have up to 2048 fields (rows). The fields can handle either numeric or alphanumeric information.

Lotus 123 has limited input screen design capability and input type checking and verification. Fields can be derived by calculation. Input can be checked against a range through the use of macros (a sequence of stored commands). Searching is fairly limited, but is sufficient to handle most functions. records are not indexed, therefore accessing of a particular record is somewhat slow. Lotus 123 can perform sorts either in ascending or descending order. it does allow for primary and secondary keys in the sorting process. However, sorting can only be done with one field for each sort key.

In terms of file processing capability, Lotus 123 is better than most integrated programs, but is no match for

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[8]The operating system is a program or collection of programs used to manage the hardware and logical functions of a computer system.

ad hoc data bases, such as dBase II.[9] The maximum number of files opened at one time is one. Restructuring of the data base is fairly easy without losing the information contained within the data base. Lotus 123 does interface with other languages, data bases, and spread sheets; and common files can be shared between them without great difficulty.

While Lotus 123 does not have a report generator per se, the user can create simple report forms with some difficulty. Lotus does provide the user the ability to select which records to print by the use of macros. Headers, footers, and page number can be provided for the report with little difficulty.

In terms of ease of use, Lotus 123 is fairly easy to work with. For someone unskilled in its operations, a tutorial diskette is provided and is a must for the novice user. The creation of data files is fairly easy. The only problem most people experience with the software is in the printing of reports. From time-to-time, the printed output can come out in an unusable form. Overall, while Lotus 123 is a fairly easy program to work with, it is not a true data base per se. Thus, it is unsuitable for the demands that will be placed on it by the proposed project.

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[9]Barry Crawford, "1-2-3: The Jewel in the Lotus," Personal Computer Age 2 (July 1983): p. 48.

Friday!

Friday! is a simplified file handling system based on dBase II. In fact, it is written using the dBase II language. The program is menu driven, i.e., almost all the functions that one would need to use in regards to a data base are already preprogrammed and made accessible by the use of menus.

The program itself requires at least 128K of memory and one disk drive. Friday! uses DOS or CP/M-86 for the operating system. The Friday! diskettes are not copy protected so back-up copies can be made of it. It is a flat file data base.[10] Files created by Friday! can be password protected. The maximum number of records that Friday! can handle are 65,000 per file. The maximum number of bytes per record is 999. There can only be 32 fields per record. Maximum field size is limited to 999 bytes. The types of data that can be entered in the fields are alphanumeric, numeric, or dates.

Input screens can be designed by the user fairly easy. Input can be checked to see that it is the right type. However, Friday! does not permit defaults, input verification, and range checks to be made on the data.

Searching can be accomplished through the use of Boolean operations. Likewise, complex nested searches are permit-

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[10]A flat file data base is a simplified version of a relational data base. Storage is in a two-dimensional array with accessing similar to relational systems.

ted and records can be accessed by range searches. Sorting can be done in either ascending or descending order. Sorts can performed using up to five fields.

In terms of file processing capability, Friday! is fairly straight forward. However, there can only be one file open at a time. Data base restructuring, such as adding and/or deleting files, can be accomplished without losing the data in the data base. Data base files cannot be merged to create a single file.

Report creation is fairly easy with Friday! Provisions have been made so that once a report is created it can be stored for future use. Heading, footer, and page numbering are available. Logic control is provided so that selected records can be printed without much problems.

Overall, Friday! is a pleasure to work with. The novice programmer will have to read the manual though since no tutorial diskette is provided with the program. The biggest problem one may have with Friday! is locating the print menu. It is not labelled as such and can cause some confusion. For those people who desire speed, they will find Friday! at bit slow as it goes about its functions. As a data base for the proposed project, Friday! could not do what is required of it so therefore it would be of limited use.

dBase II

Ashton-Tate's dBase II is the "granddaddy" of data base

management systems. Introduced back in 1981 it has since gone on to become the industry standard.[11] It is a relational data base management system with its own language. This languages allows programmers to develop applications faster than they could using an equivalent BASIC program.

dBase II requires at least two disk drives or one disk drive and a hard disk. dBase II also requires a minimum of 128K of memory. It uses either DOS or CP/M-86 for the operating system. It is not copy protected. There is no security control via the use of passwords. The maximum number of records per file is 65,535. The maximum number of bytes per record is 1000. The maximum number of fields per record is 32 with field size limited to 254 bytes. Further, field data can be entered in three ways: logical, numeric, or alphanumeric.

Input specifications are more advanced than Friday! The user can design his own input screens. Input can be checked against ranges and type of field. Fields can be programmed to verify data and default to predetermined values.

Searching and sorting are also more advanced. Boolean operations and complex nested searches can be performed. Searches can be done on field ranges, subfields, multiple fields, and on null or empty fields. Sorting can be performed using a combination of fields, subject to a limit of 100

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[11]"dBase II: The Standard Bearer," PC: The Independent Guide to IBM Personal Computers 3 (August 21, 1984): p. 171.

characters. Likewise, indexing can performed using multiple fields or a portion of any given text field.

dBase II allows two files to be open at once for greater file handling capability. The data base files can be merged as required and audit trails can be created. Data base restructuring is somewhat limited and takes a little programming to accomplish without the loss of information in the file.

dBase II does possess a report generator that is capable of producing a quality report without a great deal of programming. Headers and footers can be programmed. Selected records can be gotten through logic control. Report formats can be stored as desired for later use. Additional text can be inserted in the reports as required. Unfortunately, multiple file printing is not permitted.

dBase II is easy to learn. A novice at programming has the help of a very good tutorial program to aid in getting started. With its own programming language, dBase II offers something for everyone. The beginner will find the language easy to learn and with a little practice, he/she can start programming simple data bases. The experienced programmer will find that the language is a very powerful tool and can be used for a variety of situations. The only problems with dBase II are its sometime cryptic error message and the two files open at a time limit. As a language for the proposed project, dBase II would be language of choice if it were not

for its more powerful successor, dBase III.

dBase III

dBase III is the follow-on package to dBase II and as such it contains all the same features plus some new ones. The principle differences between the two is dBase III requires at least 256K of memory, the number of fields per record is now 128, maximum record size has increased to 4000 bytes, maximum number of files opened at once is now ten, the sort/indexing routines are much faster, and there are two new data types in addition to the old ones: date and memo. Also of note is dBase III supports more operating systems than dBase II.

The principle drawback of dBase III is that it is copy protected, thus preventing back-up copies from being made. (However, this problem can be overcome if one purchases one of the copy protect unlock programs that are available on the market.) Further, the dBase III language is more sophisticated, thereby requiring more effort in order to master the language.

Overall, dBase III appears to have overcome some of the shortcomings of dBase II. It is a much more powerful language with a menu driven sub-system that will walk first time users through the system. It seems to be the language most capable of accomplishing the tasks necessary to create the proposed data base management system.

SUMMARY

From the literature review, one quickly confronts the complexity of what is required of a data base management program. It touches on all phases of the information flow from data receipt, to data storage and retrieval, to final report(s). The demands placed on the data management program are such that an inadequate software package can easily cause unnecessary problems in the data/information flow, thereby causing work inefficiencies.

In the next chapter, the present system will be reviewed and the information requirements determined. After this is accomplished, the data bases that were reviewed above will be appraised on their ability to meet the needs of the those information requirements. From this analysis the most appropriate data base will be chosen.

CHAPTER III

METHODOLOGY/ANALYSIS

INTRODUCTION

From Chapter II, one gains an insight into the world of the data base program. It touches all phases of the information flow from inception to final product. That it is an integral part of any management system is obvious; an inadequate software package will be a bane on the informatiom flow through a system.

Now attention must be given to the information requirements of the system. Implicit in any information system is the decision making process that is derived from the information output. What are these output requirements? What is needed to achieve the output desired? These questions must be answered first in order to achieve the goal of increased automation in the decision making process.

PRESENT SYSTEM REVIEW

As was mentioned earlier, the present system is done by hand. In general, the system works like this. A request for counselling is received by the Small Business Administration office in Fargo, North Dakota. An SBA representative selects the nearest counselor available from the 150 counselors at

his/her disposal. The counselor then contacts the small business that requested the assistance and tries to resolve the problem plaguing the firm. The counselor keeps the Fargo SBA office abreast on the progress of the assignment. Likewise, when the assignment is complete, the SBA office is notified and the records are updated to reflect this.

For the system, decision making occurs at two points in the system: 1) when a match is made between counselor and the small business, and 2) during the monitoring phase as the counselor assists the small business. In the first instance, the person who initially selects the counselor for the small business seeks to match counselor and business based on the following criteria:

1. Send closest geographic counselor possible.
2. Select a SCORE before an ACE counselor.
3. Assign the counselor with fewest cases.
4. Minimize conflict-of-interest in the match-up.
5. Do not assign the counselor to too many cases.

After a counselor is selected and assigned to a case, the SBA must be able to monitor his/her progress and take any actions necessary to ensure swift problem resolution. These actions may include having to assign another counselor to the case, having to reassign the case if the assigned counselor's performance is unsatisfactory, etc. Finally, as part of the monitoring process, the SBA must determine what course of action to take to follow-up the case

after it is completed. This could include providing additional help as a follow-on to the small business, tracking the small business client for any additional assistance, reassigning the counselor or another counselor to help the business again, etc.

The information flow for the present counselor selection process is fairly simple. A file is kept on the counselors and contains information such as their area(s) of expertise, address, and business experience. This file is created initially as an individual offers his/her services as a counselor. The other side of the information flow involves the file of small business' help request. This file has all the information as is contained on SBA Form 641 (see Figure 1).

These two files are merged together when a counselor is selected for a particular case and they serve as the initial entry point in the SBA assistance system. From there the information that is used to monitor the counselor's progress is gotten by bi-monthly assignment reviews. These reviews allow the SBA to monitor the progress of the counselor and serve as feedback on the case.

INFORMATION REQUIREMENTS

As is readily seen from the preceding section, the output requirements for the proposed counselor selection system must provide information in three areas: 1) infor-

FIGURE 1.
REQUEST FOR COUNSELING (SBA Form 641)

OMB Approval No. 3245-0091
Expiration Date: 11-30-84

U.S. SMALL BUSINESS ADMINISTRATION

REQUEST FOR COUNSELING

Please Print

Name of Company	Name of Inquirer	Telephone #

Street	City	State	County	Zip

Employer ID #	Social Security Number	Veteran	Viet Era Veteran
		Yes ☐ No ☐	Yes ☐ No ☐ Discharged:

Are you presently:	Yes	No	Can you furnish a recent:	Yes	No
In Business?	☐	☐	Balance Sheet?	☐	☐
Starting a Business?	☐	☐	Profit & Loss Statement?	☐	☐
SBA Borrower?	☐	☐			

Kind of business/services (Please specify)

Retail (Selling) _____ Construction _____

Service (Kind) _____ Wholesale (Selling) _____

Manufacturing (Product) _____ Other (Specify) _____

Check the problem areas for which you seek assistance.

- ☐ 1. Starting a New Business
- ☐ 2. Sources of Credit and Financing
- ☐ 3. Increasing Sales
- ☐ 4. Advertising & Sales Promotion
- ☐ 5. Market Research
- ☐ 6. Selling to the Government
- ☐ 7. Bidding and Estimating
- ☐ 8. International Trade
- ☐ 9. Recordkeeping and Accounting
- ☐ 10. Financial Statements
- ☐ 11. Office or Plant Management
- ☐ 12. Personnel
- ☐ 13. Engineering and Research
- ☐ 14. Inventory Control
- ☐ 15. Purchasing
- ☐ 16. Credit & Collections

Please describe how SBA may be of assistance.

I request management assistance from the Small Business Administration. I understand that this assistance is free of charge and that I incur no obligation to SBA or its counselor for providing this assistance. I authorize SBA to furnish relevant information to the assigned management counselor although I expect that information to be held in strict confidence by him/her.

I further understand that any counselor has agreed not to: (1) recommend goods or services from sources in which he/she has an interest and (2) accept fees or commissions developing from this counseling relationship. In consideration of SBA's furnishing management or technical assistance, I waive all claims against SBA personnel or counselors arising from this assistance.

Signature and Title of Requestor	Date

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mation for the small business customer, 2) information for SBA management's use, and 3) information for follow-on customer assistance. Towards providing this information, the types of reports needed are periodic reports, management reports, and inquiry reports.

The periodic reports would provide information on the status of the case. Breaking this down further, the reports would provide information on the assignment(s) of the counselor, when the case/assignment is completed, recommendations for a follow-up on the small business, and a determination as to whether further assistance is needed for the small business client. Generally, these reports will be printed bi-monthly or as a case is completed.

The management reports would consist of what counselors are being assigned to what small business cases, when follow-up actions are required, and whether the assignment is completed or not. These reports will be printed whenever the need arises or at least on a bi-monthly basis.

Inquiry reports will provide SBA management with the means to do a quick look on the status and/or progress of a particular counselor or small business case. Generally, these reports would be gotten via direct inquiry into the data base system and would be displayed on the cathode ray tube (CRT).

INPUT REQUIREMENTS

To determine what the input requirements are, attention must first be given to what type of information is needed to produce the above mentioned reports. In general, the information needed for the reports can be divided into three areas: 1) information about a given counselor, 2) information about a given small business, and 3) information pertaining to a given counselling case.

In regards to the information on a given counselor, this could include the name of the counselor, his/her address, cases assigned, business/service expertise, business experience, assignment(s) completion dates, dates when to review the counselling assignment (if the case is not completed), whether he/she is ACE or SCORE, and when the counselor is unavailable for a case.

For the small business client, the information needed for these reports would include name, business address, the type of business, the problem area, whether the business requires additional help, follow-on needs for future SBA assistance, the date SBA help is requested, whether the small businessman is a veteran, the counselor assigned to the case, and the date the case is closed.

Information regarding a given counselling case would be derived from the name of the counselor assigned to the case, the name of the small business requesting the assist-

ance, the date the case was assigned, the date help was requested from the small business, the date the case should be reviewed (if not completed), the date the case was closed, any follow-on action required, and whether the counselor requires reimbursement.

The present system currently provides the necessary source documents to facilitate obtaining the above mentioned information. The source documents currently in use are illustrated in Figures 1 and 2. In Figure 1, the information is provided by the small business that is requesting assistance. This information then becomes part of the customer file. Figure 2 is the document that a person fills out when he/she initially becomes an SBA counselor. The document provides the information that eventually becomes part of the counselor profile file.

As an outgrowth of the source documents, the two files when used either individually or when merged together, can provide the information needed to produce the three types of reports. Consequently, in the proposed system, it would not be necessary to have to redesign the present source documents, since the files that are created by the source documents are adequate.

FIGURE 2.
COUNSELOR PROFILE

COUNSELOR PROFILE

Name_____ Please Check ____ACE ____SCORE

Address_____City_____State_____Zip_____

Telephone Home_____

Business_____

Kind of business/service of expertise:

___Retail
___Service
___Manufacturing
___Construction
___Wholesale
___Agribusiness
___Other (Specify)_____

Business Experience - In a few short sentences please describe the businesses you managed and/or owned successfully and approximate year.

_____

_____

_____

_____

_____

_____

_____

_____

Please Check area of Expertise:

___Starting a New Business
___Sources of Credit and Financing
___Increasing Sales
___Advertising and Sales Promotion
___Market Research
___Selling to the Government
___Bidding and Estimating
___International Trade
___Computers
___Recordkeeping and Accounting
___Financial Statements
___Office or Plant Management
___Personnel
___Engineering and Research
___Inventory Control
___Purchasing
___Credit and Collection
___General Business Practices

Additional Related Expertise/Experience (Optional):

FILE SPECIFICATIONS

As is mentioned in the preceding section, there will be two files associated with the proposed system: 1) the counselor file and 2) the customer file. Figures 3 and 4 provide a detailed look at the information that will be contained in each record in the files. Both files will be updated as counselors and customers are added and deleted from the system. Further, both files can be accessed so that editing can be performed on the contents.

SYSTEM SPECIFICATIONS

File manipulation will be accomplished through several subsystems or programs. Overall control will be provided by a series of menus that will allow the user to select his/her choices without having to program. Thus, the system will be for the most part "user-friendly". Figure 5 through Figure 12 show the various functions that the proposed system will be providing.

Figure 5 is concerned with the creation of the counselor data base. From the data provided in Figure 1,a record will be created and added to the counselor data base. Counselor record creation will be done on an infrequent basis due to the relative stability of the data base file.

Figure 6 involves the creation of records for the customer data base. Creation of records will be infrequent and accomplished whenever a request is received by the SBA. The

FIGURE 3.
FILE SPECIFICATION - CUSTOMER PROFILE

ITEM	SIZE OF ITEM (BYTES)
Name of Company	30
Name of Inquirer	30
Telephone Number	10
Street	30
City	20
State	2
County	20
Region	1
Zip Code	9
Employer ID Number	9
Social Security Number	9
Veteran	1
Viet Era Veteran	1
Discharged (Month/Year)	4
Business Condition:	
In Business	1
Starting Business	1
SBA Borrower	1
Can Furnish:	
Balance Sheet	1
Profit & Loss Statement	1
Area Requiring Assistance:	
Starting a Business	1
Sources of Credit/Financing	1
Increasing Sales	1
Advertising/Sales Promotion	1
Market Research	1
Selling to Government	1
Bidding and Estimating	1
International Trade	1
Recordkeeping/Accounting	1
Financial Statements	1
Office/Plant Management	1
Personnel	1
Engineering/Research	1
Inventory Control	1
Purchasing	1
Credit/Collections	1
Name of Counselor assigned to Customer	30
Date 641 Received	6
Date 641 Assigned	6
Memo Field	Varies

FIGURE 4.
FILE SPECIFICATION - COUNSELOR PROFILE

ITEM	SIZE OF ITEM (BYTES)
Name of Counselor	30
Street	30
City	20
Region	1
State	2
Zip Code	9
Home Phone	10
Office Phone	10
ACE/SCORE	1
Dates Not Available (From,To)	12
Expertise:	
Retail	1
Service	1
Manufacturing	1
Construction	1
Wholesale	1
Agribusiness	1
Other	1
Other Type of Expertise	15
Area of Expertise:	
Starting a Business	1
Sources of Credit/Financing	1
Increasing Sales	1
Advertising/Sales Promotion	1
Market Research	1
Selling to Government	1
Bidding and Estimating	1
International Trade	1
Computers	1
Recordkeeping/Accounting	1
Financial Statements	1
Office/Plant Management	1
Personnel	1
Engineering/Research	1
Inventory Control	1
Purchasing	1
Credit/Collections	1
General Business Practice	1
Social Security Number of Customer Assigned and next Review Date (Maximum 4 Cases):	
Customer SS Number	9
Review Date	6
Memo Field	Varies

data that will go into this file is derived from the form illustrated in Figure 2. As request is made, the customer will receive a letter acknowledging the request.

Figure 7 is concerned with matching the customer to the counselor. The two data bases are merged together and a list of possible counselors is printed. From this list, the person in charge of the counselor selection process will chose the counselor that will handle a particular customer. This subsystem will likewise be done on an infrequent basis, i.e., only whenever a request is received by the SBA for help.

Figure 8 involves the periodic monitoring of the counselors' performance. The operation depicted will be done bi-monthly to aid in assessing if progress is being made by the counselor(s). Management will only enter the picture if a counselor's performance is deemed unsatisfactory.

Figure 9 is similar to Figure 8: both deal with counselor performance. However, in this flow diagram the counselor has finished his/her assignment. Upon notification, both counselor and customer data bases will be updated to reflect the change. Management and the customer will receive a report/letter telling them of assignment completion.

Figures 10 through 12 are concerned with data base file/record maintenance. Figure 10 involves updating the data bases and is done as necessary. It derives some inputs from the subsystem depicted in Figure 7. Figure 11 allows

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Figures 10 through 12 are concerned with data base file/record maintenance. Figure 10 involves updating the data bases and is done as necessary. It derives some inputs from the subsystem depicted in Figure 7. Figure 11 allows

FIGURE 5.
DATA BASE CREATION OF COUNSELOR PROFILE

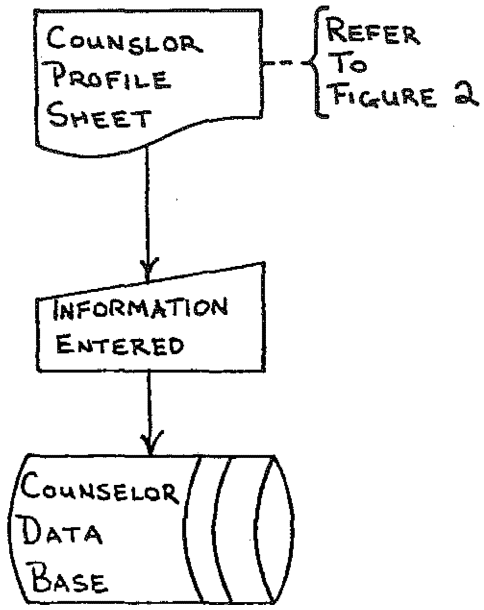


FIGURE 6.
DATA BASE CREATION OF CUSTOMER PROFILE

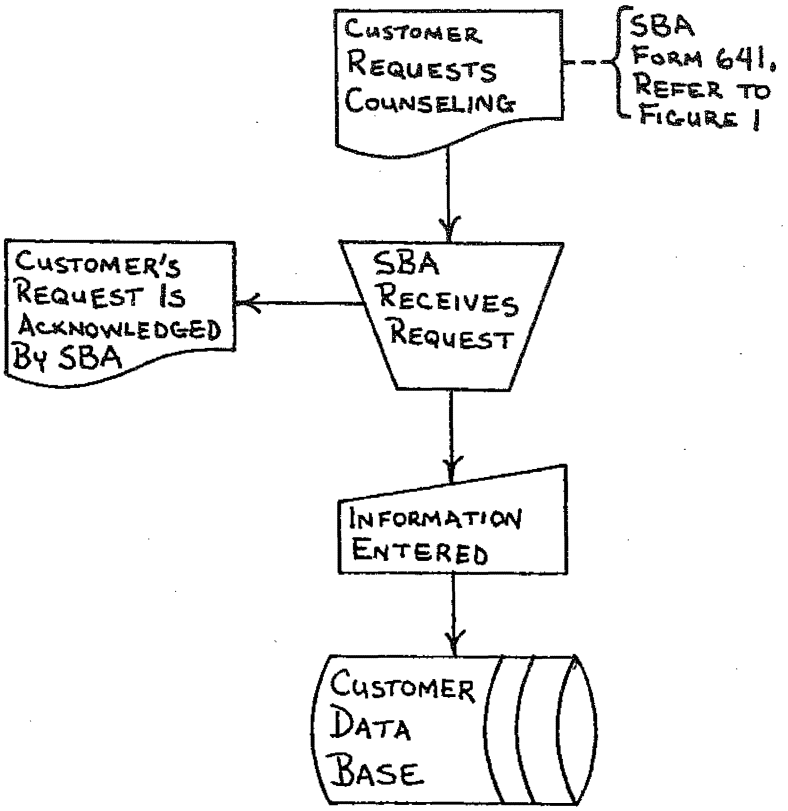


FIGURE 7.
COUNSELOR SELECTION

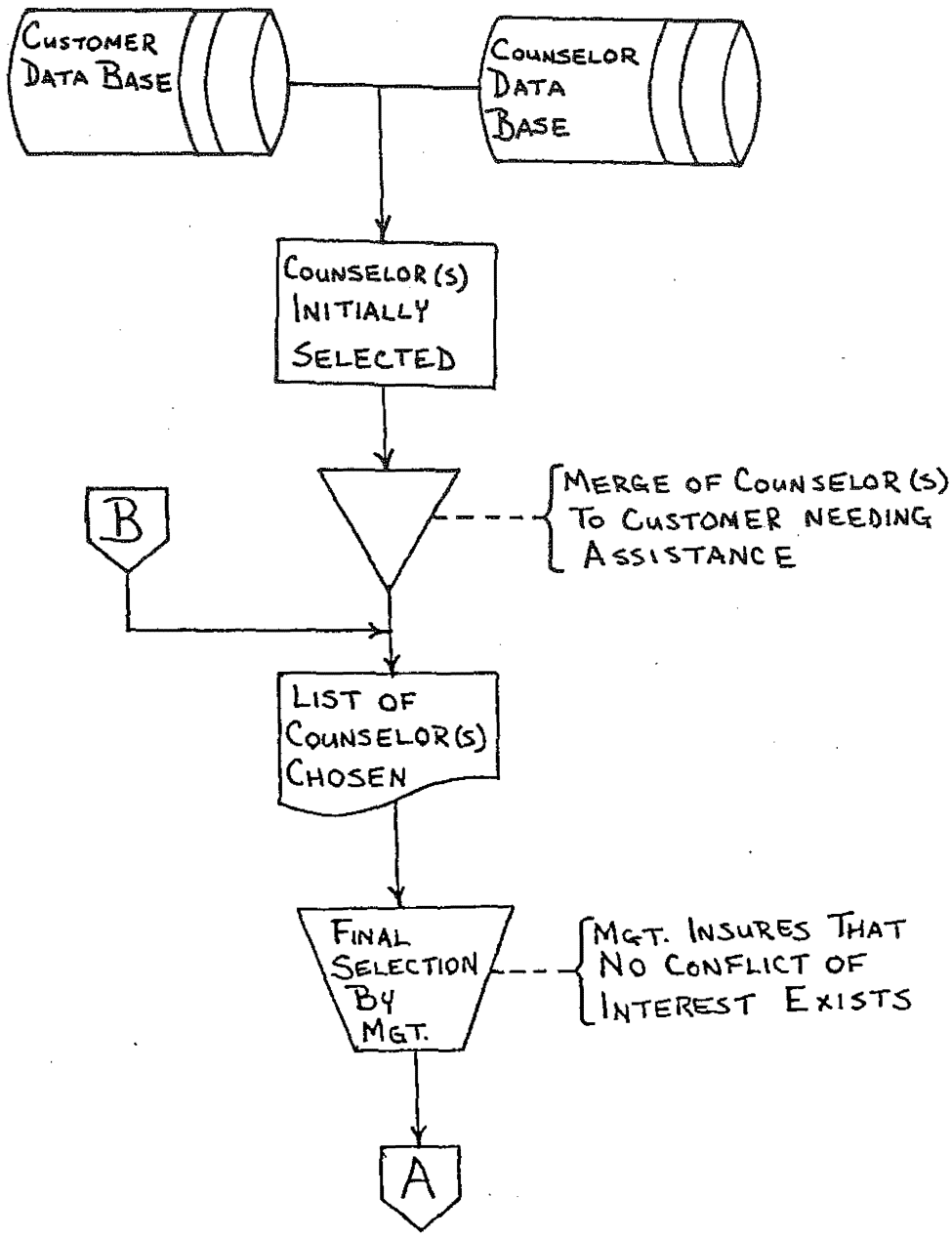


FIGURE 7 (CONTINUED).
COUNSELOR SELECTION

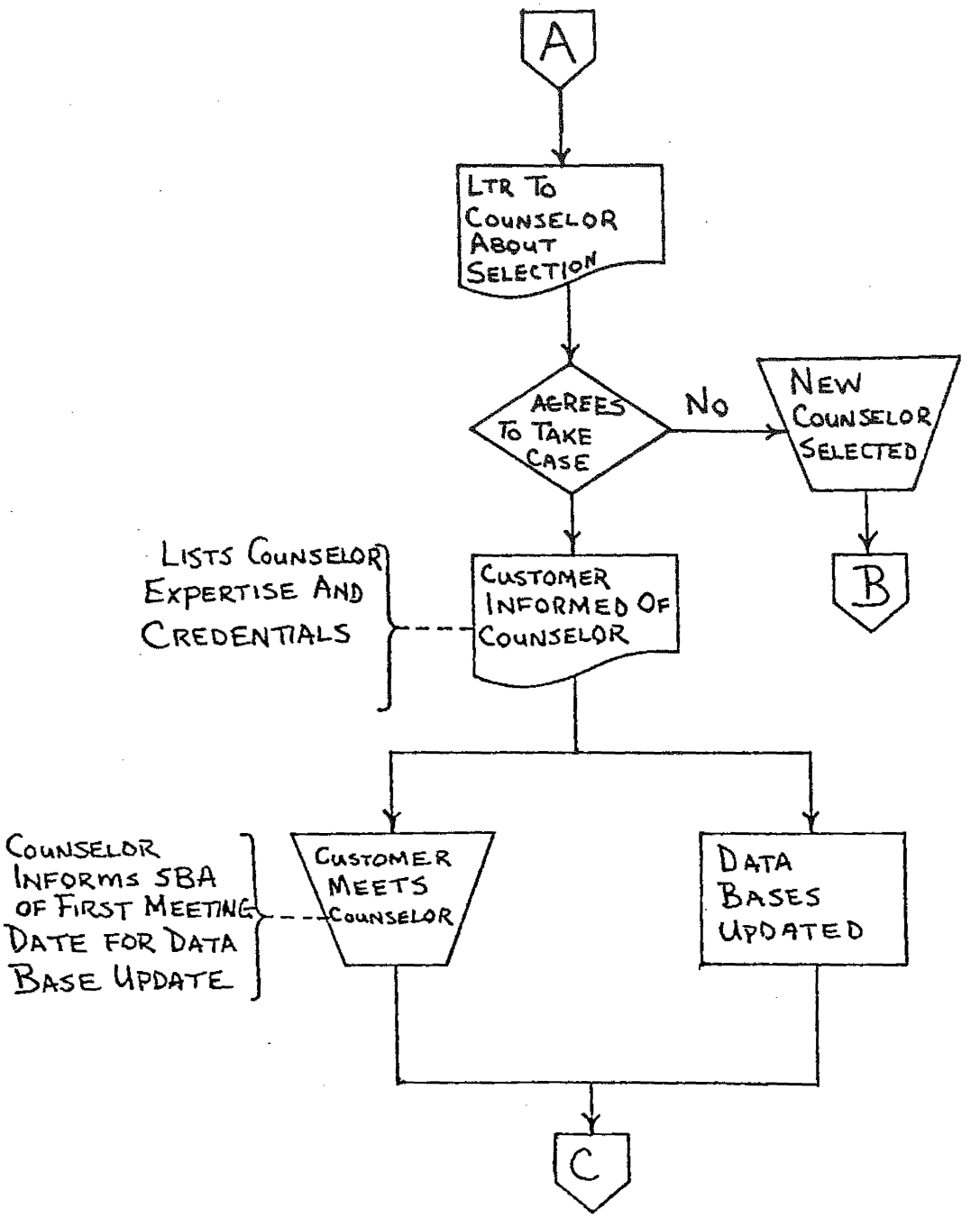


FIGURE 8.
PERIODIC REPORT ON COUNSELORS
(ASSIGNMENT NOT COMPLETE)

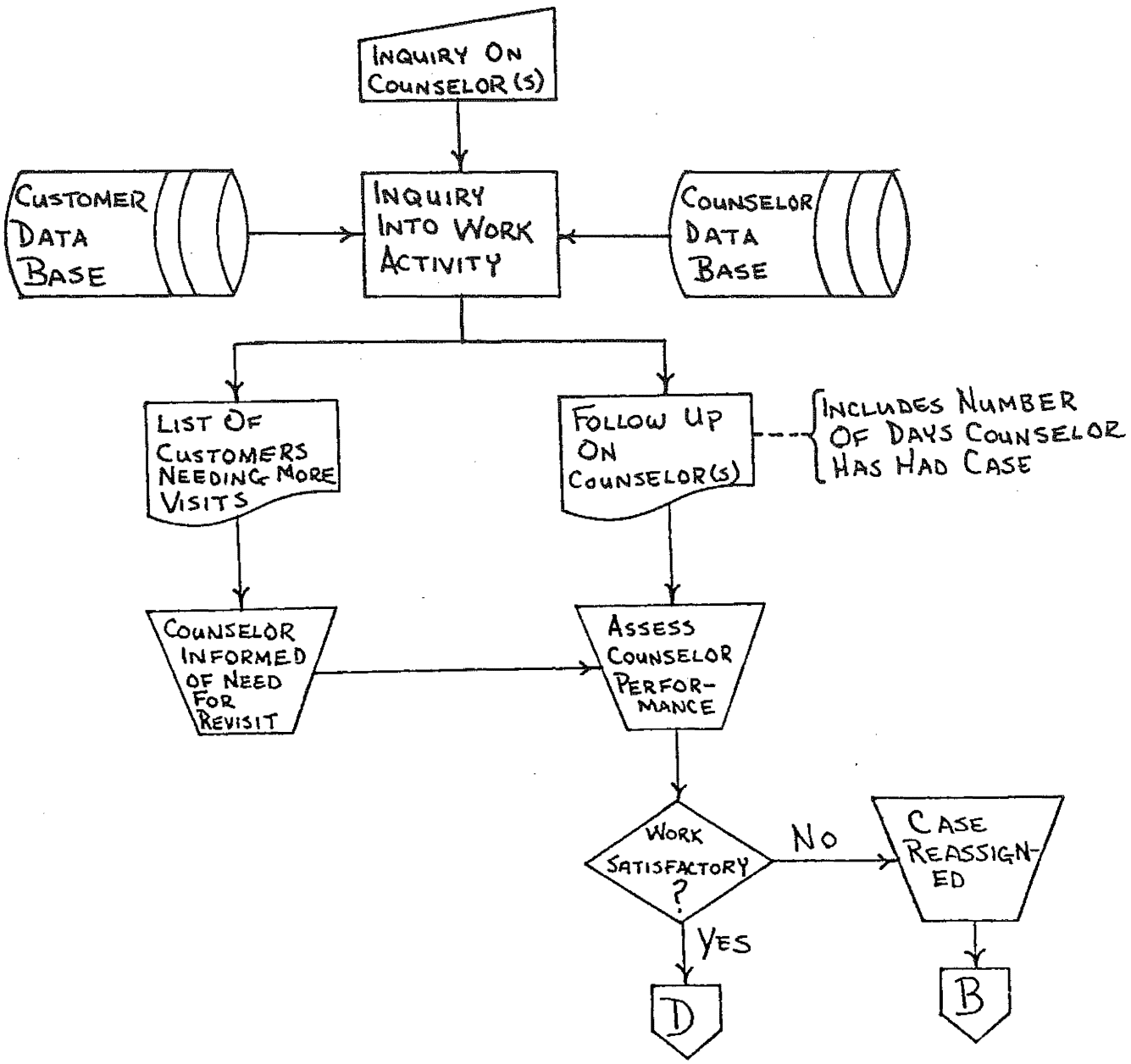


FIGURE 8 (CONTINUED).
PERIODIC REPORT ON COUNSELORS
(ASSIGNMENT NOT COMPLETE)

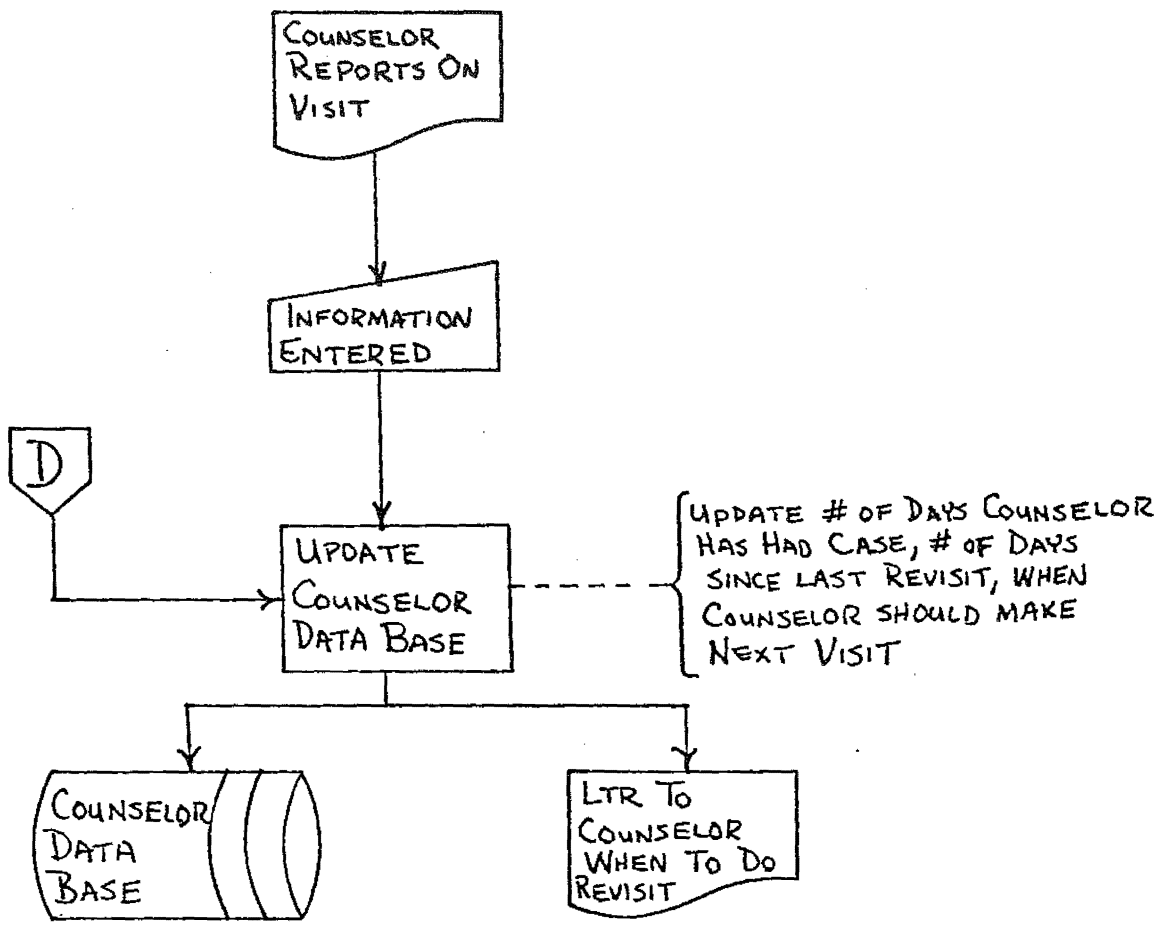


FIGURE 9.
PERIODIC REPORT ON COUNSELORS
(ASSIGNMENT COMPLETE)

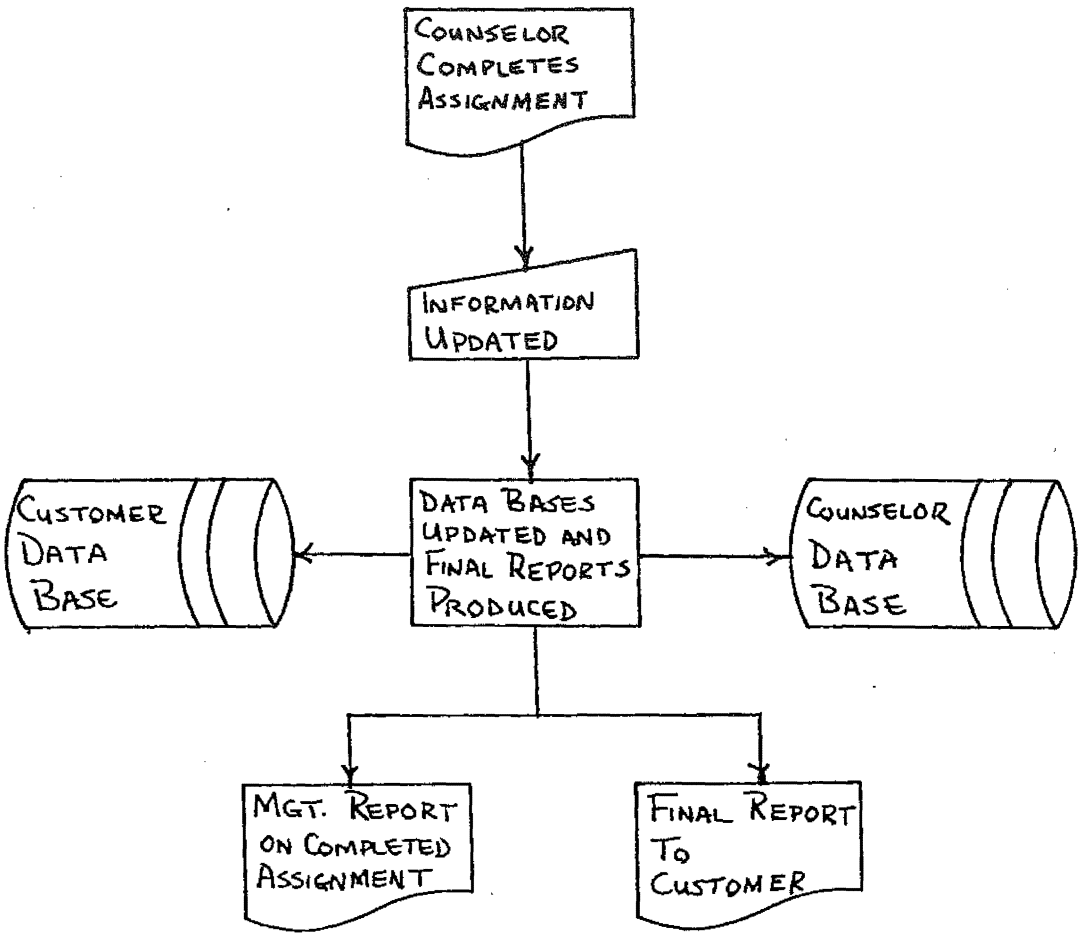


FIGURE 10.
DATA BASE UPDATE

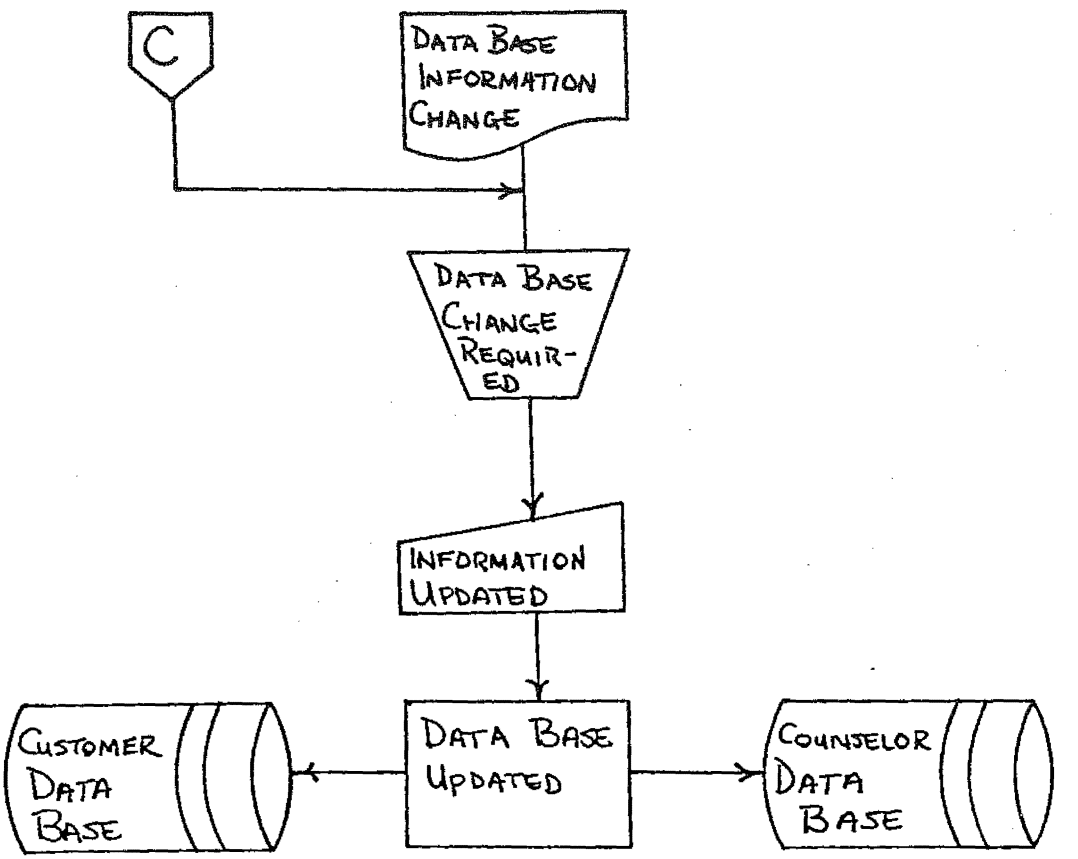


FIGURE 11.
DATA BASE INQUIRY

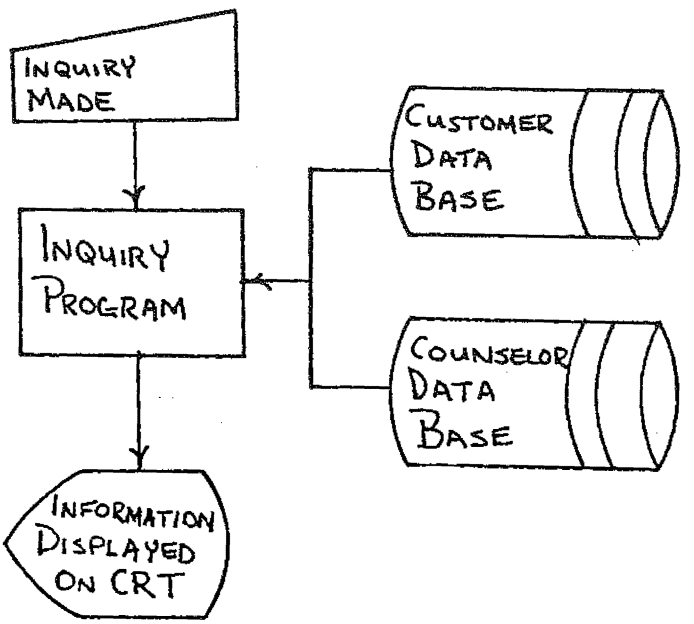
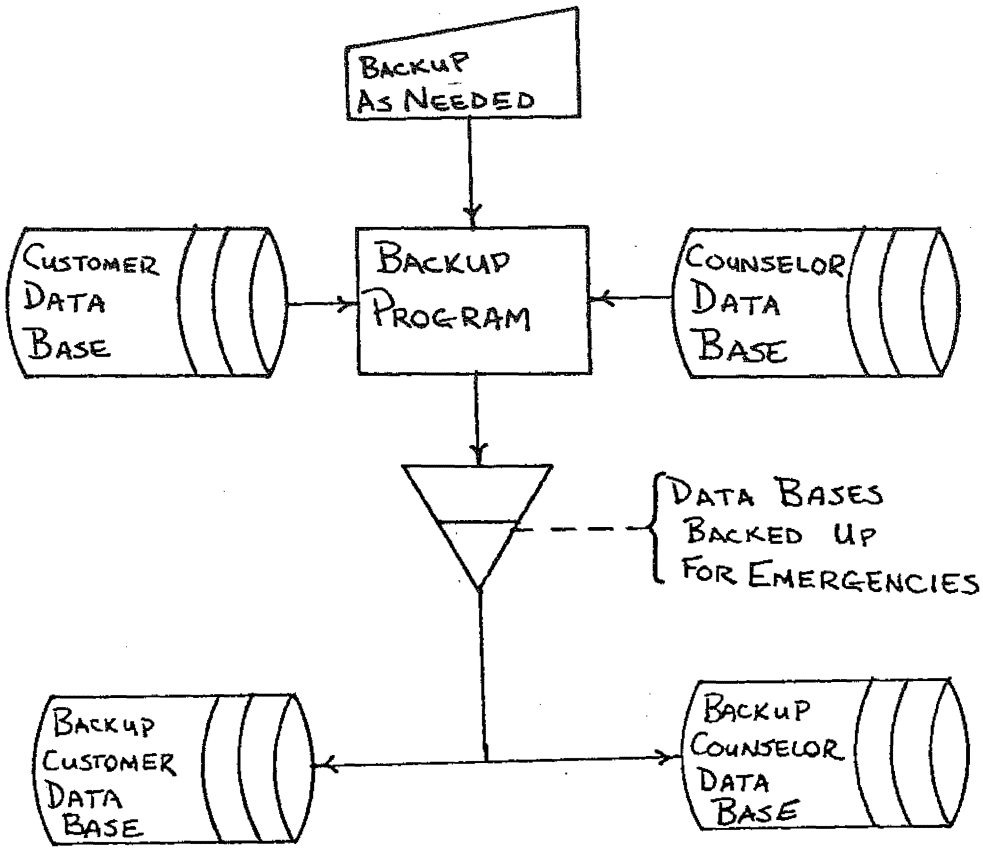


FIGURE 12.
DATA BASE SYSTEM BACKUP



inquiries to be made into the system for a particular record from either data base. It will be done as the need arises. Figure 12 concerns itself with backing up the data bases so as to prevent complete data loss should a file go down. It should be done as a minimum whenever the data bases are changed; or a least weekly.

SELECTION CRITERIA FOR PROPOSED SYSTEM

The proposed system will match counselors to a given customer based on the following set of criteria (in order of importance):

1. Expertise in the area required.
2. City.
3. Region.
4. Counselor Availability.
5. Number of cases currently assigned to counselor.
6. SCORE.
7. ACE.

The region selection criteria was derived by subdividing the state, along the major highways, into nine sectors or regions:

Region

1. North of Hwy 2, West of Hwy 83.
2. South of Hwy 2, West of Hwy 83, North of Hwy 94.
3. South of Hwy 94, West of Hwy 83.
4. East of Hwy 83, North of Hwy 2, West of Hwy 281.
5. East of Hwy 83, South of Hwy 2, West of Hwy 281, North of Hwy 94.
6. East of Hwy 83, South of Hwy 94, West of Hwy 281.
7. East of Hwy 281, North of Hwy 2.
8. East of Hwy 281, South of Hwy 2, North of Hwy 94.
9. East of Hwy 281, South of Hwy 94.

DATA BASE SELECTION

As can be seen by the requirements of both the output and input, the data base needed must be able to print a variety of reports and be able to manipulate multiple files. Further, it must also be able to accommodate future demands placed upon it.

In Chapter II, several data bases were reviewed as to their applicability for the proposed system. Such areas as file processing capability, report generator specifications, ease of use, functional specifications, and input requirements were looked at. From this review, one data base seemed to meet all the necessary requirements and appears to be the most applicable for this project. This data base is dBase III.

dBase III will provide the necessary functions needed to transition the SBA manual system to an automated one. It is fairly easy to use and is utilized extensively throughout the business world. Further, it will also allow for growth within the new counselor selection system.

PROPOSED SYSTEM BENEFITS

There are numerous benefits that can be gotten by automating the counselor selection process. Foremost among these is the increased efficiency that can be derived by better counselor management. The selection process can now be done a lot quicker, counselor assignments will be more evenly

distributed, management can track the cases easier, and the counselor selection process can be handled by someone that required detailed instruction in the selection process.

The net result of the automation will be a reduction in clerical activity, improvements in customer service, and better management, as well as, enhancing the SBA image.

SUMMARY

Chapter III covered what requirements were dictated by the needs of the output and input of the present counselor selection system. A new automated system was then proposed and a data base was chosen based upon those requirements. Additionally, the proposed system benefits were assessed.

From the requirements, the file specifications were derived, input source documents were looked at, what type of reports needed were discussed, and finally, flow diagrams outlined the flow of information through the system.

CHAPTER IV

SUMMARY AND IMPLICATIONS FOR FURTHER STUDY

The scope of this study focuses on changing the present counselor selection system through the use of automation. It endeavored to stay within the current boundaries of the manual system whenever possible. For example, the present source documents were used as the input documents into the proposed system.

The study was divided into two sections. The first section reviewed current literature on data bases and provided a working definition of data base management systems that were to be used. Section two concerned itself with the analysis of the present system and presented an alternative to it. This alternative was automation.

Included in the second section were information requirements for both the input and output, file specifications, system specifications, selection of an appropriate data base, and proposed system benefits.

Within the current constraints, automation of the Small Business Administration counselor selection process is indeed possible. Its use would greatly facilitate better management control.

As for implications for further research, there were several areas that were beyond the scope of this study that should be looked into.

The first area that should be further investigated is the area of forms design. Figure 1 and Figure 2 serve as source documents into the present and proposed system. Unfortunately, there are several areas on each document that have no counterpart on the other document. For example, on the Counselor Profile sheet one of the areas of expertise is computers. However, on the Request for Counseling form, computers is not one of the problem areas requiring assistance. Better integration between the forms could improve the SBA ability to serve the small business.

Another area that should be studied is the addition of statistical analysis to the system. By studying what small business is requesting the most help, what regions need more counselors, etc., the SBA could likewise improve its service to the small business customer.

Finally, further research is warranted to see if the expenses incurred by the counselors as they help the small businessman can be tracked by the system. By combining this with the proposed system, SBA management will be better able to track what expenses are being incurred, analyze trends in expense accounts, and control expenses.

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