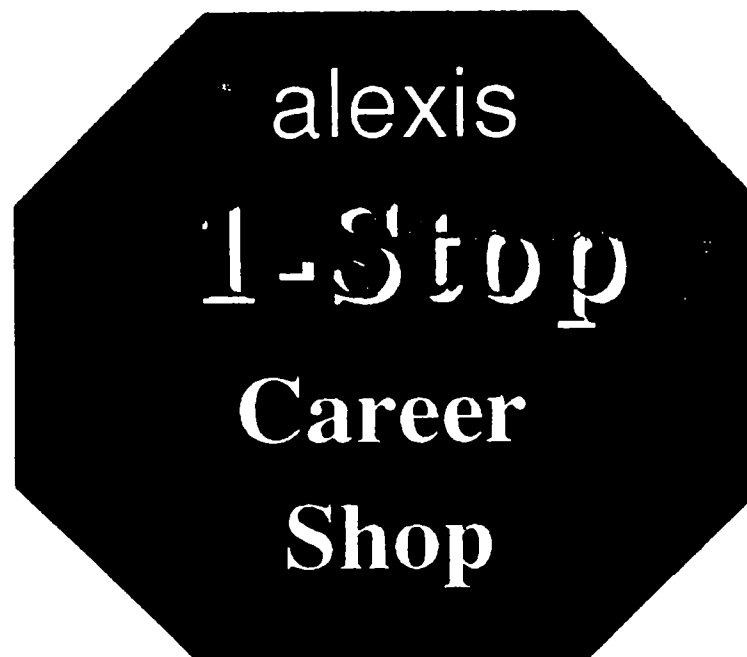


Delaware

ALEXIS

[ALEX Integrated System]

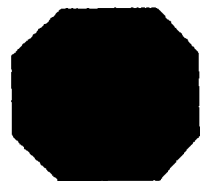


Delaware Department of Labor



Provide direct client access to jobs, training, and labor market information.

- ***Increase value of ALEX***
- ***Provide rapid response (remote)***
- ***Reduce duplication of effort***
- ***Achieve shorter periods of unemployment***
Free DOL staff from routine inquiries.



ALEX Self-Service Job Searches Initiated by the Public

Mainframe ALEX Network:

15 Self-Service Computer Terminals

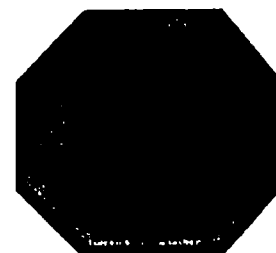
8 Statewide Locations:

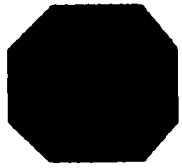
3 Division of E&T Local Offices

1 DET Satellite Offices

4 Remote Sites

60,704 Public Job Searches Initiated
05/01/91 through 03/21/93





Touch Screen ALEX:

1 Kiosk available for placement at remote sites

Unveiled week of 4/17/91 at Legislative Hall, Dover

11,136 Job Searches Initiated

2,907 Job Order Printouts Requested

12/03/91 - 09/31/92

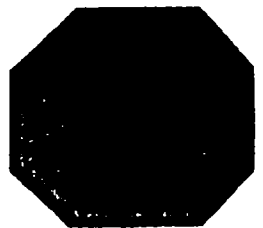
Goodwill Industries, Newark

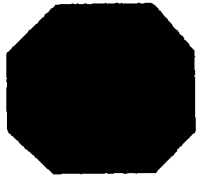
1,052 Job Searches Initiated

576 Job Order Printouts Requested

03/29/93 - 04/21/93

General Motors, Boxwood Plant





PC ALEX:

Piloting at:

- **Kingswood Community Center**
- **Latin American Community Center**
 - **Christiana High School**



alexis

**1-Stop
Career
Shop**

ALEX

**Job Orders & Applicants
International Job Bank**

*Division of Employment &
Training*

+

DEL-OIS

**Occupational Descriptions
Occupational Projections
Industry Data
Training Information**

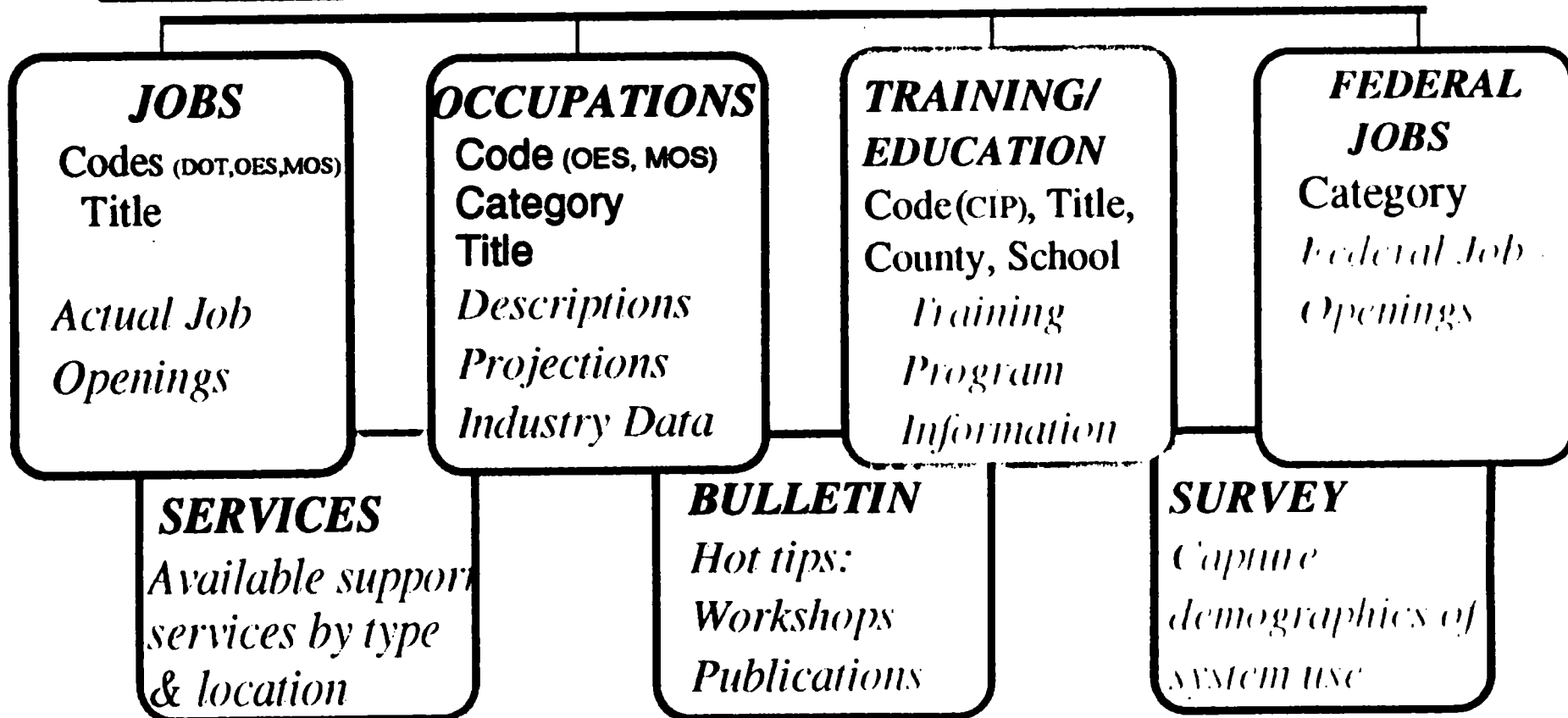
*Office of Occupational &
Labor Market Information*

= alexis



User: Student or Client

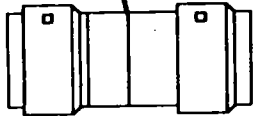
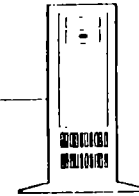
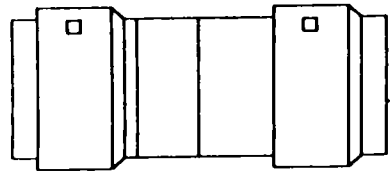
- ✓ Unemployed
- ✓ Underemployed
- ✓ Facing Unemployment



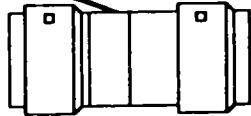
The State of Delaware 1 - Stop Career Shop ALEXIS Network

DOL - Mainframe
University Plaza
Newark, DE

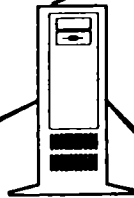
DET Local Area Network
File Server
University Plaza
Newark, DE



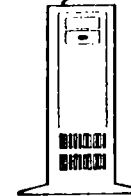
Delaware DHSS
Mainframe
New Castle, DE



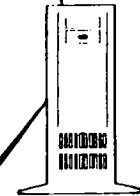
Interstate Job Bank
Albany, NY



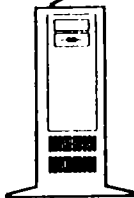
Dover Local Office
Local Area Network
Dover, DE



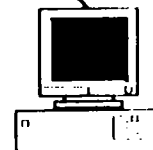
Pencader Local Office
Local Area Network
Newark, DE



Cannery Local Office
Local Area Network
Wilmington, DE



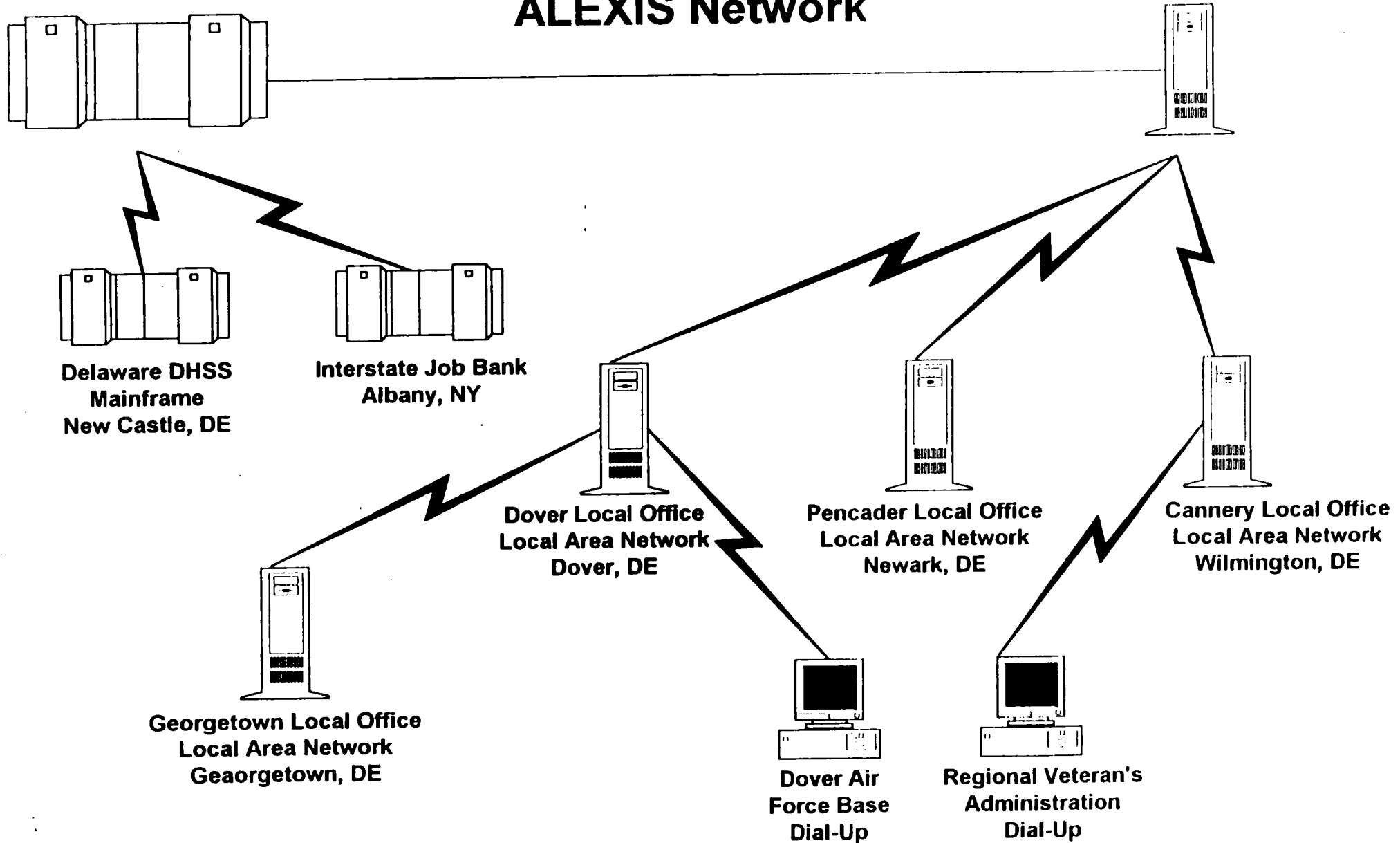
Georgetown Local Office
Local Area Network
Geaorgetown, DE



Dover Air
Force Base
Dial-Up



Regional Veteran's
Administration
Dial-Up



Why



Will Work:

ALEX Self-Service Job Searches Initiated by the Public

Mainframe ALEX Network:

- 15 Self-Service Computer Terminals at
 - 8 Statewide Locations:
 - 3 Division of E&T Local Offices
 - 1 Division of E&T Satellite Offices
 - 4 Remote Sites

60,704 Public Job Searches Initiated 05/01/91 through 03/21/93

Touch Screen ALEX:

1 Kiosk available for placement at remote sites.
Unveiled week of 04/19/91 at Legislative Hall, Dover

11,136 Job Searches Initiated
2,907 Job Order Printouts Requested
12/03/91 - 09/31/92
at Goodwill Industries, Newark

1,052 Job Searches Initiated
576 Job Order Printouts Requested
03/21/93 - 04/21/93
at General Motors, Boxwood Plant

PC ALEX:

Now piloting at:

Kingswood Community Center
Latin American Community Center
Christiana High School

DELAWARE LEADS NATION WITH ALEXIS INITIATIVE

PROBLEM: No centralized source of job openings, occupational information, education and training opportunities, and supportive services available to public.

The information exists today in stand-alone systems developed by different agencies:

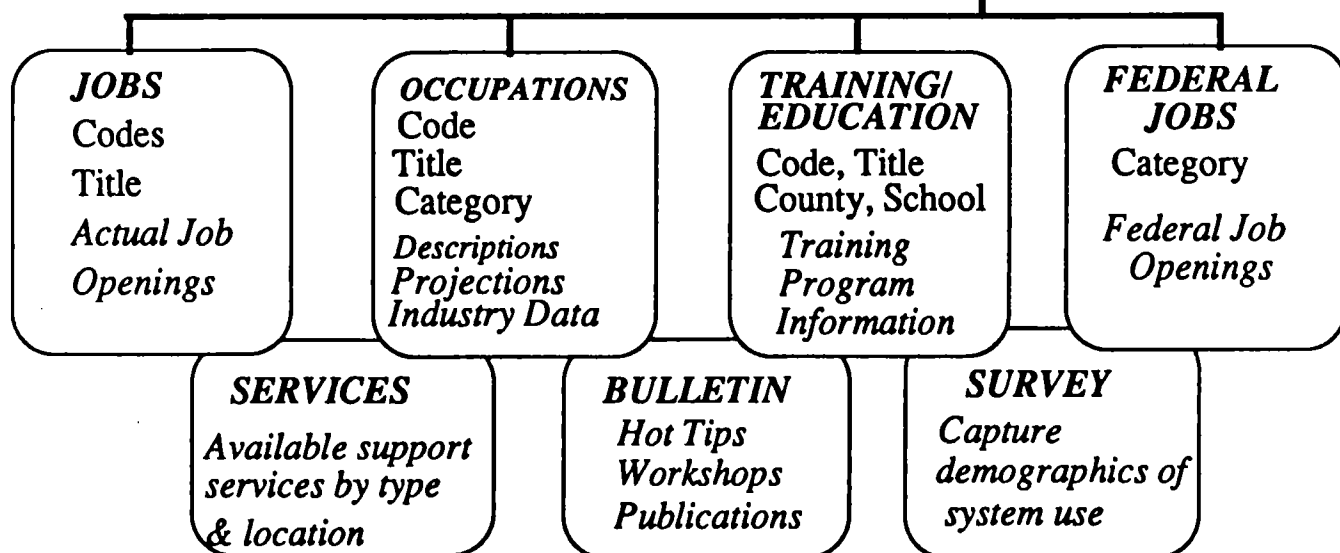
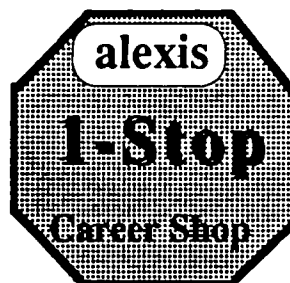
ALEX - Automated Labor EXchange, Division of Employment & Training
DEL-OIS - Delaware Occupational Info. System, Office of Labor Market Information
STI - State Training Inventory, Office of Labor Market Information
HELPLINE - Supportive Services Inventory, United Way/Dept. of Health & Social Services

DELAWARE'S SOLUTION: ALEXIS 1-STOP CAREER SHOP

ALEX + DEL-OIS + STI + HELPLINE = **ALEX** INTEGRATED **S**YSTEMS

User: Student or Client

- ✓ Unemployed
- ✓ Underemployed
- ✓ Facing Unemployment



Benefits:

Provide direct client access to jobs, training, and labor market information

- Increase value of ALEX
- Provide rapid response (remote)
- Reduce duplication of effort
- Achieve shorter periods of unemployment
- Free DOL staff from routine inquiries.

Delaware Occupational Information System

DEL-OIS is a computerized occupational information system for those who:

- *plan employment and training programs;*
- *face career decisions; and*
- *counsel or provide information to others.*

DEL-OIS is designed to provide a fast, user-friendly way to obtain the most current and comprehensive Delaware-specific occupational and educational information available.

The system was developed around existing data supplied by the Department of Public Instruction, the Delaware Higher Education Commission, the Department of Labor, and private business and technical schools. This data is arranged into clusters, which group together related occupations and training programs.

DEL-OIS provides:

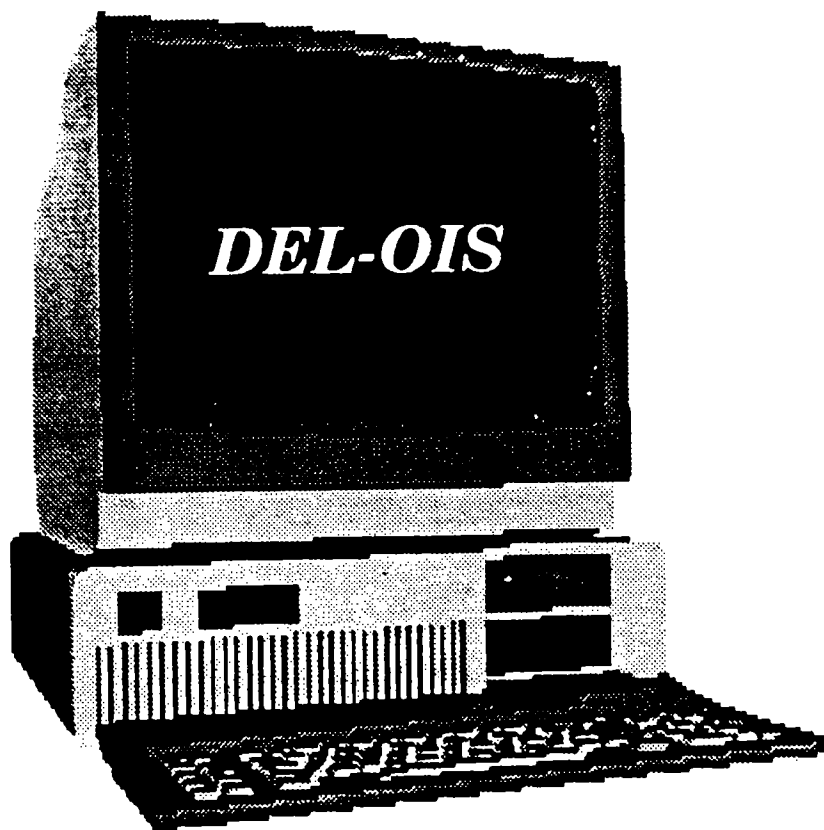
- Projected job openings, now through the year 2005;
- Numbers of people completing each training program offered in the State of Delaware; and
- An analysis of each cluster, including job descriptions, training routes, salary, employment outlook and future trends.

DEL-OIS also provides:

- Training/School Directory--a listing of educational and vocational training opportunities in the state.
Search for the schools that offer programs of interest to you, or for schools in your area of the state and their program offerings.
- Occupation/Industry/Employer Module--a directory of occupations and the industries in which they are found.
Find out which industries employ people with your skills, and which employers are within each industry. This will help you know where to look for a job.
- Occupational Characteristics Module--a profile of characteristics for each occupational cluster (SOC code).
Find out which abilities, physical demands, environmental conditions, or other characteristics apply to the job you want. Using this module allows you to answer such questions as "How good in math must I be?"

DEL-OIS has been developed for use on all IBM and compatible microcomputers by the Delaware Occupational Information Coordinating Committee of the Delaware Department of Labor. For further information, call Jan McCullough at (302) 368-6963.

Delaware Occupational Information System

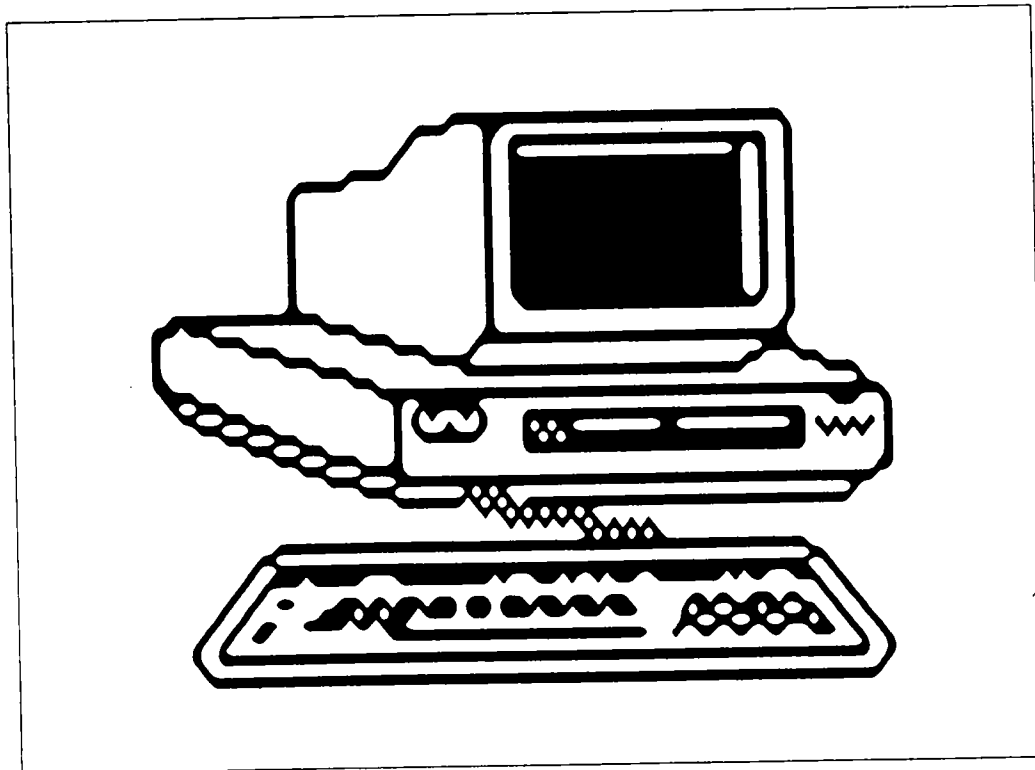


Delaware Occupational Information Coordinating Committee

Office of Occupational and Labor Market Information
Delaware Department of Labor

ALEX

SELF - SERVICE
AUTOMATED LABOR EXCHANGE
SYSTEM



DELAWARE DEPARTMENT OF LABOR
DIVISION OF EMPLOYMENT AND TRAINING

MAY, 1993

ALEX

The Automated Labor EXchange

Friendly ALEX is a computerized job search system that gives you access to local, statewide, regional, and national job opportunities listed with the **Delaware Department of Labor, Division of Employment and Training**.

Friendly ALEX is easy to operate and allows you to perform your own independent job search. No knowledge of computers is required. Simply follow the directions on each ALEX screen to select job opportunities that match your interests and abilities.

Friendly ALEX also gives you access to announcements of statewide, regional, national, and worldwide Federal Job Opportunities. The announcements provide sufficient information for you to make direct contact with the appropriate Federal agencies.

Friendly ALEX allows veterans to enter their Military Occupation Code and view civilian job opportunities that match their military training and experience.

HELP YOURSELF TO A JOB WITH ALEX, THE AUTOMATED LABOR EXCHANGE

A friendly, computerized, self service job search system is now available for use by the public at each of the four offices of the Delaware Department of Labor, Division of Employment and Training as well as the Veterans Administration, Dover Air Force Base, the Office of State Personnel in the Carvel Building, and the Porter State Service Center. Called ALEX (Automated Labor Exchange), the system allows job seekers to perform their own independent job search, without professional assistance, using a computer terminal. Friendly ALEX is easy to operate. No knowledge of computers is required to select job opportunities that match your interests and abilities. ALEX gives job seekers access to local, statewide, regional and national job opportunities listed with both the Division of Employment and Training and the National Interstate Job Bank system.

MAINFRAME ALEX

The Division implemented ALEX on a statewide basis in May of 1991. The system currently consists of fifteen computer terminals dedicated for public use at eight different locations throughout the state. During the period May, 1991 through March, 1993 (23 months) there have been a total of 60,704 job searches initiated by the public on the system.

TOUCHSCREEN ALEX

An advanced model of ALEX, featuring an interactive touchscreen, is available for placement at remote, non-traditional sites. This stand alone system allows the public to search for employment opportunities simply by pressing pressure sensitive areas on an info-window, touchscreen monitor. The system also features color graphics, motion videos, an on-screen narrator, job information printouts, and help screens in an effort to bring a self search, job information system to the public at sites outside of traditional Employment and Training offices.

Touchscreen ALEX was first unveiled at Legislative Hall in Dover during the week of April 17, 1991.

While placed at the Goodwill Industries store on Main Street in Newark from 12/5/91 through 9/30/92 (9 months), 11,136 job searches were initiated by the public and 2,907 job order information printouts were requested.

Touchscreen ALEX is now at the General Motors, Boxwood Assembly Plant. During the first three weeks of placement at the plant (3/29/93 - 4/21/93), 1,052 job searches were initiated by GM employees and 576 job order information printouts were requested.

PC ALEX

The newly released PC (personal computer) version of ALEX is currently being piloted at:

Kingswood Community Center
Latin American Community Center
Christiana High School

This version of ALEX permits users to access the system through a stand alone personal computer. Once the ALEX search programs are loaded onto the PC, the job files can be updated via floppy diskettes or dial-up file transfer.

**SELF-SERVICE ALEX TERMINALS ARE AVAILABLE TO THE PUBLIC AT
THE FOLLOWING LOCATIONS:**

PRIMARY LOCATIONS

New Castle County DET Area Office
Cannery Shopping Center
3301 Lancaster Pike
Wilmington, Delaware
577-2755

Newark DET Satellite Office
Pencader Corporate Center
Building 225, Suite 225
Route 896
Newark, Delaware
368-6622

Kent County DET Area Office
Carroll's Plaza
Route 13
Dover, Delaware
739-5473

Georgetown DET Area Office
Route 113
Georgetown, Delaware
856-5230

SPECIAL LOCATIONS

State of Delaware
State Personnel Office
First Floor
Carvel State Office Building
820 N. French Street
Wilmington, Delaware

Porter State Service Center
509 West 8th. Street
Wilmington, Delaware
Project Weed and Seed
577-3400

Regional Veterans' Administration and Medical Center
1600 Kirkwood Highway
Elsmere, Delaware
633-5492 (Veterans Only)

Dover Air Force Base
Family Support Center
Dover, Delaware
677-6930 (Veterans and Active Duty Military Only)

**STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF EMPLOYMENT AND TRAINING**

**JOB TRAINING 2000 INCENTIVE GRANT
PROJECT REPORT**

*Planning for the Expansion of the
Automated Labor Exchange System
(ALEX)*

Volume 1

*Existing Systems and
New Requirements*

MARCH, 1993

The Job Training 2000 Incentive Grant which supported this project was funded by the U.S. Department of Labor, Employment and Training Administration under the authority of Title IV of the Job Training Partnership Act.

Planning for Expansion of the Automated Labor Exchange System (ALEX)

Existing Systems and New Requirements

Contents

1. Introduction	2
1.1. Overview	2
1.2. Analysis Approach	3
2. Existing Systems.....	5
2.1. Job Search	6
2.2. Training Search	6
2.3. Occupation Search	6
2.4. Automated labor exchange system	8
2.4.1. Platform	8
2.4.2. Access	8
2.4.3. Function.....	8
2.4.4. Special Benefits or Limitations	9
2.5. Delaware Occupational Information System	11
2.5.1. Platform	11
2.5.2. Access	12
2.5.3. Function.....	12
2.5.4. Special Benefits or Limitations	13
2.6. State Training Inventory	15
2.6.1. Platform	15
2.6.2. Access	15
2.6.3. Function.....	16
2.6.4. Special Benefits or Limitations	16
2.7. On-line Data Entry and Display System.....	16
2.7.1. Platform	17
2.7.2. Access	17
2.7.3. Function.....	17
2.7.4. Special Benefits or Limitations	17
2.8. Information Problems and Issues.....	17
3. New System Requirements	21
3.1. System Level Requirements.....	22
3.2. Functional Requirements	23
3.2.1. System Access Requirements	24
3.2.2. Jobs.....	26
3.2.3. Training	28
3.2.4. Occupation	30
3.2.5. Supportive Service.....	32
3.3. Data Requirements	34

Planning for Expansion of the Automated Labor Exchange System (ALEX)

Existing Systems and New Requirements

1. Introduction

The Division of Employment and Training, in coordination and cooperation with the Office of Occupational and Labor Market Information, has undertaken a planning project to substantially improve the functionality of the ALEX system to support specific program objectives. The project involves three major activities:

- Describing what the manual and automated systems do today;
- Defining what the automated and manual systems should do in the future. These system requirements include support for the Office of Occupational and Labor Market Information, the State Occupational Information Coordinating Committee (SOICC), the Division of Vocational Rehabilitation, and other inter and intra departmental agencies; and
- Planning for the migration from the “as is” to the “to be” environment.

This report presents the results of the first two activities.

1.1. Overview

The Division of Employment and Training within the Delaware Department of Labor (DOL) contributes to the economic health of the state by “assisting individuals in developing skills and obtaining employment” and “coordinating and developing training programs that reflect employers’ needs”.¹ The first half of this mission is supported, in part, by the Division’s Automated Labor Exchange System (ALEX), which offers access to current job order information through a self-service workstation.

ALEX figures prominently in the strategic objectives of the Department. Employment and Training managers have developed plans to increase the use of the system as a marketing tool to attract and sustain employer and applicant participation in Employment and Training programs. Other plans envision an increase in the information and service delivery capacity of the Department of Labor through the installation of the system at a variety of public locations

¹Division of Employment and Training Strategic Plan - 1992

throughout the State. It is also believed that the value of the system to the DOL constituency and staff can be significantly increased if a number of existing system problems can be resolved or mitigated.

The purpose of this project is twofold. First, the requirements for a new ALEX system must be developed. These requirements will describe what the system should do to better support the Department's information, service delivery and marketing objectives while increasing the productivity of Department staff. Second, this project will produce a plan for the migration from the existing system to a system that accomplishes the new requirements.

1.2. Analysis Approach

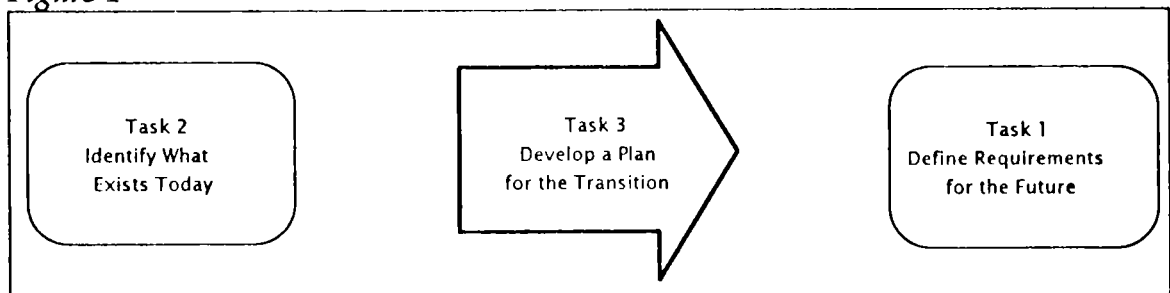
The purposes of the project are addressed through three distinct analyses. The first is an analysis of existing systems to document the ways in which information about occupations, employment opportunities, and skill development (training) resources are provided to DOL clients. This analysis describes the existing work flow associated with the provision of this information, the automated tools in place to support this function, and the problems with the existing systems.

The second analysis focuses on the requirements for a new, reengineered process that addresses limitations of the existing system while improving the value of the process for both clients and workers. This analysis describes the improved workflow and required automated tools, along with a model of the information required to perform the new process in an efficient and effective manner.

The final analysis provides a blueprint for the transition from the existing system to the new one. This blueprint identifies the steps required to create the new system, provides a timetable for the completion of each step, and provides an estimate of the resources required to carry out the plan.

The relationship between the three analyses is shown in Figure 1.

Figure 1



The analyses were conducted over a period of two months through a series of structured workshops conducted with DOL staff from the various Divisions. Individuals selected to participate on the work group represented a variety of experience and skill levels, ranging from hands-on experience as a employment and training worker, experience with the analytic and information systems of the Division, and experience in employment and training management and planning. As needed, these workshops were supplemented by individual interviews with experts in specific areas, and by a review of existing automated systems and system documentation.

The approach taken focused first on the definition of new system requirements. The philosophy was to start with a blank piece of paper to describe the new system in ideal terms, without reference to the current ways of doing work. The analysis focused on the needs of a client seeking job, occupation and training information and the "best" way of providing that information.

With a basic description of the new process, the analysis turned to the existing systems. This analysis introduced realistic constraints on the ideal system, and highlighted the gap between what was desired and what was in place in the organization today. The result of this task was a description of the existing system and a modification of the new system requirements to reflect what the work group felt was realistic and possible.

This report presents the results of the first two analyses. The existing system is described first, followed by the description of the new system requirements.

2. Existing Systems

The scope of this analysis includes all activities of the Department of Labor staff associated with the process of providing information to individuals about specific occupations, jobs available within those occupations, and training resources available to establish or increase skill levels required for specific types of employment. An overview of the work required to provide this information is shown in Figure 2.

Figure 2 - Client Information Search Overview

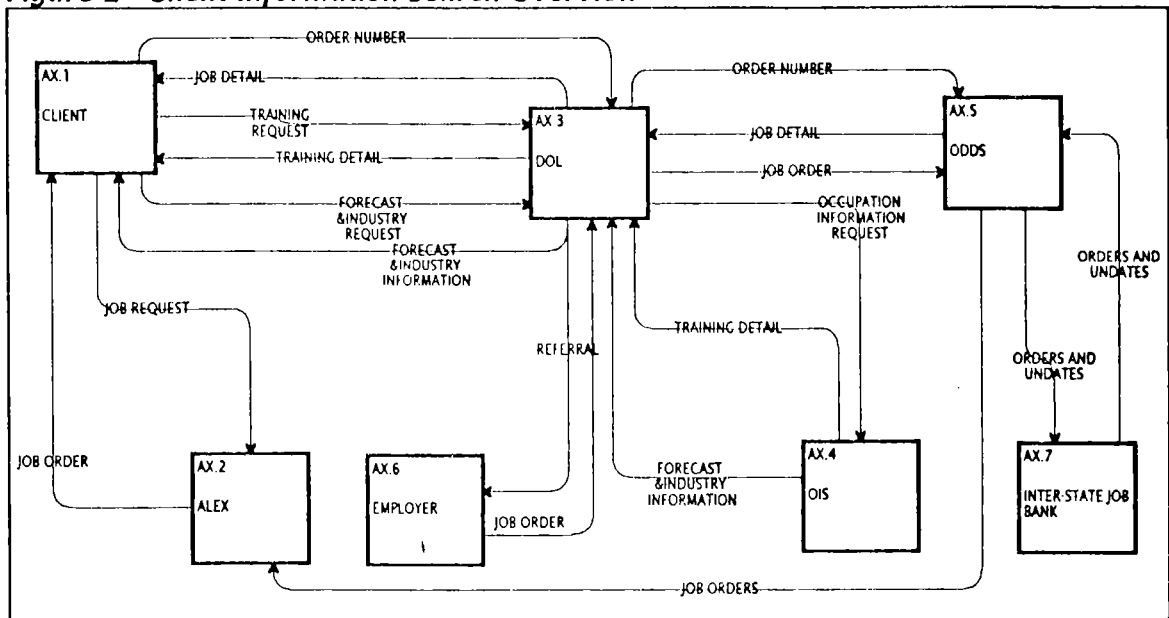


Figure 2 identifies the major actors and transactions within the target process. The primary actors are the counselors, clients and students needing information and the DOL staff that provide information, counseling and related services. These are supported by three systems: The Automated Labor Exchange System (ALEX), the Delaware Occupational Information System (OIS), and the On-line Data Display System (ODDS).

The following sections provide a description of the work performed in this process, and the systems in place or available to support this work. For each system, a description is provided for the hardware and software platform, the method of system access supported, the functions provided by the system, and current system benefits and limitations.

2.1. Job Search

The typical user is a client or student who is unemployed or facing unemployment, or seeking to obtain or change employment. Basic job order information may be obtained by the client by either using the ALEX self-service system and a self-directed job search or by using the services of DOL staff. If the ALEX system is used, the client is able to obtain all information required to follow-up on a job opportunity if the job is one within the Federal government. For all other opportunities, the client obtains a description of the opportunity and a job order number. The system does not provide detail on the employers name, address and telephone number. For further information on a particular opportunity and a referral for interview, the client presents the job order number to a counselor who retrieves the detailed job information from ODDS, satisfies inter-state Job Bank processing requirements, and ensures that the individual meets all the requirements of the job order. Finally, appropriate clients are referred to the employer. In lieu of ALEX, a job search may be initiated by an employment interviewer on behalf of the client.

2.2. Training Search

A second type of transaction involves a search for appropriate training. There are three major events that could initiate this type of search: A client or student may have identified a job of interest but believes that he or she needs specific training to qualify for the position; a client or student may have identified an occupation and is interested in general training that would qualify him or her for work in that occupation; or a client may have been evaluated by an employment interviewer or counselor and found to need basic job skills training before any referral can be made.

The Employment and Training interviewer or counselor obtains training information in a variety of ways. First the interviewer or counselor has access to the training notices and contract documents for training sponsored by the Department, with additional information and updates provided in regular staff briefings. Counselors who have received appropriate training may also obtain training information from the OIS, which contains a training database that is updated annually. Finally, interviewers and counselors may rely on their own knowledge and experience of existing training programs to make an appropriate training referral for a client.

2.3. Occupation Search

A final type of transaction involves a very broad search to find an occupation of interest. In this case, the client is searching for an occupation with certain characteristics, or one which is expected to have a relatively high rate of growth

in the labor market. Once an occupation is selected, a job search for existing opportunities may be initiated or a training search to qualify for the occupation may be initiated. As with the training search, occupation information is obtained from DOL staff.

Delaware OIS is the primary source of occupation information, including growth forecasts and description of industries employing specific occupations. This information may be obtained from reports generated by the Delaware Occupational Information Coordinating Committee (SOICC), or from direct access to OIS by DOL staff.

2.4. Automated Labor Exchange System

The Automated Labor Exchange (ALEX) System was developed through a cooperative effort between the Multi-State Job Bank Pilot Project (the six states in Federal ETA Region III: Delaware, Maryland, Pennsylvania, Washington D.C., Virginia and West Virginia) and the Interstate Job Bank of the Department of Labor and is the only DOL automated system directly accessible to clients.

2.4.1. Platform

ALEX is available to clients through terminals connected to a mainframe, microcomputer and keyboard, and PC touch screen. Mainframe ALEX is a CICS COBOL program using VSAM files. PC Keyboard ALEX was written in the C programming language. Touch screen ALEX was created using the authoring system Troubadour from Sparrowhawk Solutions, formerly available as InfoWindow Presentation System from IBM. This authoring system controls video, audio, graphics, and the touch screen. Like Keyboard ALEX, the Touch screen database search functions are implemented in C programming language.

2.4.2. Access

One of the major aims of ALEX is to be accessible and provide information directly to DOL clients. To serve that purpose ALEX is available at Job Service Offices, as well as at non-DOL sites.

2.4.3. Function

ALEX provides four menu choices representing different approaches to a job search. These menu options are:

Military Specialty: Access to the search by military specialty menu option begins with the entry of a military occupational code followed by the designation of the branch of service in which the client served and whether she/he was in the officer or enlisted ranks. From this point, the military specialty function operates in the same manner as the self directed search feature by providing a list by job code, the user designation of a geographic region, a listing of job orders, and the job description.

Job Codes: Entry of a nine-digit DOT job code permits the user to proceed directly to a geographic selection, followed by the same information presentation is the self-directed search.

Federal Job Opportunities: The client must make a selection from the 22 occupational categories presented. After a subsequent sub-category designation, specific information concerning this job title is displayed including a control number, job title, location, grade level, filing period, and an address for obtaining additional information and application forms. If the Senior Executive Service is selected as the initial occupational category, a geographic area must be designated, prior to the presentation of a job list by job title, city, state, salary, education and experience.

Self Directed: The self-directed job search begins with the user selecting a broad occupational category from a list of seven possible categories presented on screen. Multiple screens with ever more narrowly defined choices are displayed as the user makes succeeding choices. A listing of jobs ordered by job code and including the job title and number of available jobs is subsequently presented. The user must then select one of the displayed job code items and indicate the geographic region (Delaware, another state, regional, or national) for which he wishes to view jobs data. Ultimately, a list of job orders containing the job title, city, state, salary, education, and experience is provided. The client may also view a description of the job which, in addition to the information provided on the list screen, displays the job number, job code, hours worked per week, duration of the job, and a job summary.

Navigation within ALEX is limited to following the step-down menu or entering a letter to designate the desire to go back, restart a search, or end a process.

Differences between the mainframe, PC Keyboard, and Touch screen versions of ALEX include:

- Touch screen ALEX does not currently support search by SOC code.
- PC Keyboard and Touch screen ALEX both include administrative programs providing the ability to customize programs for use at different locations.
- Touch screen and PC Keyboard ALEX also both have the ability to display information of public interest stored in text files.

2.4.4. Special Benefits or Limitations

ALEX is directly accessible to clients and is available in PC Keyboard, Touch screen, and mainframe versions. This multiplicity of approaches provides flexibility in the use of ALEX according to the location in which ALEX is placed. Because ALEX is used independently by clients, job seekers are able to obtain information without the assistance of staff, thus conserving DOL resources for other activities.

The mainframe ALEX files are maintained and updated through daily electronic transfer of data between the participating states and the Inter-State Job Bank, with Delaware both receiving and transmitting data to the IJB.

Updating of the database on the PC and Touch screen versions of ALEX is more problematic.

2.5. Delaware Occupational Information System

The Delaware Occupational Information System (DEL-OIS) was developed by the Delaware Occupational Information Coordinating Committee (DOICC) under the National Occupational Information Coordinating Committee (NOICC).

DEL-OIS provides information on occupations and education/training which is specific to Delaware. The system compares Delaware occupational projections (labor demand) with vocational training program computees (labor supply), which allows educational and employment training planners and administrators to make decisions regarding program planning. OIS has been in pilot operations statewide over the past year in Delaware

Specific types of information available through DEL-OIS include:

Occupational Employment Projections, including the occupation title, code, base and projected employment, projected percent change in employment levels, and average annual openings due to growth and separations. Also provided is the number of students completing academic or vocational training programs and a narrative description of a specific occupational cluster.

Training Institutions and Programs, including which schools offer certain training programs, which programs are found in specified schools, and a listing of all schools based on geographic area.

Occupational/Industry Matrix - Search on OES Code, which displays the industries in Delaware that utilize a specified occupation and in what percentage and lists Delaware employers within a specific industry that employ a designated occupation.

Industry/Occupational Matrix - Search on Matrix Industry Code, which displays occupations within that industry and in what percentage, and the demand for each occupation.

Occupational Characteristics which matches certain occupations with a client's aptitudes and skills or displays skill and aptitude requirements for specified occupations.

2.5.1. Platform

DEL-OIS operates on a IBM PC platform running MS-DOS and requires about 12 MB of disk space.

2.5.2. Access

The information contained in DEL-OIS is currently directly accessible only to DOL staff and 25 pilot locations. The information on training, occupations, and industries could be a great benefit to clients and students were it independently accessible to them.

2.5.3. Function

DEL-OIS uses a step-down menuing system which is principally code-driven. The user enters either a code number or the title or key word to search for occupations and training programs. The purpose of the title or key word search is, however, solely to find out the code numbers needed for further access to the occupational information.

Codes used by DEL-OIS include:

- Classification of Instructional Programs (CIP) Code which is a six-digit number that identifies a specific training program offered in Delaware schools.
- Occupational Employment Statistics (OES) Matrix Code which is an eight-digit number representing specific Delaware occupations.
- Standard Industrial Classification (SIC) Code which is a three-digit number identifying a particular industry.
- Standard Occupational Classification (SOC) Code which is a four-digit code that clusters occupations into groups depending upon the type of work performed in those occupations.

Through the "Direct Access to Reports" menu selection, the user is able to access occupational employment projections, training program completers data, and the narrative analysis of the specified cluster. Access to the desired information can be made by the entry of a cluster code, OES code, or CIP code.

DEL-OIS users also have access to a "Selected Search" function which permits the entry of parameters for the variables of base employment, projected employment, average annual growth, average annual separations, annual

openings, and percent change in employment. A single variable or a combination of variables may be used in the search to create a customized listing which fits within the criteria specified for a particular search.

The "Listings - Training Institutions" menu option provides the user with a listing of schools offering a given training program, training programs offered by a given school, or schools in a given geographic area. Either a CIP or cluster code must be entered to specify the training program.

A specific county or statewide must be designated after choosing the "Occupational/Industry Matrix" menu function. Further access can only be gained by entry of an OES or cluster code. The user must also specify the percentage of employment to govern the display of industries in Delaware that employ at least the specified percent of the total number for that occupational group. The industries displayed are ordered by their SIC codes. Using the SIC codes, the user may also elect to request a list of employers. This listing will contain the employer name, address and number of employees.

The "Occupational Characteristics" selection supports the entry of specific values for general education development, training time, physical demands, environment, and aptitudes, and these values can be used alone or in conjunction with specified aptitude levels in order to display occupations which fit the specified criteria. The list of occupations is ordered by SOC code. Another activity supported by this menu choice is the comparison of aptitude and skill requirements of two or more occupations by entering the SOC codes of the occupations to be compared. The remaining activity provided under this menu selection is obtaining a description of an occupation by entry of its SOC code. The description provides both skill and aptitude indicators, as well as a brief, generic occupation narrative description.

While the DEL-OIS does have a Help function, it is only available from the menu screens. The Reference Files, which provide a complete alphabetical and numerical listing of the CIP, Cluster, OES, and SOC codes, are also accessible from the Main Menu. DEL-OIS gives the user the choice of having the results of his search displayed on the screen or printed to a printer.

2.5.4. Special Benefits or Limitations

While containing an impressive array of information, DEL-OIS is not particularly user friendly, nor does it provide flexible methods of access to data. The use of the step-down menus is time-consuming, and the entry of multiple types of codes is fairly complex. The use of function keys for special activities or the movement from one section of the program to related information in another section of DEL-OIS is not supported. The user must always return to the menu to initiate access to another type of data.

Data in DEL-OIS is updated annually except for some national data which may not be updated for 18 to 24 months. The accuracy of some data may be affected by the quality of responses to survey questionnaires, the need to extrapolate information from other data, and projection methodology.

2.6. State Training Inventory

The State Training Inventory (STI) system was developed by the National Occupational Information Coordinating Committee (NOICC)/State Occupational Information Coordinating Committees (SOICC) Network to provide state and local users with basic information on training institutions and the educational programs they offer in a given locale. STI was built using two existing resources, the Civilian Training Inventory (CIVTRAIN) and the Economic Development and Employer Planning System (EDEPS), as well as information obtained from state departments of education and labor.

States may choose their own training inventory area. A given version of STI may contain information for a single state or, more commonly, a region of states. The Delaware version of STI contains data from Delaware, Maryland, Pennsylvania, and New Jersey.

All information in STI can be presented for the entire region contained in the database or for a more specific region, such as a single state or a county within a state. Information provided by STI includes:

- Schools offering a specific training program
- Schools by geographic area
- Training programs offered by a specific school
- School profiles and program descriptions

The Delaware information contained in STI replicates data which is also available through the Delaware Occupational Information System (DEL-OIS).

2.6.1. Platform

The STI software is a compiled database management (dBase) system designed to operate on a microcomputer.

2.6.2. Access

This is a new system recently completed for the State of Delaware, and plans have not been made for general distribution of the software at this time.

2.6.3. Function

STI is a menu-driven system with menu choices being made by highlighting the selection. Function keys are also used for special functions, such as on-line help, printing, descriptions, and changing the region for which information is displayed. Unless the user chooses the function key approach, the menu steps down from broad areas of interest through submenus to increasingly specific information. STI refers to this method as the "funnel approach." Schools may be searched by geographic level, school type, and/or program. By using a function key, the user also has the option of searching for a region, program title, or school name through the entry of a key word. Two other methods of access are provided for program titles through the entry of a Classification of Instructional Programs (CIP) Code or a key word search for related occupational titles. Technically, the key word search matches the specified occupational key word entry with the OES Matrix titles and/or selected lay terms. These titles are then crosswalked to the CIP programs using the National Crosswalk and the National Units of Analysis.

The user has the opportunity to narrow the range of information which will be presented by indicating a desired region smaller than that of the whole database and by indicating for which types of schools information is desired.

Users have three options to print STI information: the current screen, an entire report, or to save a report to an ASCII data file.

2.6.4. Special Benefits or Limitations

The Delaware data in STI is a sub-set of the more comprehensive information contained in DEL-OIS. STI, however, is much easier to use than DEL-OIS and provides more than one means of access to information, according to the user's needs and level of expertise. STI also contains information in regard to neighboring states which might be of benefit to clients living near Delaware's borders.

The quality of the data contained in the database is dependent upon the quality of state data submitted to the NOICC/SOICC Network for inclusion in the program. Since STI is a new program, the timeliness and quality of revised information for updating the various STI state databases is unknown.

2.7. On-line Data Entry and Display System

The On-line Data Entry Display System (ODDS) is the primary management information system for the registration and tracking of DOL clients. The ODDS database contains a superset of the job order information used in the various

versions of ALEX, and is the data entry system for the capture of Delaware job information. ODDS was developed and is maintained by the Employment Security Institute of Kansas, in association with the Kansas Department of Human Resources.

2.7.1. Platform

ODDS is a mainframe CICS COBOL application residing on the DOL mainframe computer system.

2.7.2. Access

ODDS is available to DOL workers State-wide through a 3270 terminal network.

2.7.3. Function

ODDS is a full featured client tracking system. It supports collection and retrieval of applicant registration data, tracking of applicant referrals and services, and collection and retrieval of job order data (jobs and employers). The system also supports a variety of functions for case management, and support functions such as searches on the Dictionary of Occupational Titles (DOT).

2.7.4. Special Benefits or Limitations

ODDS provides satisfactory support for DOL case management activities and no changes are planned for this system as a result. A major benefit of the system is that it is developed and maintained as a packaged solution by an outside organization and is used by a number of employment and training agencies nationwide. For this reason, regular updates and maintenance are available to DOL at a reasonable cost. Because of this approach, the Department's ability to create custom functionality in the system is very limited, and any system (such as ALEX) that shares job order data must adhere to the ODDS data standards to ensure future compatibility.

2.8. Information Problems and Issues

Three general shortcomings have been identified in the current environment. These problems relate to fragmentation and redundancy of data, fragmentation of function, and inefficient processing. As with most organizations, the systems described in the previous sections were developed to address specific needs, without regard for the logical relationships that may exist between the work supported by the various systems. As a result, a request for information relating job, occupation and training information requires access to three separate systems, each with its own distinct user interface and conventions. For the user,

this also means that information must often be obtained from one system, written down, and then used as input into another system.

As shown in Figure 2, there is a need for DOL staff to locate and provide requested information to the user. This increases the time and effort required to complete a request.

In addition to these general problems, specific problems and constraints have been identified for particular types of information.

Jobs Information:

- Employer data should always be sanitized for presentation to clients in order to support tracking of the work performed under the employment and training program. Because Federal jobs are not sanitized, there are problems tracking results for clients seeking these positions. Sanitizing data means that it will continue to be necessary for client to identify a job order and then go to an interviewer for detailed employer address and telephone information. In the future, it may be possible to include complete information for selected jobs, but this must be addressed on a case-by-case basis. Future changes in the measures used by the Federal government to chart performance of DOL could also permit a freer exchange of information and a reduction of work for DOL staff.
- Only a percentage of the actual job openings in the state are included in the DOL systems. For the benefit of clients, there is a strong need to capture information from more employers. However, this creates additional workload for DOL staff as each listing must be individually reviewed and job/client matches sought, and there is currently insufficient capacity within the Division to handle the data entry load. The State of Delaware and the City of Wilmington regularly supply information on openings. This information is currently keyed in manually. The possibility of getting this information by electronic means, as well as data from other major employers, has been discussed and should be investigated.
- Job information is received from the Job Bank daily, Federal job information is received weekly, and Delaware jobs are batch-entered daily. Because of a need to continue to use current data sources and processing to maintain up-to-date databases, the data contained in these files represent a de-facto standard for all job information used by the Division. Any future systems must continue to use these standards.

Training:

- There is a need for better course descriptions and the ability to capture some eligibility criteria and information on target groups. Clients need to receive appropriate information on who to contact and where to obtain further information about training/education opportunities and whether they qualify for special programs. However, clients must be directed to workers able to assist them in regard to program eligibility, rather than the client directly contacting the school.
- There are some problems in maintaining a base of accurate and timely training information. Updated information is received annually through the Integrated Post secondary Education Data System (IPEDS) and through the State Department of Public Instruction; however, considerable follow-up activity to obtain all necessary data is required of SOICC staff. In addition, information needed from programs run by VocRehab and DHSS JOBS is not consistently collected.

Occupation Information:

- Occupation information is updated annually as estimates are developed and revised by the Department of Labor. It is currently available in the OIS system, and in paper reports issues by the Office of Occupational and Labor Market Information.

Forecast Information:

- Forecast (labor demand) information is updated annually, with some items which must be computed from national data on an 18 to 24 month cycle.
- For users, forecast information includes a narrative, growth rates in percentage and actual numbers, and average annual openings.

Industry Information:

- Industry information is obtained annually from projection data.
- Clients have an interest in knowing the number of available jobs by both occupation and industry.

Supportive Service Information:

- Supportive services are those services that enable individuals to search for work, attend job interviews and participate in training and education

activities. Such services could include child care, elder care, and transportation services, or services that provide eyeglasses, hearing aids or similar supportive items. Although this information is desirable from the perspective of both the client and the DOL staff worker, the information is not systematically available. Information available from the United Way Helpline and DHSS First Step program need to be available to DOL clients and staff.

3. New System Requirements

Department of Labor Project staff have developed a vision for a new, integrated automated system to support direct client access to jobs and training information which is presently fragmented and inaccessible for clients. This job and training information will be supplemented with related information about occupations, the job forecasts for these occupations, and the industries in which these occupations are employed. Finally, the new system will provide access to current information on services available throughout the state that support the job search process. The successful implementation of the system will produce a number of benefits including:

- Encouraging self-directed searches for information thus freeing DOL staff for more skilled and productive tasks;
- Assisting clients in achieving shorter periods of unemployment through the provision of more comprehensive information in a timely manner; and
- Reducing duplicative efforts.

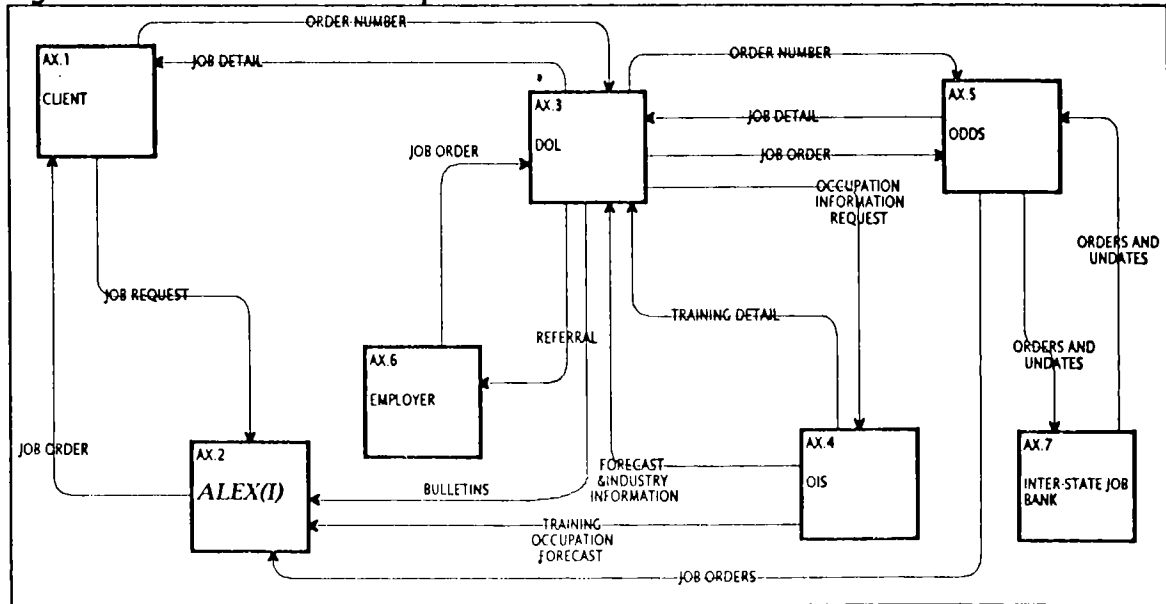
Figure 3 contains an overview of the client information search process in the new system. In comparison with the current system described in Figure 2, the new system will rely more heavily on a self-directed information search on the part of the client, and less on the intervention of DOL staff. Although it is not expected that DOL staff will be completely removed from the search process, a well designed system is expected to result in a significant reduction in staff support for the process.

The key characteristic of the new system is that all required information will be integrated into a single, easy to use application with natural and logical links between related pieces of information. The system will use the core functions of ALEX as a starting point, and will build on this core through the addition of a more intuitive interface, and the expansion of the ALEX database to include information about:

- Occupations,
- Training for specific occupations,
- Forecasts for job growth within occupations, and
- Services to support the job search process.

Because the new system will be an integrated version of the basic ALEX program, it has been renamed ALEX Integrated or "ALEXI".

Figure 3 - Automated Client Information Search



3.1. System Level Requirements

To ensure that the new system will be able to realize its expected benefits, the project team has identified a set of guiding principles to be applied to all system functions.

Integration of All Information

The system database must include natural linkages between all classes of ALEXI information. In addition to displaying information about a particular item such as a job, the system must also support access to related information, such as an occupation. For example, every job can be classified by occupation, and every occupation can be used to classify training programs. The data requirements in section 3.3. more fully describe the data integration requirements.

Object Action Orientation

Every client could potentially have a different purpose for using ALEXI. In addition each client may have his or her own way of thinking about the information in the system, and the way it should be used. For this reason, the system must minimize the use of menus to guide a user through the system and instead adopt an object action orientation. The implication of this orientation is that a client will be able to select any system object, such as a job, and be able to immediately retrieve any related information, such as a list of all the training available to develop skills for the job.

Intuitive Interface and System Instructions

To ensure that the system is used, it must be extremely easy to operate. To this end, the system must make extensive use of available technology to draw the user into the system and let them use it in a manner that is natural and logical for them. All system functions must be fully explained to the user through integrated documentation that can be requested at any point. This documentation must, where appropriate, be sensitive to the context of the actions being performed by the user at the point where documentation was requested. The existing multi-media ALEX should be used as a guide for developing the system interface.

Hard Copy Products

At any point, the user must be able to request and receive information on paper concerning any of the individual ALEXI items being examined. In addition to providing the contents of the ALEXI database for the item, the system should routinely provide guidance for what the user should do next, and where they can go to obtain additional information.

Adherence to Existing Data Standards

ALEXI will be an information retrieval system only, with updates to system data being supplied from the databases of other systems such as OIS, the DOL Delaware Job Bank, and the Inter-State Job Bank. In addition, the potential exists for other States to use ALEXI in a manner similar to Delaware. For this reason, the database design must be constrained by the data standards of these existing systems to ensure ease of update and future compatibility with changes in these systems.

3.2. Functional Requirements

The functional requirements identify more specifically what the system must do to support the retrieval and uses of ALEXI database information. Detail information is provided for the use of Job, Training and Occupation information. Not included is detail on Federal Job information, which is expected to work similarly to the current ALEX system. Throughout this section, prototype screen layouts are presented to more fully explain system functions. These layouts are included for communications purposes only, and are not to be construed as representing the look and feel of the ALEXI system.

3.2.1. System Access Requirements

Main Menu

The "main menu" is the interface presented to the user when they initiate use of the system. The main menu selections should be succinct, easily understood, and descriptive of the functions of the system. This is the "control panel" of ALEXI and provides a starting point. However, selected functions will also be directly accessible by "jumping to" them from another detail functions of the system.

System security will control access to two versions of the system. The first version will be the self-service version for DOL clients. This version will retrieve all information except data such as employer address or training contact that must be sanitized. The second version will be the DOL staff version which will permit access to all system functions and data.

MAIN MENU

1 - Jobs 2 - Occupations 3 - Federal Jobs 4 - Training 5 - Supportive Services 6 - Bulletins 7 - Survey Enter Selection:> F1=Selection Definitions
--

Access Screen: Once a client has made a selection on the Main Menu, the following entry options would be available before the client is presented with the "list boxes" of items such as are found on the Occupation and Job Screens. The system will include a means of counting the modes of access used by clients in order to establish which function is the most helpful to clients, and to plan for future improvements.

- Jobs: Upon selecting the Jobs option, the client will be given the option of entering a key word such as "nurse" or some portion or all of an OES, DOT or military MOS code. The jobs listed on the resulting job screen would be those meeting the client's entry specification.
- Occupation: Upon selecting the Occupations option, the client would have the opportunity to make a selection from the major OES categories or to enter as little as one digit or more up to the complete number of digits of the OES code. The occupations listed on the next screen (Occupation Screen) would be governed by whatever is entered on this screen.

- Federal Jobs: The screen presentation and ordering following menu selection remains the same as in the current ALEX system. There will be no access to the Federal jobs function except through the Main Menu.
- Training: Upon selecting the Training option the client would be presented with a screen supporting selection of training by school, location, or major OES category or a combination thereof.
- Supportive Services: Upon selecting the Supportive Services option the client would be presented with a screen supporting selection of services by type and geographic location.
- Bulletins: Another Main Menu option, Local Interest Bulletin, would provide site specific information which may have a very short time line. In addition to being a menu choice, the bulletin could be displayed on the screen, rather than the menu, whenever the machine has not been used for a period of time, thus immediately bringing the information to the client's attention before beginning his/her menu choices.
- Survey: A survey of clients using the system will also be available, but will not be required of clients using the system. "Survey" will be presented when the client asked for printed copies if the client has not previously completed the survey. Survey questions would help identify the demographics of system users and may include asking the client if he/she is a veteran or welfare recipient, his/her age group, and employment status.

Comparison with the current system:

Federal Jobs: Federal jobs will remain a separate menu item not linked to the other jobs/occupation functions. To include Federal jobs with all other jobs would require a weekly translation of data and would make Delaware's system significantly different than that being used by other states.

3.2.2. Jobs

Jobs Screen

The Job Screen will list actual job orders. Although there may be more than one job of a given type on a single job order, clients will not be expected to deal with the job order concept, but will be assured that at least one job of the title, location, salary, education, and experience listed is available.

- **Filtering:** A key requirement of list management used throughout the system is the ability to "filter" the list to focus on items of interest. When first presented, the Job Screen will always be prefiltered for Delaware as the location; however, clients can change this location to national, regional, or a single county in Delaware. Clients can use a text entry to further filter the Job Titles and Boolean searches (= / > / <) for salary, education and experience.

JOB SCREEN

	Job Title	City	State	Salary	Ed	Exp
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
	Title	Location		Salary	Ed	Exp
Choice:		DE				
F1=Help	F2=Return	F3=Occupation	F4=Training	F5=Information	F6=Support Serv.	
	F7=Backward	F8=Forward	F9=Industry	F10=Expand		

Actions available from the Jobs Screen:

- F1: Provides the client with explanation of how to use the list through filtering techniques and the purpose of each function key.
- F2: Returns the client to the previous screen.
- F3: Displays the Occupation Screen.
- F4: Presents the Training Screen, prefiltered for the occupation of this job.

- F5: Gives the client all specific information about this job order, including salary, job order number, and DOT code.
- F6: Provides direct access to the Supportive Services database.
- F7 and F8: Provides a means of navigation through the list when longer than that which can be contained on one screen.
- F9: Would provide the client with information about industries that would employ personnel in this job title.
- F10: If a code entry of more than one digit was entered on the previous screen, the client would have the opportunity to expand his or her search by dropping one digit of the code each time the function key is depressed. If the client entered only one digit of the code, no further expansion would be possible and a message to that effect would be displayed.

3.2.3. Training

Training Screen

The training screen will list actual training programs available in the State. Each item on the list will contain a program title which must be assigned a CIP code cross-referenced to OES, a location, the school type, such as secondary, which will be displayed to assist clients in selecting training appropriate to their educational and skills level, and identification of the school.

- Filtering: Clients would be able to filter the list of training programs by entering a key word/text entry for Program Title. The client would also have the opportunity to reduce the number of items listed by filtering on School Type, School, or location to include training programs state-wide Delaware (D), or by county (N,K,S), or All (A) to include programs in surrounding states.

TRAINING SCREEN

Program Title		Location	School Type	School
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
Title		Location	Type	School
Choice:				
F1=Help	F2=Return	F3=Jobs	F4=Occupation	F5=Information
	F7=Backward	F8=Forward		F6=Support Serv.

Actions available from the Training Screen:

- F1: Provides the client with explanation of how to use the list through filtering techniques and the purpose of each function key.
- F2: Returns the client to the previous screen.
- F3: Displays the Jobs Screen.

- F4: Presents the Occupation Screen, prefiltered for the occupations applicable to the training program.
- F5: Gives the client all specific information about this training program. In addition to the information about courses and schools, this action will also provide information about financial aid or free courses/training.
- F6: Provides direct access to the Supportive Services database.
- F7 and F8: Provides a means of navigation through the list when longer than that which can be contained on one screen.

3.2.4. Occupation

Occupation Screen

The Occupation Screen will provide a list of occupational titles associated with individual OES codes. While codes are necessary for system design and sorting, they are not necessary for client viewing and will not be displayed on the screen. In addition to the occupational title, the list will identify the number of available jobs for each occupation, calculated from job orders in the database, and growth rate for the occupation as a percentage.

- Filtering: Clients would be able to filter the list of occupations by Boolean searches on No. of Jobs and Growth, entering =/</> and a numeric entry to view only those occupations meeting the desired criteria. Occupation Titles could be further filtered by a key word/text entry. Although originally presented with all occupations of the type selected (A-all or national), the client would have the opportunity to reduce the number of items listed by filtering on location to include only occupations in the region (R), Delaware (D), or by county (N,K,S).

OCCUPATION SCREEN

01 02 03 04 05 06 07 08 09 10	Occupation Title		No. of Available Jobs		Growth	

Choice:		Occupation	No. Jobs		Growth	Location

F1=Help	F2=Return	F3=Jobs	F4=Training	F5=Information	F6=Support Serv.	
	F7=Backward	F8=Forward	F9=Industry	F10=Expand		

Function Keys:

- F1: Provides the client with explanation of how to use the list through filtering techniques and the purpose of each function key.
- F2: Returns the client to the previous screen.

- F3: In conjunction with a line item choice, presents the Job Screen.
- F4: Presents the Training Screen, prefiltered for this occupation.
- F5: Gives the client the OES Title, description, and forecast information. Forecast information will be displayed in terms of percentage and actual numbers, along with the average annual openings.
- F6: Provides direct access to the Supportive Services database.
- F7 and F8: Provides a means of navigation through the list when longer than that which can be contained on one screen.
- F9: Would provide the client with information about industries would employ personnel in this occupation.
- F10: If a code entry of more than one digit was entered on the previous screen, the client would have the opportunity to expand his search by dropping one digit of the code each time the function key is depressed. If the client entered an OES category or only one digit of the code, no further expansion would be possible and a message to that effect would be displayed.

3.2.5. Supportive Service

Requirements for the capture and display of supportive service information will be based on the capabilities of an existing service database, such as the Helpline database maintained by the United Way of Delaware. Since this database is still under development, and since the requirements will be driven by what is possible within that system, these requirements may be modified in the future. Unlike other information included in ALEXI, Supportive Services will have no logical links to other program data.

Supportive Service Screen

The Supportive Service Screen will provide information on a wide array of human services in Delaware. Included will be the service title, the location in which it operates, the type of service indicating the class of problem addressed by the service, and the agency providing the service.

- Filtering: Clients would be able to filter the list of services with a key word/text entry for Service Title. The client would also have the opportunity to reduce the number of items listed by filtering on Service Type, Agency, or location to include services provided state-wide Delaware (D), or by county (N,K,S).

Supportive Service

Service Title	Location	Service Type	Agency
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			
Title	Location	Type	Agency
Choice:			
F1=Help	F2=Return	F3=Jobs	F4=Occupation
	F7=Backward	F8=Forward	F5=Information
		F9=Training	

- F1: Provides the client with explanation of how to use the list through filtering techniques and the purpose of each function key.
- F2: Returns the client to the previous screen.

- F3: Displays the Jobs Screen.
- F4: Presents the Occupation Screen.
- F5: Gives the client all specific information about this particular service. At a minimum, this information will include a description of the service, information about fees and eligibility, and contact information for the agency.
- F7 and F8: Provides a means of navigation through the list when longer than that which can be contained on one screen.
- F9: Presents the Training Screen

3.3. Data Requirements

This section provides a description of the data requirements to support the new ALEXI process. The requirements are presented in two diagrams. Figure 4 contains a logical model of each object or "entity" required to support ALEXI functions. For each entity, a narrative description of the entity is provided, and the relationship between entities are identified. Figure 5 is a second view of the model contained in Figure 4, which identifies the individual items of information or "attributes" that will be maintained for each entity.

The model was developed first from the description of the functions to be supported by ALEXI. This modeling step identified the major entities and attributes. This model was then "normalized" to identify logical relationships and to ensure that redundant data was removed and that all data was related only to the unique entity identifiers. This step also produced the crosswalks or "associative entities" required to link related information. Finally, the model was checked against the databases of the existing system to ensure that the system requirements of adherence to data standards had been addressed. In all cases, the definitions of attributes are those defined in the source system. Table 1 identifies the primary modeling source for each entity.

Table 1 - Source of ALEXI Data

Entity	Source System
Occupation	Delaware OIS
Occupation Forecast	Delaware OIS
Job	Inter-State Job Bank/ODDS
Occupational Training	Delaware OIS/STI
Federal Job	Inter-State Job Bank/ODDS
Federal Address	Inter-State Job Bank/ODDS
Industry	Delaware OIS
Training	Delaware OIS/STI
Supportive Service	Delaware Helpline (Tentative)
Occupation Industry	Delaware OIS
DOT	Inter-State Job Bank/ODDS
DOT/OES	Inter-State Job Bank/ODDS
Military Occupation	Inter-State Job Bank/ODDS

Figure 4 - ALEXI Entity Definitions

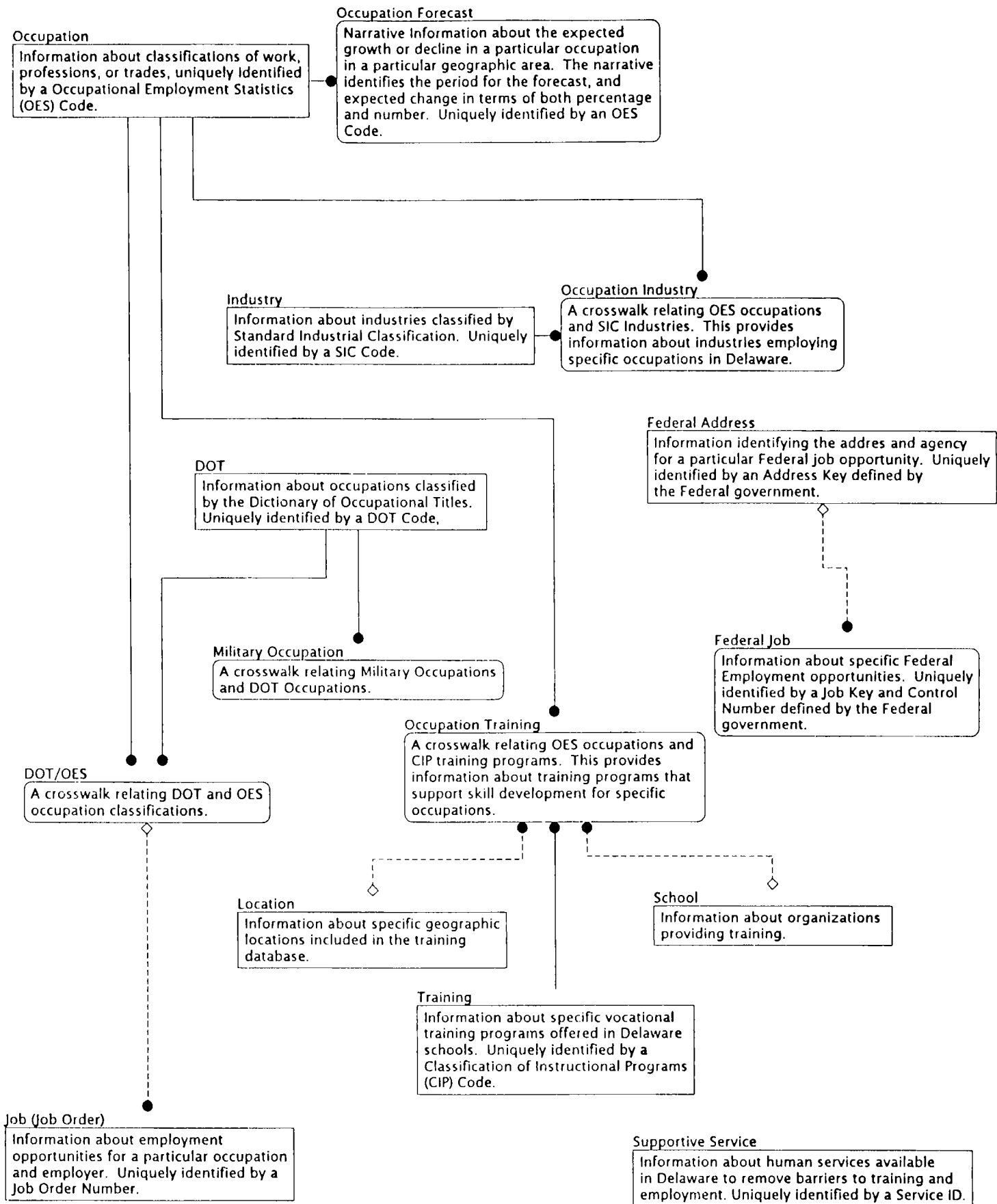
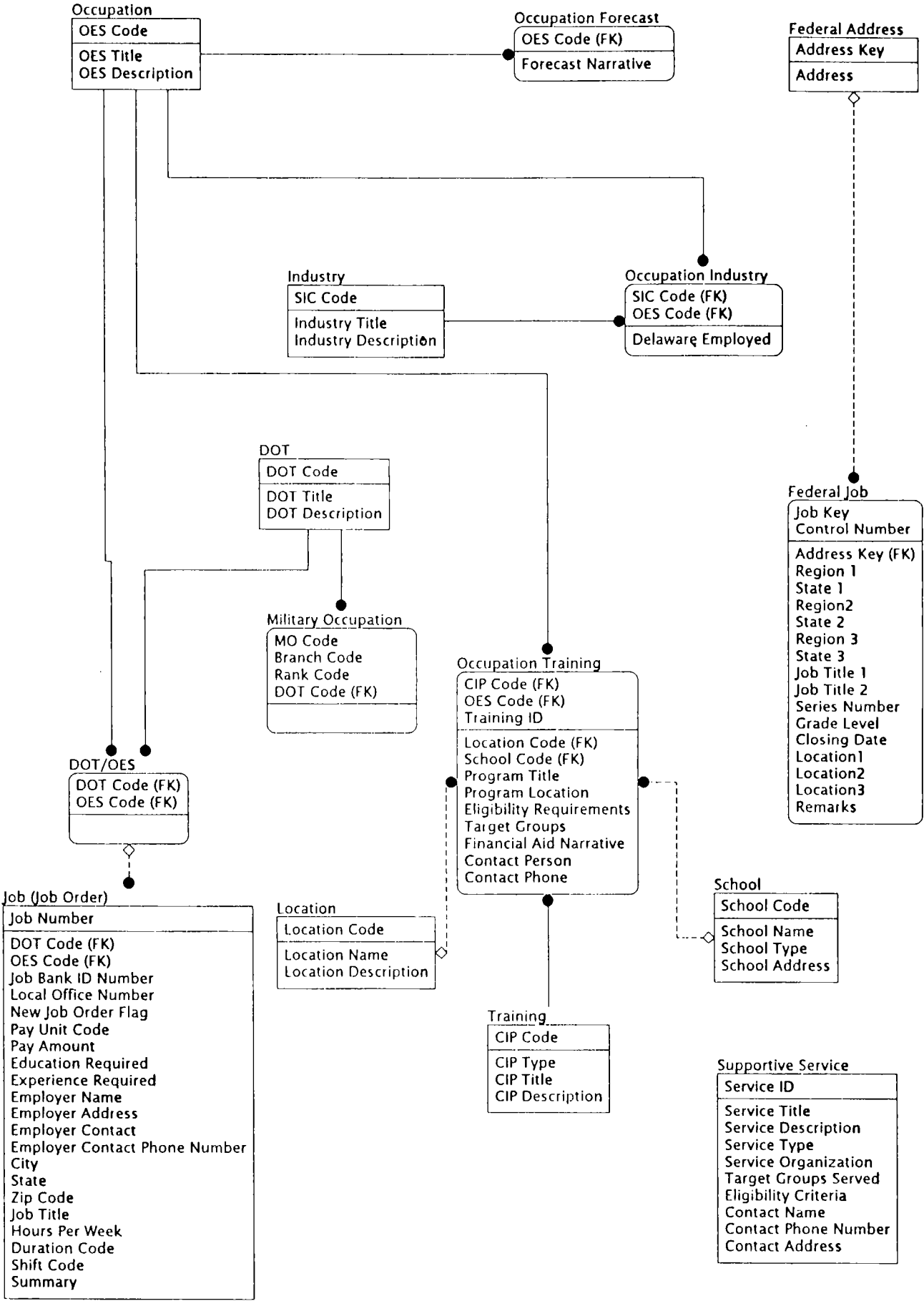


Figure 5 - ALEXI Entity Attributes



**STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF EMPLOYMENT AND TRAINING**

**JOB TRAINING 2000 INCENTIVE GRANT
PROJECT REPORT**

*Planning for the Expansion of the
Automated Labor Exchange System
(ALEX)*

Volume 2

Systems Development Plan

MARCH, 1993

The Job Training 2000 Incentive Grant which supported this project was funded by the U. S. Department of Labor, Employment and Training Administration under the authority of Title IV of the Job Training Partnership Act.

Planning for Expansion of the Automated Labor Exchange System (ALEX)

System Development Plan

Contents

1. Introduction	2
2. Overview	3
2.1. Design Considerations	4
2.2. Technical Approach	6
3. Development Methodology	7
4. Task Plan	8
4.1. Organization Phase	8
4.1.1. Organize the Project Team	8
4.1.2. Select the Technical Approach	8
4.1.3. Develop the Geographic Architecture	8
4.1.4. Establish the Development Environment	8
4.1.5. Provide Development Training	8
4.2. Development	9
4.2.1. Design ALEX Databases	9
4.2.2. Convert Existing Databases	9
4.2.3. Develop the Test Plan	9
4.2.4. Develop the ALEXI Application	9
4.2.5. Develop User Documentation and Help System	9
4.2.6. Conduct System Testing	9
4.3. Implementation	10
4.3.1. Develop Implementation Plan	10
4.3.2. Purchase and Install System Hardware and Software	10
4.3.3. Develop Operating Procedures	10
4.3.4. Conduct User Training	10
4.3.5. Initiate Pilot Operations	10
4.3.6. Evaluation Pilot Operations	10
4.3.7. Install System State-wide	10
5. Schedule	11
6. Budget	12
7. Next Steps	16

Planning for Expansion of the Automated Labor Exchange System (ALEX)

System Development Plan

1. Introduction

The Division of Employment and Training, in coordination and cooperation with the Office of Coordination of Occupational and Labor Market Information, has undertaken a planning project to substantially improve the functionality of the ALEX system to support specific program objectives. The project involves three major activities:

- Describing what the manual and automated systems do today;
- Defining what the automated and manual systems should do in the future. These system requirements include support for the Office of Occupational and Labor Market Information, the State Occupational Information Coordinating Committee (SOICC), the Division of Vocational Rehabilitation, and other inter and intra-departmental agencies; and
- Planning for the migration from the “as is” to the “to be” environment.

The results of the first two activities are summarized in the report on ALEX Existing Systems and New Requirements (Requirements Analysis). This report presents the results of the planning activity.

Section 2, **Overview**, provides a technical description of the new integrated system, ALEXI, as well as major design criteria. Section 3, **Development Methodology**, describes the development approach to be used to create the new system while Section 4, **Task Plan**, identifies the specific steps to be taken under this approach. Section 5, **Budget**, provides a labor and materials cost estimate for system development and Section 6, **Schedule**, describes the timing and sequencing for the task plan. The final section, Section 7, **Next Steps**, describes the immediate steps to be taken to proceed with ALEXI development.

2. Overview

Department of Labor project staff have developed a vision for a new, integrated automated system to support direct client access to jobs and training information which is presently fragmented and inaccessible for clients. This job and training information will be supplemented with related information about occupations, the job forecasts for these occupations, and the industries in which these occupations are employed. Finally, the new system will provide access to current information on services available throughout the state that support the job search process. The successful implementation of the system will produce a number of benefits including:

- Encouraging self-directed searches for employment and occupational information thus freeing DOL staff for more productive tasks;
- Assisting clients in achieving shorter periods of unemployment through the provision of more comprehensive information in a timely manner; and
- Reducing duplicative efforts.

The key characteristic of the new system is that all required information will be integrated into a single, easy to use application with natural and logical links between related pieces of information. The system will use the core functions of ALEX as a starting point, and will build on this core through the addition of a more intuitive interface, and the expansion of the ALEX database to include information about:

- Occupations,
- Training for specific occupations,
- Forecasts for job growth within occupations, and
- Services to support the job search process.

Because the new system will be an integrated version of the basic ALEX program, it has been renamed ALEX Integrated or "ALEXI". A full description of the functional and data requirements for ALEXI are contained in the system Requirements Analysis.

2.1. Design Considerations

To ensure that the new system will be able to realize its expected benefits, the project team has identified a set of guiding principles to be applied to all system functions.

Integration of All Information

The system database must include natural linkages between all classes of ALEXI information. In addition to displaying information about a particular item such as a specific job, the system must also support access to related information, such as occupational information. For example, every job can be linked to an occupation, and every occupation can be linked to training programs.

Object Action Orientation

Every client could potentially have a different purpose for using ALEXI. In addition each client may have his or her own way of thinking about the information in the system, and the way it should be used. For this reason, the system must minimize the use of menus to guide a user through the system and instead adopt an object action orientation. The implication of this orientation is that a client will be able to select any system object, such as a job, and be able to immediately retrieve any related information, such as a list of all the training available to develop skills for the job.

Intuitive Interface and System Instructions

To ensure that the system is used, it must be extremely easy to operate. To this end, the system must make extensive use of available technology to draw the user into the system and let them use it in a manner that is natural and logical for them. All system functions must be fully explained to the user through integrated documentation that can be requested at any point. This documentation must, where appropriate, be sensitive to the context of the actions being performed by the user at the point where documentation was

requested. The existing multi-media ALEX should be used as a guide for developing the system interface.

Hard Copy Products

At any point, the user must be able to request and receive information on paper concerning any of the individual ALEXI items being examined. In addition to providing the contents of the ALEXI database for the item, the system should routinely provide guidance for what the user should do next, and where they can go to obtain additional information.

Adherence to Existing Data Standards

ALEXI will be an information retrieval system only, with updates to system data being supplied from the databases of other systems such as OIS, the DOL Delaware Job Bank, and the Inter-State Job Bank. In addition, the potential exists for other States to use ALEXI in a manner similar to Delaware. For this reason, the database design must be constrained by the data standards of these existing systems to ensure ease of update and future compatibility with changes in these systems.

2.2. Technical Approach

ALEXI will be developed using a Microsoft Windows multimedia authoring system such as Authorware Professional for Windows¹ or Multimedia Toolbook². At a minimum, the multimedia functions will include an audio-video help system and an interface supporting both touch screen and mouse inputs. Where applicable, the interface will conform to the Windows design standards as documented in The Windows Interface, An Application Design Guide³.

ALEXI will be developed to operate on an IBM compatible multimedia PC that meets or exceeds the multimedia standards (MPC) developed by the Multimedia PC Marketing Council. The base hardware will include a 486/33 processor, 8MB of memory, a minimum 200MB hard drive, and a Super VGA non-interlaced monitor.

Support hardware such as sound and video output devices and the touch screen will be selected based on the support provided by the authoring tool. Because the use of sound and video will be limited, and because development and maintenance cost must be kept to a minimum, the PC hard disk will be used to store both sound and video in lieu of a CD-Rom.

A laser printer that meets current Hewlett Packard Laserjet standards will be used for all hard copy output associated with the ALEXI application.

ALEXI will use a relational database to store all ALEXI information. Although a SQL standard database is desirable, the database decision will be based on the capabilities of the authoring software.

ALEXI will be developed to operate both in stand-alone mode and as a client on the Banyan Network of the Department of Labor. ALEXI databases will be updated periodically from a central point for all network based

¹Authorware Incorporated

²Asymetrix Corporation

³Microsoft Press, Redmond Washington, 1992

implementations, and will be updated manually for all stand alone implementations.

A “hardened” kiosk will be designed and constructed to house and protect the ALEXI hardware when placed in general public access locations.

3. Development Methodology

For this project, an intensive, three-month period has been allocated for “rapid iterative development”. Using the products of the ALEXI requirements analysis, a development team comprised of technical staff, the DOL project manager and support staff from other agencies within the Department will develop an initial working prototype of the system. Following this, on approximately a weekly cycle, the system will be reviewed in detail by a larger project team through facilitated workshops of one or two days each. Immediately following these workshops, the development team will modify the system to incorporate all changes or enhancements identified by the team. This process will be repeated for twelve weeks. During this period, the system will evolve from a high-level working model to a fully functional application system through step-wise additions of system detail and function.

The key characteristics of this approach are extensive user involvement in the development process and the use of automated tools by well trained technicians. The focused involvement of key users is critical to the development of a quality system since these individuals are the best source of information about system requirements and are ultimately the best judge of how well an application meets their needs. Powerful tools and well trained technicians permit designs to be transformed into an application in a highly productive manner, with quick turn-around resulting in errors and problems being identified and resolved before they become unmanageable.

4. Task Plan

The task plan is organized into three major phases and eighteen tasks. the **Organization** phase is concerned with preparation for ALEXI development, the **Development** phase is concerned with the actual construction of the system, and the **Implementation** phase is concerned with placing the finished system into production.

4.1. Organization Phase

4.1.1. Organize the Project Team

This task will result in the selection of individuals to guide the project and participate in the development process. Included in this task are the procurement of any outside resources required for the project, the establishment of organizational and reporting responsibilities, and the creation of a project charter which summarizes all responsibilities and expectations.

4.1.2. Select the Technical Approach

This task involves the evaluation and selection of the hardware and software to be used for system development. To the extent possible, this software evaluation should include review of written evaluation in trade publications, contact with users of selected systems, and review of demonstration copies of the development software.

4.1.3. Develop the Geographic Architecture

This task will produce a graphic and narrative description of the hardware, software and communications systems needed to support ALEXI state-wide. The plan should identify both stand-alone and networked installations.

4.1.4. Establish the Development Environment

This task will result in the purchase and installation of the hardware and software tools required for the development of the system, as defined in task 4.1.2. At the conclusion of this task, all components will purchased, installed and tested.

4.1.5. Provide Development Training

Technical training in the use of the tools will be provided to all technical team members. This task will produce trained staff and the development of a small system using the tools to demonstrate basic capabilities.

4.2. Development

4.2.1. *Design ALEX Databases*

Using the data requirements as a starting point, this task will result in a fully normalized database for the ALEXI system. Using the database management system selected during task 4.1.2, the actual ALEXI database will be installed in the development environment.

4.2.2. *Convert Existing Databases*

This task will result in the development of programs and the conversion of data from the various stand alone systems to the integrated ALEXI database. Included in this task will be the manual collection of all new data specified in the database design that does not exist in current system databases, and final identification of the source for "supportive service" data.

4.2.3. *Develop the Test Plan*

The test plan will describe the criteria, testing process and individual test scenarios that will be used to demonstrate the successful completion of the system.

4.2.4. *Develop the ALEXI Application*

This task involves the iterative development of the ALEXI application by the project team. During this phase, the team will be committed a minimum of one day every two weeks for review of the evolving system. (See Section 3, Development Methodology).

4.2.5. *Develop User Documentation and Help System*

A dual-purpose document will be developed to serve as both paper and on-line documentation of the system, and the translation of the documentation into the audio-video help system. This product will also form the basis of the user training materials.

4.2.6. *Conduct System Testing*

At the completion of ALEXI development, the test plan will be executed with problems and errors being used for subsequent iterations of the development process.

4.3. Implementation

4.3.1. Develop Implementation Plan

This task will produce a detailed task plan for the pilot operations and the phased installation of system hardware, provision of user training, and software installation.

4.3.2. Purchase and Install System Hardware and Software

Under this task, hardware and software identified during task 4.1.3 will be purchased and installed in accordance with the implementation plan (4.3.1). All users will have network profiles, IDs, and access rights granted to the extent that they are not current network users.

4.3.3. Develop Operating Procedures

This task will result in the development of an operations manual that will provide guidance on systems administration, database management and problem resolution.

4.3.4. Conduct User Training

During this task, training materials will be finalized and all organizations/locations identified in task 4.1.3 will receive ALEXI system training.

4.3.5. Initiate Pilot Operations

Pilot operations at one site will be used as a final “shake-down of the system” prior to full operations. During this pilot, individuals from the project team will serve as ALEXI support staff for the pilot organization. Any problems or errors will be fed back into a final iteration of the development cycle.

4.3.6. Evaluation Pilot Operations

At the conclusion of the pilot, results will be evaluated and modifications to operating procedures and the implementation plan will be made accordingly.

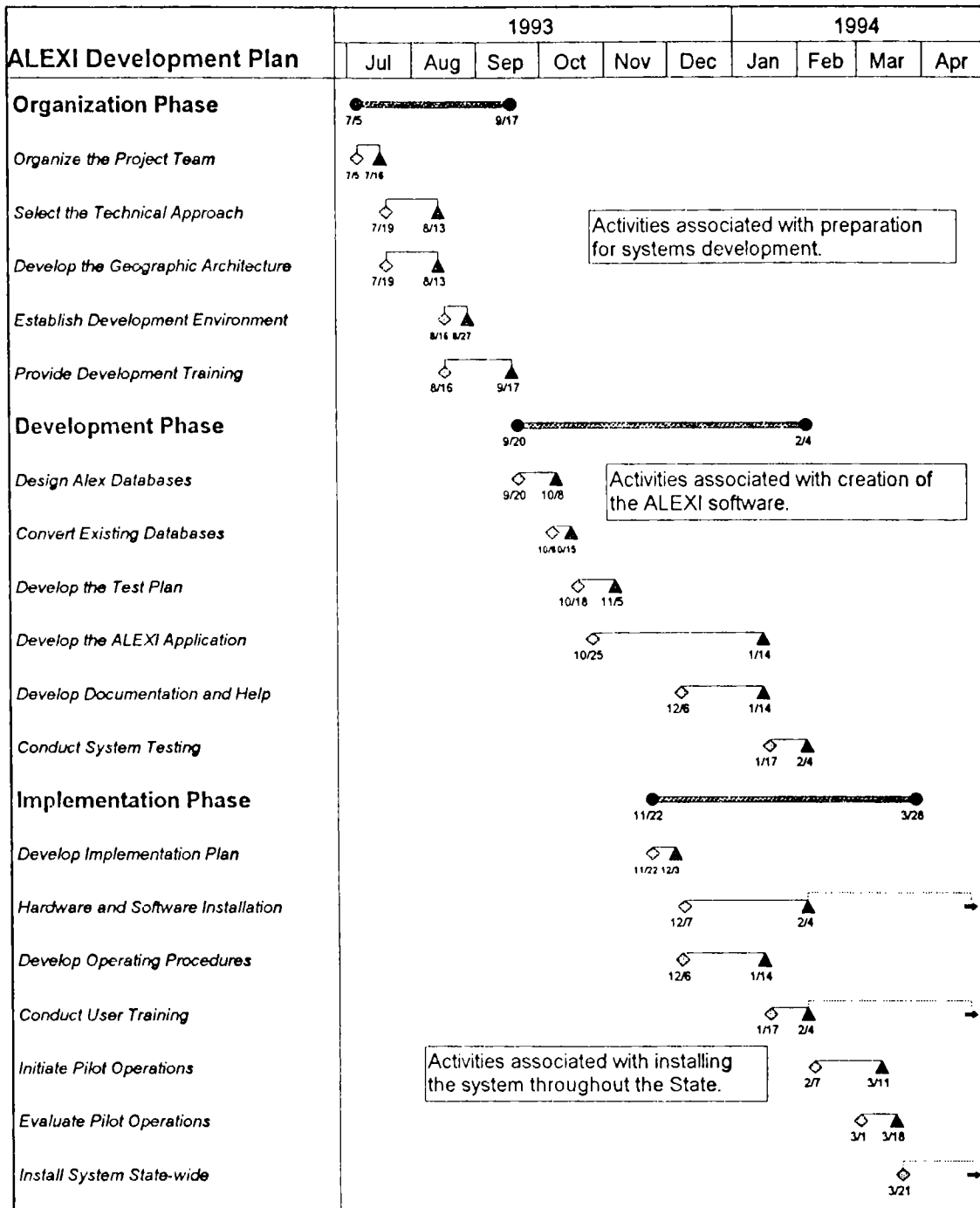
4.3.7. Install System State-wide

Upon presentation and acceptance of the pilot project evaluation, ALEXI will be installed state-wide in accordance with the final implementation plan.

5. Schedule

Figure 1 provides information on duration and sequencing for all tasks outlined in Section 5. The project is planned to begin on July 5, 1993, and end on March 21, 1994, spanning 49 weeks.

Figure 1 - ALEXI Project Schedule



6. Budget

Table 3 provides a labor day estimate, by labor category, of the effort to complete each task. In general, these should be viewed as conservative estimates for work performed by individuals with average skill levels and average previous experience with the development tools selected for ALEXI. As skill levels and experience increase, the labor day estimates would decrease and the schedule presented in Section 5 would be compressed.

Estimates are provided by labor category so that DOL may pick and choose those tasks which will be performed by Department staff, and those, if any, which will be performed by contract staff. For Department staff, the estimates provide a guide to the time commitment required. For contract staff, the estimates may be used for project budgeting. Table 1 provides a general description of each labor category, a range of contract rates, and an estimate of the cost of contracting for that labor category for the ALEXI project. It should also be noted that as skill levels increase, the rates charged by contract staff will tend toward the high side of the range. It is assumed that the project team and the systems administrator will be DOL staff. Descriptions for DOL staff participating in the ALEXI development project are shown in Table 2.

Table 1 - Labor Category Descriptions and Cost Estimates

Labor Category	Experience	Responsibility	Days	Rate Range	Cost Range
Project Management	10-20 years Systems management, analysis, design and development	Project planning, control and oversight, project team facilitation, problem resolution. Works in close coordination with the Systems Administrator.	39	\$600 to \$1000 per day	\$23,400 to \$39,000
Systems Analyst	5-15 years Systems analysis, design and development	Design coordination, design and project documentation, testing procedures and training. Works in close coordination with the programmer.	90	\$360 to \$800 per day	\$32,400 to \$72,000
Programmer	2-10 years Programming including Windows and C	Technical task management, tool selection, programming, testing;	112	\$280 to \$800 per day	\$31,360 to \$89,600
Network Administrator	2-10 years Network planning and management including Banyan, client-server and hardware.	Network and ALEXI hardware, software selection, installation, and maintenance	23	\$400 to \$800 per day	\$9,200 to \$18,400

Table 2 - Labor Category Descriptions for DOL Staff

Labor Category	Experience	Responsibility
Systems Administrator	10-20 years Program management, systems management.	User project management, review and approval of products, ALEXI production system management.
Project Team	Various Specific program knowledge and expertise, program management.	Review and approval of products, participation in design and development decisions, system acceptance testing.

Hardware and Software Costs

In addition to direct labor costs, ALEXI will require specific hardware and software purchases. Estimates for the development software, development hardware, and workstation hardware are shown in the following table:

<u>Kiosk Hardware</u>	<u>Cost</u>
Computer	\$2,699
Basis: Dell 433/M. i486 DX 33, 8MB RAM, 170 MB HD, SVGA	
Touch Screen	\$895
Basis: Visage Corporation TouchMate	
Multimedia	\$875
Basis: NEC Multimedia Gallery: Soundboard, CD-ROM, Speakers, Cables, Software	
Printer	
Basis: Texas Instruments MicroLaser Plus	\$899
Total:	\$5,368
<u>Development Hardware</u>	<u>Cost</u>
As above, with addition of 300MB Hard Disk and i486 DX 66 processor	\$5,768
<u>Development Software Examples</u>	<u>Cost</u>
Authorware Professional for Windows	\$8,000
IconAuthor	\$4,995
Multimedia ToolBook	\$695

Other costs of ALEXI which cannot be accurately estimated at this time include:

- Training costs for the development software. This is sometimes included in higher price tools and may be unnecessary if programming staff with required skills are used.

Table 3 - Labor and Labor Day Estimates by Task

ID	Task	Dates		Duration		Labor Categories						Notes
		Start	End	Days	Weeks	Project Management	Systems Analyst	Programmer	Network Administrator	System Administrator	Project Team	
	Organization Phase	7/5/93	9/17/93	55	11							
4.1.1	Organize the Project Team	7/5/93	7/16/93	10	2	3	1	1	1	3	1	Excludes contractor procurement activity.
4.1.2	Select the Technical Approach	7/19/93	8/13/93	20	4	1	5	5		1		
4.1.3	Develop the Geographic Architecture	7/19/93	8/13/93	20	4	0.5			6	0.5		
4.1.4	Establish Development Environment	8/16/93	8/27/93	10	2	0.5	1	5	1	0.5		Includes 5 days training and 15 with tools. Project Team Review on all work products.
4.1.5	Provide Development Training	8/16/93	9/17/93	25	5		5	15				
	Project Meetings					5	5			5	5	
	Total:					10	17	26	8	10	6	
	Development Phase	9/20/93	2/4/94	100	20							
4.2.1	Design Alex Databases	9/20/93	10/8/93	15	3	1	5	5		1		Project Team Review on all work products.
4.2.2	Convert Existing Databases	10/6/93	10/15/93	8	2	0	1	5				
4.2.3	Develop the Test Plan	10/18/93	11/5/93	15	3	0.5	5	5	1			
4.2.4	Develop the ALEXI Application	10/25/93	1/14/94	60	12	5	12	60		5		
4.2.5	Develop Documentation and Help	12/6/93	1/14/94	30	6	0.5	15			1		
4.2.6	Conduct System Testing	1/17/94	2/4/94	15	3	2	5	5	2	2	5	
	Project Meetings					10	10			10	10	
	Total:					19	53	80	3	19	15	
	Implementation Phase	11/22/93	3/28/94	91	18							
4.3.1	Develop Implementation Plan	11/22/93	12/3/93	10	2	2	6		2	2		Includes pilot installation only.
4.3.2	Hardware and Software Installation	12/7/93	2/4/94	44	9	0.5			8	0.5		
4.3.3	Develop Operating Procedures	12/6/93	1/14/94	30	6	1	5			5		Includes pilot installation only.
4.3.4	Conduct User Training	1/17/94	2/4/94	15	3		1	1	1	0.5		
4.3.5	Initiate Pilot Operations	2/7/93	3/11/93	24	5	1	2	5	1	5	5	Depends on Implementation Plan Project Team Review on all work products.
4.3.6	Evaluate Pilot Operations	3/1/94	3/18/94	14	3	1	2			1	1	
4.3.7	Install System State-wide	3/21/94	4/24/94	25	5							
	Project Meetings					4	4			4	4	
	Total:					9.5	20	6	12	18	10	
	Total for All Tasks:					39	90	112	23	47	31	

- Database software and tools if required by the development software.
- Development software runtime modules. This is included royalty free with certain tools, minimal cost in others.
- Costs for demonstration or evaluation copies of development software.
- Network adapters and cabling for Banyan workstations. This is within the existing network expansion plans of the Department.
- Duplication and binding of manuals and presentation materials.

The primary cost driver for the development of ALEXI is the tool selected for systems development and the skill of the individual using the tool. The combination of a skilled user and a powerful tool will reduce the development time, thereby cutting programming cost, the number of days spent in development workshops, the time devoted to problem resolution, and the need for extensive project management. For this reason, the project cost and schedule should be reevaluated at the conclusion of the Organization Phase of the project to determine if adjustments are required or possible.

7. Next Steps

With the completion of this plan, the work of the ALEXI project will move into a presentation and discussion phase in order to educate managers at the State and Federal levels of government about the project, and to begin a search for possible funding sources. To this end, the existing project team will:

- Develop presentation and briefing materials to communicate decisions made and plans developed through this project;
- Present the concepts developed for ALEXI to the management and staff of the Department of Labor in order to gain broad-based support for the effort;
- Schedule and conduct a briefing with National Occupational Information Coordinating Committee (NOICC) in an effort to gain project support and financing;
- Continue to monitor and promote the Department's "Automation Grant", which is critical to building the network infrastructure needed to make ALEXI a reality throughout the State.

In addition, the Department will begin work on the Organizational Phase tasks in an effort to maintain the momentum and commitment for ALEX expansion that has been established within the organization, and to smoothly transition to ALEXI systems development once development resources have been obtained.

