

The Web-Based HEAP Application

By

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the Degree of Bachelor of Science
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Abstract

The HEAP office, a State of Ohio agency, gives energy assistance to poverty stricken people of the State of Ohio. The poverty stricken people, clients, apply for assistance through the HEAP application. Clients must be tracked and approved for assistance by the HEAP office. The Web-Based HEAP Application is designed as a client intake and tracking system for the HEAP office. The current intake for the HEAP office is done in many locations throughout the State of Ohio and is not centralized. This causes many complications for the clients and State employees. The State of Ohio's HEAP office commissioned this change in the way they intake their clients. The Web-Based Application was created to provide a central point of intake and tracking of client data. The site will be easy to maintain for staff, gather important information about clients, and increase the level of service provided by the State of Ohio.

The Web-Based HEAP Application

1. Statement of the Problem

There are fifty-two Community Action Agencies (CAAs) in the State of Ohio (1). There are six different software vendors for them. Ohio pays a maintenance fee to these software companies regularly. Each change that might be requested by the State or Agency to their current software costs money. Ohio didn't have a central database system that Community Action Agencies could connect to via the Web. In several discussions in January-March 2003 with Don Skaggs, Manager of Research and Planning, I discovered that Ohio is trying to implement a web-based application. Because of other projects, however, Ohio wasn't able to get a consultant to come in and create the system. I also learned that the state completed a request for proposal (RFP). This request contained some of the recommendations for the web-based project:

- It should be user-friendly. Since the people that will enter the applications are most likely temporary employees or those with little computer experience.
- It should have a central database backend. One of the major goals of this project is to have the central database. It makes data collection easier.
- Since all Community Action Agencies are located all over the state the application will need to be on the web.
- The application contains private information of the applicant so it must have security.
- The agencies currently do reporting for their own use, so this system must continue to allow agencies the access to do reporting of their own data.
- Internet connections aren't always reliable, so the system must be able to be used offline.

- When the system is offline the data must be collected locally then sent to central database as a batch file when connection is restored.
- Since users are typing data in text boxes, due to human error, there must be validations put in place before data is sent to database.

A central database complete with data entry capabilities and reports to support capture of common information found on the Home Energy Assistance Program (HEAP) application, as well as the capability to expand and add new programs (i.e., Community Service Block Grant) to the system. This central database serves as the hub for the various assistance program modules that will provide program specific functions and reports to complete the web-based system (2).

2. Description of Solution

This application creates an Internet based system for temporary office workers to enter Home Energy Assistance Program (HEAP) applications into a real-time central database. The core of this application is a relational database. The database can permanently retain all applications entered in system. The archived data can be recalled for viewing and printing various reports. HEAP Intake operates in a multi-user network environment.

There are two main elements to this Web application, the database and the Internet based user interface. The user interface is the front end to the database. Temporary office staff will enter all HEAP applications into the database through the user interface. The database validates all applicants' information and stores a permanent record. Other software applications may access the database and retrieve these records.

2.1 User Profiles

Intake Workers

The intake workers are primary users of the application. Their function will be to enter all applicants' information into the database.

Intake workers are seasonal employees. Very few intake workers return for another season to work in the HEAP office. These employees are hired through a temporary agency so most are not skilled in computers. The Intake workers go through two weeks of training in order to use the system properly.

Application Reviewer

An application reviewer's job is to review the Intake workers' applications to confirm the information is being entered correctly. They will have the power to change the data in the database.

The application reviewers are one step above the Intake workers. The reviewers are permanent employees of the State of Ohio. They are moderately skilled computer users and are capable of doing any editing of the system. The reviewers are the immediate supervisors of the intake workers.

Case Review

A case review worker's job is to correct errors that make it past the original validations. They also may call the applicant to get correct and current data. They will have the power to change and update the data in the database.

The case review users are permanent employees of the State of Ohio. They are moderate computer users and have the ability to perform their function. Case review users are experienced computer users.

Administrators

An administrator's job is to manage users, tables, and the system. They will have every power granted by the system. There will be at most three administrators and all administrators will be employees of the State of Ohio. They are expert computer users who are currently database analysts in the office.

2.2 Screen Design

Login Page

The first page of the application will be the login page. Each user will have a logon name and password. It will have two text boxes and a enter button. The Home Energy Assistance Program logo will be at the top of the login page.

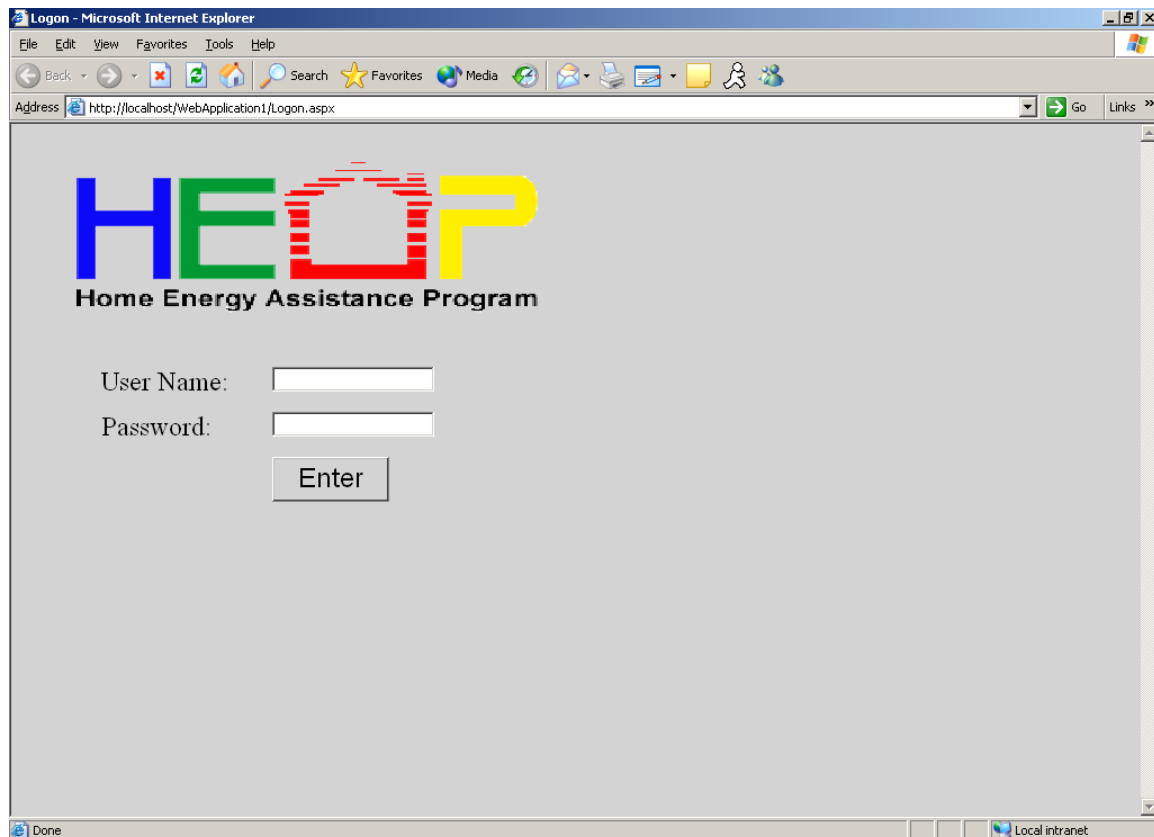


Figure 1: The Log in Page

Page 1

On the second page the user will be given a choice of whether they are entering in a new application, edit or review an application, and/or check for duplicate social security numbers. There will be five buttons on this page for the user to choose from. A list box will also be located on this page so multiple dependent social security numbers can be check for duplicates at once.

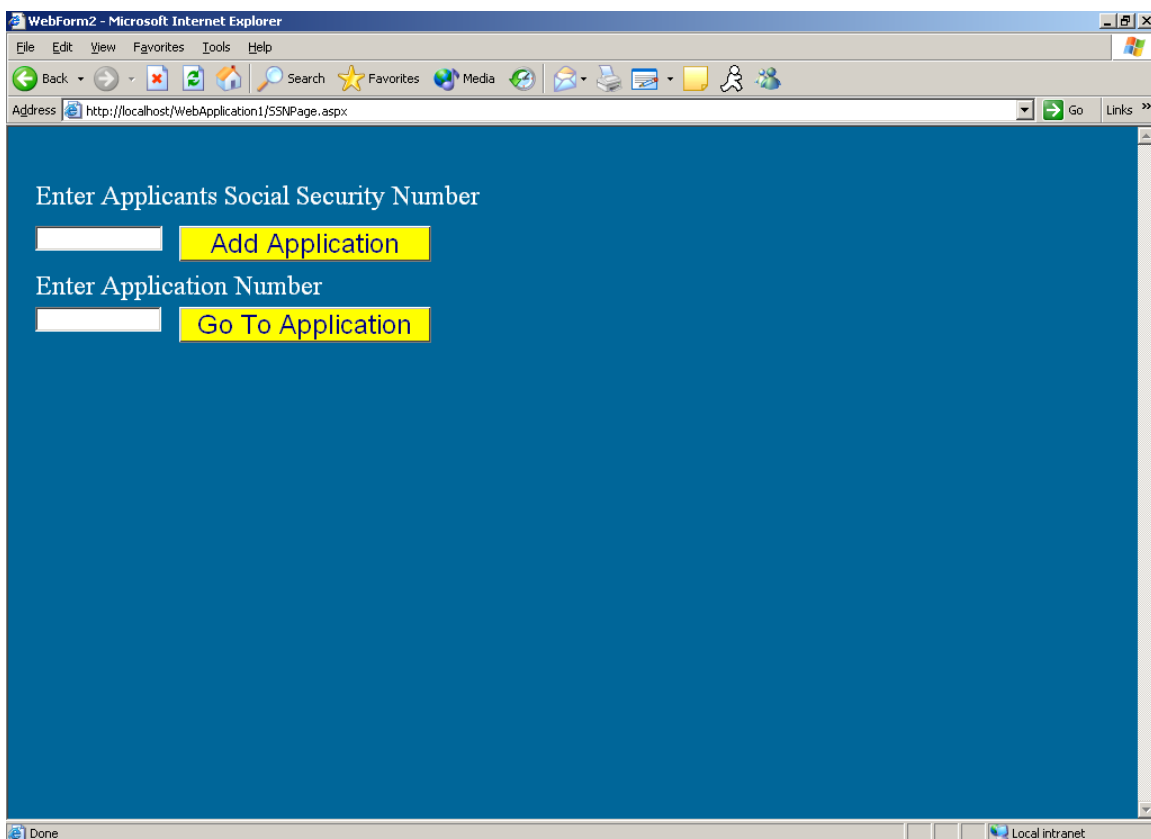


Figure 2: Page 1 of Application

Main Section

This section will have all the rest of the fields from the application ([Application](#)). Each applicant will be given a batch number for tracking. All fields in this section will have validation checks. Once the user fills in all of the fields

they may press submit to send the data to the database. Once data is sent the GUI will return to page 1 of entering a new application.

At any moment the user may log off. However, if they do not submit the record it will not be recorded in the database.

WebForm2 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address http://localhost/WebApplication1/Page1.aspx Go Links

Page 1 Page 2 Page 3 Page 4 Page 5

First Name

Middle Initial

Last Name

Social Security Number 465456456

Mailing Address

Street Number Street 1st Directional Street Name

Street Suffix Street 2nd Directional Apartment Number City

Zip Code County Adams

Phone Number

Date-of-Birth

Service Address

Street Number Street 1st Directional Street Name

Street Suffix Street 2nd Directional Apartment Number City

Zip Code County Adams

Done

Start My Documents FinalReport.doc - Micros... WebApplication1 - Micros... WebForm2 - Microsof... Local intranet 8:42 PM

Figure 3: Page 1 (Main Section)

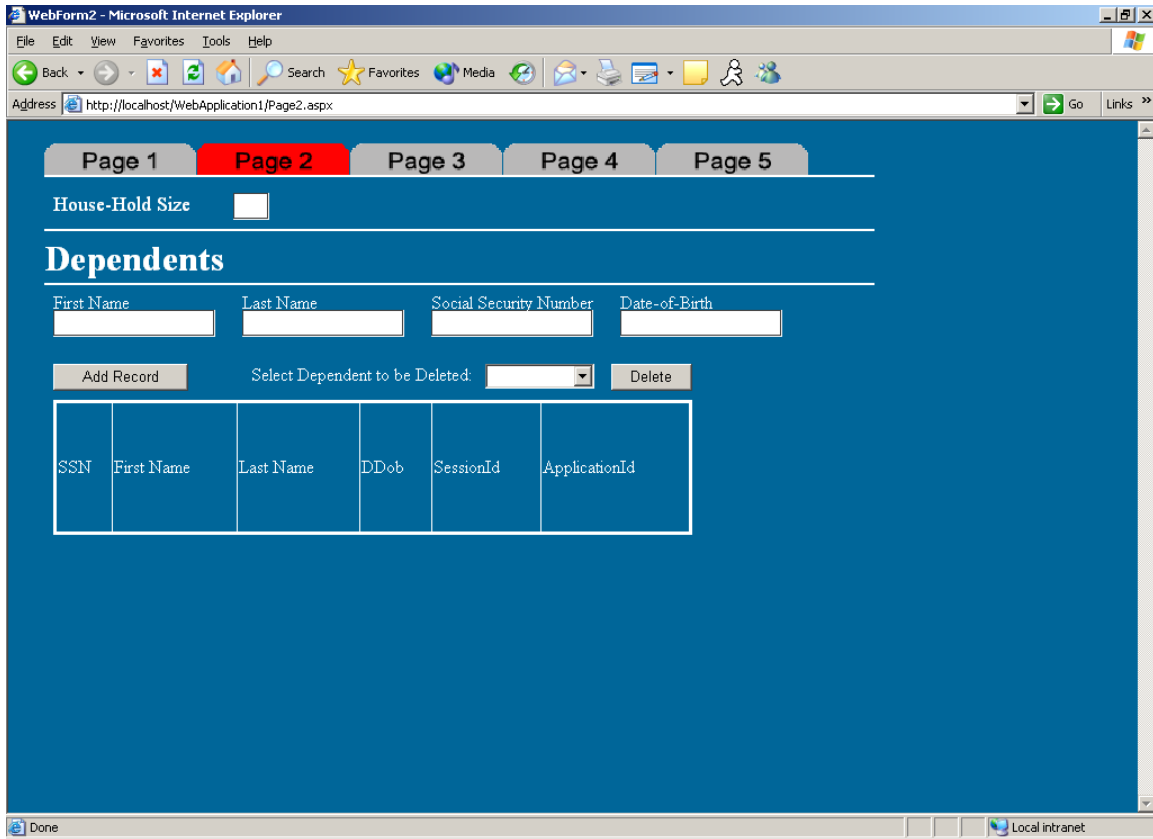


Figure 4: Page 2 (Main Section)

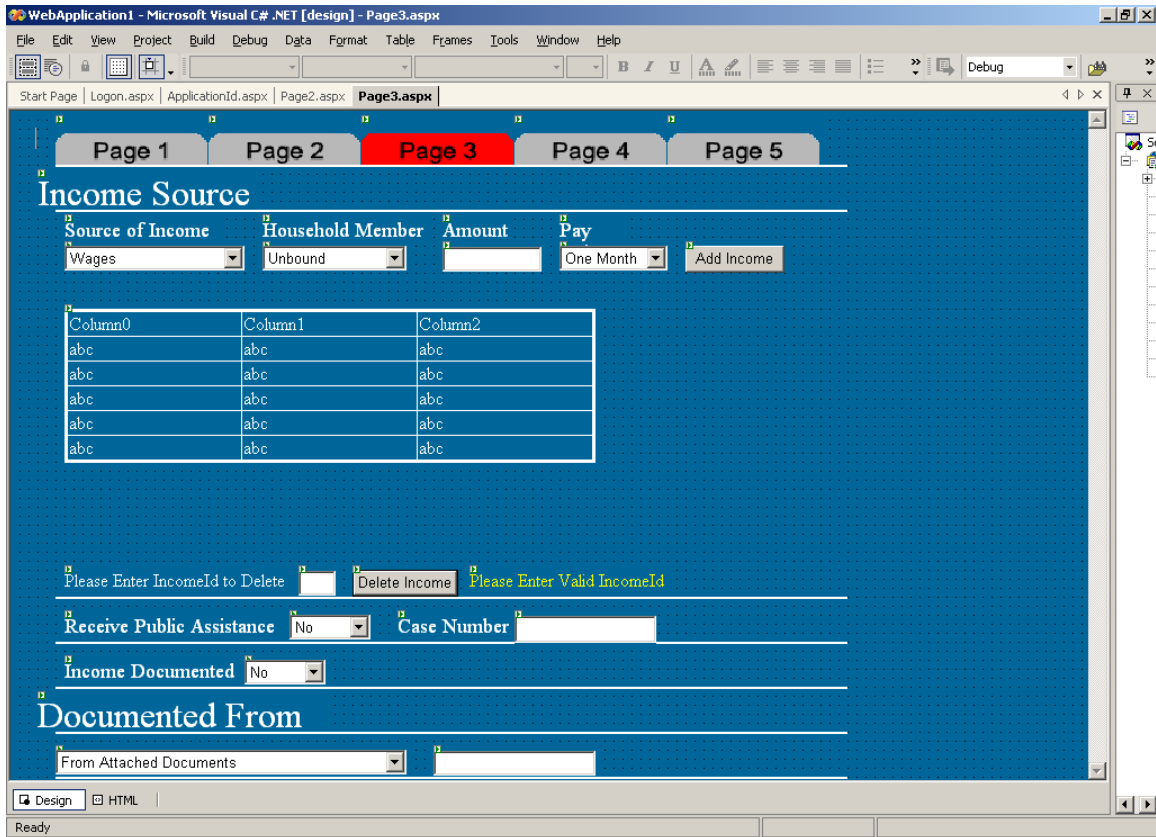


Figure 5: Page 3 (Main Section)

Page 4 - Microsoft Internet Explorer

Address: http://localhost/WebApplication1/Page4.aspx

Page 1 Page 2 Page 3 **Page 4** Page 5

Citizen of another country Permanent Status
Temporary Status

Number of Native Americans Number of Migrant Farm Workers
Number of Disabled Disability Documentation

Weatherization Services

Programs

Utility Weatherization Program USF Targeted Program
Home Weatherization Assistance Program Other
Govt Rehabilitation Program

Would you like to apply for Weatherization Services?

Do you Rent or Own your home?

Landlord Name
Address:
Phone Number

Roomer Subsidized Housing

Type of Building

Done Local intranet

Figure 6: Page 4 (Main Section)

Page 5 - Microsoft Internet Explorer

Address: http://localhost/WebApplication1/Page5.aspx

Page 1 Page 2 Page 3 Page 4 Page 5

Heat Source Code

Fuel Type Documentation Provided

Documentation Form:

From Attached Documents From Last Year's File

From Phone Calls Date Contacted

From Utility Verification Company Contacted

Account Number Found?

Main Heating Source

Pip Enrolled

Vendor Code

Account #

Heat Cost in Rent

Different Last Name

Shared Heat Meter

Electric

Pip Enrolled

Vendor Code

Account #

Heat Cost in Rent

Different Last Name

Shared Heat Meter

Submit or Save Application

Done Local intranet

Figure 7: Page 5 (Main Section)

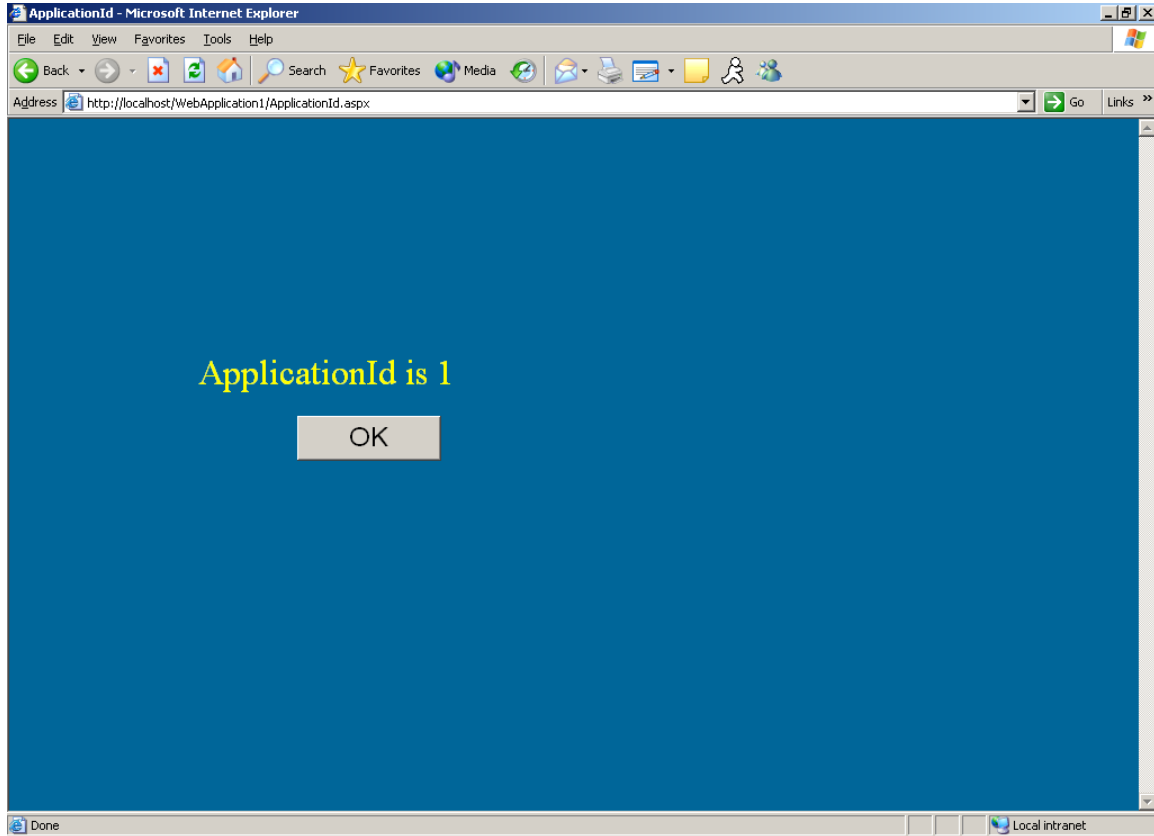


Figure 8: Application Id Page (Main Section)

Database Design

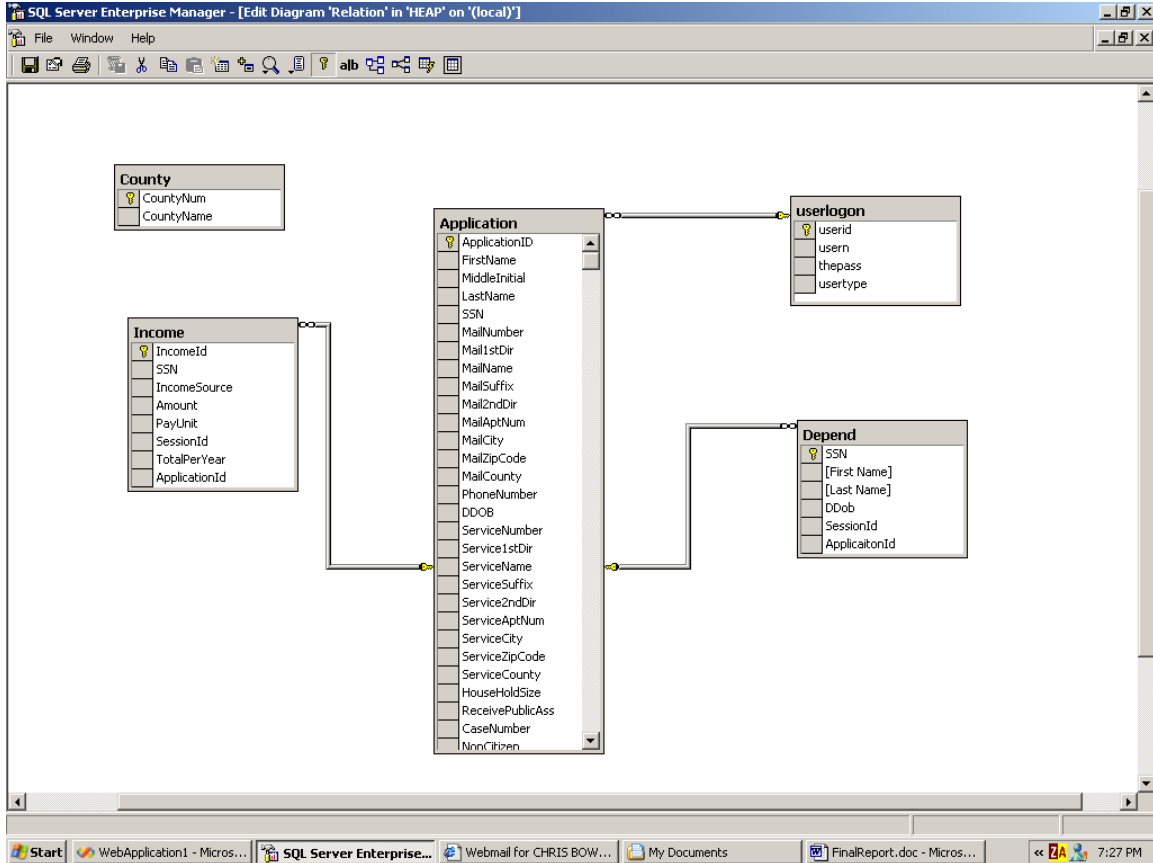


Figure 9: Database Relationship Diagram

3. Deliverables

1. A Web based system with client intake and tracking.
2. The GUI will be written in C# and ASP to allow for future expansion.
3. The GUI is written in C# and ASP to communicate with database.
4. The administrator will be able to create new accounts.
5. Users will have a secure login authenticated by the database.
6. Users will be able to complete the following tasks:
 - a. Input Applicant information into the database
 - b. Review data already in database

- c. Change data already in database

4. Design and Development

4.1 Timeline

Senior Design I Spring 2003

- Gathered Information – April 2003
- Sketched design of database – May 2003
- Sketched design of GUI – May 2003
- Proposal – June 2003
- Begin creating database – June-September 2003

Senior Design II Fall 2003

- Finish creating database – September 2003
- Begin creating GUI – October 2003
- Design Freeze – November 2003
- Created prototype – November 2003
- Demonstrated working prototype – December 2003
-

Senior Design III Winter 2004

- Begin testing of prototype – December 2003
- Finalized testing and final product – February 2003
- Submitted final report – March 2003
- Demonstrated final product – March 2003

4.2 Budget

Item	Cost
Microsoft Visual Studio .Net*	\$ 1,079
SQL Server 2000 Dev. Edition*	\$ 50
Web Server**	\$ 2,000
Client Machine**	\$ 1,200
Total	\$ 4,329

*Prices found at Microsoft.com

**Prices found at Gateway.com

4.3 Software and Hardware Requirements

Hardware

- SQL Server Database
- IIS Web server
- Client machines with internet access

Software

- SQL Server 2000
- Microsoft Visual Studio .Net
- Internet Explorer 6.0+

5. Proof of Design

The next section discusses in detail how deliverables of the project were satisfied and what challenges we encountered.

5.1 A Web-Based Client Intake and Tracking System

The backbone of this system is the client intake and tracking system. This system is on the web so it can be used throughout the State of Ohio by the intake workers. All applications will be entered into the system via the web.

5.2 User Interface allows for future expansion

The user interface for this system is going to be expanded in the future. The current interface is the core of the system and more programs or functions will be added. The interface is written in C# and ASP .Net which allows for the future expansion.

5.3 Communication with Database

Microsoft's Visual Studio .Net has many tools to communicate with databases. The central database at the State offices is SQL Server and the user interface communicates frequently with the database. Once the data is entered in the user interface it is then submitted to the database which illustrates the communication between the two.

5.4 New User Accounts

Each user on the system must have a log on to use the system. When the administrator logs into the system he has the option to create user accounts. This gives the system a central point of administration. New users will be added frequently to the system since the employees are temporarily hired each year.

5.5 Log on to System

Security of the system is the number one priority. Each user of the system must be an authenticated user. The user will not have any access to any of the system if they do not authenticate first. The first page of the system asks for the user to log in and authenticate. The users are saved in a table of the database so a hacker would have to hack the database to discover the log on id and password.

5.6 System Responsibilities

The Web-Based HEAP System begins with an application filled out by the applicant. This application is then entered into the system. The data is allowed to be entered into the system and eventually in the database with minimum validation.

The data already residing in the database is able to be recalled by Social Security Number and viewed in the system. The data in the database may go through many changes therefore it is allowed to be edited until it is marked as completed.

6. Testing Procedures

Testing of the system was essential to confirm it's capability and ease of use. The testing had three phases: the logical, the user, and stress testing. The logical testing was done by me and Shawn Robinson, a database analyst for the State of Ohio. He knows the system and helped me test to confirm logically it is working properly. The user testing was completed by temporary employees of the State of Ohio whom I trained to use the system. The errors or complaints were logged and reviewed to see whether or not they were true bugs. Stress testing had all of the temporary employees on the system at once to see how stable the system was and to make sure there were no issues regarding the test. All testing was finished with no complaints and very few minor bugs that were corrected.

7. Conclusions and Recommendations

7.1 Conclusions

This project was created in response to the State of Ohio's need for a Web-based HEAP System with client intake and tracking. I created a Web-based HEAP client intake and tracking system. This project allows for all of the paper applications information to be entered and maintained in a central database by the State of Ohio. The project was completed using the new technologies of Microsoft's Visual Studio .Net (C# and ASP .Net) and SQL Server. The project was completed over the three quarter Senior Design sequence. The budget of approximately \$4300 would be a real-world estimate for the completion of this project before labor costs and some other hardware not described in this project. The project fulfilled all of the original deliverables. Testing was performed to ensure the product's functionality and ease of use.

7.2 Recommendations

A project of this size needs multiple developers. A person with a full understanding of ASP .Net would have been very helpful for the advanced features of this project. When this project is enhanced in the future by a consultant company they must fully understand how the current functions of the system work. An ASP .Net professional should also be a member of the consultant team.

References

1. The Ohio Department of Development Web site, "About Ohio's Community Action Agencies", <http://www.odod.state.oh.us/cdd/ocs/cacs.htm>, May 1, 2003.
2. Battelle, "Project Description Statement", April 1, 2003.