Food Service Management Utilities

By

Daniel Hayes

Submitted to
the Faculty of the Information Engineering Technology Program
in Partial Fulfillment of the Requirements for
the Degree of Bachelor of Science
in Information Engineering Technology

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Daniel Hayes	Date
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Acknowledgements

I would like to give to give special thanks to the food director at Wyoming City Schools, Marcy Hayes. With her continuing help, support and guidance, this project was made possible. I would like to give thanks to all of the professors at the college of Applied Science. This project was completed through their advice and constructive criticism. Finally, I would like to give special thanks to my fiancée, Kelli Lanter, for her support and patience throughout my college career.

Table of Contents

List of Figures

Abstract

Food Service Management Utilities was created as a tool that is utilized to track employee information and daily sales in the Wyoming School district. The purpose of the Web site is to provide an interface for the food director to enter and track daily sales of food sold. In addition, the Web site provides employee information including pictures of other coworkers. There is a lack of a current system for the food director to display employee information or to systematically keep track of daily sales. The project stems from a root problem of not having daily sales information available. I created this Web site using graphically enriched interfaces to display employee information. It is visually appealing to users who work in kitchens everyday. The Web site takes advantage of using easy navigation allowing users to move freely anywhere throughout the pages. My Web site was designed using the latest tools: Dreamweaver, Fireworks, Photoshop, SQL Server, and ASP.NET. The Web site is simple to utilize for users with very little computer skills, yet is professionally displayed giving it a sophisticated look.

Food Service Management Utilities

1. Statement of the Problem

Through discussions with Marcy Hayes, the current food director at a local school district, I gained knowledge of the system being used to keep track of inventory and employee data (2). The current system uses Excel spreadsheets with data entered manually. The data is deleted each month, negating the opportunity to make comparisons with previous sales. Information about employees is saved as an Excel document on a hard disk drive located at Wyoming High School. Inventory data is saved on floppy disks.

The food service management services for Wyoming school district needs a computer system to manage its service. The current system to manage and maintain employee and inventory data is inadequate. According to MIRUS, a company dedicated to serving the restaurant industry by use of web-based reporting tools and Back Office applications, customers achieved the following benefits:

- Savings of 1-2 percentage points in food costs.
- Reduction in 95% in administrative time and cost.
- Reduction of overtime.
- Increase in sales.
- Greater control over operations (1).

The functions that Mrs. Hayes thought she needed in an application for food service is listed below:

- It should be user friendly, because most of her employees do not have extensive computer knowledge.
- It should be able to add, update, and delete employee information in the system.
- It should be able to add, update, and delete inventory records including various vendors and the products they provide.
- It should have login pages for managers at the various schools in the district.
- It should be available over the internet so employees can work from other places besides the building the application is stored.
- It should be secure enough to block computer hackers.

The solution I proposed to the problem for the school district solved my needs for a capstone project as an Information Engineering Technology student at the College of Applied Science. The primary area of interest was programming with the use of a database. I used the knowledge from the Object Oriented Programming Sequence, Database sequence, and a special topics class in ASP.NET.

2. Development

2.1 Problem/need definition

The current system to store records of inventory and employee data may result in many mistakes. Currently, only one person manages the system, the food director. It would be wise to delegate the duties from the food director to the managers of each school in the district and have the food director do a follow up check to oversee all operations. This would provide a checks and balances to the way inventory is ordered. Through follow up discussions with Mrs. Hayes, I found out that most schools use some sort of spreadsheets to enter and save data. She also explained that in the smaller school districts, managing the information was placed on the food director while in larger school districts, managing the information was either delegated to high school or middle school managers (2).

I have searched for competition in this area and found that a system does not exist in the Cincinnati area. Systems similar to the one I propose include MIRUS, but are mostly used from organizations like small restaurants all the way up too Fortune 500 companies (1). Custom software deployment of this type is typically too expensive for the limited budgets that most public school districts have.

2.2 Solution definition

I proposed to create a Web application that connects to a database. The application is available over the Internet to allow the employees to work from any school or from their houses. It has a secure login page for managers. The managers of each school have access to add, update, or delete employees from the database. They also have access to change the inventory of the food specified in the categories from different vendors. Each manager is able to view but not update or delete information in other schools to get an idea of how the ordering system looks for other schools. The food director has full administrative access to change any information in the system. The food director is able to check the work of the managers working in the district. This application provides the user with the following functions:

- Has a different page for each school in the district.
- Provides up to the minute data to enable the food director to check status at any time.
- Able to work on most modern computers as well as older computers.
- Includes contact information such as e-mail and phone numbers to contact employees at different schools.
- Works with different Internet platforms.

The different platforms it is designed to work with includes Windows NT/2000/98/ME/XP. It was tested on platforms including different versions of Netscape and Internet Explorer as well as the American Online Browser.

3. Resources and Logistics

3.1 Resources

I have chosen to use Microsoft products because they are compatible with most systems where the users will run the application. I developed forms that look similar to all windows forms so the user feels comfortable using them. I chose to go with the .NET architecture because it will become an industry standard in the near future.

I kept in contact Mrs. Hayes about information needed to complete the design of the project. I also contacted other food directors from different districts to find out if more information could be included to make a better design. I also contacted managers in the district to find out information that they would like to see implemented in the design of the project.

3.2 Deployment

Current task requirements involved in Senior Design I include researching information about the design of the application. This involved questioning different managers and food directors in the district. Formulating and presenting a proposal are also important steps in Senior Design I. Long-term tasks involved in the completion of the project included developing the database, developing the Graphical User Interface, and developing the different Web pages. Most of the development occurred during Senior Design II. After each step was complete, I tested the application to make sure it was as flawless as possible. I presented a working prototype at the end of Senior Design II. After I presented the prototype, I made sure the errors were corrected and the exploits were minimal. At the end of Senior Design III, I presented the completed project.

4. Product Description and Intended Use

Due to recent issues involving missing stock and unaccounted products, there is a demand for an application involving the storage of inventory in the Wyoming School District cafeteria. The Food Director at Wyoming School District is in search of software to help manage the employees and store information including inventory and worker's data. Currently, the Food Director uses Excel spreadsheets to enter in daily food counts and employees contact information.

The current system is not applicable to fit the needs for food service demand. Under the current system, the Food Director stores the employee information on a floppy disk. Floppy disks are easily destructible and subject to damage. The daily counts of food data are kept as a hard copy with the totals entered into a spreadsheet file. There is not a simple approach to promote communication between employees. Reports cannot be generated in their current system.

There are problems with the current system from the Food Director's point of view. When a new Food Director enters the district, the records are kept with the old Food Director. The system starts over when a new Food Director enters the district. There is no way to maintain a history of data to compare to current records. A new application was constructed to modernize the inadequate system.

The final product is user friendly and allows the Food Director to print reports (weather it is for payroll or daily/monthly sales). The Food Director is able to update the information over the Internet in a fast and friendly manner. Employees are able to effectively communicate between one another through the use of their contact

information. Communication between the web and the database occurs through the use of ASP.NET pages.

The Food Director is able to update any information the database. The employees are only able to update and/or view information delegated to them based on position in the school district. Everyone can view contact information.

5. User Profile

The intended users for Food Service Management Utilities occur at three different levels. The three levels are the Food Director, the managers at the high school and middle school, and employees working at all the schools.

5.1 Food Director

The Food Director has full control over the system. Knowledge in Windows, Microsoft Word, and a web browser (Internet Explorer preferably) are required. Basic knowledge of software usage is also required. Slight knowledge in a business oriented situation is considered a prerequisite. The Food Director should be able to analyze a sales report with daily/monthly data. The Food Director reports to the superintendent of the school district.

5.2 Manager

The managers are able to enter data into the system to be stored in the database. Managers rely on instructions from the Food Director in order to enter information into the database. Knowledge in Windows, Microsoft Word, and a web browser (Internet Explorer preferably) will be required. The managers report to the Food Director with problems or concerns on the system.

5.3 Employees

The employees are able to view data about other employees in the system. Knowledge in Windows and a web browser (Internet Explorer preferably) will be required. The employees report to the managers if information needs to be changed in the system regarding them.

6. Project Design

I used four areas in the Information Engineering Technology program to complete the application. The main is a connection to a database through web pages. I concentrated on making a flashy design through the use of a simple layout. I used networking to set the web site up on a server. I have defined how I will use these four areas below.

6.1 Microsoft SQL 2000 Database

The database includes many-to-many relationships and one-to-one relationships. The database is accessed through the Internet causing a security risk. A user has to login before accessing the database.

6.2 Multimedia Design

I used Macromedia Dreamweaver to create the web pages. I also used Macromedia Fireworks to complement the web pages. I created navigation buttons and tabs using Adobe Photoshop. A simple flash animation may be considered for phase II development. The web pages are sophisticated yet simple and fast loading.

6.3 Networking

I used my knowledge gained from networking classes to set up the Internet Information Server through Microsoft Windows 2000. The web site is currently being hosted on the DIT-Senior server until funds are available from Wyoming School District.

6.4 Programming

I used programming to communicate with the database. I decided to use ASP.NET pages to provide a safe connection. Another important reason I have chosen to make use of ASP.NET is because it will be a faster loading application. By using ASP.NET the throughput will is optimized. The response time and the execution time is minimal. This gives the application improved scalability over previous languages.

7. Web Layout

7.1 Screen 1 – Home Page

This is the main page in the web site. Different shades of blues, whites and silvers are used to create this page. At the left there are a set of buttons that will:

- Allow the user to go to the different school pages
- Go to an Administration page
- Go to an a job posting page

A simple design is shown below:

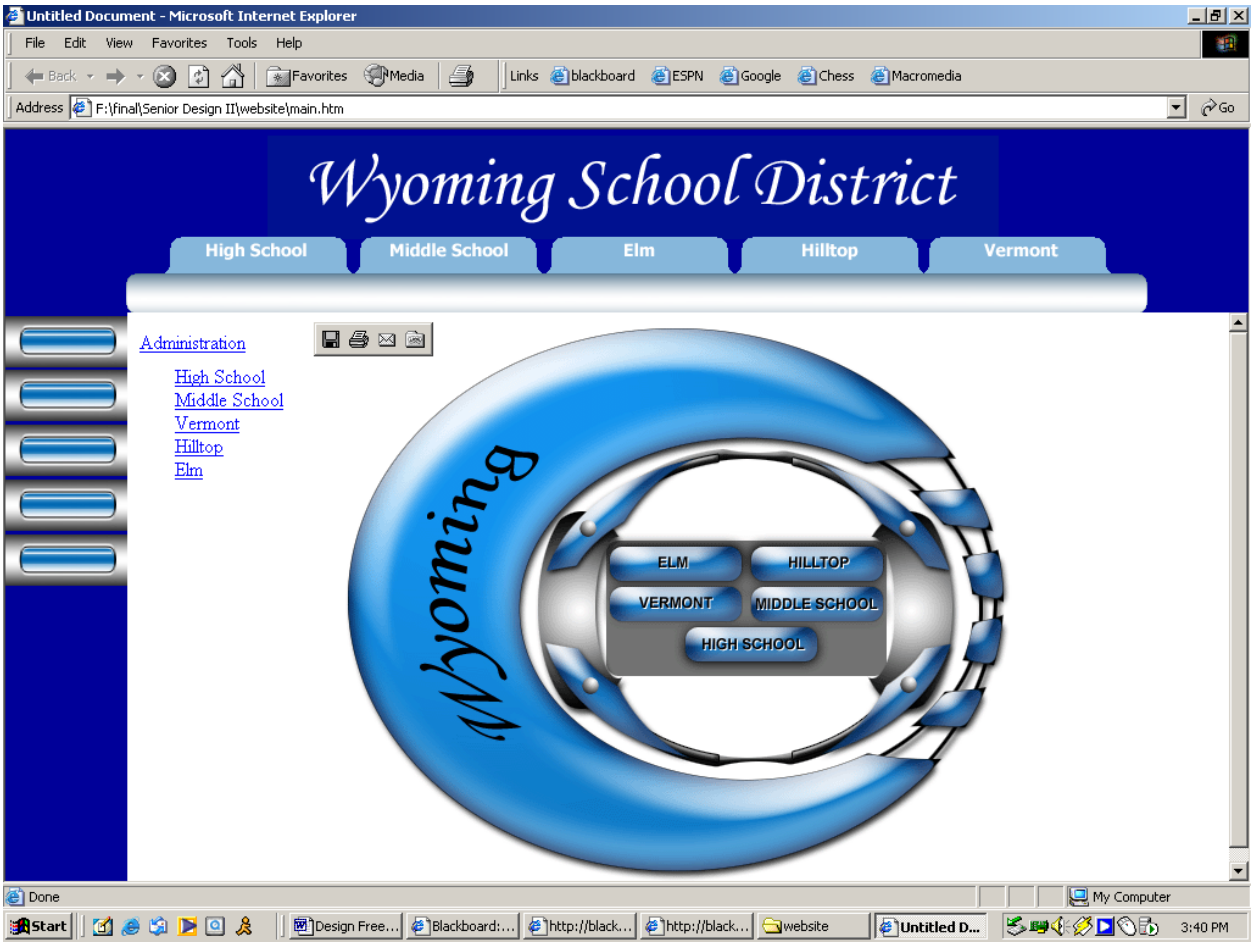

Figure 1. Home Page Screen Shot

7.2 Screen 2-6 – Employee Information Pages

These pages are individual pages for the five schools in the district. They display employee contact information and a photograph of each employee.

7.3 Screen 7 – Job Posting Page

This is a simple page allowing the user to see if there are any available positions for employment.

7.4 Screen 8 – Login Page

This page is a login page for administration. It redirects the authenticated user to an administration page.

7.5 Screen 9 – Administration Page

This page has links that allow the authenticated user to add sales information, vendor information, and employee information.

7.6 Screen 10 – Administration Employee Page

This page allows the Food Director to Add/Update/Delete employees from the database. It shows all employee information in list format.

7.7 Screen 11 – Administration Vendor Page

This page allows the Food Director to Add/Update/Delete vendors from the database. It shows all vendor information in list format.

7.8 Screen 13 – Administration Sales Page

This page allows the Food Director to Add/Update/Delete sales from the database. It shows sales information in list format.

8. Database Design

The database contains the following tables shown below:

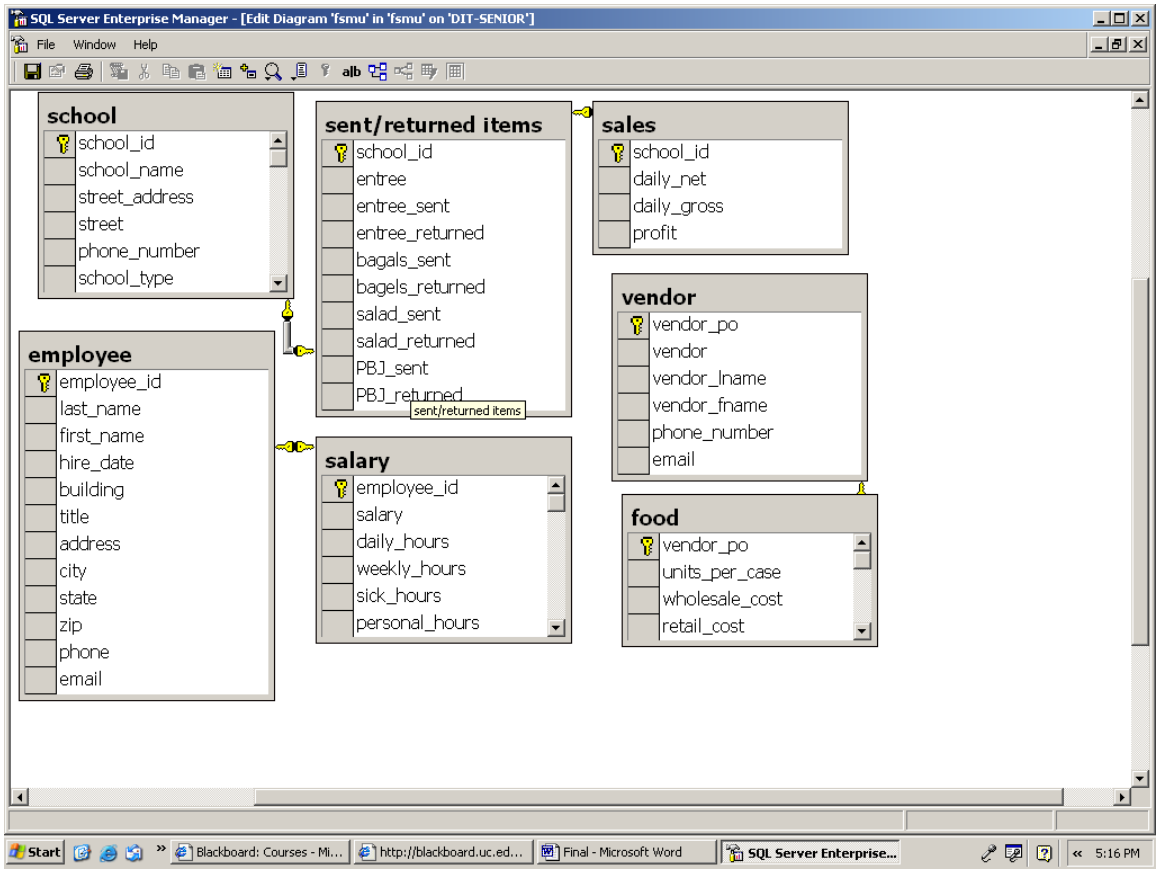

Figure 2. Database Tables

9. Timeline

A timeline for this project is shown below.

Task	Start Date	End Date	Complete
Research Topic	3/30/02	4/10/02	Yes
Project Approval	3/30/02	4/12/02	Yes
Research Project	3/30/02	5/28/02	Yes
First Draft of Proposal	4/20/02	5/20/02	Yes
Revise Proposal	5/20/02	5/28/02	Yes
Prepare Presentation	5/24/02	5/28/02	Yes
Documentation	5/20/02	6/20/02	No
Present Proposal	5/29/02	5/29/02	Yes
Develop Prototype I	5/30/02	11/13/02	Yes
Test Prototype	5/30/02	11/13/02	Yes
Test Prototype II	11/13/02	11/27/02	Yes
Final Test of Prototype	11/20/02	11/27/02	Yes
First draft of Design Freeze	9/30/02	11/6/03	Yes
Revise Design Freeze	11/20/02	12/03/02	Yes
Prepare Presentation	11/27/02	12/03/02	Yes
Present Prototype	12/4/02	12/04/02	Yes
Complete web site	12/5/02	4/6/03	Yes
Complete code	12/5/02	4/6/03	Yes
Test	1/5/03	4/20/03	Yes
Prepare Final Paper	3/30/03	5/20/03	Yes
Prepare presentation	5/20/03	5/30/03	Yes
Present Application	6/3/03	6/3/03	Yes

Figure 3. Timeline

10. Software and Hardware Requirements

The following shows a budget for this application.

Software: Server side-	
Microsoft's® SQL Server 2000 Standard Edition	$1489.00
Microsoft's® Visual Studio .NET	$1079.00
SubTotal	$2568
Hardware: Server side-	$699.00
SubTotal	$699.00
Hardware: Client side-	
ATX Desktop Case	$49.00
Maxtor 40Gb ATA100/7200RPM	$62.00
256Mb Dimm/DDR PC2100 266 MHz	$36.00
AMD K7 T-Bird Socket A 266 MHz bus	$80.00
ASUS A7V266 Socket A motherboard	$123.00
SubTotal	$350.00
Total	$3617.00

11. Deliverables

Web-Based Inventory Database Application

1. A web-based inventory database application
2. A back-end RDBMS will be developed on Microsoft SQL Server 2000.
3. A dynamic front-end interface developed using Macromedia Dreamweaver and Fireworks for the web development.
4. Graphics are created using Adobe Photoshop.
5. A simple flash animation opens the site with flash buttons to add motion to some dull areas.
6. ASP.NET communicates between client and database.
7. An easy navigation system for each page to allow easy access for input of information.
8. Ability for users to:
    a. Add employees and their respective information
    b. Add inventory of food sold daily
    c. Update type of products sold and employee information

12. Testing

I conducted tests at all stages from the beginning of the development of the prototype. I conducted an extraneous test before letting the Food Director view a beta version in March of 2003. At this time, I let the Food Director access the system and enter in data. I included the following in testing:

- Authorization of users to enter data
- Authorization of Food Director to change information and view personal page
- Opening the web page in different browsers (versions)
- Check positioning of graphics set on different resolutions
- Check user id characters and length
- Check for inappropriate viewing of the password
- Correct error messages for unauthorized users

13. Conclusions

This project was created in response to Wyoming School districts need to centralize data of daily sales. It also stems from a root problem of employees not being able to communicate with other employees. I created a graphically enriched Web site that incorporates the use of all schools. The different pages include a Fireworks menu system to easily navigate through the site. Simple ASP.NET pages do not overload the user with complicated material. I used Adobe Photoshop 6.0, Macromedia Dreamweaver MX, Macromedia Fireworks MX, SQL Server 2000, and ASP.NET. The project was completed during the Senior Design sequence. The budget of $3617 is a current real-world estimate for the hardware and software costs. The project fulfilled the Senior Design deliverables and testing ensured the project's usability.

14. Recommendations

While working on this project, I came across many challenges. The first challenge I encountered was the how the images were loaded on the pages. I wanted to make sure the images are loaded from one location. By doing this, I had to make the files relative to the document so I could easily transfer the Web site from location to location. When first starting out I came across broken images because the browsers were looking for files located on my hard drive.

Another problem I encountered was trying to get ASP.NET to work on the computers in the IET lab. Many patches help fixed the errors of pages not able to be found. This does not seem to be a major problem anymore considering the advancements that have taken place through the sequence (approximately one year in length). It is helpful to have an understanding of how ASP.NET and ADO.NET before diving into the code. At the current time it seems to be that most books are written to work with the command line compiler and not the IDE interface.

One problem that occurred when using Fireworks was saving the file. In order to bring the file into Dreamweaver, you have to export the HTML file. In Dreamweaver you have to insert Fireworks HTML in order for the file to work. You cannot just save the .PNG file and insert that file into Dreamweaver.

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