A Web-Based Genealogy Application System

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Abstract

Over the last two decades many commercial shrink-wrapped software application packages have been developed for the Microsoft Windows Operating System environment and some of these are now being re-engineered and developed into Web-based applications. In order to explore how this is done and possibly to advance the art of Web-based application software development, we take as an example the genealogy application, for which several commercial packages exist, and create a Web-based genealogy application that has many advantages over the existing stand-alone systems. Our Web-based system allows any number of specified family members to update and maintain their branch of the family tree. To reduce the possibility of having several family members making changes to the data, we grant write and change permission to only certain family members and to specified portions of the family tree. These family members can make their changes remotely through a Web interface, and all family members can view the family tree information on the Internet, possibly limiting access to family members by password. The development of this system includes theoretical studies of family trees and their properties, and the use of application software language techniques to facilitate real-world Web-based programming. For example, we augment the usual HTML in our Web interface with Cold Fusion tags to facilitate interaction with an SQL backend database that stores the family tree information. We describe the design and implementation of our system and present an example based on the genealogy of some of England's royalty.

Introduction

More and more computer applications are becoming Web based. There are still many stand alone windows-based software in the market that did not migrate to the web world yet, and the family trees software are a good example of them.

As an example of developing a Web-based application, or of moving one from being PC-based to Web-based, we explore the family tree genealogy application. We design and create a Web-based genealogy application with new and improved functionality.

Family tree software has been available for over a decade and most available today are Microsoft Windows applications [1-3]. These software packages assist the user in

finding genealogical information by providing CDs containing such data as Social Security records, passenger and immigration lists, marriage records, land and naturalization records, and military records. The Windows program then helps the user to input, format, and publish the family tree information.

The objective of the Genealogy Application Project is to advance the art of web-based application software and simultaneously to apply principles of software engineering to advance the art of genealogy application package. As an example of developing a Web-based application, or of moving one from being PC-based to Web-based, we explore the family tree genealogy application. We obtained new requirements, design, and created a web-based genealogy application with new and improved functionality. The work of the project includes theoretical studies of family trees and their properties, conversion of the existing genealogy data to operate with the new Web-based system, and empirical studies of the application of advanced language techniques to real world programming, especially in the areas of high-performance networks and operating systems.

This Family Tree software can be used anywhere one can connect to Internet. The system has a Web Interface to a backend database that securely stores all the family tree information. We augment the usual HTML in our Web interface with Cold Fusion tags to facilitate interaction with the MySQL backend database.

The family tree software available today are Microsoft Windows applications, such as Family Treemaker [1], Cumberland Family software (45 day free trial) [2], and SierraHome Genealogy [3]. There are weaknesses in the currently available software, primarily concerning how the information is presented and how it can be updated and maintained. What frequently happens is that one family member researches, inputs, and publishes their family tree and thereby undertakes the tedious and never ending task of updating and maintaining it. This task is particularly burdensome for large family trees.

Our Web based solution distributes this burden by allowing other family members to update and maintain their branch of the family tree. However, write and change permission can be limited to these family members and to specified portions of the tree. These family members can make their changes remotely through Web pages and the current family tree information is, of course, available on the Internet, limiting access to family members by password control.

Use Case Scenario

The Family Tree software can be used anywhere if connected to Internet, with Windows Operating System, also accessible on remote PC. Basically, this software is a Web Interface with all the family information stored securely on the backend database and the front-end application (Cold Fusion) used for performing actions by user.

As an example, we input the data of Kings of England royalty and the result has been represented below in a hierarchical form:
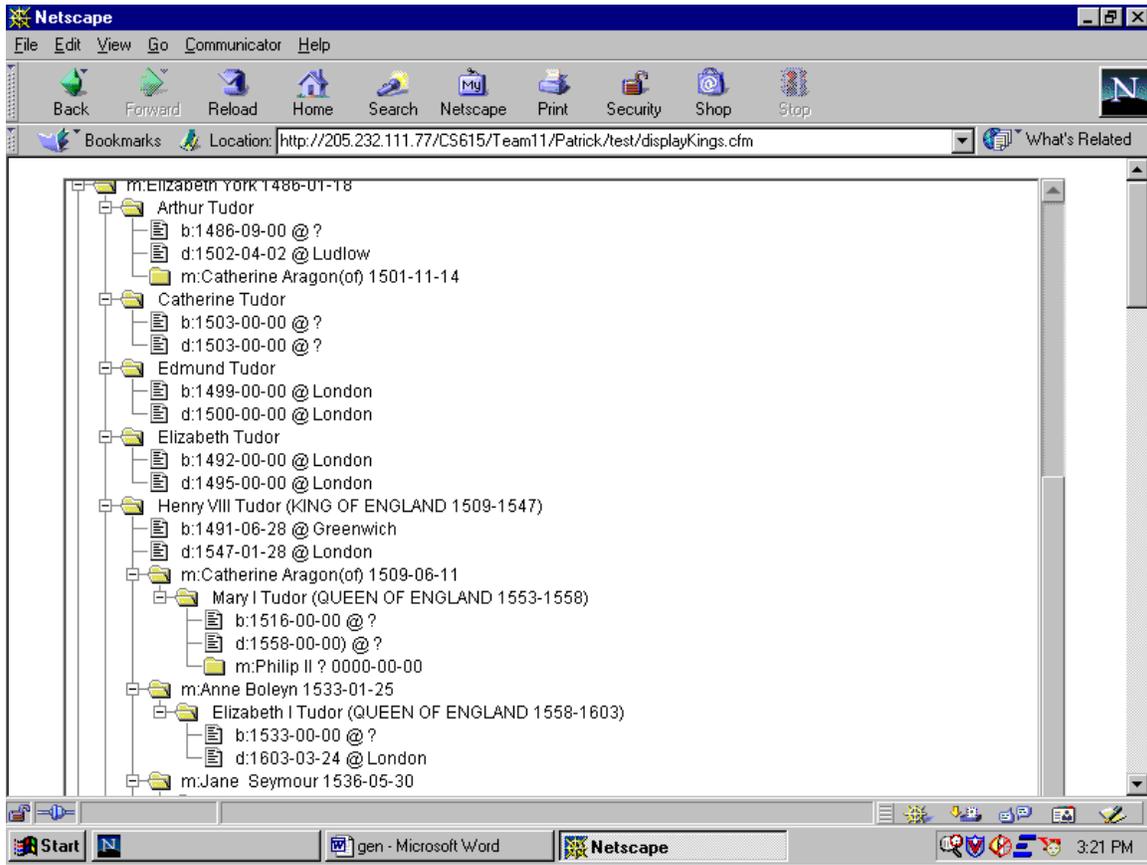
Figure 1

Data Design

The data design involves refining data objects and developing a set of data abstractions, implementing data object attributes as one or more data structures, reviewing data structures to ensure that appropriate relationships have been established and simplifying data structures as required.

After going through all these steps we finally decided for the following Entity-Relationship Diagram:
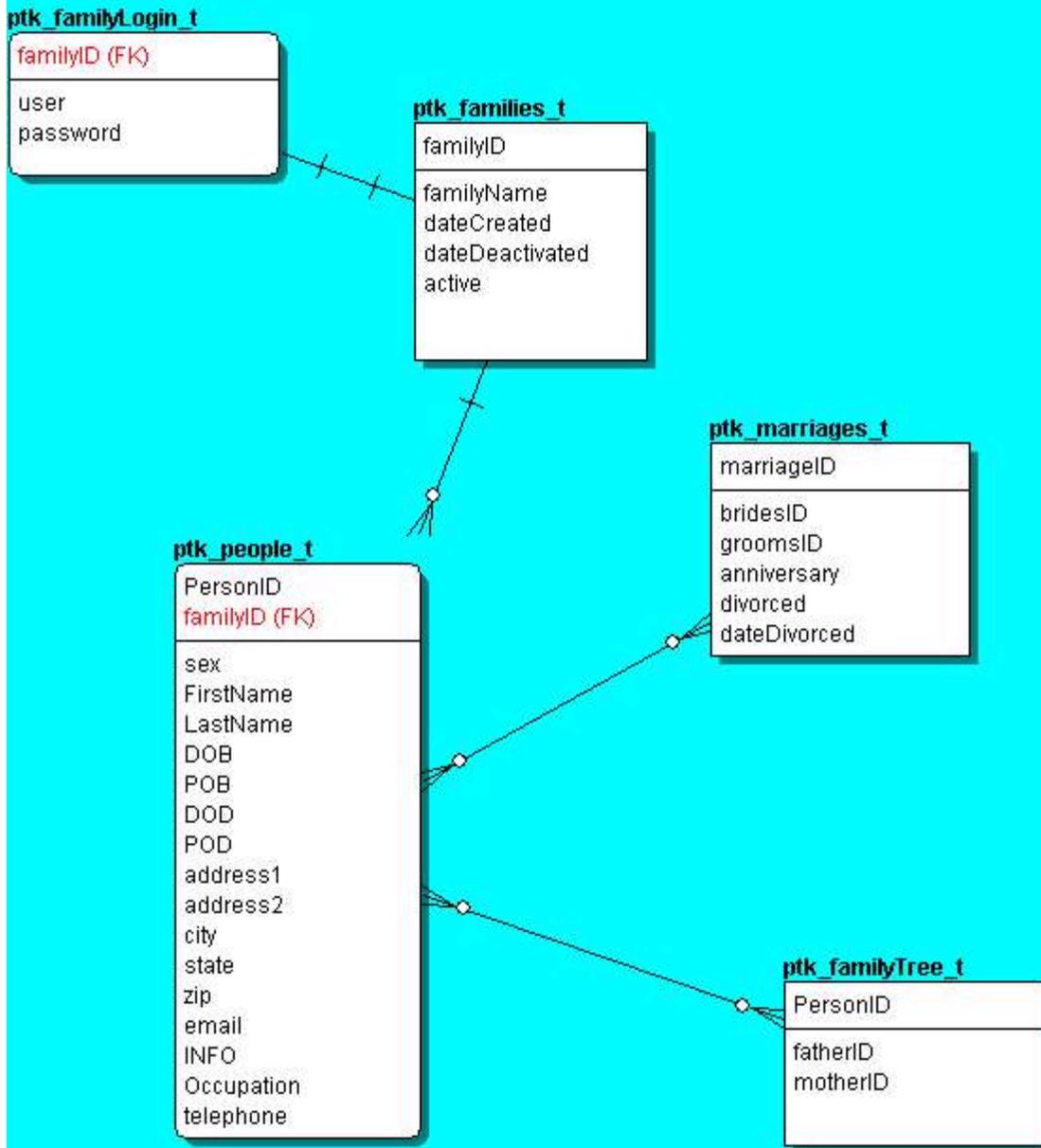
Figure 2

Software Architecture

The software is built using HTML, Cold Fusion (used to interact with the database) and MYSQL. Pace university provides a project development server for system development and testing. As a backup procedure, we keep an updated copy of our project files on a free server provided by Cold Fusion.

The greatest advantage of keeping this backup server is to continue the development process even when Pace's server is down.

Architectural Style

The style applied is **data centered**. Database resides at the center of the architecture and is accessed frequently by other components that update, add and delete data.

Conclusions and Suggestions for Future Work

Our genealogy Web application successfully removes the major weaknesses of the currently available family tree software, especially concerning how the information is presented and in how it can be updated and maintained. The tedious and never-ending task of inputting and updating the family information, done by one family member in the currently available systems is over. Our solution has distributed this burden by allowing other specified family members to input and update their branch of the family tree. It enables a family spread around the world to use the same system.

This project is an example where it might be possible and appropriate to interface to an existing commercial-off-the-shelf (COTS) package [4]. For example, a shell that calls the package might handle the additional functionality. Here, consideration is given to converting the existing genealogy data to operate with the new Web-based system. Finally, it might be interesting to develop a business plan for marketing such a Web application since it is not as simple as selling Windows software because users will need space on a server as well as an easy way to upload the changes. It could be commercialized following the .Net rules. The user would pay for the service instead of buying the software, and by doing so he would be able to use the software that would be available at a specific service provider.

References

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