

# Wisconsin Badger Camp Registration System

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## Abstract

Wisconsin Badger Camp is a non-profit organization devoted to serving people with developmental disabilities by providing quality outdoor recreational experiences. Currently, the camp uses a long and tedious process for registration with a twelve week submittal to acceptance turn-around period. This antiquated process can no longer accommodate the number of camper applications which are submitted each year. Our goal is to modernize the camp's registration system in order to reduce the time it takes to process camper applications and help streamline the camper check-in procedure used when the campers first arrive at the camp.

The camp registration system will consist of three parts:

1. Online registration application
2. Camper check-in process
3. Office application

All three portions of the system were designed during the fall 2008 semester by the students of the "Systems Analysis and Design" course. The online application and the database are currently being developed by the students in the "Web Protocols, Technologies and Applications" course.

The application will include a log-in system which will connect to the database and allow the camper or his/her guardian to access the various registration forms online. This will allow users to complete each form at their own pace and allow them to update any information as necessary before attending camp. The application will be developed with Microsoft Visual Studio 2008 using ASP.NET and other technologies.

The project in its entirety is set to be completed by the end of spring, 2009.

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# 1 Introduction

In 2008, Wisconsin Badger Camp contacted the University of Wisconsin – Platteville’s community outreach department (PACCE) requesting that we help them build a computerized registration system in order to replace their outdated system. [1] Over several semesters, students of UW – Platteville’s Computer Science and Software Engineering department (CSSE) designed and developed this system from the bottom up. In the fall semester of 2008, the system was analyzed by the students of the “Systems Analysis and Design” (SAAD) course under the direction of Dr. Lisa Landgraf. In February 2009, students of the “Windows Programming” (WP) class led by Dr. Qi Yang started development of an office application and camper check-in tool which will allow camp administrators access to the stored information regarding each camper and streamline the process used to check campers in as they arrive at Badger Camp. Simultaneously, development of the online portion of the registration system was undertaken by students of the “Web protocols, Technologies and Applications” (WPTA) course also under the supervision of Dr. Yang. The authors of this paper belong to the latter group (WPTA) and thus the focus of this paper will be on the online application portion of the project.

Organization of a software project is fundamental to its success and therefore, it has been given a great deal of attention here. There have been some organization and communication challenges which hindered progress in the beginning stages of the development of this project; challenges which the students of WPTA are conquering each step of the way. The design of the project was not properly communicated between the teams that designed the system in fall 2008 and those currently developing it in spring 2009. It is a testament to the dedication of the students and teachers involved in the project that it is still on track with its end of semester deadline.

As for the organization of our class, the students of WPTA are divided into three development teams each tasked with equally important sub projects working simultaneously. Communication is very important as each team relies on the others in order to make progress. The project itself has been organized into phases, each with specific deadlines and requirements which must be met in order to keep the teams in line with the final project due date.

The online registration system itself consists of two main parts: a Front-End user interface consisting of several registration forms and a Back-End database and database manager software package.

## **2 About Badger Camp**

### **2.1 Wisconsin Badger Camp**

Wisconsin Badger Camp's mission is to provide a positive natural environment where individuals with developmental challenges can learn about their surroundings and realize their full potential. Badger camp was started by a small group of parents, teachers, and concerned citizens in 1966. Their aim was to give those individuals with developmental disabilities the chance to experience the same camping environment as other children. Living in a group setting, campers have an opportunity to develop friendships and expand their social skills. [2]

### **2.2 Current Registration Process**

The current registration process consists of a cumbersome back and forth exchange of registration papers via snail-mail between the camper (or their responsible party) and the camp; a process which can take up to 12 weeks before a camper may be approved. The registration application itself consists of relatively short six pages of information which must be filled out and mailed to the camp registration office. There, the application is filed and reviewed on a first come first serve basis. With a growing number of applicants each year, this process is quickly becoming too difficult to handle with the camp's limited staff. A computerized solution is necessary in order to accommodate the increase. [2]

### **2.3 Our Objective**

The goal of our project is to create a faster, more accessible and more reliable camper registration process for the Wisconsin Badger Camp. Both medical and personal information from the application will be entered into a database. As the database becomes populated from year to year, personal records will remain in the database to allow users to re-register each year without having to re-enter camper and contact information.

There will be a login system which will protect the personal information of individual campers and allow authorized users administrator level access while limiting the access of general users. Organizationally, a general user account may contain an unlimited list of individual campers, within which, individual camper records will be accessible. A user may make as many general user accounts as they wish. Each general user account would then contain a list of campers and their pertinent personal information (emergency contact, guardian, etc.); additionally, an individual registration must be completed for each camper to be reviewed by an administrator.

As an application is completed, it will be flagged as ready for review at which point an administrator will be able to look over the form to ensure completeness and assess the camper's registration form before accepting them into the camp.

This setup will be a vast improvement over the current system because it allows a user to enter or change information at their own pace and lessen the need for office workers to manually file, retrieve and update applications since all information is automatically entered into the database.

## **2.4 Background and Challenges**

This project has been an excellent learning experience from day one. In fall 2008, a team of students (SAAD) initially analyzed and designed the Badger Camp project. They produced a very thorough analysis document complete with use case diagrams, a fully designed database and a budget analysis. Unfortunately, that was not what was needed. Despite its strengths, it lacked a proper requirements analysis for the system, and only included designs for a windows application which would access the database excluding the web portion of the project.

This presented a unique challenge to the students in the spring 2009 semester, specifically those belonging to the WPTA class. This experience has taught us just how important a proper specification of a project is before development is attempted. WPTA students with the direction of Dr. Yang have completely redesigned the web portion and the database for the project, and have succeeded in remaining on task and on track for the deadline.

## **3 Project Organization/Leadership**

### **3.1 Organization**

In WPTA, the students have been divided into three teams with Dr. Yang guiding their direction. The first two teams (Badger One and Badger Two) are very similar in that they are both web development teams working on the same website application, but with different design approaches. Each Badger Team is tasked with designing and implementing the web site application. It was decided to use two teams working on the same sub project since it injected some healthy competition into the development process. Each team works independently, and then demonstrates what they have done by the deadline of each phase of the project. Thus far, both teams have taken separate approaches to the design of the project. The best one will be picked at the end of the development process. The team that will be selected must meet the following criteria:

1. Their code is readable
2. Their code is easily maintainable
3. Their code is efficient and not redundant

The database team is separate from Badger One and Two and is responsible for the design of the database and the design and implementation of the database manager used to access it. Since the database manager is pivotal to the core operation of the website, it was decided that it would be too confusing to have more than one database team to choose from. Currently the database team's main goal is to finish the database manager software package so that the web development teams are able to access the database and continue to make progress on their websites.

### **3.2 Badger One**

Badger One is the first of two web development teams led by Robert McKinney. Its team members include Jon Clifton, Joe Waterstreet, Alex Haberlie and Mark Holm.

### **3.3 Badger Two**

Badger Two is the second web development team led by Matt Zirtzlaff. Its team members include Kyle Thering, Adam Post, Shawn McGuier and Brandon Welu.

### **3.4 Database Team**

This team consists of the authors of this paper (Adam Rossmiller, Craig Kuehn, Ali Karbassi and Brandon Resheske) with Brandon elected as the group leader.

## 4 Registration System

### 4.1 Technologies

This project is being developed in Microsoft Visual Studio 2008 using VB.Net, ASP.Net and C#. These languages were specifically chosen for this project because of their ease of use, the ability of these languages to interact together and programmer preference.

The web pages will be designed aesthetically at a future date using a combination of CSS and JavaScript.

AJAX is used to reduce the amount of page loading required as the user interacts with the web form.

### 4.2 Front-End – User Interface

The Front-End of the online registration system consists of several aspx web forms which control user access and guides them through the registration process. These forms make up the web interface to the user. The Front-End teams are also responsible for implementing a login system which will protect the personal information of individual campers and allow authorized users administrator access.

On the development side, the two teams (Badger One and Badger Two) are using ASP .Net with Visual Basic .Net to code each form. Each form corresponds to a single table or multiple tables in the database and information entered into the controls can be saved to the database by clicking a save button located at the bottom of the page. Figure 01 is an example of one of these forms.

The controls are wrapped in ASP .Net “AJAX” controls to reduce the amount of page loading that is required. A code example Code 01 is presented below.

The teams developing the Front-End also have access to a set of utility functions which give them specific access to the database which they read from and save to. These methods are used in the VB files behind each form.

These forms have been designed from the bottom up by each team separately.

### 4.3 Back-End – Database

#### 4.3.1 Database Design and Normalization

The database design is currently complete and in its final version. It has been normalized as much as is necessary to reduce the amount of redundant data stored. It consists of 29 tables generated from analysis of the current registration form. Since the current registration form will still be available to those who do not want to fill out an application online, the database was modeled as closely as possible to the paper application.

#### **4.3.2 Database Manager**

The database manager (DBM) is a package of classes which are used by the Front-End teams to access the database. Unlike the Front-End, this package is developed completely using C# then compiled into a dynamic link library so that methods can be called in the web forms using Visual Basic .Net. The main reason for this difference is coding style and programmer preference.

DBM uses a layered protection scheme designed completely by the members of the database team which allows us to break up the code into more manageable size pieces and greatly increases readability, maintainability and security. It also allows the database team to easily control exactly what the web development teams have access to.

As shown in Figure 02, the outer layer of the database protection scheme is the DBManager, the class which contains all methods that the web development teams can use to manipulate the database. The prototypes of most of the methods included in this class have been designed by Dr. Yang and are general methods such as “getCamper(...)” and “addWebAccount(...)”. Also included in this layer are classes which encapsulate the fields of some of the tables in the database. For instance, included in the package is a Camper class which contains data members for all of the fields that define a camper. This class is used by the web development teams to save to the database in a way which is more meaningful than simply stuffing data into fields of a table. Code 02 is an example of the Camper class.

The next layer, DBHandler, is a class of table functions one step below the DBManager class which the database team uses to implement the higher level methods. Each function manipulates a single table or a group of similar tables. A majority of database errors are caught and significantly handled here. The functions in this class are protected and can only be accessed by methods in the DBManager class.

The inner layer, DBShell contains three types of functions all of which directly access the database. Each of these functions generates and executes a single update, insert or select SQL query.

## **5 What is Left**

Currently, the update, select and insert functionality for the DBM is under construction and must be completed or there is risk of hindering the web development groups' progress. This is high priority.

The website is not yet fully functional and has much work left before it will be complete. While some development is dependent on the progress of the DBM, this is still high priority.

Designing the look and feel of the web forms has also been put on hold until the website functionality can be completed. This is medium priority.

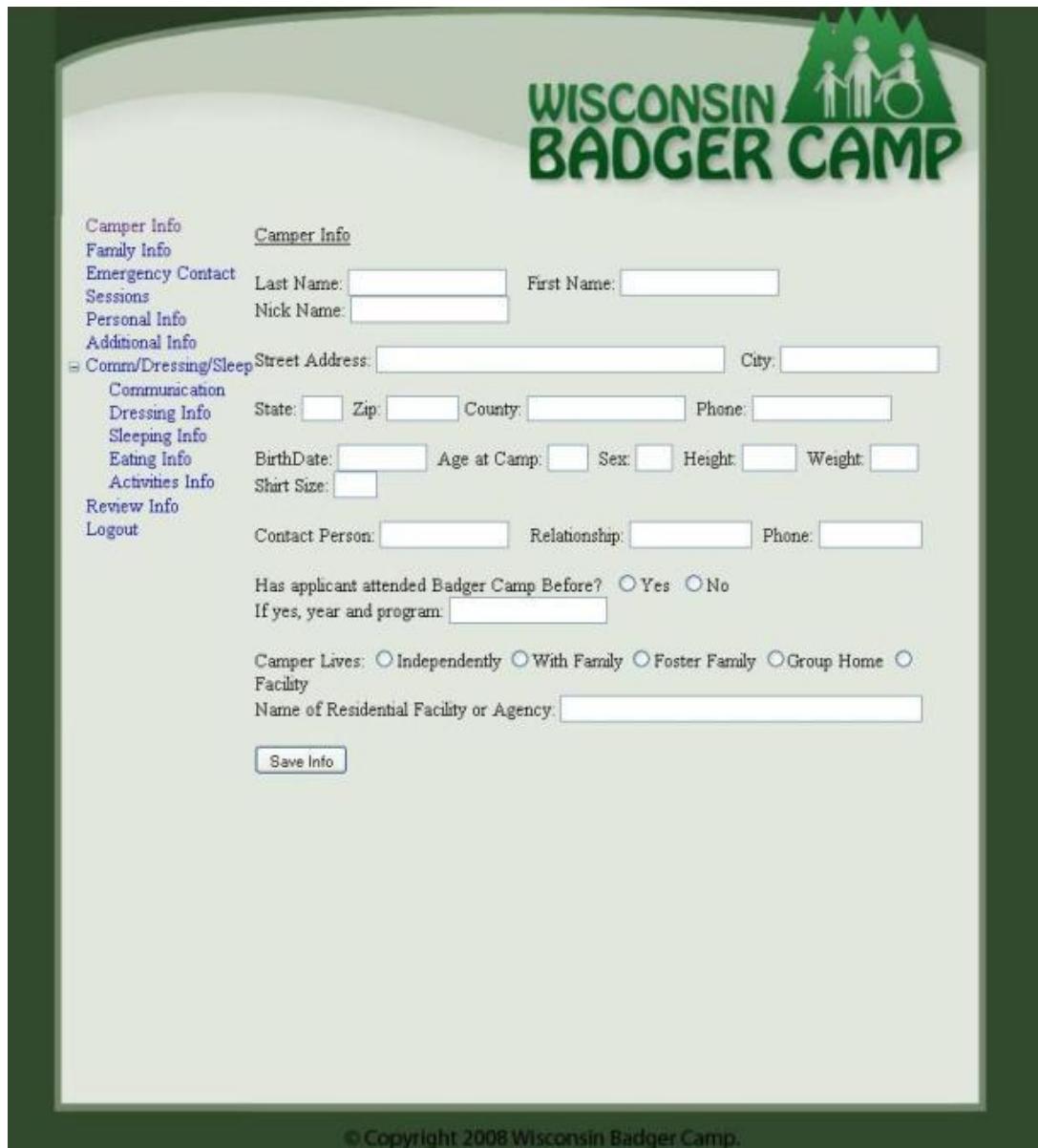
Delete functions have been excluded from the project because they have been deemed unnecessary. Delete functionality will be implemented on an “if we have time” basis. This is low priority

## **6 Conclusion**

Designing and implementing this system has been an incredibly valuable learning experience and opportunity for the students involved to reach out to the community and help them modernize their operation. The development process and challenges that go along with it have gone a long way toward helping us understand how software is developed in industry and how to overcome daunting obstacles. Perhaps more importantly, it has taught the value of leadership, teamwork, cooperation and communication in a large software system.

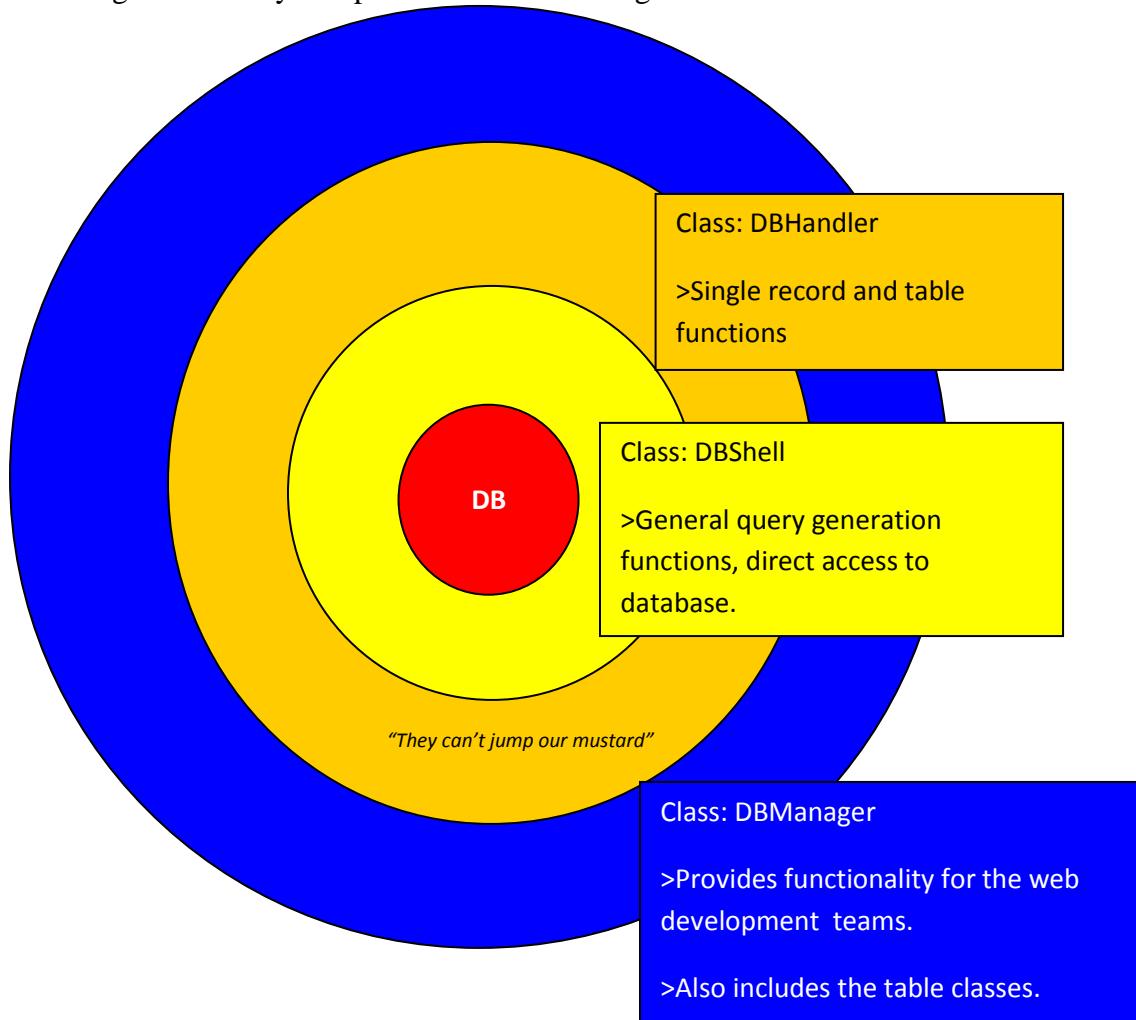
## 7 Appendix A – Figures

Figure 01 – Add camper form.



The screenshot shows a web-based application for adding a camper to Wisconsin Badger Camp. The page has a green header with the camp's logo featuring two stylized figures and a wheelchair. The main content area is titled "WISCONSIN BADGER CAMP". On the left, there are several navigation links: "Camper Info", "Family Info", "Emergency Contact", "Sessions", "Personal Info", "Additional Info", "Communication", "Dressing Info", "Sleeping Info", "Eating Info", "Activities Info", "Review Info", and "Logout". The "Camper Info" section contains fields for "Last Name" (with a placeholder "John"), "First Name" (placeholder "Doe"), "Nick Name" (placeholder "Johnathan"), "Street Address" (placeholder "123 Main Street"), "City" (placeholder "Anytown"), "State" (dropdown menu), "Zip" (text input), "County" (dropdown menu), "Phone" (text input), "BirthDate" (text input), "Age at Camp" (dropdown menu), "Sex" (radio button), "Height" (text input), "Weight" (text input), "Shirt Size" (dropdown menu), "Contact Person" (text input), "Relationship" (text input), and "Phone" (text input). Below these fields are two questions: "Has applicant attended Badger Camp Before?" with radio buttons for "Yes" and "No", and "If yes, year and program:" with a text input field. Further down are sections for "Camper Lives:" with radio buttons for "Independently", "With Family", "Foster Family", "Group Home", and "Facility", and "Name of Residential Facility or Agency:" with a text input field. At the bottom left is a "Save Info" button, and at the bottom right is a copyright notice: "© Copyright 2008 Wisconsin Badger Camp."

Figure 02 – Layered protection scheme diagram.



## 8 Appendix B – Code Examples

Code 01 – Example of ASP.Net code behind the camper form in Figure 02.

```
<asp:ScriptManager ID="ScriptManager1" runat="server">
</asp:ScriptManager>

<asp:UpdatePanel ID="updPnlGridView" runat="server" ChildrenAsTriggers="False" Visible="True"
    UpdateMode="Conditional">
    <ContentTemplate>
        <asp:GridView ... >
            ...
        </asp:GridView>
        <asp:AsyncPostBackTrigger ControlID="btnSave" EventName="Click" />
        <asp:AsyncPostBackTrigger ControlID="GridView1" EventName="SelectedIndexChanged" />
    </ContentTemplate>
</asp:UpdatePanel>
```

Code 02 – Example camper class.

```
/// <summary>
/// Class Camper encapsulates a camper. Inherits from Person.
///
/// Team: Ali Karbassi, Craig Kuehn, Brandon Resheske, Adam Rossmiller.
/// </summary>
public class Camper : Person
{
    private DateTime _DOB;
    private Gender_Sex_Type _gender;
    private String _image_URL;
    private String _created_by_username;

    public Camper(String ID, String firstname, String lastname, String middlename, String nickname,
        List<Phone> phones, List<Address> addresses, DateTime dob, Gender_Sex_Type gender, String
        image, String webAccount_username): base(ID, firstname, lastname, middlename, nickname,
        phones, addresses)
    {
        ...
    }
}
```

## 9 References

1. <http://www.uwplatt.edu/pacce/>
2. <http://www.badgercamp.org/>
3. <http://www.uwplatt.edu/csse/>