MIDWEST ONLINE MANAGEMENT SYSTEM

by

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This project document, submitted by Balaji Yarlagadda in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

(Faculty Advisor)

This project document meets the standards for appearance, conforms to the style and format requirements of the Computer Science Department of the University of North Dakota, and is hereby approved.

Graduate Director

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Date
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Title: Midwest Online Management System

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ABSTRACT

Collecting and maintaining data for IFMidwest project is tedious and time consuming. It is also difficult to search manually for data from various records. Midwest Online Management system is concentrated on developing online management system which will be easier and less time consuming to collect, maintain and search records. This will help to maintain data online which will be easier to make changes to data at the research place.

The system will collect, maintain and search people’s record from various ethnic races. It will generate reports on the search data and will save these reports in Word format. This project is developed on the Linux platform. The web server used for the project is Apache and the database is Mysql. Different scripting languages used in this project include PHP & Java Script. To develop the project, the Dream Weaver editor is used to make things easier.
Chapter I

Introduction

1.1 Problem Statement

Dr. Virgil Benoit is an Associate French Professor in the Language Department at the University of North Dakota (UND), whose research is on the people who migrated from the Quebec region in Canada to Northern parts of the United States. In conducting his research Dr. Benoit has the following problems:

- It is difficult to maintain records for the different people who are from various ethnic groups.
- It is hard to store and maintain all the records on paper.
- It is difficult to gather information from people who live far away.
- To maintain the information of people based on the different criteria within different tables is getting difficult.
- In his research, he has to search records based on different criteria including place of work, place of origin, community, name of the town, map number and family name.
- There is no efficient search system to search for records as the data is maintained on paper.
- The data collected from the different ethnic people has to be validated with them once the data is stored.
• The data has to be maintained properly so that it will help his future research.
• It is hard for users to send their updated information to the professor.
• It is difficult to save the records which are obtained from the search process as the data is maintained on paper.

To resolve the above problems, Dr. Benoit decided to implement the Midwest Online Management System (MOMS). MOMS allow users to fill different forms, allows user to search using different keywords, and allows users to send messages and announcements to the discussion board. Users can update their personal information and other information in the MOMS. Users can also validate their records which are already in the database. Generation of reports based on the search can be done easily using MOMS.

1.2 Requirements

MOMS has to allow three kinds of user to login into the system. The users who logs into the system can access different forms through which they can fill or update their records. One kind of user will have limited privileges to access the database and the other users will have all privileges to access the database. There have to be four types of users to view the system:

• Guest User
• Registered User
• Administrator
• Super Administrator (Dr. Benoit)

Guest Users can be any User who will not have any privileges to access the system but only have access to the home page. Registered Users are the people from
different ethnic races who are involved in Dr. Benoit’s research. Based on the ethnic races, they are classified into Acadian, French, French Canadian, Métis, Teacher and Others. Others are the people who will not be from any one of those ethnic races. Once the Registered User is successfully authenticated into the system, they can access different forms through which they can insert and update different records into the database. The different records in the MOMS are based on the data that Dr. Benoit wants to collect.

The Administrator can be a GTA, GSA and professors from other universities who are involved with the research. The Administrator has to Insert a record, Update a record, Delete a record, Search a record, Generate reports on the search record, Post a message and Grant a message. Super Administrator will have all these privileges and can even delete the Administrator account for existing users. Figure 1 show the different users who can log into the system

![Diagram of User Roles in MOMS]

**Figure 1. Users that can log into MOMS**

The software has to allow the Super Administrator to create different accounts for different user categories. The privileges for every user must be restricted based on the
user type. The system has to allow the Super Administrator to make necessary changes to the Registered User records, delete an account and change the privileges allocated to a user.

The software has to allow the Super Administrator and the Administrator to add data. The system has to allow other users to access their data. The system also has to allow the Administrator and the Super Administrator to update data in the database. The changes can be due to incorrect entry in the record or updates in people’s information.

The system has to allow users to sign up, who want to get access into the system. During the sign up process, the user has to specify which ethnic group he belongs to. The users should not get access to add their records into other ethnic group. The system has to allow the user to use forms that are valid to that particular ethnic group the user belongs to. The system has to allow the Super Administrator and the Administrator to delete the users who misuse their privileges.

The system has to allow the Registered Users to Fill a Record, Update a Record, Send a message, Update Password and Personal Information. It has to allow the Registered Users to view the message board. The system has to allow this user to retrieve username and password if they forget.

The Super Administrator and the Administrator have to search the people records with various keywords depending upon the type of record they want to search. These searches can be from one type of record or from the combinations of the different records. From these searches, the Super Administrator or Administrator can make different conclusions which are the major part of Dr. Benoit’s research.
The system has to allow the Super Administrator and the Administrator to generate records on different criteria. The criteria can be results of the search and updating the records. The system has to allow these records to be saved as a word file, so that Dr. Benoit can make necessary conclusions by observing these files.
Chapter II

Specifications

Based on the requirements, the Midwest Online Management System (MOMS) has been developed in which the system will have a front end with web forms and a back end with a database. Web based html pages has been developed, so that normal users can access the system through the web. The web forms have been developed using Hyper Text Markup Language (HTML) through which a user can enter data. PHP has been used as a server side scripting language. To store the user entered data, Mysql database is used. Java script has been used to validate the entered data.

Dr. Benoit deals with various ethnic groups for his research. People from following ethnic groups are involved in his research:

- French
- Acadian
- Métis
- Teacher
- Others
- French Canadian

Based on the ethnic groups different data has to be collected. The data that has to be stored for all ethnic groups, except Teacher group, is:
• Place they are living – details of the place where they are living
• Community Details – details of the community where they are living
• General history of families and individuals – personal details of the family and individual
• First Generation details – details of the first generation of a user
• Second Generation details – details of the second generation of a user
• Personal History of the details – personal details of a user.
• Contemporary manifestations of French cultural identity – French culture details of a user

For Teacher group different data has to be collected. The Teacher group will have people from other ethnic groups. For Teacher following data has to be collected:

• Institutions – details of the institutions where the user(teacher) used to work
• Teachers with interest in French history in North America – teaching experience details
• The Poutrincourt Acadian Project – details of the Poutrincourt.

The MOMS will start with the main page (figure 2) which will have the option to login into the system. Figure 3 is the main login GUI that all users can access. If the user wants to login into the system, they will have the option to login based on the type of user. Figure 3 shows the login page for all users.

If the user is a Registered User, they will click the Login as a User in the main login page (figure 2) which will take them to the GUI which is shown in figure 4.
The user will also have the option to retrieve their username and password if they forget them. If the user is not registered, they have the option to sign up which will give them access to the system.

Once the Registered User logs into the system they will get a GUI which will provide the options to access the database. The Registered user main GUI is shown in figure 4.
By selecting the Fill the record option, the Registered User will have the option to select what type of information they want to provide. Once the Registered user selects the type, a corresponding GUI will be provided to enter the data. In figure 5, the Registered user selects to fill personal information and the corresponding GUI is opened where they can provide the data.

For the ‘Update the Record’ option, a corresponding GUI will be opened when the Registered User selects the type of information they want to update. In figure 6, the
Registered User selects to update the First Generation information, the GUI is opened and they can update the data.

![Update page for Registered Users.](image)

**Figure 6. Update page for Registered Users.**

Similarly corresponding GUI’s will be opened when the user selects ‘Update Password’ and ‘Request to Post a message’ options. These GUI’s are shown in figure 7 and 8 respectively.

![Update password for your account](image)

**Figure 7. Update password for Registered user**
If the Administrator wants to login into the system, they have to click ‘Login as a Administrator’ from the main login GUI (figure 3). The Administrator will have the GUI to login which is shown in figure 9:

**Figure 8. Page to post a message**

Access to the Admin users

**Figure 9. Login page for Administrator**

Once the Administrator logs into the system, it will take them to the Administrator main GUI which will have Administrator options. The GUI in figure 10 shows the Administrator main page.
When the Administrator selects ‘Insert the record’ they will have the option to select the type of information they want to insert. Once the Administrator selects the type, corresponding GUI will be displayed which will allow inserting the record. In figure 11 Administrator selects the Place Details corresponding GUI is opened, where they can insert the data in the fields shown.

If the Administrator selects ‘Update the record’ they will have the option to select the type of information they want to update. Corresponding GUI will be opened when the
Administrator selects the type of information they want to update. The update record action is shown in figure 12.

![Update Record](image)

**Figure 12. Update page for Administrator**

If the Administrator wants to Search the record, first they have to select the keyword. Once the keyword is selected and when the keyword entered, corresponding search results will be displayed in the GUI.

In figure 13, the Administrator selects Family Name as a keyword to search records from the Donation details. When the Administrator submits the keyword, a GUI will open which will give all the results based on the Family name entered. Figure 14 shows where the Administrator can enter Family name on which they want to search. Figure 15 shows the records that have family name with ‘yar’.
In Figure 15 records are displayed which have the lastname with ‘yar’. The keyword ‘yar’ which entered in figure 14 can be any where in the lastname.

The options Update password and Post a message on the Administrator main page are the same as the options which are shown on the Registered User main page.
Figure 15. Search based on the Keyword

If the Super Administrator wants to log into the system, they have to click **Login** as a **Researcher** from the main login GUI (figure 3). Once the Super Administrator successfully logs into the system, they can have various options in the Administrator main page. The Super Administrator main GUI is shown in figure 16:

![Super Administrator main page](image)

**Figure 16. Super Administrator main page**

Insert a record, Update a record, and Search a record are the same as on the Administrator main page. Update password and Post a message are the same as on the Registered User main page. The Super Administrator will have the option to ‘Grant
Administrator privileges’ and Drop ‘Administrator privileges’. If the Super Administrator selects ‘Grant Administrator privileges’ a GUI will open in which they have to enter the firstname, familyname, username and password in order to grant Administrator privileges. If the Super Administrator wants to delete the Administrator account they have to choose Change Administrator Privileges a GUI will open and the Super Administrator has to enter the id in order to drop the Administrator privileges. The GUI’s for both options are shown in figure 17 and 18.

![Figure 17. Grant Administrator Privileges page](image1)

![Figure 18. Change Administrator Privileges page](image2)
Chapter III

Software Design

The Software Design Process is the essential part in a project, which is a process in collecting the information of the project, analyzing the requirements, and designing the project with UML and some other notations. This will help in minimizing the errors in coding and make the coding part clear and easier. It will be used as the communicating language between software programmers. In general for the database project, the ER diagram is used along with other UML notations.

3.1 Designing the Database

Based on the requirements and from specifications, a database Midwest is created with the following tables in order to store the data:

- Place
- Community
- Geninfo
- Firstgen
- Secondgen
- Personnel
- Manifestations
- Institution
- Interest
- Poutrincourt
- Donor
- Users
- Administrator
- Super Administrator

Place, Community, Geninfo, Firstgen, Donor and Personnel are the common tables that are going to be shared by French, Acadian, French Canadian, Métis and Others. But the Teachers are going to use Institutions, Interest, Manifestations and Poutrincourt. Donor is created in order to store the information for the people who are going to donate funds to the Midwest project. Details table is created in order to authenticate users and for password recovery. During the registration process an Id is created in the Users table automatically by the database. For all the tables the Id which is a primary key for each table will be derived from the Users table automatically when they authenticated. So a unique Id will be maintained through out the database. The tables defined in the Midwest database are as shown in figure 19.

Figure 19. Represents the Midwest database
The Community table consists of various fields which are defined as below. Id is the primary key which will be allocated to each record and retrieved from the Users table. This table is basically designed to store the community details in which Acadian, French, Métis, French Canadian and Others are living. It will allow evaluating the job opportunities, organizations, ethnic groups, and events in a particular community. In these fields except firstname and familyname all other fields can be null. The firstname and familyname values will be retrieved automatically during authentication and will be inserted in the corresponding table. An html form is developed in order to enter the details into the table 1.

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Null</th>
<th>Default</th>
<th>Key</th>
<th>Extra</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cid</td>
<td>int(10)</td>
<td>No</td>
<td></td>
<td>Primary Key</td>
<td></td>
</tr>
<tr>
<td>Firstname</td>
<td>varchar(50)</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familyname</td>
<td>varchar(50)</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Events</td>
<td>varchar(100)</td>
<td>Yes</td>
<td>NULL</td>
<td></td>
<td>NULL</td>
</tr>
<tr>
<td>Influences</td>
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<td>Familynet</td>
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<td>NULL</td>
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<td>NULL</td>
</tr>
</tbody>
</table>

The Firstgen table is developed to store the First Generation details of a person. The research of the professor is mainly on the General history of families and individuals and their generation who migrated from Quebec to northern parts of the United States of America. So this table gives all the information of the first generation of the people. This table will help to find the next generations of a particular family. This table is used by French, Acadian, Métis, Teachers and Other people. A particular web form is developed along with PHP script to allow users to enter their data. The Fid, familyname and
Firstname fields will be automatically retrieved from the Users table. The table definition is shown in Table 2.

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<td>Primary Key</td>
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</tr>
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<td>Firstname</td>
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<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familyname</td>
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</tbody>
</table>

The Geninfo table consists of the Genealogical information for families and individuals of the people. It will store parent’s, children’s, and spouse details of a particular user. The information is basically on the birth details, place of origin, work done, and contact information. The Gid which is defined in Table 3 is derived from the Users table automatically. Through the Geninfo table, we can find various information that will be useful to find out the Ancestors and Children’s information. Using this information, we can find how the People and their generation are migrated to various places and where they are settled. This particular information will be the critical part of the whole MOMS research.

A web form is defined in order to allow the user to enter the details. The table definition is shown in Table 3.
<table>
<thead>
<tr>
<th>Field</th>
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</tr>
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<td>Sfirstname</td>
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<td>0000-00-00</td>
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</tr>
</tbody>
</table>

The Personnel table will have the personal details of the user. These Personnel history details are remembered directly or transmitted by some other source. This table will have the Pid as a primary key which will be derived automatically from the Users table. In order to fill the details a web based Html form is developed and PHP script is used in order to connect to the database. The table definition is shown in table 4.
Table 4. Personnel table defined in the Midwest Database

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
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<th>Extra</th>
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</thead>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

The Institutions table is created in order to store the details of a teacher. This table consists of firstname, familyname, place of origin, affiliation and other general data. This will give the general information of the Acadian, Métis, French and other people who are teachers. An html page is developed so that a user can enter the details into the database through the web form. The table definition is shown in table 5.

Table 5. Data Dictionary of Institutions table

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
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<th>Key</th>
<th>Extra</th>
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</tr>
</tbody>
</table>

The Interest table will store the details of the teachers who are interested in teaching. It consists of the teaching experience of the teachers, their personal information and their interest in future classes. This table will have Iid for each record which will be
retrieved from the Users table. From the Interest table, one can get a lot of information about a teacher’s experience which will be useful for recruiting a particular teacher’s position, when it is available in the Acadian, French and from other communities. The table definition is shown in table 6.

**Table 6. Data Dictionary of Interest table**

<table>
<thead>
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<th>Field</th>
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<th>Key</th>
<th>Extra</th>
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</tr>
<tr>
<td>Familyname</td>
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</tr>
</tbody>
</table>

The Manifestation table is designed to store the details of the registered users. It will have different fields which are Mid, Personal details of the user, Religious details, and Ethnic details of the user. The table definition is shown in table 7.

**Table 7. Manifestation table defined in the Midwest database**

<table>
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<th>Field</th>
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<tr>
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<tr>
<td>Swork</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Place table will allow a user to enter the details of the place they live. It will store Community Map Number, Name of Town, Geography characteristics and Natural resources of the place where they are living and probably their working place. It will have the field Plid which is automatically derived from the Users table. The table definition is shown in table 8.

Table 8. Data dictionary of the Place table

<table>
<thead>
<tr>
<th>Field</th>
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<td>Null</td>
</tr>
</tbody>
</table>

The Poutrincourt table is created in order to store the details of the people who are involved in the Poutrincourt project. It will have general information such as name, address and email. The table definition is shown in table 9.

Table 9. Poutrincourt table defined in the database

<table>
<thead>
<tr>
<th>Field</th>
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<th>Extra</th>
</tr>
</thead>
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<td></td>
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</tr>
</tbody>
</table>

In order to store the details of the Registered users who donated to the MOMS organization, the Donor table is created. The table will have firstname, familyname, address and type of donation. From this table we can get the information of what type of type of donations has been donated by the Registered user to the MOMS project.

Table 10. Donor table Data dictionary.

<table>
<thead>
<tr>
<th>Field</th>
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<th>Key</th>
<th>Extra</th>
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</tbody>
</table>
In order to authenticate or register a user, a table called Users is defined which will have the personal details such as first name, family name, email, address, home phone and work phone. It will also have the field which will describe to what ethnic group the user belongs. The Details table definition is shown in table 11.

<table>
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<tr>
<th>Field</th>
<th>Type</th>
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<td>Varchar(30)</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For Administrator and SuperAdministrator the table description will be the same, but in order to differentiate the users, separate tables are defined. These tables will have the Personal details of Administrator and SuperAdministrator, Secret Question, Secret Answer in order to retrieve username and password and what his role in the research. The table definition is showed in the figure 20.

![Figure 20. Super Administrator table defined in the Midwest Database](image-url)
3.1.1 Entity Relationship

The software design process for MOMS starts with developing an Entity Relationship diagram which will be used generally to represent a database model in a project. An Entity Relationship diagram is a detailed, logical and graphical representation between entities, associations and data elements [1]. It will give us a clear representation through which we can represent a Primary key (A key which is defined by a user from all fields through which one can perform all basic database operations on a table) and other fields in a table. We can even identify the relationship between tables. This will represent how we build a database. An Entity can be an existing or a real thing. In general, an entity can be defined as the fields which we described in our project.

In the Entity Relationship diagram (ER diagram) we can define three types of a relationship between entities:

1. **One-to-One:** one instance of an entity is associated with one other instance of an entity.
2. **One-to-Many:** one instance of an entity is associated with zero, one or many other instances of another entity.
3. **Many-to-Many:** one, zero or many instances of an entity is associated with zero, one or many other instances of another entity.

In this project there are a total of eleven tables and the relationship is defined in the ER diagram which is shown in figure 21. The problem in representing all fields for all tables makes the diagram more visually complicated. So in order to resolve this problem, the primary key in the tables is represented along with a special notation is used to represent remaining fields.
Figure 21. Represents the E-R diagram for Midwest database.
The description of the notation starts with the Place table in figure 21 and goes in the clockwise direction.

- The notation for the Place table is Pfields. The fields that Pfields represents are Geography and Naturalres.
- The notation for the Personnel table is pfields. The fields that pfields represents are Firstname, Familyname, Ffirstname, Ffamilyname, Mfirstname, Mfamilyname, Age, Documentation, Sfirstname, Sfamilyname, Ethnic, Sethnic, Swork and Information.
- The notation for the Super Administrator table is Safields. The fields that Safields represents are Firstname, Familyname, Address, City, State, Zipcode, Homephone, Workphone, Email, Username, Password, Question and Answer.
- The notation for the Interest table is Infields. The fields that Infields represents are Firstname, Familyname, Schoolname, Address, Email and Class.
- The notation for the Poutrin court table is PCfields. The fields that PCfields represents are Name, Address and Email.
- The notation for the Institutions table is Ifields. The fields that Ifields represents are Firstname, Familyname, Placeoforigin, Affiliation, Purpose, Keypersons, Source and Documentation.
- The notation for the Users table is Ufields. The fields that Ufields represents are Firstname, Familyname, Address, City, State, Zipcode, Homephone, Workphone, Email, Username, Password, Question and Answer.
- The notation for the Manifestations table is Mfields. The fields that Mfields represents are Firstname, Familyname, Activity, Community, Artistic, Religious,
Professional, Personal, Affected, Participate, Publicimage, Values, Ethnic, Sethnic, Swork and Information.

- The notation for the Community table is Cfields. The fields that the Cfields represents are Firstname, Familyname, Events, Influences, Opportunities, Ethnic, Organizations, Familynet, Social, Civil, Privatebus, Publicins and Privateins.

- The notation for the Administrator table is Afields. The fields that Afields represents are Firstname, Familyname, Address, City, State, Zipcode, Homephone, Workphone, Email, Username, Password, Question and Answer.

- The notation for the Geninfo table is Gfields. The fields that Gfields represents are Firstname, Familyname, Givenname, Placeoforigin, Province, County, Birthdate, Birthplace, Father, Mother, affiliation, Work1, Work2, Work3, Sfamilyname, Sfirstname, Splaceoforigin, Sprovince, Scounty, Sbirthdate, Sbirthplace, Sfather, Smother, Children, Cplaceofbirth, Cbirthdate, Information and Contact.

- The notation for the Firstgen table is Ffields. The fields that the Ffields represents are Firstname, Familyname, Achievements, Arrivaldate, Placeoforigin, Routes, Material, Typeofwork, Objects, Personrem, Groupperson and Routeperson.

- The notation for the Donor table is Dfields. The fields that Dfields represents are Name, Address and Email.

In this way the fields are designed in the ER diagram as shown in figure 21 for the Midwest database. By using the Primary key, we can perform all database operations on each table. In the Midwest database design, each user will be automatically assigned a unique Id during the registration process, which will be retrieved by other tables later.
The retrieval process starts once the user is authenticated and the Id which is retrieved from the Users table will become primary key for the remaining tables in the database. So the users will have a unique and the same Id for all the tables.

In this way the Midwest database is implemented with various tables. Based on these tables and the requirements, Html forms which are embedded with PHP and Java Script are designed.

### 3.2 UML Designing

MOMS is designed on the basis of Unified Modeled Language (UML) standards. UML is an Object Management Group (OMG), which is a standard used for modeling different software artifacts. MOMS uses UML notations that are applicable but not all of the notations. Following UML Diagrams are used in the MOMS:

- Use Case Diagram
- Deployment Diagram
- Data flow Diagram

#### 3.2.1 Use Case Diagram

A Use Case diagram can be defined as a diagram which will represent the interaction between actors and use cases [2]. It is defined as a set of scenarios that describe an interaction between a user and the system. An actor can be defined as a user in the system, which is going to interact with the project which is going to be modeled. A use case can be defined as the action or set of actions performed by the user in a project. The actors in the MOMS are Guest User, Registered User / Teacher, Administrator and Super Administrator.
Once the user logs into the system they will have many options to access the system and these are represented as use cases in the Use Case diagram. The use cases in the MOMS that are shown in figure 22 are Access main page, Submit Information, Update record, Search a record, Delete record, Update Personal Information, Post a Message, Grant a Message, Changing User Privileges, Granting Administrator Privileges, Generate a Word Document, Accessing Database and Retrieve Id.

The icon <<Extends>> in figure 22 tells that an actor can perform the sub-actions under a particular action. The sub-actions in the MOMS are Métis, Acadian, French, Canadian, French, Other and Teachers.

The Use Case diagram in figure 22 gives what a user can do once they logs in to the system. Following information can be retrieved from the Use Case diagram:

- A Guest User can only view the main page which will contain the Prof. Virgil Benoit research and other information. In order for the Guest Users, to access the MOMS, they have to get access by submitting the various details.

- Registered Users can submit and update their personal information and post the message, which will be filtered by the Administrator later in order to get posted on the message board. Even the Registered User can view the different messages in the message board.

- The Administrator can perform insert, update, delete and search for any record on French, Acadian, French Canadian, Métis, Teachers and Others tables.

- The Super Administrator can perform all the Use-cases in the MOMS.
Figure 22. Use case Diagram for MOMS
3.2.2 Deployment Diagram

The Deployment diagram will represent the Hardware and Software being used in the project. It can be defined as the “UML diagram which displays the configuration of run-time processing elements and the software components, processes, and objects that live on them.” [3]. The deployment diagram for MOMS is shown in figure 23. The User will interact with the system using html forms which are embedded with the PHP code. The html is usually for display purposes but in order to run the script, PHP is used in the MOMS to authenticate and interact with the Mysql database.

![Deployment Diagram for the MOMS](image)

Figure 23. Deployment Diagram for the MOMS

3.2.3 Data Flow Diagram
The graphical representation for the flow of data in a project can be represented through the Data Flow diagram. It will give the step wise representation of the flow or action taken in the project. It can be defined as “description of data and the manual and machine processing performed on the data as it moves and changes from one stage to the next stage” [4]. It will also give the details of where the data is stored such as database or disk or tapes.

![Figure 24. DFD representing the All Users](image)

Figure 24 will give information as how the user is authenticated and able to access the various parts of the project. The diagram also gives the information about the user fails authentication.
Figure 25 shows that once the user is authenticated he can perform different actions. For the insert and update they can perform on the tables Community, Donor, Firstgen, Geninfo, Personnel, Place, Secondgen and the data is stored in the Midwest database which is shown in figure 25.

![Figure 25. DFD representation of the Registered User](image)

In figure 26 the DFD represents the Administrator activities once he logs into the system. The Administrator can insert, update, delete and search any kind of people’s information. For example they can access all Métis, Acadian, French Canadian, French, Others and Teacher information. Moreover, the Administrator can grant access to post the message in order to scan for filtering the messages. They can generate the Word
documents on the basis of the search. All the information is stored in the Midwest database.

![DFD Diagram](image)

**Figure 26. DFD represents the Administrator in MOMS**

In figure 27, it shows the Super Administrator activities once they log in to the system. They can perform all the activities performed by the Administrator and also can change the Administrator privileges and can access the database.

In figure 28, the DFD diagram shows how the teacher can access the pages that are available to him. They can submit and update information for Manifestations, Institutions, Interest, Donor and Poutrincourt tables.
Figure 27. DFD represents the Super-Administrator in MOMS

Figure 28. DFD represents the Teachers in a MOMS

In figure 29, it shows that UID, Cid, Did, Fid, Gid, Iid, INid, Mid, PLid, PCid, Pid and Sid are the primary keys for the corresponding tables. But all the Primary keys for
each table are going to be retrieved from the Users table which is UID. Therefore Cid, Did, Fid, Gid, Iid, INid, Mid, PLid, PCid, Pid and Sid will become foreign keys.

The Primary Key is the key element which uniquely identifies each record in the table [5]. It can be assigned by the user or the database will assign the value which will be incremented by one for each record in the table. The Foreign Key is the element in one table that will be a primary key in another table. The foreign key can be derived or referred from another table. These are the key elements to define for different tables that have dependency between them.

In the Midwest table, every table has the first name and family name fields. It is hard for the users to repeatedly enter these fields. In order to overcome this, the user has to enter these fields during registration which will carry throughout the project. In order to do this, the Id which was created during registration is carried for all the tables in the project. So the UID in the users table which is a primary key will now carry to all the tables using PHP sessions and there it will act as a primary key and as a foreign key. This Id will be retrieved when the user enter username and password during the authentication. The PHP sessions will retrieve Id, first name and family name from the Users table and will add these fields to the other tables. This assures that a user will have the same Id throughout the project and there is no need to enter the first name and family name for all the tables.

By using PHP sessions, the user will have less work to enter the repetitive data and the Administrator can maintain the single Id for all the tables for a single user.
Figure 29. Representing the primary keys and foreign keys in the Midwest Database
Chapter IV

Implementation

MOMS was implemented on a Linux server. All GUI’s were developed using HTML and Java Script. PHP was used as a server side scripting language. Mysql database was used as the backend database to store the data.

4.1 Implementing Forms and Framesets

MOMS was implemented with forms and framesets. Java script was used to validate the data entered by the user. MOMS implementation starts with:

- Designing framesets
- Designing html forms
- Validating the data

4.1.1 Designing framesets

Frame Sets were used to maintain same header and leftfer through out the project.

There are four different framesets used for MOMS:

- Main page frameset (Figure 30)
- Registered users frameset (Figure 31)
- Administrator frameset (Figure 32)
- Super Administrator frameset (Figure 33)

These framesets are shown in figure 30, 31, 32 and figure 33 respectively.
Welcome To IFMidwest Online System

About Vinyl Benoit

Login

UND Home

Contact Webmaster

Contact

Welcome to IFMidwest Online System. This project is for the people who migrated from Quebec, Canada to Northern states of U.S.A.

Fill the Record
Update the Record
Update Password
Request to Post a Message
View Message Board
Update Personal Information

Welcome to Midwest. The place you can explore about the French heritage and French People in U.S.A.

Figure 30. Main page frameset

Figure 31. Registered User frameset
Figure 32. Administrator Frame set

Figure 33. Super Administrator Frameset
4.1.2 Designing html forms

Once the framesets were designed, the html forms will be designed for the whole site. All these html forms were designed using Dream Weaver editor. The sample html page that was designed and implemented along with the Registered user frameset is shown in figure 34. The html form in figure 34 is used by the Registered user to enter the institution details into the database. In this way all the html forms were designed.

![Registered user entering the data using a html form](image)

**Figure 34. Registered user entering the data using a html form**

4.1.3 Validating the data

Some of the html forms needed validation, and this client side validation was done using Java Script. This Java Script code was embedded in the html code. The validation had to make sure that the user had entered a correct Email address. It had to
ensure that the user had entered firstname and familyname. The Java Script code that was
implemented in order to provide above validation is:

```
<script language="JavaScript" type="text/JavaScript">
<!--
function MM_findObj(n, d) { //v4.01
    var p,i,x; if(!d) d=document;
    if((p=n.indexOf('?'))>0&parent.frames.length) {
        d=parent.frames[n.substring(p+1)].document;
        n=n.substring(0,p);
    }
    if(!(x=d[n])&d.all) x=d.all[n];
    for (i=0;i<x&i<d.forms.length;i++) x=d.forms[i][n];
    for(i=0;i<x&d.layers&i<d.layers.length;i++)
        x=MM_findObj(n,d.layers[i].document);
    if(!x & d.getElementById)
        x=d.getElementById(n);
    return x;}

function MM_validateForm() { //v4.0
    var p,i,q,nm,test,num,min,max,errors='',
    args=MM_validateForm.arguments;
    for (i=0; i<(args.length-2); i+=3) {
        if (val) { nm=val.name;
            if ((val=val.value)!="") {
                if (test.indexOf('isEmail')!=-1) {
                    p=val.indexOf('@');
                    if (p<1 || p==(val.length-1)) errors+='- '+nm+' must contain an e-mail address.
';
                } else if (test!='R') { num = parseFloat(val);
                    if (isNaN(val)) errors+='- '+nm+' must contain a number.
';
                    if (test.indexOf('inRange') != -1) {
                        p=test.indexOf(':');
                        min=test.substring(8,p); max=test.substring(p+1);
                        if (num<min || num>max) errors+='- '+nm+' must contain a number between '+min+' and'+max+'.
';
                    } } else if (test!="R") errors+='- '+nm+' is required.
';
            } else if (test!="R") errors+='- '+nm+' is required.
';
        }
    if (errors) alert('The following error(s) occurred:
'+errors);
    document.MM_returnValue = (errors == '');
}-->
</script>

If the firstname and familyname were missing, and if the Email Id was invalid
then an error would be generated which is shown in figure 35.
Once the client side validation was done, then server side scripting had to be implemented using PHP. By using PHP, the following server side modules had to be implemented:

- Database Connectivity
- Encrypt Password
- Generating Random Password
- Implementing Sessions
- Generating firstname, familyname and Id in necessary html forms

### 4.2 Implementing Database Connectivity
When the user entered data into the HTML forms and when they selected the submit button, all the data had to be inserted into the database. This was implemented using PHP. The code that is needed to implement the database connectivity and inserting the data into the database is:

```php
<?
$database="xxxxxxxxx";
$localhost="localhost";
$familyname=$_POST['familyname'];
$firstname=$_POST['firstname'];
$achievements=$_POST['achievements'];
$arrivaldate=$_POST['arrivaldate'];
$placeoforigin=$_POST['placeoforigin'];
$routes=$_POST['routes'];
$material=$_POST['material'];
$typeofwork=$_POST['typeofwork'];
$objects=$_POST['objects'];
$personrem=$_POST['personrem'];
$groupperson=$_POST['groupperson'];
$routeperson=$_POST['routeperson'];
mysql_connect($localhost,$username,$password);
@mysql_select_db($database) or die( "Unable to select database");
$query1 = "INSERT INTO firstgen VALUES
('id',"firstname","familyname","achievements","arrivaldate","placeoforigin","routes","material","typeofwork","objects","personrem","groupperson","routeperson")";
mysql_query($query1);
mysql_close();
?>
```

4.3 Encrypting Password

In order to maintain secure passwords in the database, the passwords had to be encrypted and then inserted into the database. This helps in maintaining a more secure system. The passwords are encrypted by using PHP function sha1( ). The code that is used to encrypt the password is:

```php
$pass=$_SESSION['password1'];
$pass1=sha1($pass);
```

4.4 Generating Random Password
The PHP function that was used to generate a random password is Random_Password(). This function was used when the user forgot their password. By using this function, the system generates a temporary password and that password is updated into the database. The user will receive a temporary password through an email by using the PHP function mail(). The code for generating a random password is:

```php
function Random_Password($length) {
    srand(date("s"));
    $possible_characters = "abcdefghijklmnopqrstuvwxyz1234567890";
    $string = "";
    while(strlen($string)<$length) {
        $string .= substr($possible_characters, rand()%(strlen($possible_characters)),1);
    }
    return($string);
}
```

4.5 Implementing Sessions

Sessions were used to keep track when the user visits a website. When the session was expired the user had to log into the system again, which makes the system more secure. The session is set when the user logs into the system successfully. When the user logs off, the session will be unset. The code to set the session in PHP is:

```php
$_session['username'] = $username.
$_session['password'] = $password.
```

Once the user logs out the session has to be unset. The PHP code to unset the session is:

```php
unset ($_SESSION['username']);
unset ($_SESSION['pasword']);
```

When the user tries to access MOMS, the system will check whether the session is set or not. If the session is not set the system will inform the user that the session is expired, and they have to login again. The session expired message is shown in the figure 36.
If the PHP code unset the session then the session will be expires and the message is displayed which is shown in figure 36. The PHP code required to check whether session was set or not is:

```php
<?
session_start();
header("Cache-control: private"); //IE 6 Fix
if(!isset($_SESSION['username'])){
    echo "Invalid Login";
    echo "<META HTTP-EQUIV='refresh'content='0;URL=/midwest/sessionex.html'>";
}
?>
```

Figure 36. Session Expire Error

4.6 Generating firstname, familyname and Id in necessary html forms

This can be done automatically using session variables. As the session variables have username and password, we can retrieve Id, firstname and familyname for that
particular user. These can be displayed wherever they were required in the html page.

The PHP code required for retrieving firstname, familyname and Id is:

```php
<?
$usernam1=$_SESSION['username1'];
$pass=$_SESSION['password1'];

mysql_connect($localhost,$username,$password);
@mysql_select_db($database) or die( "Unable to select database");
$query="select id familyname firstname from users where username1='$usernam1' && password='$pass1'";
$result=mysql_query($query);
$num=mysql_num_rows($result);

$i=0;
while ($i < $num) {
    $id=mysql_result($result,$i,"id");
    $i++;}
?>
```
Chapter V

Software Testing

Software testing is a process to check whether the software meets the client requirements by inputting a set of inputs. Software testing involves Software Verification and Software Validation. In Software Verification, the software will be verified whether we are building the software right. In Software Validation the software will be validated whether we are building the right software. Testing can also be defined as the process of executing a program with the intent of finding errors [11]. The testing strategies that are used to test MOMS are:

- Unit testing
- Usability testing
- Integration testing.

5.1 Unit Testing

Unit testing is a testing process used to identify the errors in html and Java Script code. In the Unit testing, each html page is considered as a unit, and the testing is done on each unit. In order to test all the html forms in MOMS, the “W3C Markup Validation Service” is used. By using this tool, all missing tags and html errors were identified. Java Script and html links were checked manually on each unit.
5.2 Usability Testing

Usability testing is one of the testing methods used to improve the quality of systems and websites, which is done with the potential users. Basic steps involved in Usability testing are:

• Select a small group of people who are representative of the audience for the website.
• Watch the user performing assigned tasks on the website, and note where they fail.
• Examine the data gathered from direct observation of users; figure out why the subjects fail to perform tasks, isolating the problems on each page.
• Explain the problem areas to the website designers and the site owners, and take corrective actions.
• Finally, start over testing the supposedly corrected site again with a new group of users.

CARE methodology is a Usability testing which is a Cheap, Accurate, Reliable and Efficient testing methodology. By using the CARE methodology, we can identify whether all the client requirements are implemented. After the options were implemented on the left and header framesets, then functionality of these options were further tested. In order to implement the CARE methodology, three different types of testers were selected on the basis of their knowledge of the web based technology. The testers are classified as below:

• High skilled testers
• Medium skilled testers
• Low skilled testers

The testers that were selected under these categories were given access to MOMS to test the functionality of the whole site. Once the testing was done, a report was taken from each tester regarding the difficulties they had faced in accessing the html forms. Based on these reports certain changes were implemented in MOMS. Sometimes the MOMS developer has to work along with the low skilled tester in order to explain how the whole MOMS operation goes.

Based on the reports certain changes were implemented in the MOMS. The changes that were implemented from the reports are:

• The Administrator and Super Administrator had problems in retrieving Id for the Registered users and Administrators. A special option was implemented to retrieve the Id for the Registered users and Administrators. This option is shown in figure 37.

![Figure 37. Retrieve Id for User and Administrator](image)

Welcome To IFMidwest Online System

Welcome to the Administrator Page.

The place where you can add the to the IFMidwest data. You have the following privileges which is shown in the left side.

Retrieve the Id
- Retrieve User Id
- Retrieve Admin Id

Admin Privileges
- Show All
Previously when users logged out, they were redirected to the page shown in figure 38.

**Figure 38. Logout page**

**Figure 39. Main page**
When the user selected ‘Click here’ in figure 38, they were redirected to the home page shown in figure 39. This makes the user confused as they don’t know where to login again. In order to clear this confusion, the link has been changed to the login page which is shown in figure 40.

Figure 40. Login page

- The user was unable to understand the functionality of some functions. In order to overcome this, Manual Pages are provided in the header frame set. Manual Page option is pointed in figure 41. When the user selects Manual Pages a word file will open with a detailed description of each functionality that is available on the main page.

- Occasionally the user accidentally selects the logout page and the sessions used to expire. In order to avoid this, a dialog box was created so that the user has to confirm whether they really want to logout. The dialog box is shown in figure 42.
When the Super Administrator wants to delete a record, they had to select ‘Ok’ from the dialog box in order to delete the record successfully.
• If the Super Administrator enters the wrong Id in order to delete the record, they can cancel the operation by selecting ‘Cancel’ from the dialog box.

5.3 Integration testing

Integration testing is used to test the different parts of an application and interfaces to determine their functionality. In order to perform Integration testing on MOMS, Real Validator is used. Real Validator is an html syntax checker for windows which uses the SGML parser [11]. As MOMS was developed on a Linux server, the validation is done by importing all MOMS files to a local windows machine. The validation is shown in figures 43.

Real Validator has three windows which are shown in figure 42. The top window shows the number of errors for that particular html file. The middle window shows the location and description of errors. The bottom window has the html code for the validation file.

Figure 43. Shows Errors in Header2.html
Conclusion

The final project (MOMS) meets all the requirements requested by Dr. Virgil Benoit for his research. MOMS was implemented by using all software engineering methodologies and the final product was tested with different testing software.

Throughout this project, I got the chance to interact with a real client and to develop a project on a Software Engineering basis. As Dr. Virgil Benoit doesn’t have any knowledge in the software field, weekly meetings helped me understand exactly what he wants from the software which is going to be developed. I divided the whole project into different steps which helped Dr. Benoit to understand how the final project will look like. Dr. Benoit’s home page is maintained by CILT (Center for Instructional Learning Technologies) at UND. The meetings with Mr. Chad Bushy (Administrator in CILT) helped me to develop user friendly software as in the future the software is going to be maintained by Mr. Bushy. Even the meetings with Mr. Bushy and Dr. Virgil Benoit helped me to explain how the software was implemented.

During the testing process, I realized it was difficult for users to use parts of the software. Testing helped me make changes in the software, which helped to develop a more user friendly software. It even helped me remove bugs from the software.

Now I understand how documentation plays a crucial part in software development. The meetings with Dr. Marsh helped me discuss the issues and to develop the necessary documentation for the software. The documentation for MOMS includes
the information how the software is developed on the software engineering basis as well as the user manual. The documentation should help future developers to make changes in the software if required.

6.1 Future Considerations

The Following future considerations can be implemented by future developers for MOMS:

- The authentication process for MOMS could be implemented using LDAP (Lightweight Directory Access Protocol) so that the users can log into the MOMS by using their Umail account. But the system has to make sure that the users who log into the system have to be registered as a Registered Users or Administrators or Super Administrators.

- All the records that are generated at present are in Word format. Future developers can generate these records in PDF format so that they can be used for publications.

- Future developers can develop maps which are used in the research using Flash. They can also implement a slide show option for the pictures that are stored in the MOMS web server. They can also redevelop the whole project in Java or .Net to add more functionality to MOMS.
References

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   ndi=40782,00.asp
APPENDIX-I

User Manual

Midwest Online Management System (MOMS) is the software developed for the research on the people who migrated from Quebec, Canada to the northern parts of U.S.A. The system will collect the necessary data required for the research. The system will help researchers in searching people records and generate records which will help to make necessary conclusion for research. MOM’s software is developed with PHP, HTML and MySql. MOMS software is developed on Linux server.

To start using MOMS, enter www2.und.edu/dept/ifmidwest.mainpage.html in web browser. MOMS starts with the main page which will give the user an option to continue in English or Francais (French) which is shown in the figure 44.

![Welcome to IFMidwest Search Page](image)

This is the place where you can get information for the French people who had settled in the middlewest of USA.

Figure 44. GUI represents MOMS Main page
Once the user selects the language, it will redirect to the corresponding main page. The main page will have following options:

**About Virgil Benoit:**

This option will open a page which will have Virgil Benoit’s profile which is shown in figure 45.

**Login:**

This option is used to login into the MOMS system. This option will open the login page which is shown in figure 45. MOMS will allow three types of users into the system. The user has to select the login option in figure 45 based on which group they belong.

**UND Home:**

This option will let the user to open UND home page in separate window.

**Contact Webmaster:**

The users can send an Email to the Webmaster for feedback and any queries regarding the MOMS by selecting this option.

---

![Welcome To IFMidwest Online System](image)

**Figure 45. Main page**

**Contact:**

The contact will open a page which will have Virgil Benoit’s Contact information.
Figure 46. Login page for all Users

Figure 47. Registered User Login page

Login as a User:

People who want to submit their information for research they have to select ‘login as a User’ option in figure 46. Users will redirect to the login page which is shown
in figure 47. If the user forgets their username or password they can retrieve it by selecting ‘Forgot username’ or ‘Password’ in figure 47.

**Figure 48.1. Sign up Page top**

**Figure 48.2 sign up page bottom**

Fill the following Personal details

- **First Name:**
- **Last Name:**
- **People:**
- **Address:**
- **City:**
- **State:**
- **Zipcode:**
- **Home Phone Number:**
- **Work Phone Number:**
- **Email:**

! Enter valid & correct Email id so that your password & username will be sent to your Email

Please Enter the following details to get Username & Password

- **Required User Name you want to register:**
- **Required Password you want to register:**
- **Select Question in order to retrieve password:**
- **Enter Answer to retrieve password:**

Submit
New users can sign by selecting ‘New User Sign up’ option in figure 47. They have to fill the information which is shown in figure 48.1 and 48.2. Once they submitted they information they can login into the system. When the Registered user successfully logs in to the system then they will be redirected to their home page which is shown in figure 49.

![Welcome To IFMidwest Online System](image)

**Figure 49. Registered Users Home Page**

Once the Registered User successfully logs into the system, their Id, Firstname and Familyname will be filled automatically in the html forms. The Registered user will have following options once they log in to the system:

**Fill the record:**

![Fill the Record](image)

**Figure 50. Shows Pop up Window for ‘Fill the Record’**

The user can add data based on seven different categories into the database. If the user selects the ‘Fill the Record’ then a popup window will appear in which they have to select...
the category of data they want to add which is shown in figure 50. The category and navigation to add the data is shown in table 12.

Table 12. Navigation to submit the data into the database

<table>
<thead>
<tr>
<th>Category</th>
<th>Navigation to add data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Select Fill the record on the left side menu -&gt; select Community from the pop up menu -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Firstgen</td>
<td>Select Fill the record on the left side menu -&gt; select Firstgen from the pop up menu -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Geninfo</td>
<td>Select Fill the record on the left side menu -&gt; select Geninfo from the pop up menu -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Personnel</td>
<td>Select Fill the record on the left side menu -&gt; select Personnel from the pop up menu -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Place</td>
<td>Select Fill the record on the left side menu -&gt; select Place from the pop up menu -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Donor</td>
<td>Select Fill the record on the left side menu -&gt; select Donor from the pop up menu -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
</tbody>
</table>

Update the Record:

Figure 51. Shows Pop up Window for ‘Update the Record’

The user can update seven different categories of data into the database. If the user selects the ‘Update the Record’ then a popup window will appear in which they have to select the category of data they want to update which is shown in figure 51. The categories and navigation to update data is shown in table 13.
### Table 13. Navigation to update data

<table>
<thead>
<tr>
<th>Category</th>
<th>Navigation to Update data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Select Update the record on the left side menu -&gt; select Community from the pop up menu -&gt; Update the details that are displayed in the form -&gt; Click Update-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Firstgen</td>
<td>Select Update the record on the left side menu -&gt; select Firstgen from the pop up menu Update the details that are displayed in the form -&gt; Click Update-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Geninfo</td>
<td>Select Update the record on the left side menu -&gt; select Geninfo from the pop up menu -&gt; Update the details that are displayed in the form -&gt; Click Update-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Personnel</td>
<td>Select Update the record on the left side menu -&gt; select Personnel from the pop up menu -&gt; Update the details that are displayed in the form -&gt; Click Update-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Place</td>
<td>Select Update the record on the left side menu -&gt; select Place from the pop up menu -&gt; Update the details that are displayed in the form -&gt; Click Update-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Donor</td>
<td>Select Update the record on the left side menu -&gt; select Donor from the pop up menu -&gt; Update the details which are displayed in the form -&gt; Click Update-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Secondgen</td>
<td>Select Update the record on the left side menu -&gt; select Secondgen from the pop up menu -&gt; Update the details which are displayed in the form -&gt; Click Update-&gt; Confirmation page will be displayed.</td>
</tr>
</tbody>
</table>

### Update Password:

The user can update the password by submitting the old password and new password by selecting ‘Update Password’ from registered user main page. The navigation is shown in table 14.

### Table 14. Navigation to Update password.

| Update Password | Select Update password from the menu on the left side -> fill the details in the form -> Click Submit -> Confirmation page will be displayed. |

### Post a Message:

This option is used to post a message into the Message board. Once the user submits the corresponding Html form, the details will be sent to the administrator or Super Administrator in the form of an email. The Administrator or Super Administrator will scan the message and post the message, if the message is not filthy. Navigation is shown in the table 15.
Table 15. Navigation to post a message

| Post a Message | Select Post a Message from the menu on the left side -> fill the details in the form -> Click Submit -> Confirmation page will be displayed. |

View Message Board:

This option is used to view all the messages in the message board. Through this message board users can view messages and announcements.

Update personal information:

The user can update their personal information which they submitted during signup process.

Login as an Administrator:

Administrators have to select ‘Login as an Administrator’ from the page shown in figure 46. Once the user successfully logs into the system, they will be redirected to the Administrator’s home page which is shown in figure 52.

![Figure 52. Administrator home page](image)

The options for Administrator have been shown on the left side menu and the header menu which is shown in figure 52. Administrator has following options

Insert the Record:

The administrator can insert ten different categories of data into the database.
Table 16. Navigation to insert the record by Administrator

<table>
<thead>
<tr>
<th>Category</th>
<th>Navigation to insert the data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Select Fill the record on the left side menu -&gt; select Community from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Firstgen</td>
<td>Select Fill the record on the left side menu -&gt; select Firstgen from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Geninfo</td>
<td>Select Fill the record on the left side menu -&gt; select Geninfo from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Personnel</td>
<td>Select Fill the record on the left side menu -&gt; select Personnel from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Place</td>
<td>Select Fill the record on the left side menu -&gt; select Place from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Donor</td>
<td>Select Fill the record on the left side menu -&gt; select Donor from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Institutions details</td>
<td>Select Fill the record on the left side menu -&gt; select Institutions from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Interest in Teaching</td>
<td>Select Fill the record on the left side menu -&gt; select Interest in Teaching from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Manifestation Record</td>
<td>Select Fill the record on the left side menu -&gt; select Manifestation details from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Poutrin court Record</td>
<td>Select Fill the record on the left side menu -&gt; select Poutrin court Information from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit-&gt; Confirmation page will be displayed.</td>
</tr>
</tbody>
</table>
When the Administrator selects ‘**Insert the Record**’ a popup window will appear in which they have to select the category of data they want to add which is shown in figure 53. In order to insert the data, they have to submit the Id of a user whose data has to be inserted. The category and navigation can be show in the table 16.

**Update the record:**

The category and navigation to update the record by administrator can be show in the table 17.

### Table 17. Navigation to Update the record by Administrator

<table>
<thead>
<tr>
<th>Category</th>
<th>Navigation to update the data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Select Update the record on the left side menu -&gt; select Community from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Firstgen</td>
<td>Select Update the record on the left side menu -&gt; select Firstgen from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Geninfo</td>
<td>Select Update the record on the left side menu -&gt; select Geninfo from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Personnel</td>
<td>Select Update the record on the left side menu -&gt; select Personnel from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Place</td>
<td>Select Update the record on the left side menu -&gt; select Place from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Donor</td>
<td>Select Update the record on the left side menu -&gt; select Donor from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Institutions details</td>
<td>Select Update the record on the left side menu -&gt; select Institutions from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Interest in Teaching</td>
<td>Select Update the record on the left side menu -&gt; select Interest in Teaching from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Manifestation Details</td>
<td>Select Update the record on the left side menu -&gt; select Manifestation Details from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Poutrin court Record</td>
<td>Select Update the record on the left side menu -&gt; select Poutrin court Information from the pop up menu -&gt; Submit Id -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
</tbody>
</table>
The administrator can update ten different categories of data into the database. When the Administrator selects ‘Update the Record’ a popup window will appear in which they have to select the category of data they want to update which is shown in figure 54. In order to update the data, they have to submit the Id of a user whose data has to be updated.

![Figure 54. Shows Pop up Window for ‘Update the Record’](image)

**Figure 54. Shows Pop up Window for ‘Update the Record’**

Search the record:

When the Administrator selects ‘Search the Record’ a popup window will appear in which they have to select the category of data they want to Search which is shown in figure 55. Before searching the data, the administrator has to search on what category of data they want to search. Once they select the category, they have to select on what search criteria they want to search the data and then they have to submit the keyword. The data will be displayed in the form based on the keyword.

![Figure 55. Shows Pop up Window for ‘Search the Record’](image)

**Figure 55. Shows Pop up Window for ‘Search the Record’**
The category and navigation to search the record by Administrator is shown in table 18.

**Table 18. Navigation to search the record by administrator**

<table>
<thead>
<tr>
<th>Category</th>
<th>Navigation to search the data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Select Search the record on the left side menu -&gt; select Community from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Firstgen</td>
<td>Select Search the record on the left side menu -&gt; select Firstgen from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Geninfo</td>
<td>Select Search the record on the left side menu -&gt; select Geninfo from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Personnel</td>
<td>Select Search the record on the left side menu -&gt; select Personnel from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Place</td>
<td>Select Search the record on the left side menu -&gt; select Place from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Donor</td>
<td>Select Search the record on the left side menu -&gt; select Donor from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Institutions details</td>
<td>Select Search the record on the left side menu -&gt; select Institutions from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Interest in Teaching</td>
<td>Select Search the record on the left side menu -&gt; select Interest in Teaching from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Manifestation Details</td>
<td>Select Search the record on the left side menu -&gt; select Manifestation details from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
<tr>
<td>Poutrin court Record</td>
<td>Select Search the record on the left side menu -&gt; select Poutrin court Information from the pop up menu -&gt; Select search criteria -&gt; Submit Keyword -&gt; Fill the details in the form -&gt; Click submit -&gt; Confirmation page will be displayed.</td>
</tr>
</tbody>
</table>
‘Delete the Message’ is an option for Administrator to delete any messages or announcements which are posted in the message board. In order to do that the administrator need the Id or the date, last name, first name of the message that has to be deleted.

**Table 19. Navigation to delete the message from message board**

| Delete the Message | Select delete the message on the left side menu -> Enter the Id or date-> click submit->Confirmation page will be displayed |

‘Grant a message’ is used to grant privileges to a message that has to be post in the message board. Administrator will receive an email which will have the lastname, firstname, Subject and message. Administrator can copy these details in to the form and can submit the message which will post in the Message board.

Update Password, View Message Board and Update Personal Information options are same as in Registered user.

**Login as a Super Administrator:**

If the Super Administrator has to login into the system then they has to select ‘Login as a Researcher’ option from the main page which is shown in the figure 46. Once the Super Administrator successfully logs in to the system they will be redirected to their home page. Super Administrator will have all the Administrator privileges but also they can Grant Administrator privileges, change Administrator privileges, delete the message and can retrieve Id. Super Administrator page is shown in figure 56. Here the Super Administrator cannot grant Super Administrator privileges to other users. The Super Administrator privileges are available to Dr. Virgil Benoit and the webmaster.
Figure 56. Super Administrator page

‘Grant Administrator privileges’ option is used to create an Administrator account for a user. Navigation to create an Administrator is shown in table 20.

Table 20. Navigation to create Administrator account

| Grant Administrator Privileges | Select Grant Administrator Privileges -> Enter firstname, familyname, username, password email -> Click Submit -> Confirmation page will be displayed |

‘Change Admin Privileges’ is used by Super Administrator to drop Administrator privileges for an Administrator. Navigation to delete administrator account for a user is shown in table 21.

Table 21. Navigation to Change Administrator Privileges

| Change Administrator Privileges | Select Change Administrator Privileges -> Enter Id -> Click Submit -> Confirmation page will be displayed. |

‘Retrieve Id’ is used to retrieve Id for a Registered user or for an Administrator. Navigation to retrieve Id is shown in table 22.

Table 22. Navigation to Retrieve Id

| Retrieve Id | Select Retrieve id from the left side menu -> Choose user or Administrator from pop up window -> submit id -> Click Submit -> Confirmation page is displayed. |