

# *Faculty Information System*

## **Software Requirements Specification**

### **Team Members**

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## **1. Introduction**

### **1.1 Goals and Objectives**

The purpose of this application is to have a common repository for all faculty information. This project will also incorporate all the software engineering principles involved in the design and implementation of a complete working system.

This system will help faculty members store and retrieve all their information. Students can also access specific areas of faculty information depending on the access provided.

Also the information is safe by enabling SSL on the web directories.

### **1.2 System Statement of Scope**

Faculty Information System is a web-based database application wherein all the information regarding the Faculty can be stored and retrieved. A user with the knowledge of how to use a browser can access and use the site. The administrator will have access to all the information present in the database, whereas the user will have privileges to view his/her information. Also users can be put into groups having access to certain areas of the website. The user interface will have the necessary input options to guide them through the process of inserting and updating their information.

Data will be inputted using data entry screens (user friendly interfaces), which will have all the steps for proper insertion. The administrator will have all the privileges to add or update any data in the system. Output will be in the form of an information repository showing user information pages.

Faculty Information System will hold the following information:

- Faculty Personal Information
- Work History for each faculty member.
- Publication archiving and retrieval for each faculty.
- Degrees earned by the faculty members.
- Grants/Awards given to faculty members.
- Courses taught by the Faculty members.

### **1.3 System Context**

This system will be an information database and can be used by Universities to hold their faculty information and display it on the web. People with minimal web browser experience can use the system to their fullest.

### **Potential Users**

Potential users include faculties, students, university officials such as Dean, chairs, etc and general users.

**Faculty members:** The system must allow each faculty member to manipulate his or her own information like the basic information, publications, grants details, etc. The operations can be add, delete, and modifying the faculty data.

**University Officials:** For the sake of faculty evaluation, university officials are often interested in faculty members' recent publications. The system must provide a good summary of all or recent publications.

**Students and general users:** The system must allow students to easily browse the bibliography information according to faculty names or recently published research topics. Using research topic keywords, they must be able to find all faculty members who have recently published papers in their respective fields.

## 1.4 Major Constraints

Since Faculty Information System is to be used on the web; there will be no system restraints on the users. Anyone with an Internet connection and a browser will be able to use the website to the fullest of its capabilities.

The working prototype of System is expected at the end of the semester, making the drop on 05/06/2003.

## 2. Usage Scenario

### 2.1 User Profiles

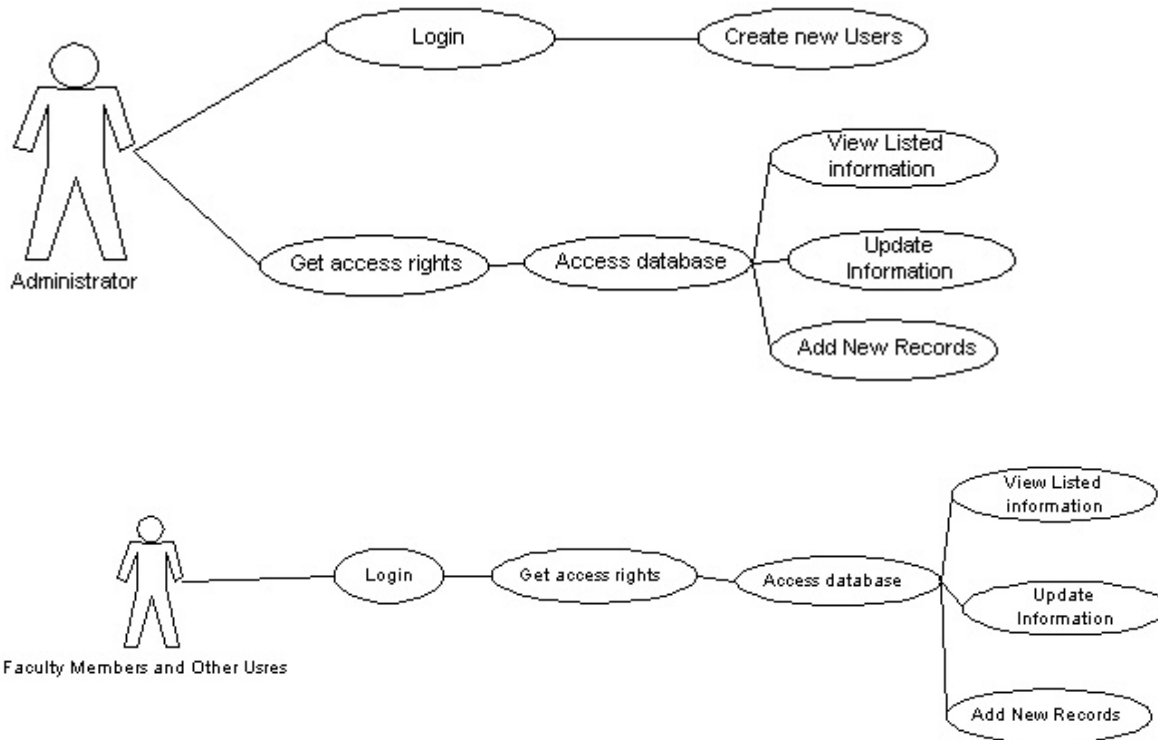
Three groups of users will access the faculty system. They are as described below :

**Faculty members:** Faculty members will provide their login credentials and get access to areas depending on their rights. They will login to update their existing information and also to add new information to the database. Only information specific to the faculty member can be edited or added.

**University Officials:** University officials like the staff will login to the system for the sake of faculty evaluation and also keep a track of all the events happening and the publications being published by the school faculty. University officials are often interested in faculty members' recent publications. University officials with administrative rights can add or edit information for all users.

**Students and general users:** Students and other will use the system to browse the bibliography information according to faculty names or recently published research topics. Using research topic keywords, they must be able to find all faculty members who have recently published papers in their respective fields. Only view facilities are available to users in this category.

## 2.2 Use Cases



### Login

The login credentials decide whether the user is an administrator or any of other users. This is used to validate against the users database and assign users to groups. Only if the username and password is correct, does the user get access to the system.

### Create New Users

Only the administrator has rights to create a new user. Here the basic user details like his first name, last name, username and password are entered.

### Get Access Rights

This is very important module, which decides what areas of the system are accessible to the users depending on their login credentials. Not all areas of the system are accessible to all users.

### Access Database

Once users rights are determined access to the system database is given.

### View Listed information

All the information present in the database is available to the user in a friendly format. Menu driven pages will help the user to get proper content.

### Update Information

Users with updating rights can update their information and save it back to the system.

### **Add New Records**

Users with addition rights can add new records to their names. Administrators have rights to add records to any user of the system.

### **2.3 Special usage considerations**

The only requirement for using the system is that the users login to the system and then if present get their access rights depending upon their respective groups.

## 3. Data Model and Description

### 3.1 Data Description

#### 3.1.1 Major Data Objects:

The following data modules will be presented and managed by the system:

- User Authentication / Insertion Module

This object will manage connections to the Users Database and retrieve appropriate information depending on the user login credentials. It will also manage the groups users belong to and accordingly give them access to privileged sections of the website. It will also contain processing to add a new user to specific group in the database.

- Data Entry Module

This module will encompass all the data entry to be done in the system. Entries like the departments in the University, courses offered, office addresses, etc.

- Faculty Personal Information Module

Here personal information for the faculty member can be entered or updated as per the privileges given.

- Work History Module.

This module links the work history records of the faculty and displays it to the users. Users can add more records to their name depending on their rights. Updating of records is also permitted.

- Publication archiving and retrieval Module.

This module will have the insertion and display of all the publications present in the database. Users can add or edit publications. Also search facilities will be available to search for a particular publication.

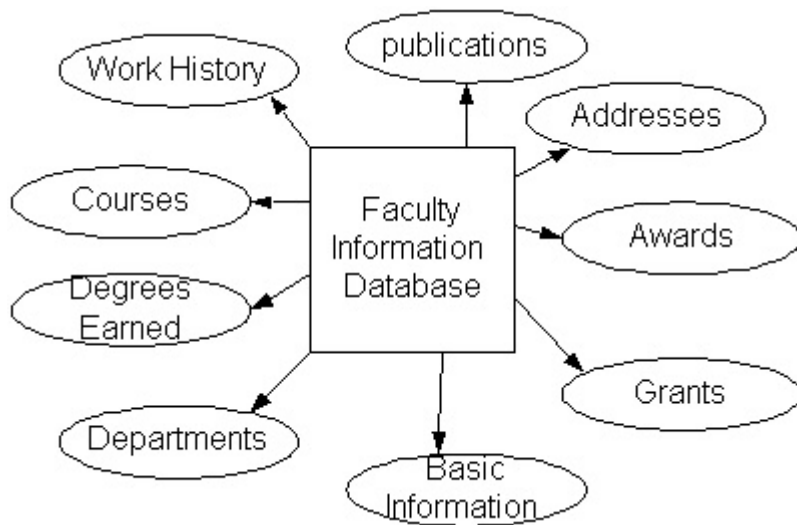
- Degrees earned by the faculty members Module.

This module links the degrees earned records of the faculty and display it to the users. Users can add more records to their name depending on their rights. Updating of records is also permitted.

- Grants/Awards given to faculty members Module.

This module links the Grants and Awards details of the faculty and displays it to the users. Users can add more records to their name depending on their rights. Updating of records is also permitted.

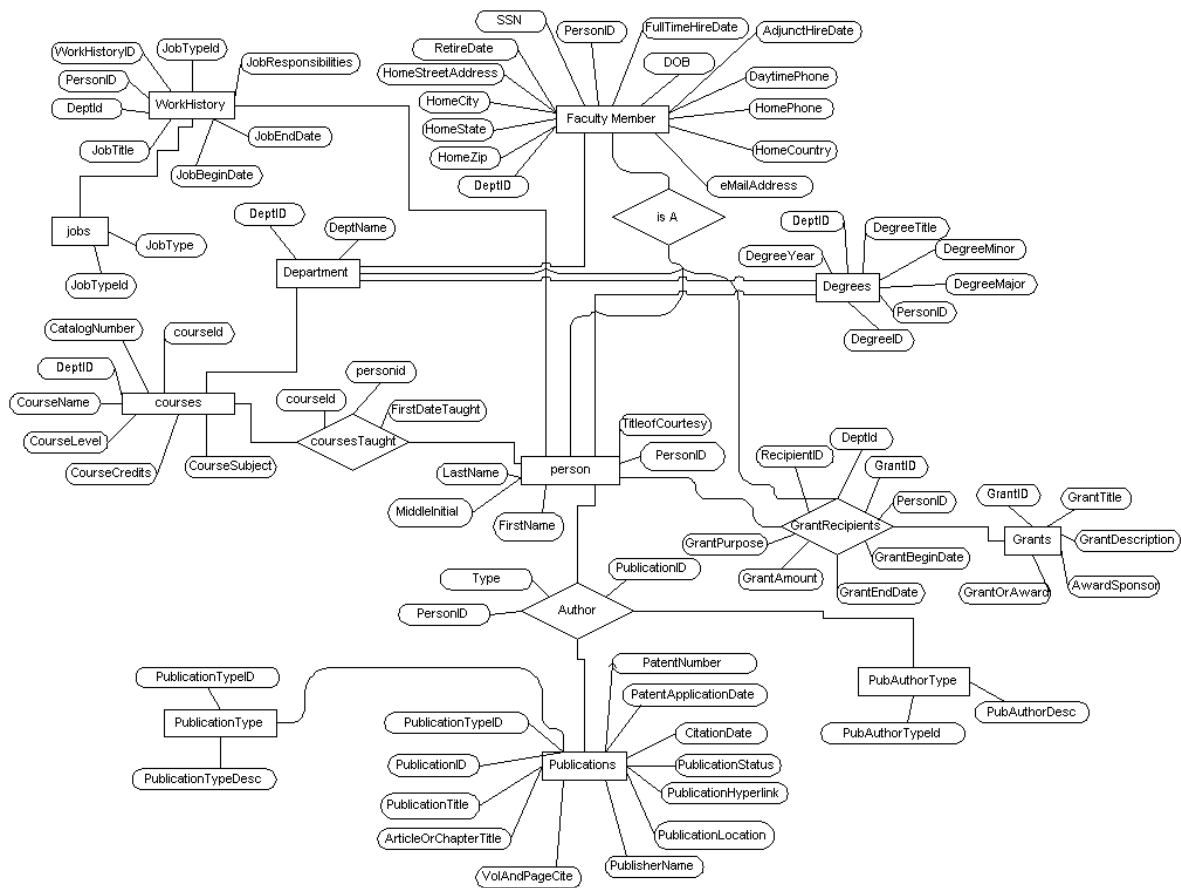
#### 3.1.2 Relationships



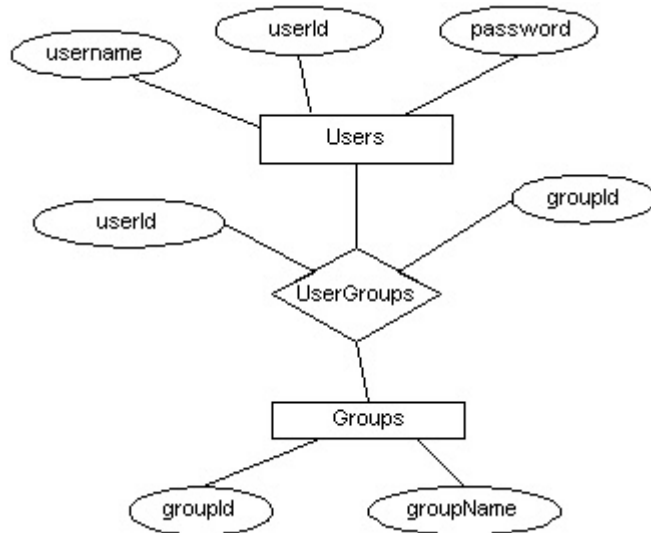
### 3.1.3 Complete Data Model

Following is the ERD for Quiz Wizard and its description.

ERD for Faculty Database



## ERD for Users Database



### **Users database**

The Users database will hold information regarding the user credentials of the System. It also has table to specify the groups the users fall in so as to grant them privileged access. The user will get access to the Faculty System only after being authenticated by the users database.

#### **Users Table**

This table will hold the users in the system. It will have columns like userid, password, etc

#### **Groups Table**

This will hold all the groups the users fall in like administrators, instructors, students, etc.

#### **UserGroups Table**

This is a relationship table joining both the Users and the Groups table.

#### **Users Database Interface Description**

This interface will be available only to the administrator and will allow him to add new users to specific groups in the database. Users can be added to multiple groups. It will also allow the admin to remove users from a group if needed.

### **Interfaces and Processing to access Faculty Information Database**

These interfaces will be accessible to users authenticated with the Users database. They will include search functions, complete faculty information screens, facilities like add and update and data entry screens.

#### **Interface Description**

##### **Search Screens**

Searches can be performed based on users, departments, publications, publication types, authors for the publication, events faculty takes part in and phone numbers to determine offices.

##### **Data Entry Screens**

Data entry screens will be provide to enter departments, courses offered, publication types, job types for the faculty, offices and their addresses and organizations.

##### **Information adding, editing and retrieval screens**

These screens will allow the user to edit and update his details. They will also allow him to add records like his/her awards or publications. The administrator will have rights to add records to any user in the database.

### Faculty Information Database

Faculty Information System will be a repository to all the faculty information available using a web browser. It will have all search facilities, record based additions and updating, etc.

#### Faculty Information Database Description

Faculty Information System has twelve entities and four relations.

**Person and Faculty member** entity contain personal information about the faculty member.

**Publication** entity holds information regarding the publications.

**Work history** gives all the work history details for the faculty member.

**Courses** give the list of courses in the database.

**Degrees** entity will give all the information regarding the degrees earned by the faculty member.

**Grants/Awards** will display all the grants/awards earned by the members.

**Department** – List of all departments

**Jobs** – List of all jobs

**PublicationType** – List of all publication types

**PubAuthorType** – List of publication author type.

The relationship tables are

**Author** with a "many to many" relation because one faculty writes multiple papers and one paper can be coauthored by many authors.

The mapping cardinality of the relationship called "**Is key**" is "one to one" because each person in the database is a faculty member.

**CoursesTaught** is "many to many" because each faculty member can teach multiple courses and more than one faculty member can teach each course.

**GrantRecipients** is "many to many" because each member can have more than one grant/award and each grant/award can have more than one recipient.

### 3.1.4 Data Dictionary

Entity Users		
Attribute	type	Description
userID	Int	primary key, User's ID
userName	Nvarchar (10)	Username for the user.
password	Nvarchar (10)	password

Entity Groups		
Attribute	type	Description
groupID	Int	primary key, Group's ID
groupName	Nvarchar (50)	Username for the user.



**Relation UserGroups (m-m)**

Attribute	type	Description
userID	Int	Foreign key to Users table
groupId	Int	Foreign key to Groups table

**Entity Person**

Attribute	type	Description
PersonID	Int	primary key, author's ID
TitleofCourtesy	Nvarchar (5)	author's title like Dr.
FirstName	Nvarchar (20)	author's first name
MiddleInitial	Nvarchar (3)	author's middle initial
LastName	Nvarchar (20)	author's last name

**Entity FacultyMember**

Attribute	type	Description
PersonID	Int	primary key, unique identification number
SSN	varchar(20)	Social Security Number
HomeStreetAddress	nvarchar (80)	Address
HomeCity	nvarchar (30)	City
HomeState	nvarchar (20)	State
HomeZip	nvarchar (10)	Zip Code
HomeCountry	nvarchar (20)	Country
HomePhone	nvarchar (15)	Home Phone Number
Daytime Phone	nvarchar (15)	DayTime Phone
AdjunctHireDate	datetime	Adjunct Hire Date for the faculty
FullTimeHireDate	datetime	Full Time Hire Date
RetireDate	datetime	Retire Date
eMailAddress	Nvarchar(30)	Email address
DOB	datetime	Date of Birth.

**Entity Publications**

Attribute	type	Description
PublicationID	number(4)	primary key, unique identification number for the publication.
PublicationTitle	number(3)	Title for the publication.
ArticleOrChapterTitle	number(2)	Article or chapter title

VolAndPageCite	varchar2(50)	The volume and citation
PublisherName	Nvarchar(125)	Publisher for the publication
PublicationLocation	Nvarchar(100)	Location where published
PublicationHyperlink	ntext	Web link for the publication.
PublicationStatus	Nvarchar(30)	Status where on hold or published
CitationDate	Nvarchar(20)	Citation date
PatentApplicationDate	datetime	Patent application date
PatentNumber	(50)	Patent Number
PublicationTypeID	int	Publication type id like paper publications,journals,etc references PublicationType

<b>Entity WorkHistory</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
WorkHistoryID	int	primary key, unique identification number for table
PersonID	int	Foreign key references Person
DeptId	int	Foreign key references Department
JobTitle	Nvarchar(100)	Title for the job held by the faculty member.
JobBeginDate	datetime	Job starting date
JobEndDate	datetime	Job end date
JobResponsibilities	Nvarchar(250)	Job responsibilities
JobType	smallint	Foreign key references Jobs

<b>Entity Degrees</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
DegreeID	int	primary key, unique identification number.
PersonID	int	Foreign key references Person
DegreeMajor	nvarchar (200)	Degree Major for the member
DegreeMinor	nvarchar (40)	Degree Minor
DegreeTitle	nvarchar (20)	Title for the degree
DeptId	int	Foreign key references Department
DegreeYear	datetime	Year the Degree was earned.

<b>Entity Grants</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
GrantID	int	primary key, unique identification number.

GrantTitle	Nvarchar(150)	Grant/Award title
GrantDescription	Nvarchar(250)	Grant/Award description
AwardSponsor	Nvarchar(150)	Grant/Award sponsor
GrantOrAward	bit	Field to determine whether the entry is for a grant or the award.

<b>Entity Courses</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
CourseID	int	primary key for the table
DeptId	int	Foreign key references Department
CatalogNumber	Nvarchar(15)	The catalog number for the course
CourseName	Nvarchar(100)	Course name
CourseLevel	Nvarchar(20)	Level like 504 or 600
CourseCredits	Smallint	Course credits
CourseSubject	Nvarchar(5)	Course name.

<b>Entity Department</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
DeptId	int	Primary Key
DeptName	Nvarchar(50)	Department name

<b>Entity PubAuthorType</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
PubAuthorTypeId	smallint	Primary Key
PubAuthorDesc	Nvarchar(50)	Publication author type description

<b>Entity users</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
userId	Nvarchar(100)	User id
password	Nvarchar(100)	password

<b>Entity PublicationType</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
PublicationTypeID	Int	Primary key
PublicationTypeDescr	Nvarchar(50)	Type descriptions for publications.

<b>Entity Jobs</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
JobTypeId	smallint	Primary key
JobType	Nvarchar(100)	Type descriptions for publications.

<b>Relation Author (m-m)</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
Type	smallint	Foreign key references PubAuthorType.
PublicationID	number(4)	foreign key to Publications
PersonID	int	foreign key to person

<b>Relation CoursesTaught (m-m)</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
CourseID	int	foreign key to Courses
PersonID	int	foreign key to Person
FirstDateTaught	number(2)	Date the course was first taught.

<b>Relation GrantRecipients (m-m)</b>		
<b>Attribute</b>	<b>type</b>	<b>Description</b>
RecipientID	smallint	Foreign key references PubAuthorType.
DeptId	int	foreign key to Departments
GrantID	int	foreign key to Grants
PersonID	int	foreign key to Person
GrantBeginDate	datetime	Begin date
GrantEndDate	datetime	End Date
GrantAmount	money	Grant/Award Amount
GrantPurpose	Nvarchar(250)	Purpose

## 4. Functional Model and Description

Major software functions in this system are authentication, assignments of groups, addition, updating and viewing of records.

### 4.1 Description for functions of the Faculty System

#### 4.1.1 Description for function Authentication

##### 4.1.1.1 Processing narrative (PSPEC) for function Authentication

The Authentication transform performs login name and password validation for the Faculty System. Authentication receives login name and password from the user. If it's correct it takes the users to group assignment function and if it's incorrect it takes the user back to Authentication.

##### 4.1.1.2 Authentication flow diagram



##### 4.1.1.3 Authentication interface description

*Input interface* - Login name can be alphanumeric with maximum ten characters.

Password can be alphanumeric with maximum ten characters.

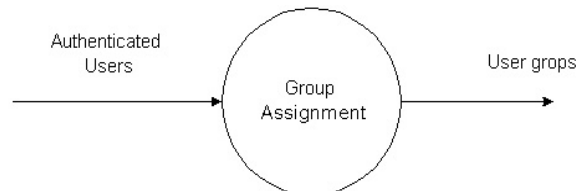
*Output interface* - A message indicating if Authentication was successful or not.

### 4.1.2 Description for function group assignment

#### 4.1.2.1 Processing narrative (PSPEC) for function Group Assignment

The group assignment function assigns the users to groups depending on their login credentials. Access rights are determined depending on the groups the users belong to.

##### 4.1.2.2 Group Assignment function flow diagram



##### 4.1.2.3 Group Assignment function interface description

*Input interface* - Users can be added to or removed from groups using the group assignment interface.

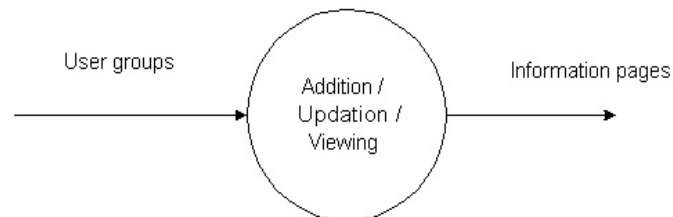
*Output interface* - A message indicating that the users have been added/removed to/from specified groups.

### 4.1.3 Description for function addition/ updating/ viewing

#### 4.1.3.1 Processing narrative (PSPEC) for function Groups - addition/ updating/ viewing

These function groups allow the users with addition, viewing and updating of information. Information is only accessible to users depending on their access rights.

#### 4.1.3.2 Addition/ updating/ viewing function flow diagram



#### 4.1.3.3 Addition/ updating/ viewing function interface description

*Input interface* - Input interfaces will contain search screens and pages for entering data into the system. This will also include the data entry screens and other pages.

*Output interface* – Output will be in the form of information pages which will display updated information.

## 4.2 Software Interface Description

### 4.2.1 External Machine Interface

None identified.

### 4.2.2 External System Interfaces

Faculty System requires the following components to operate:

§ Web Server

§ JavaScript enabled browser

### 4.2.3 Human Interface

The Faculty System will have two general set of users. One comprises of the administrators and the second the general users. The general users will be the staff members, faculty members and the students. Only the administrator has the rights to create a new user and it is he who will put the user to a specific group. This group to which the user belongs will decide the access rights of the user to the privileged sections of the System. The administrator will provide username and password to the user and from here the user after logging in will be able to access his/her information. He can add or edit his details like personal information, publications, award details, etc. A general user will have access only to his /her details.

The administrator will be provided with a search screen wherein he can search for users present in the database. Searches will be performed on first name, last name, username, department the user belongs, etc. Now after locating a specific member in the database the administrator has full rights to add or modify his details. The administrator can also add publications published by the members and also input the events they participated in.

Also as an enhancement we will implement reports to be generated as per the user requirements.

## **5. Behavioral Model and Description**

### **5.1 Description for software behavior**

This system will have two broad sets of users. The first is the administrator and the second category will be the general users (faculty and students). Users will login to the system using their credentials and depending on their groups they will have access to the system. The application after authenticating and assigning users will retrieve pages specific to the person sought.

#### **5.1.1 Events**

Idle

User enters login/password

Administrator adds users

Administrator enters user registration information

Login successful

Login unsuccessful

User performs various searches.

User performs data entry.

Administrator selects a particular user to add or modify user data.

User adds or modifies information.

User saved data back to database.

#### **5.1.2 States**

Ready

Login

Registration

New User

User Created

User Saved

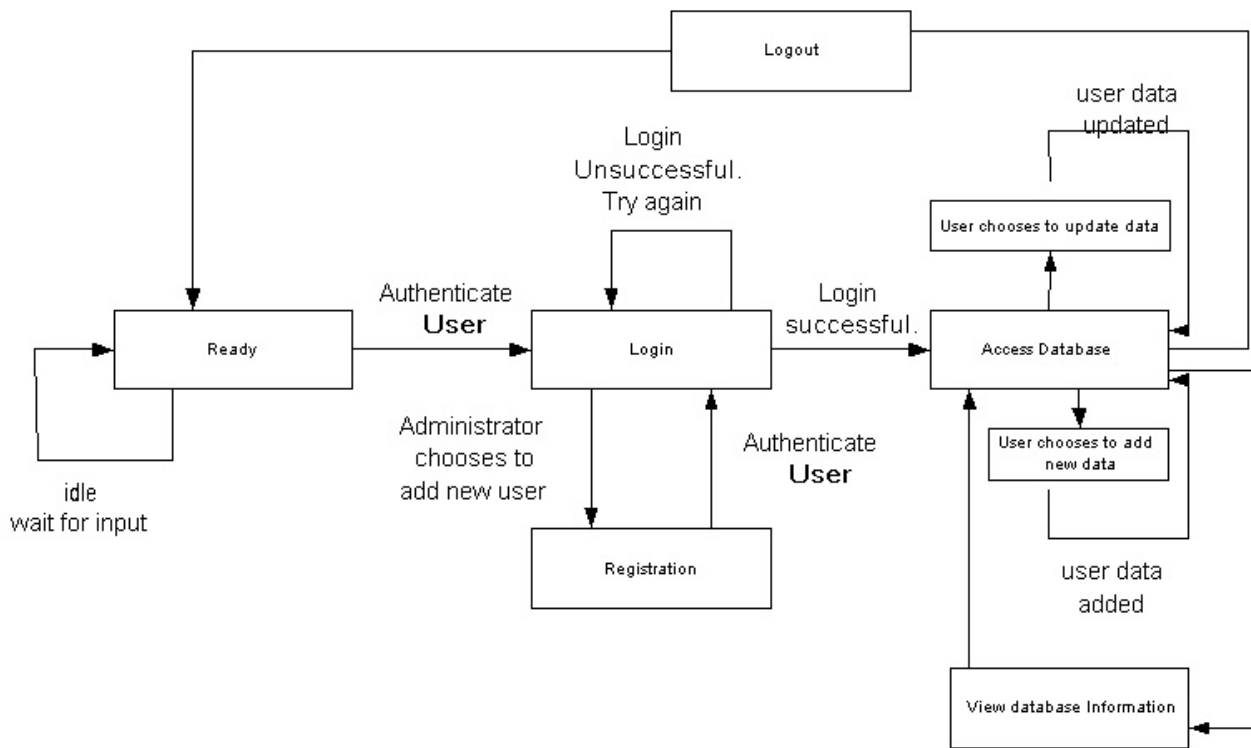
List Users

Begin Search

User Records

User Updated

## **5.2 State Transition Diagrams**



### 5.3 Control Specification (CSPEC)

Events	Processes		
	Authentication	Group Assignment	Addition/Updation/Viewing
<b>Idle</b>			
<b>User enters login/password</b>	✓		
<b>Administrator adds users</b>	✓		
<b>Administrator enters user registration information</b>			
<b>Login successful</b>		✓	
<b>Login unsuccessful</b>	✓		
<b>User performs various searches.</b>			✓
<b>User performs data entry.</b>			✓
<b>Administrator selects a particular user to add or modify user data.</b>			✓
<b>User adds or modifies information.</b>			✓



<b>User saves data back to database.</b>			✓
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## **6. Restrictions, Limitations, and Constraints**

Proper user credentials required

Only users with access rights can perform privileged tasks.

## **7. Validation Criteria**

Will be addressed at a later stage.