



Technical Training Manual for Online Data Management System for Agronomy



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1. PREFACE

Soybean in India, not only occupies a coveted position among oilseeds grown, but also plays an important role in national economy by way of saving expenditure on import of edible oil (soy oil supplements about 13% of edible oil produced) and export earnings to the tune of average Rs. 20, 000 million through export of soy meal (Chauhan and Joshi, 2005; Joshi 2005). Realizing the potentials of soybean, the Indian Council of Agricultural Research took a visionary decision to establish a multi-location inter-disciplinary All India Coordinated Research Project on Soybean (AICRPS) in 1967 with a network of 7 main-, 13 sub-centers and 8 need-based locations representing different agro-climatic regions of the country. The coordinating unit for AICRPS is located at Directorate of Soybean Research (DSR), Indore. Under the AICRPS, every year a sizeable quantum of data of agronomic experiments is generated by each cooperative centre and is manually processed in the form of annual report leading to a high level of drudgery with a possible component of manual error. Moreover, it becomes cumbersome to lay hands on data generated over the years. The report is quite handy in taking decisions on location specific recommendations on production technology for soybean growers. In view of above, a data management and report generation system, which is simple, easy-to-handle, user-friendly, accurate and efficient, was developed at (DSR), for Soybean.

Initial system developed was standalone and only data entry was done online. The present system is developed using ASP.NET and is completely web based, linked to the organization website (www.dsrindore.org), using which data-entry is done from different location by the DEO's (Data Entry Operators) and accordingly reports in the form of summary tables are generated by the system .The system also maintains historic data bases on which performance analysis is done.

The developed at Directorate of Soybean Research (DSR) for All India Coordinated Research Project on Soybean (AICRPS) experimentation provides routine processing of data and production of summary table reports in easy, efficient and user-friendly manner. It is an on-line data-entry system allowing users the flexibility to enter/edit the data from any place provided they have internet connectivity. This on-line data-entry and management system is developed using and ASP (Active Server Pages) .NET. The database at back end is designed using SQL Server 2005 relational database. The reports are generated in the form of summary tables which is exported to EXCEL worksheets and MS WORD also.

2. INSTALLATION STEPS

2.1 Installation Steps for System Administrator

Before starting the installation administrator should ensure the system requirements.

➤ System Requirements

- **Software Requirements:-**

The computer should have –

1. Windows XP or higher version of professional operating system.
2. MS Office 2000/2003/2007.
3. Microsoft Visual Studio 2010 Professional with Framework 4.0.
4. Microsoft SQL Server 2005.
5. Google Chrome Browser (software works best with this browser and not with Internet Explorer)

- **Hardware Requirements:-**

1. Pentium IV with at least 1 GB RAM and 10 GB Hard Disk Space with CD-ROM.
2. If the system requirements are fulfilled then installation steps as given below is to be followed.

2.2 Installation Steps of Tools/Software

2.2.1 Installation Steps for MS Visual Studio 2010

1. Insert the installation CD of MS Visual Studio 2010 in the CD drive.
2. First Install Microsoft .NET Framework
3. Double click the “Setup.exe” file.
4. Click “Next” wherever asked during installation process.
5. Wait until installation is complete.

2.2.2 Installation Steps for MS SQL Server 2005

Insert the installation CD of MS SQL Server 2005 in the CD drive.

1. First Click SQL Server x86(Upgrade Adviser)
2. Install SQL Server 2005 Upgrade Adviser. Click “Next” wherever asked during installation process.
3. Double click the “Setup.exe” file.
4. Apply all Components to install then click next.
5. Then Apply Install on Local Hard Disk.
6. Use the built in system account-local system or network system.
7. Apply mixed mode (Windows Authentication and SQL Authentication).
8. User Id: a and choose a Password: s
9. Wait until installation is complete.
10. Check for Microsoft SQL Server 2005 folder in All Programs.
11. If it is available then installation is complete or else re-installs the software.

2.2.3 AICRPS Database Installation Steps

There are 2 ways for database installation -

- i) By attaching .mdf files e.g. Aicrps2013.mdf.
- i. Copy .mdf and .ldf files from software cd in a specific location e.g. Data folder in F drive.
- ii. Open “Microsoft SQL Server Management Studio” by double clicking the icon  available on desktop after SQL server installation or go to Start -> All Programs -> Microsoft Sql Server 2005 ->  SQL Server Management Studio.
- iii. “Connect to Server” window will appear as shown below

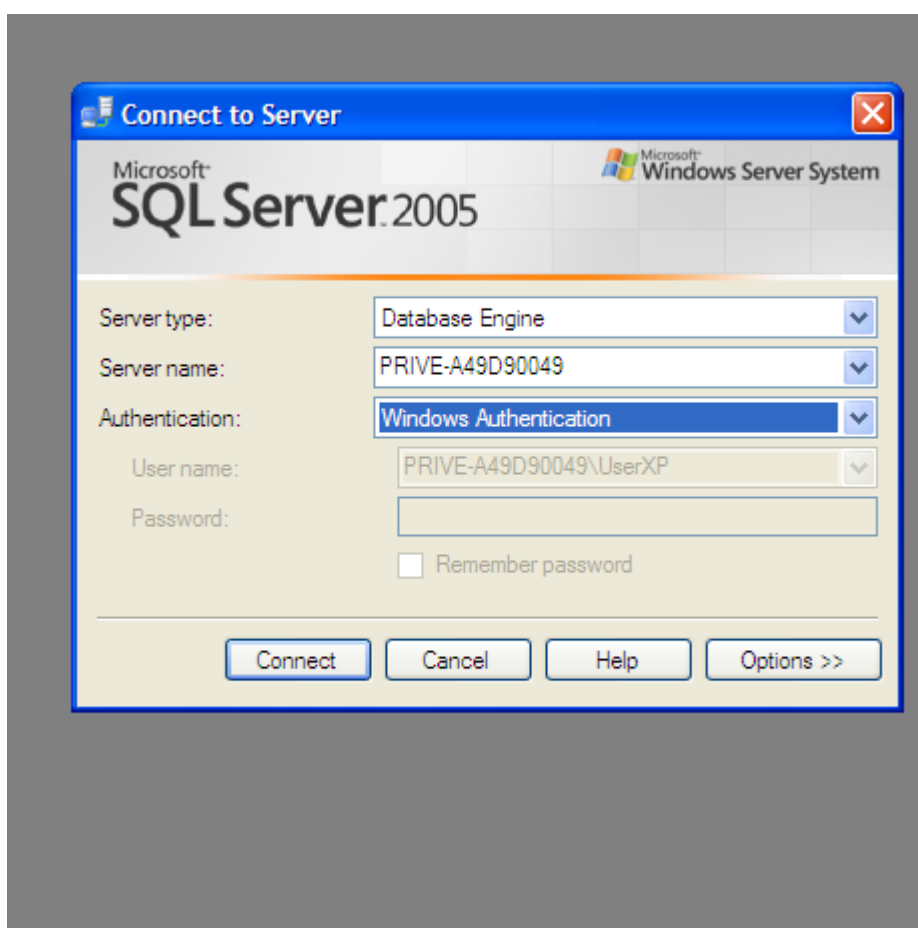
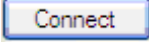


FIGURE 1 CONNECT TO SERVER WINDOW

- iv. Select Authentication as Windows Authentication or SQL Server Authentication (provide User name= “sa” and Password = “dsr*123” as given during MICROSOFT SQL SERVER installation e.g. “start”).

1. Press  button to open window as shown below

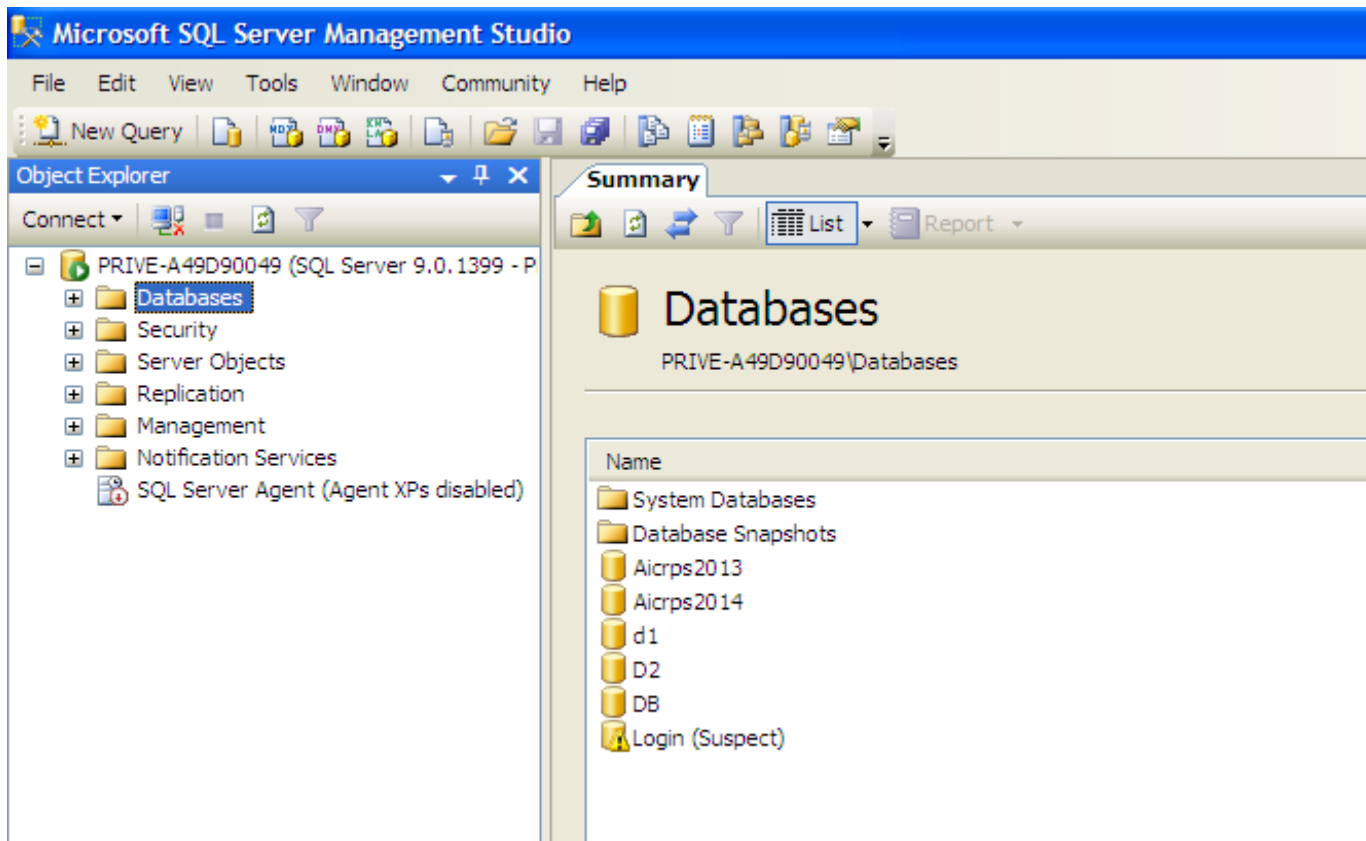
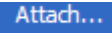
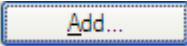
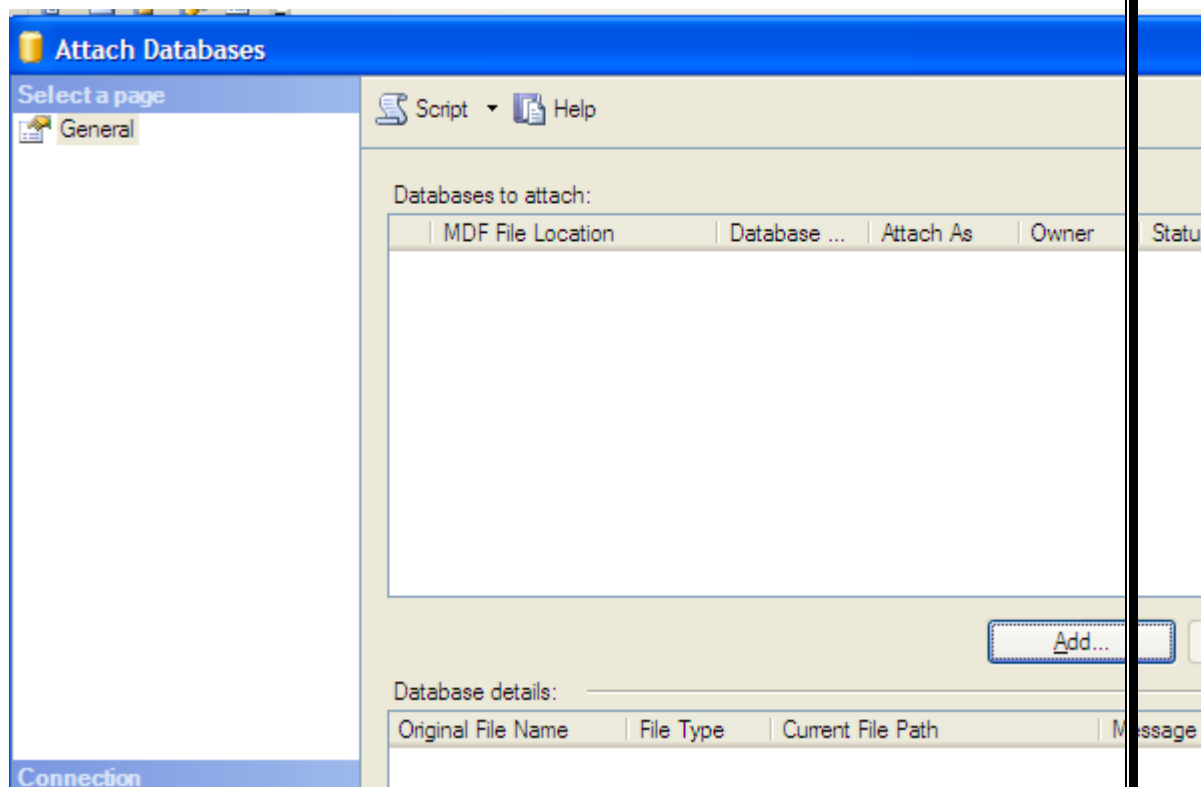


FIGURE 2 CONNECT DATABASE

- b. Right click on  option in Object Explorer panel which appears on left side of the window and select  option as shown below

Press  button in the “Attach Databases window”
a



c. FIGURE 4 ATTACH DATABASES WINDOW

Now browse for .mdf files using “Locate Databases” window as shown below.

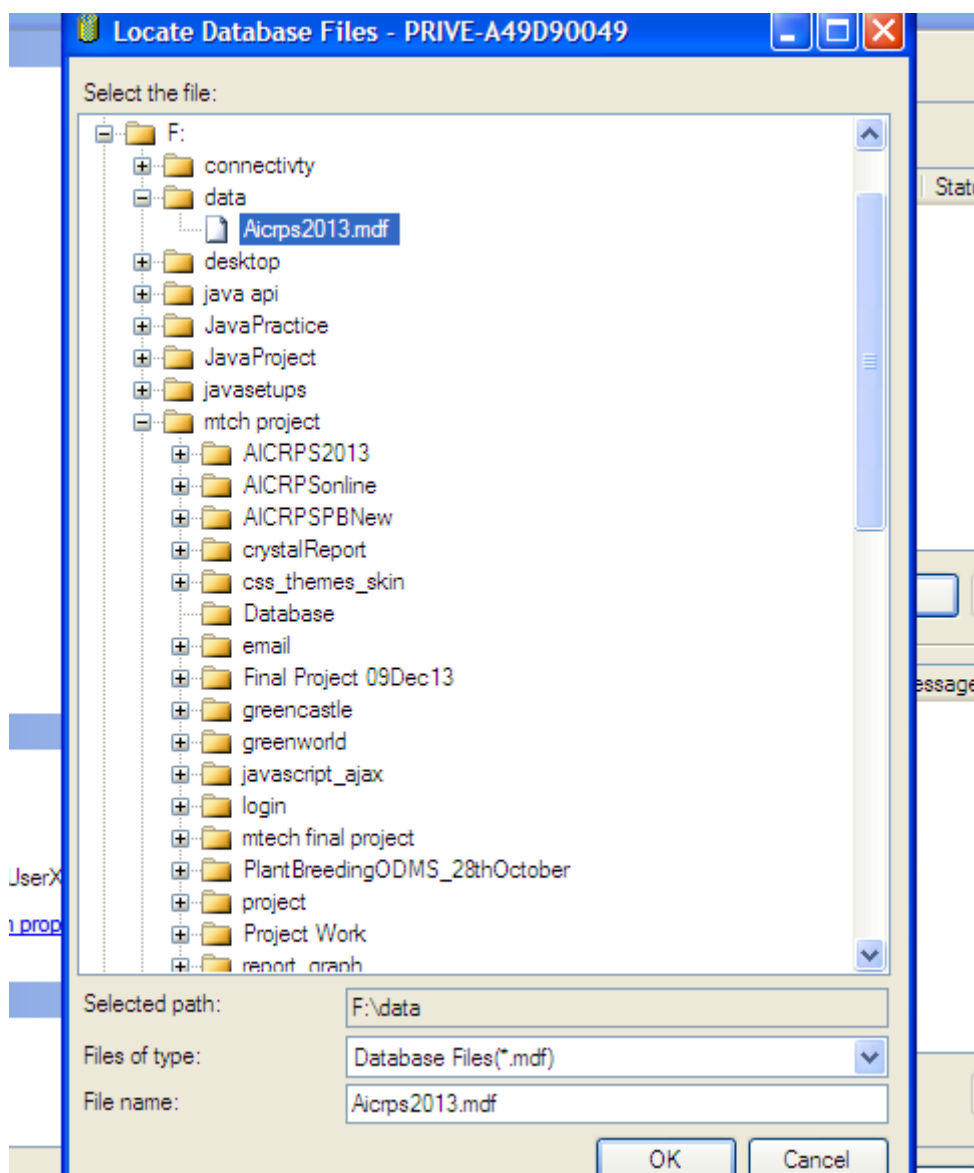
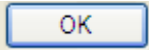


FIGURE 5 LOCATE DATABASES

- a. Press  button for final attachment of AICRPS database which will appear in the sub-list of databases in Object explorer panel on left hand side of the window as show below.

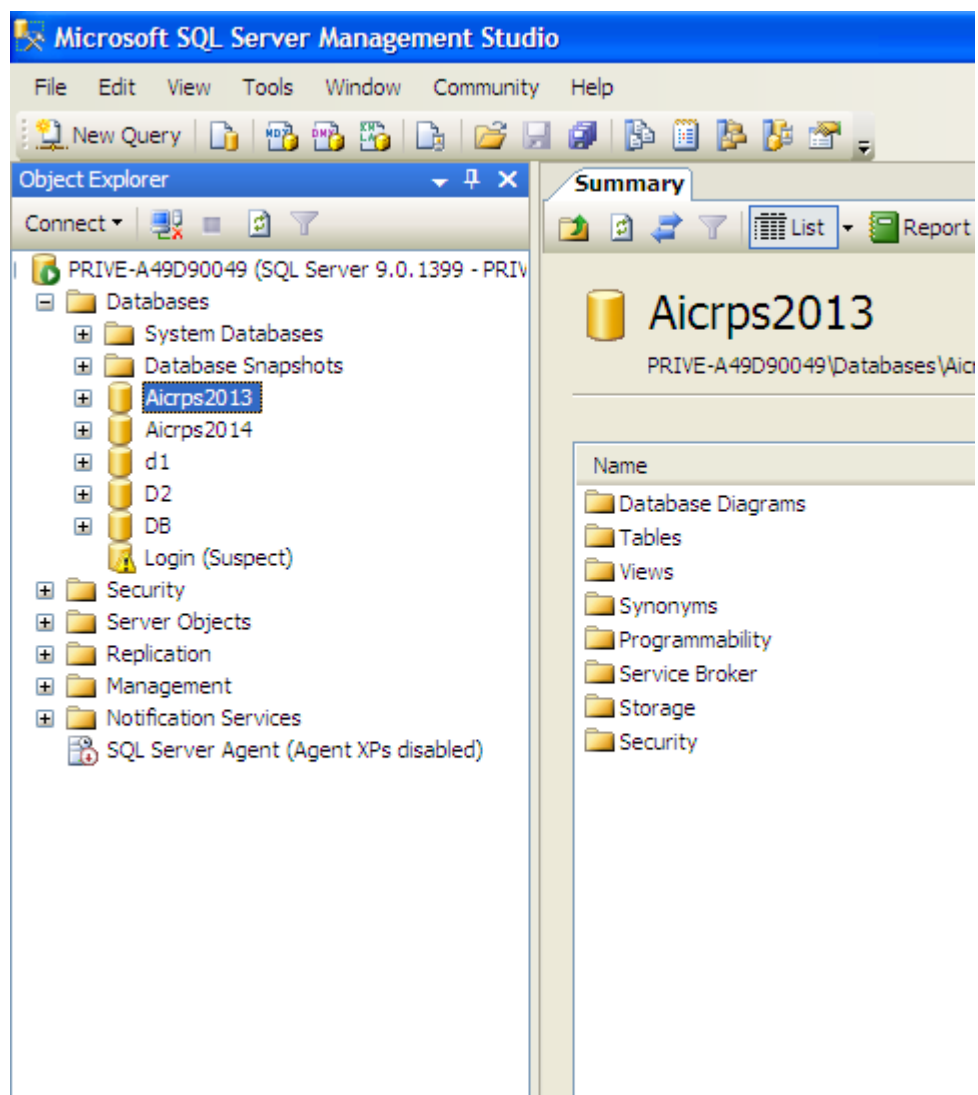


FIGURE 6 DATABASES CREATED

ii) By restoring Backup e.g. Aicrps 2013-14.bak.

- a. Copy .bak file in a specific location e.g Aicrps 2013-14.bak in Data folder in F drive.
- b. Follow Steps “b to e” of DATABASE INSTALLATION STEPS to open Microsoft SQL Server.
- c. Right click on **Databases** option in Object Explorer panel which appears on left side of the window and select **Restore Database...** option as shown below

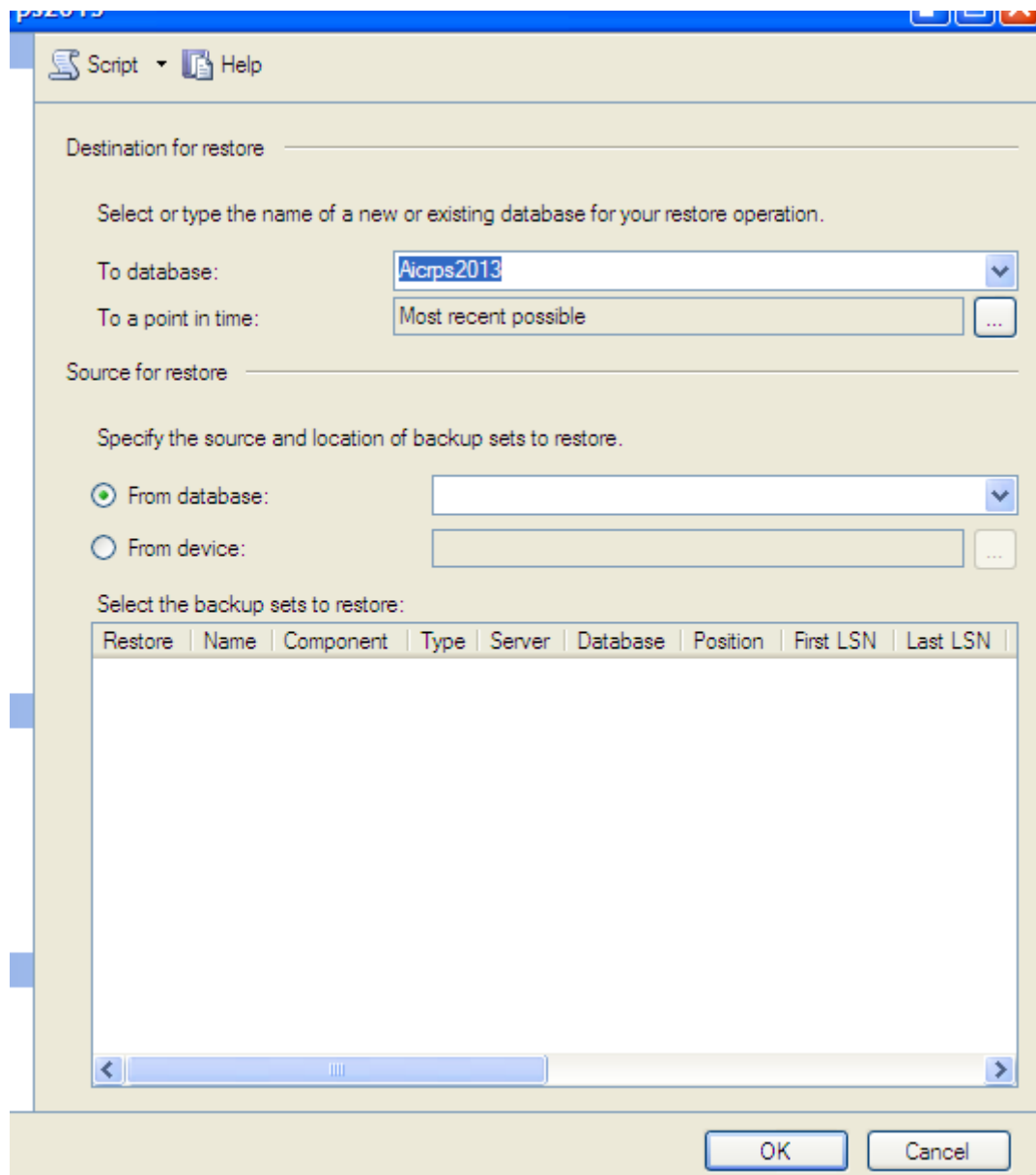


FIGURE 8 LOCATE DATABASES

- e. Select 'From device' radio button to specify the source and location of backup sets as shown below

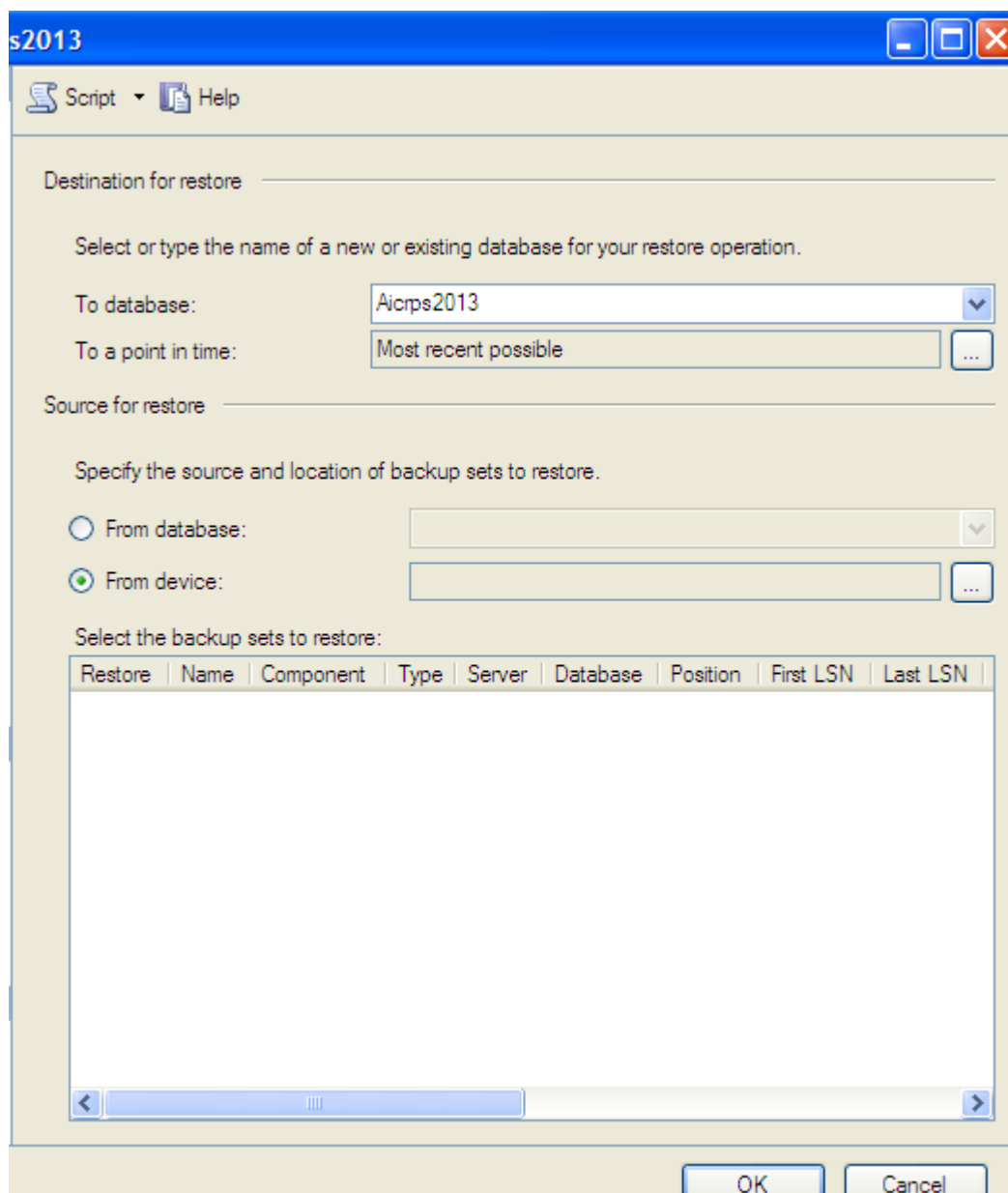
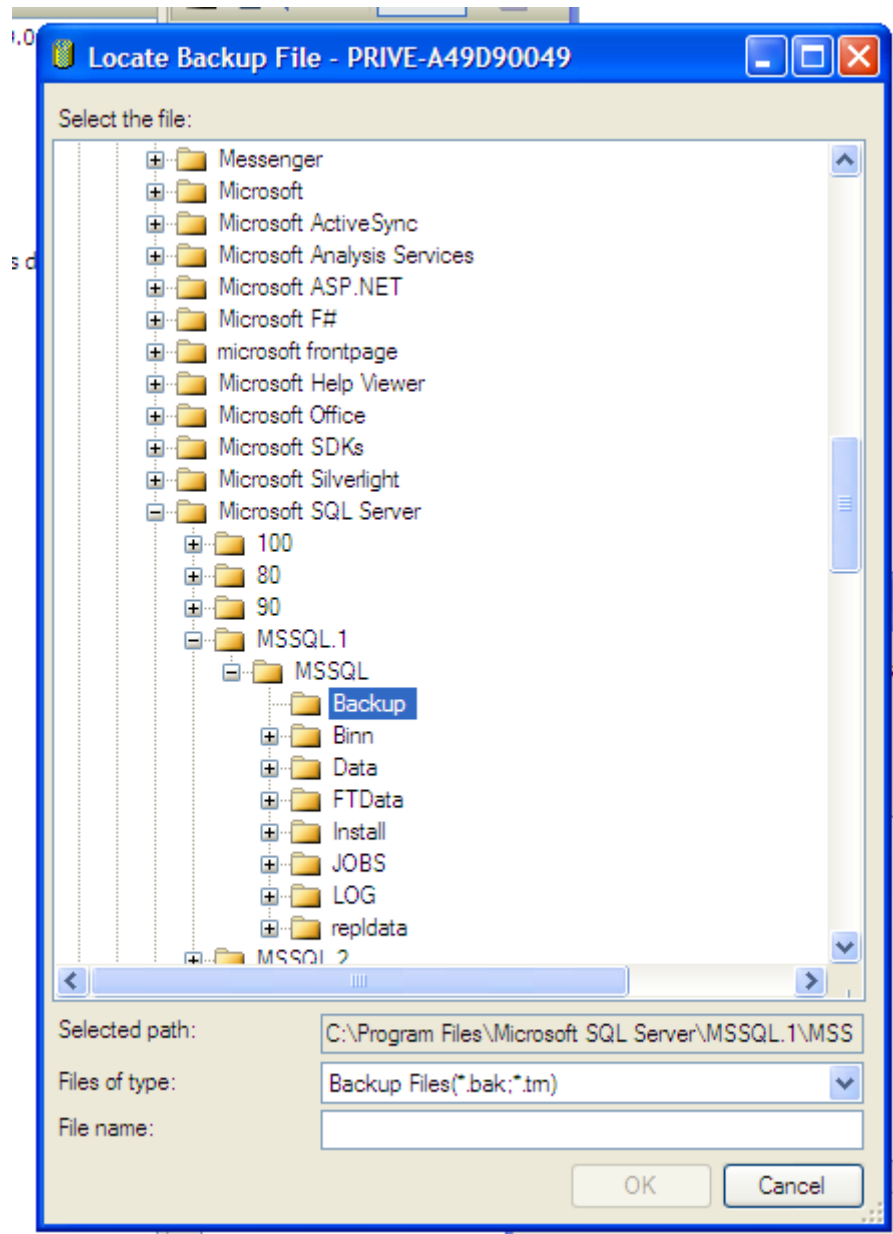


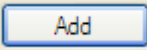
FIGURE 9 LOCATION OF BACKUP

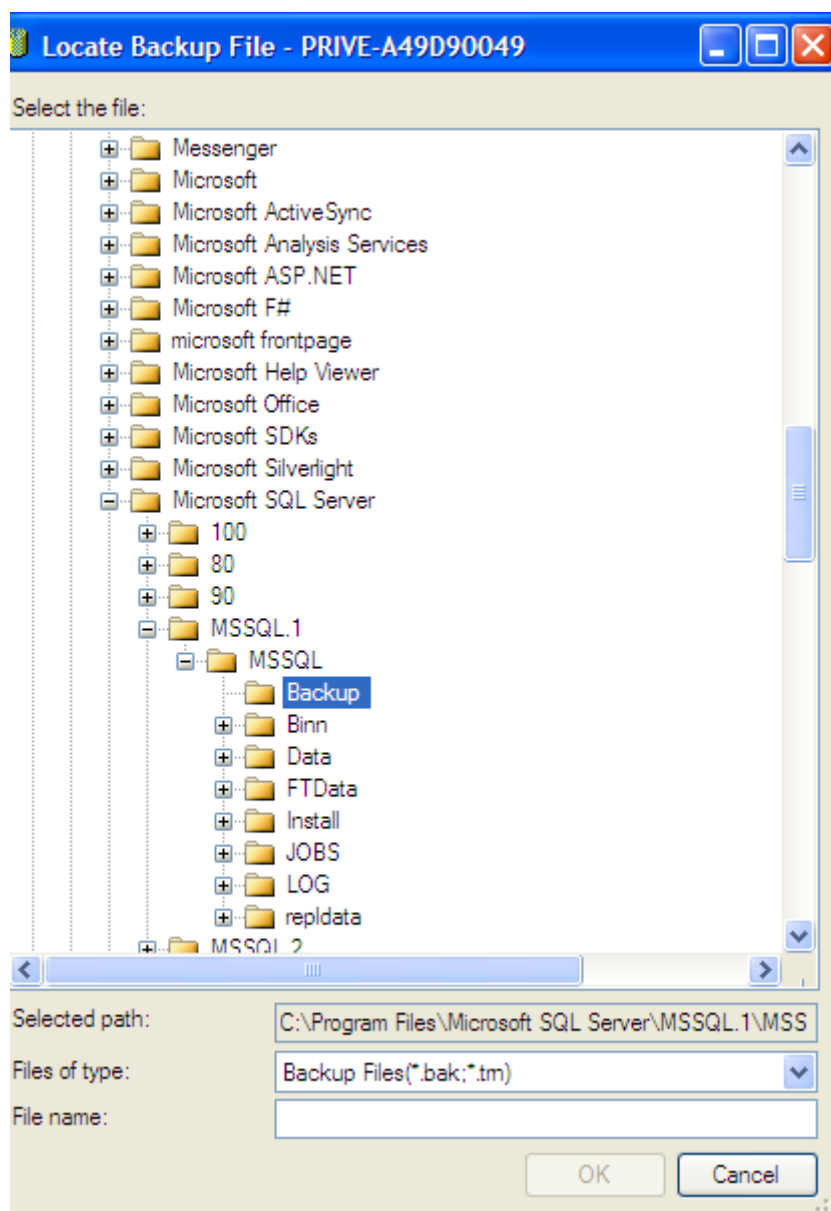
(f) Press  button to open “Specify Backup” window as shown below



f.

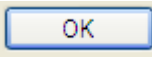
g. FIGURE 10 LOCATE BACKUP FILE

(g) Press  button to browse for .bak file in “Locate Backup File” window as shown below



h.

i. FIGURE 11 LOCATE BACKUP FILE WINDOW

(h) Select desired backup file e.g. AicrpsAgro06-06-2014.bak (Backup will be saved with the date when backup of database is taken) and press  button for final restoration as shown below

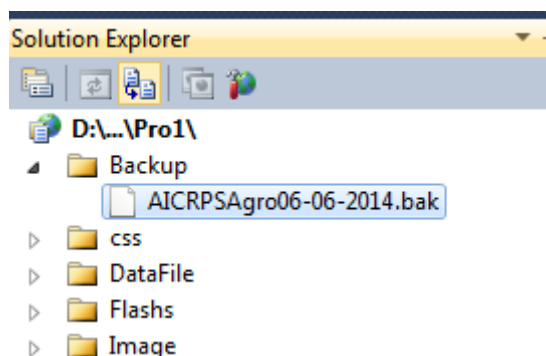
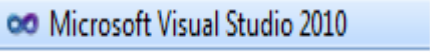


FIGURE 12 LOCATE BACKUP FILE

2.2.3 AICRPS Software Installation Steps on Server

1. Copy all the contents of the software folder “AICRPSPB” in a specific location e.g. in E drive with the same folder name.

2. Open “Microsoft Visual Studio” by double clicking the icon  available on desktop after Microsoft Visual Studio installation or go to Start -> All Programs -> Microsoft Visual Studio 2010 folder -> .

3. Start window of Microsoft Visual Studio will appear as shown below

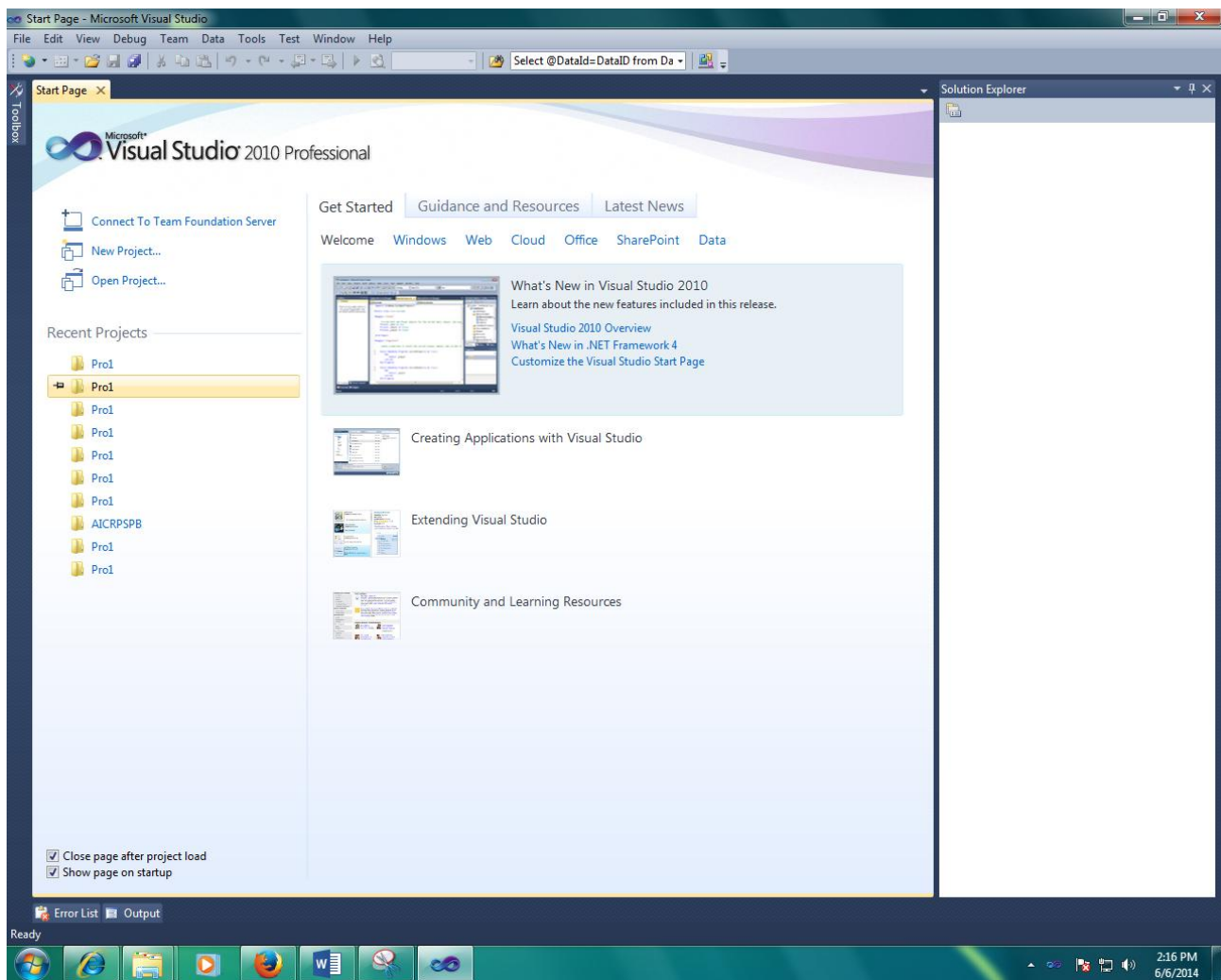


FIGURE 13 MICROSOFT VISUAL STUDIOS

4. Go to “File” option in the main menu.
5. Select “Open” and then “Web Site” in the submenus as shown below

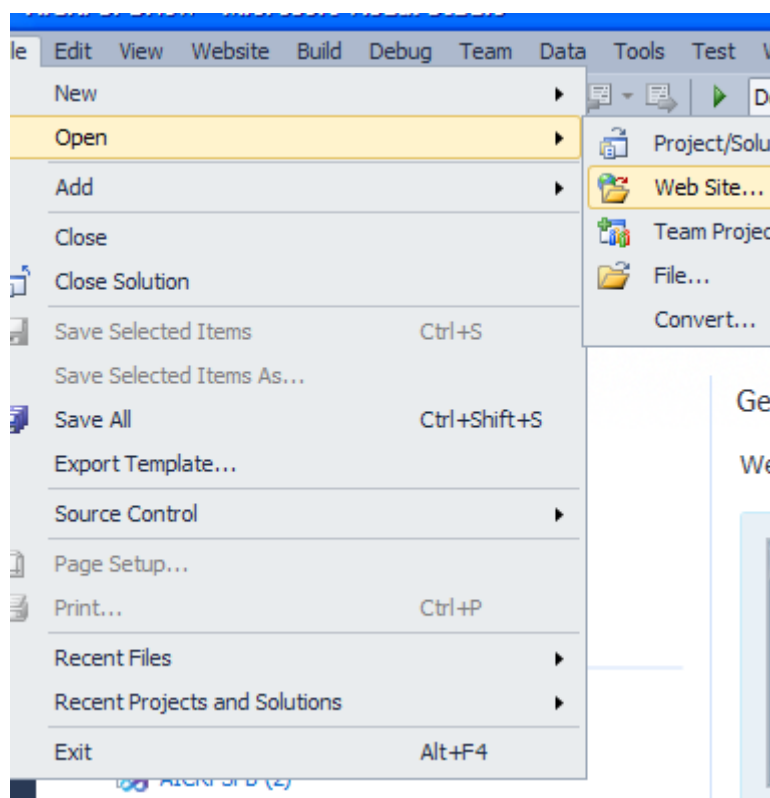


FIGURE 14 SELECT OPEN WEBSITE

1. For testing the functionality of the AICRPS s/w after installation, Browse for the AICRPS Agronomy folder in “Open Web Site” window as shown below
2. Select the project folder and press “Open” button.

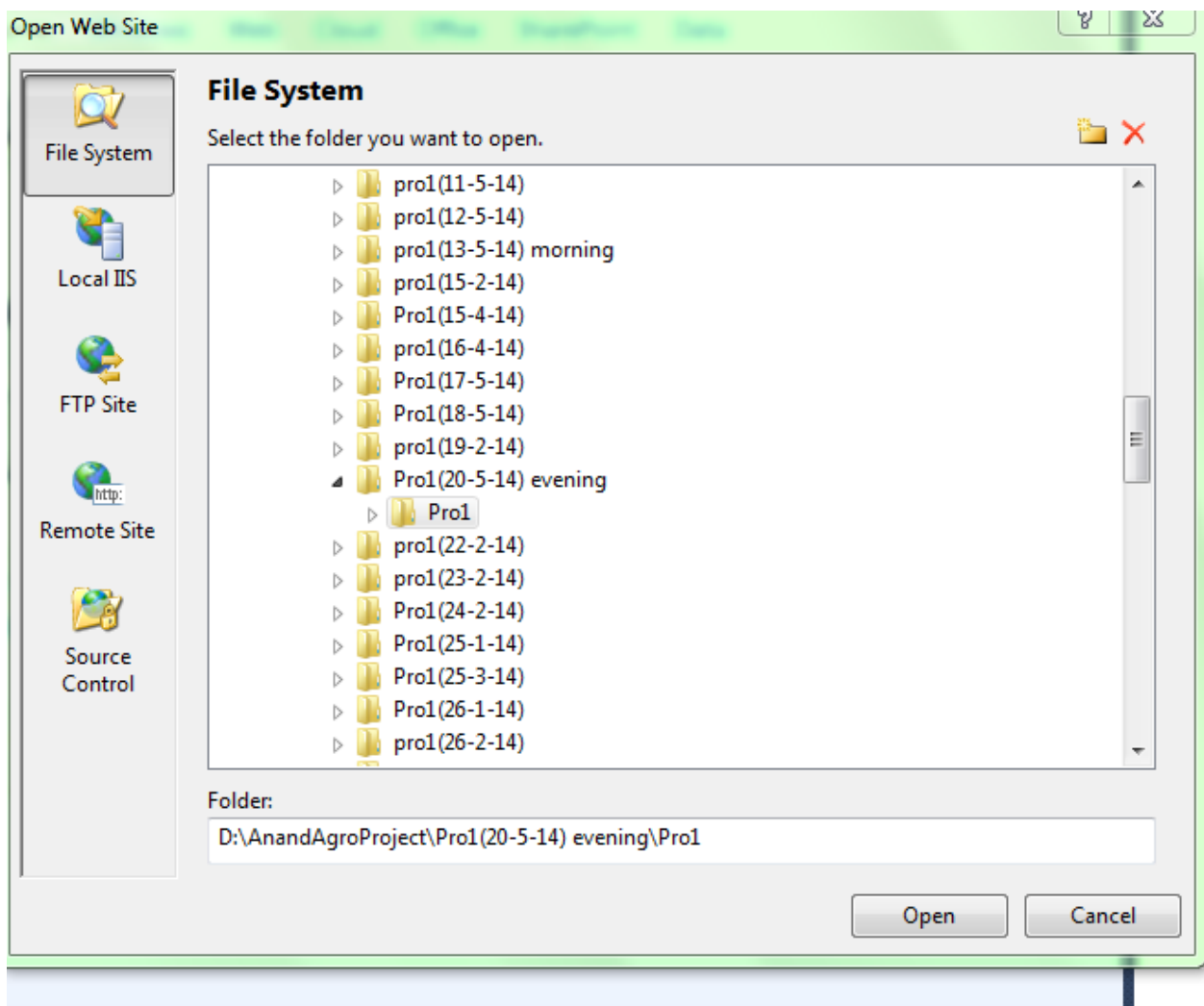


FIGURE 15 OPEN WEB SITE

3. Go to “View” option in the main menu.
4. Select “Solution Explorer” in the submenu as shown below

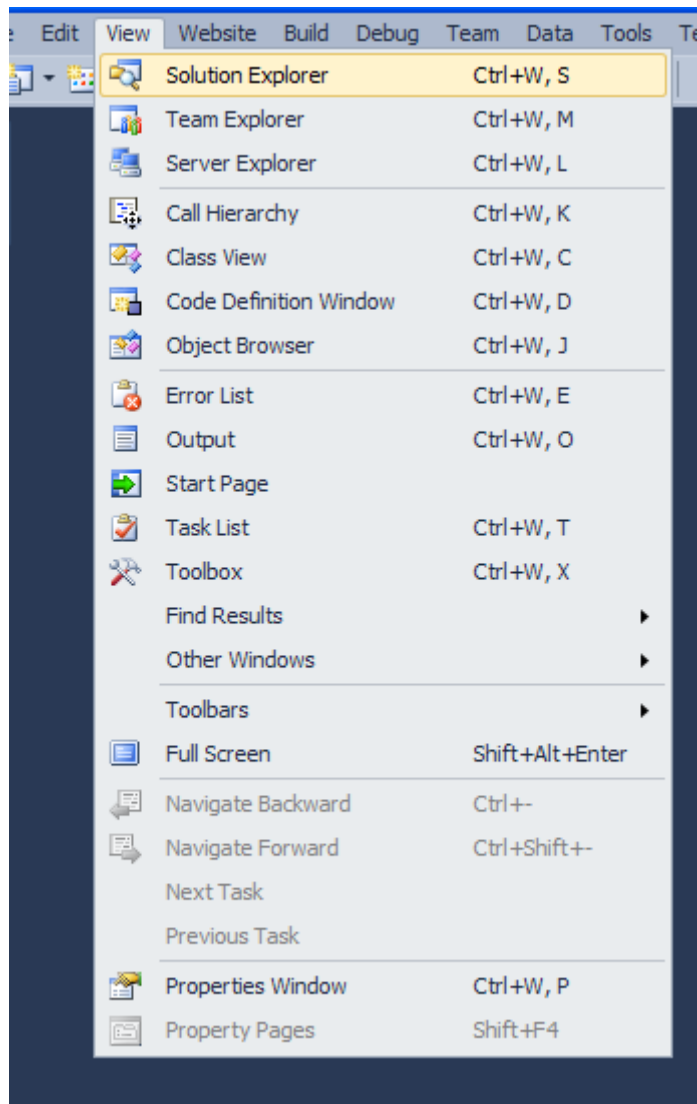


FIGURE 16 SOLUTION EXPLORERS

10. Select “web.config” file from the listing of the Solution Explorer for database connectivity as shown below

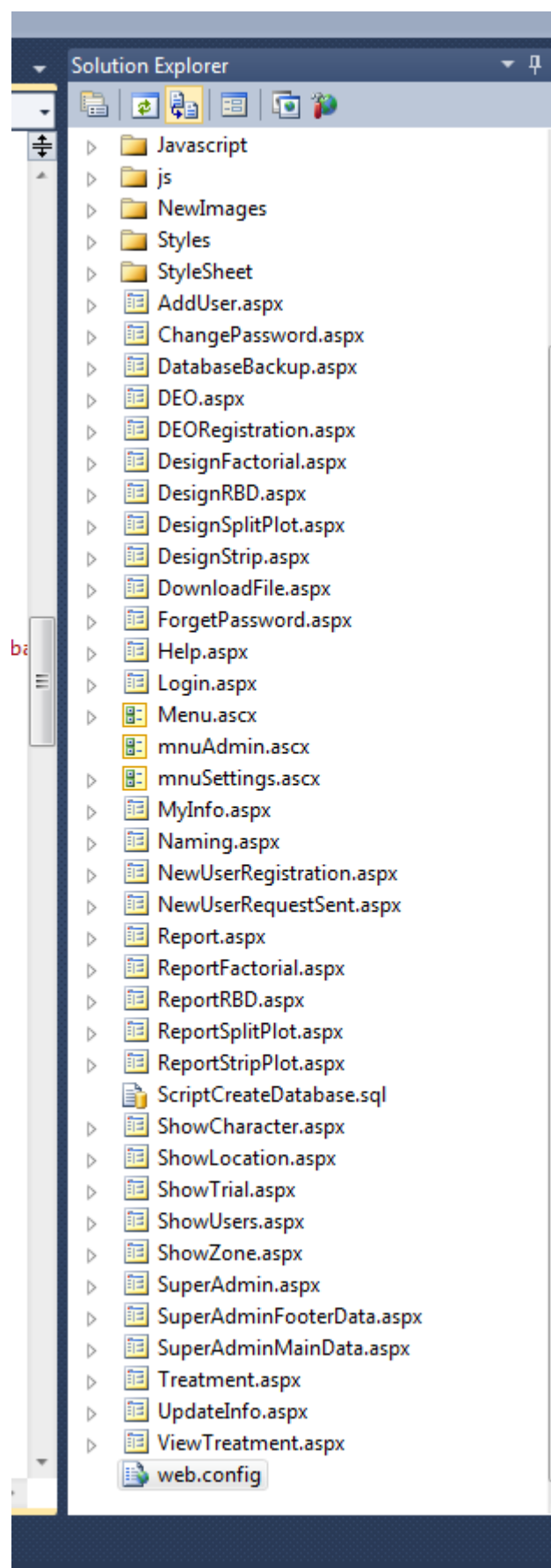
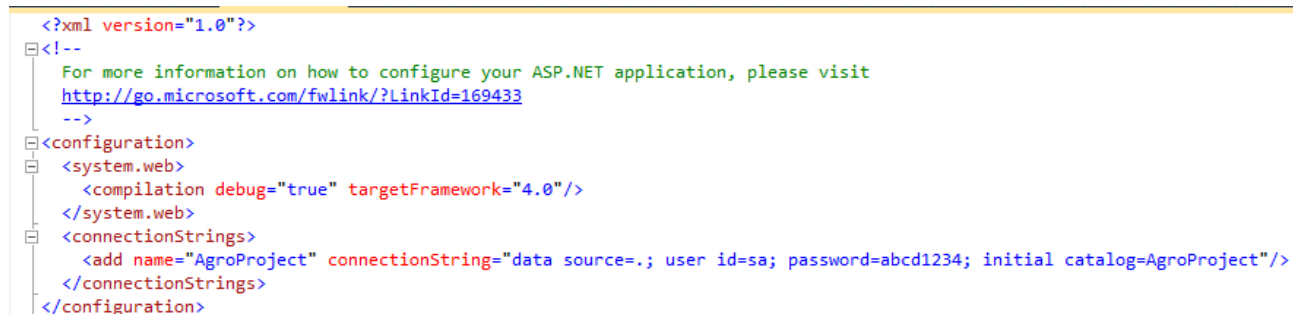


FIGURE 17 SOLUTION EXPLORERS

11. (Important Step) Double click on “web.config” to open its coding page as shown in Fig 23.
12. Replace the selected line with “Data Source = Comp1; Initial Catalog =agronomy; User ID = abcd; Password =abcd1234” where Comp1 is Computer Name, Db1 is Database name , abcd is user id of SQL Server and abcd1234 is Password of the same.



```
<?xml version="1.0"?>
<!--
  For more information on how to configure your ASP.NET application, please visit
  http://go.microsoft.com/fwlink/?LinkId=169433
-->
<configuration>
  <system.web>
    <compilation debug="true" targetFramework="4.0"/>
  </system.web>
  <connectionStrings>
    <add name="AgroProject" connectionString="data source=.; user id=sa; password=abcd1234; initial catalog=AgroProject"/>
  </connectionStrings>
</configuration>
```

FIGURE 18 WEB CONFIG FILE

1. Select **Login.aspx** from the list of forms as shown in the Solution Explorer

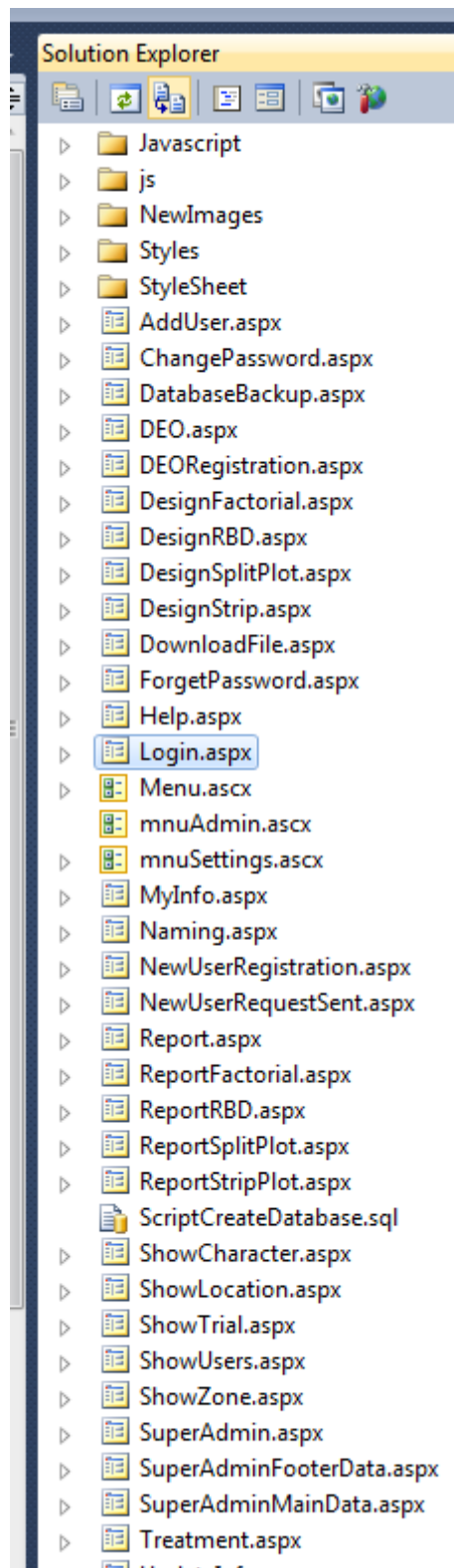


FIGURE 19 SOLUTION EXPLORER WINDOWS

14. Right Click on **Login.aspx** form.
15. Click “View in Browser” option as shown below

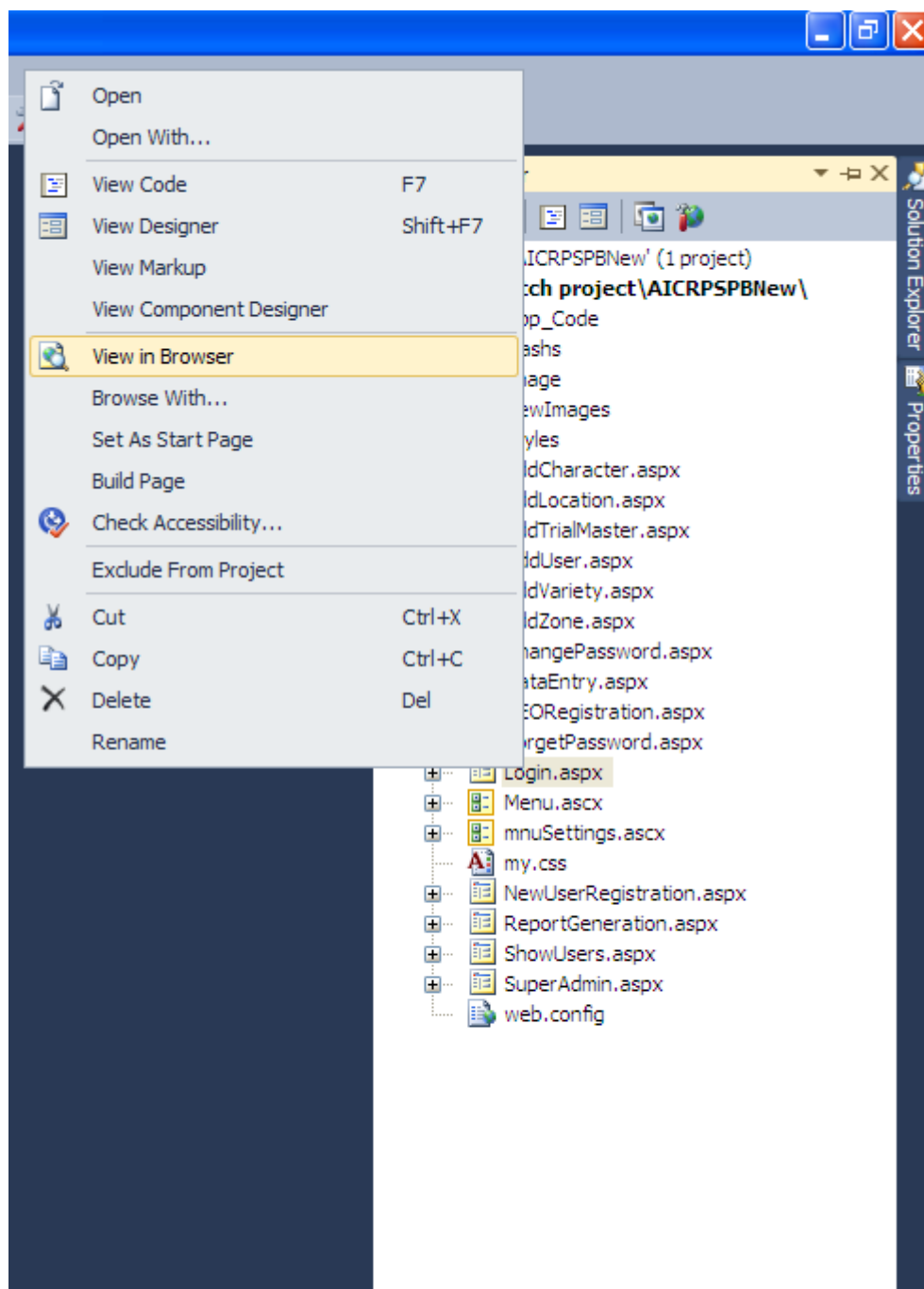


FIGURE 20 VIEW IN BROWSER

16. Running Login form will appear as shown below

17. Enter “User ID” and “Password” and Click  button to login.

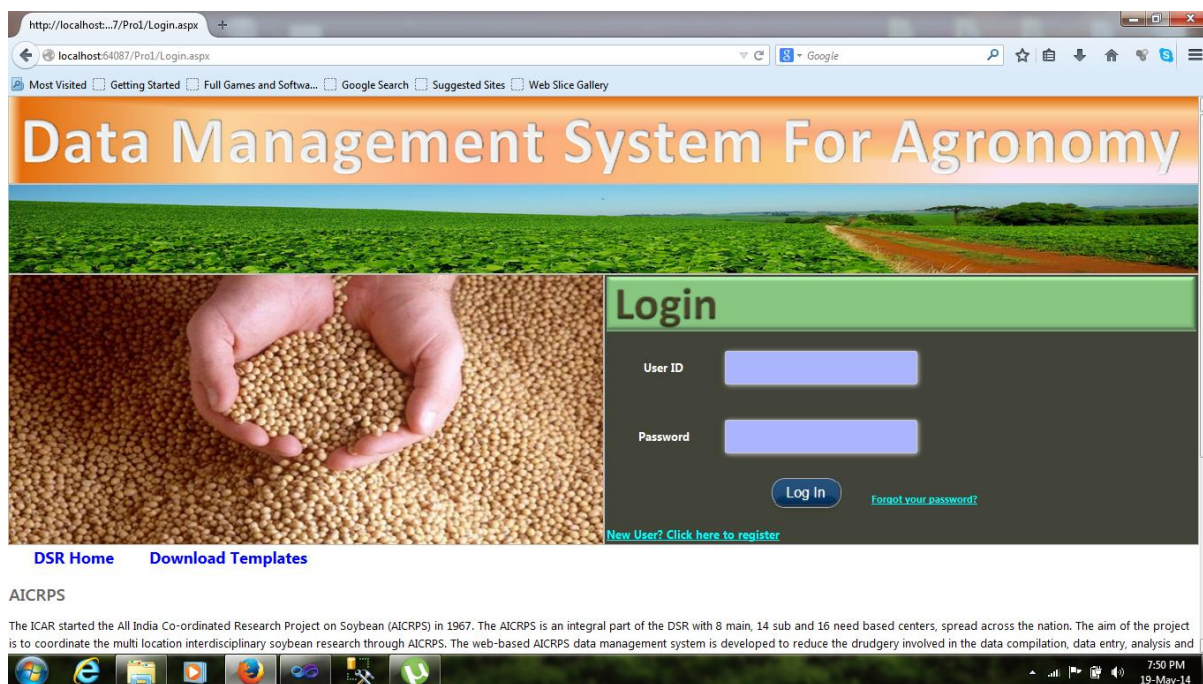


FIGURE 21 LOGIN FORM

2.2.4 Steps for configuring the system for running it on Remote Client

(NEW Virtual Directory Creation Steps):-

1. Go to start → Programs → Administrative Tools → IIS Manager to open “Internet Information Services (IIS) MANAGER WINDOW” as shown below in Fig.28.

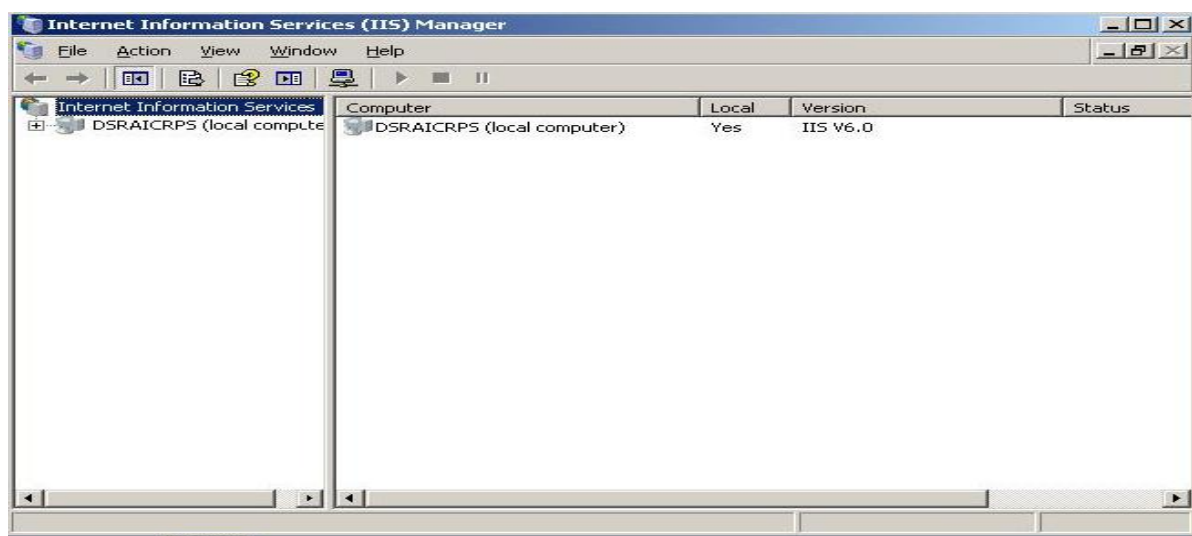


FIGURE22 INTERNET INFORMATION SERVICES (IIS) MANAGER

2. Select  **DSRAICRPS (local computer)** and open its sub list by clicking “+” as shown below in Fig.29.

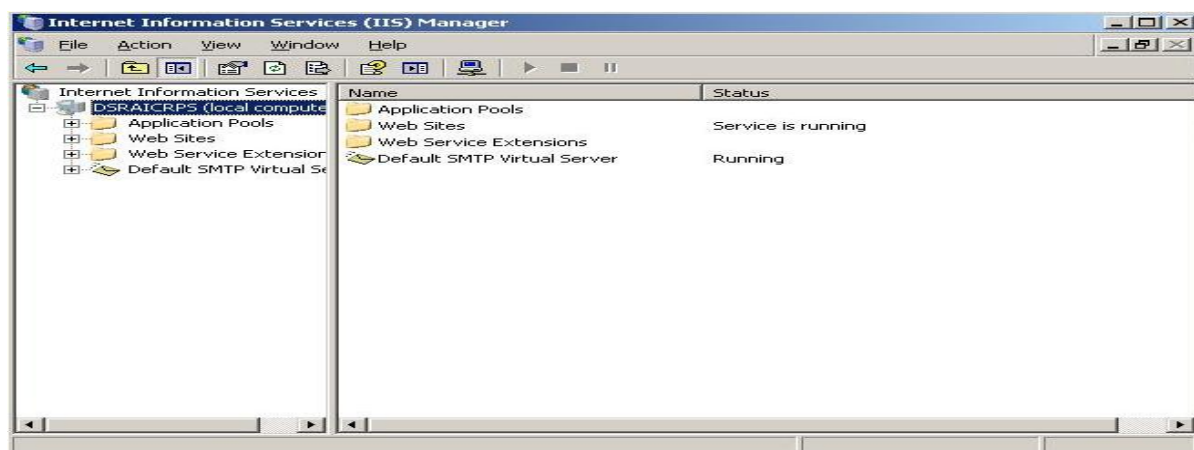


FIGURE23

3. Open  **Web Sites** sub list and select  **Default Web Site** as shown below in Fig.30.

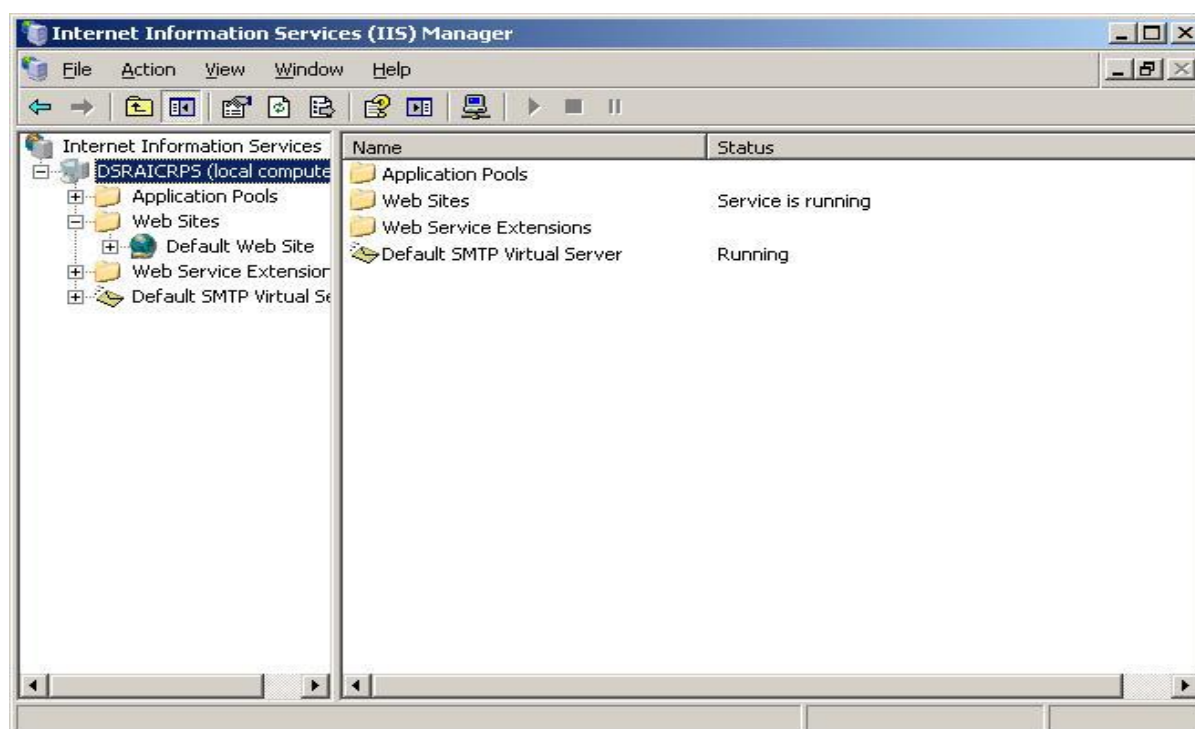


FIGURE 24 IIS MANAGER

Right click on  **Default Web Site** and go to **New** → **Virtual Directory...** as shown below in Fig.31.

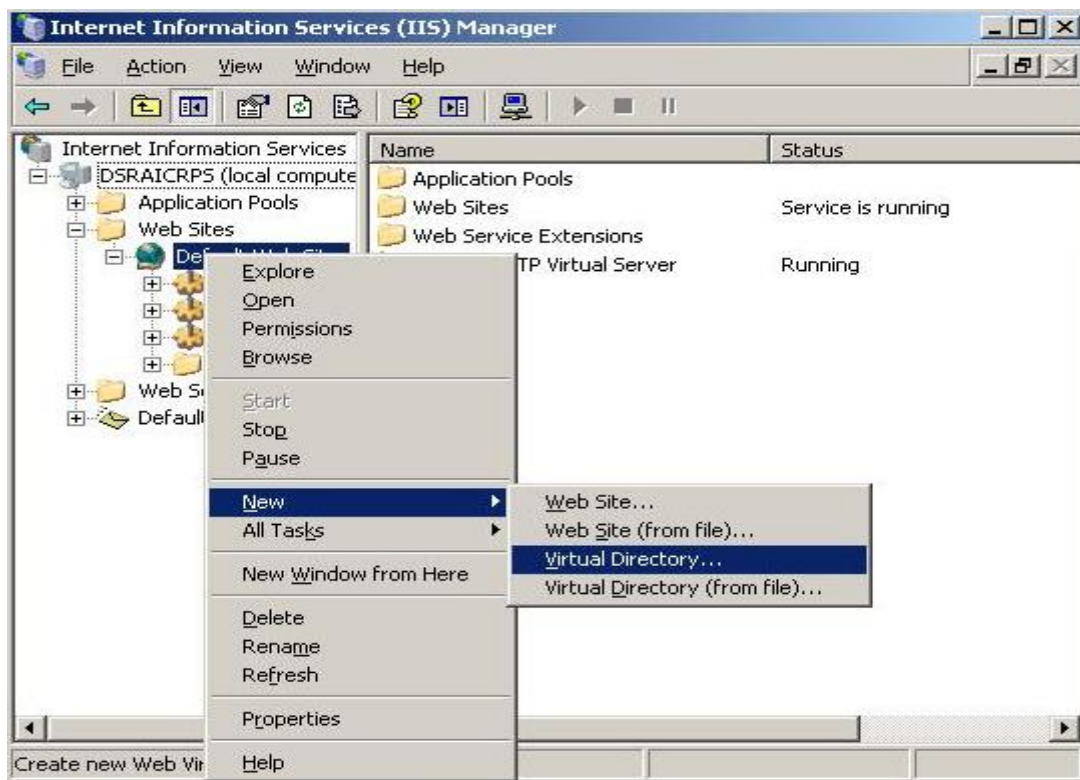


FIGURE 25 IIS MANAGER (VIRTUAL DIRECTORY)

4. In the “VIRTUAL DIRECTORY CREATION WIZARD” press  button to continue as shown below in Fig.32.



FIGURE 26 VIRTUAL DIRECTORY WIZARDS CREATION

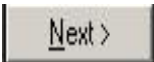
5. The “VIRRTUAL DIRECTORY ALIAS WINDOW” will open and in this window give virtual directory name that is to be used for providing hyperlink from homepage of institute website e.g. **Agro** and press  button as shown below in Fig.33.



FIGURE 27 WEBSITE CONTENT DIRECTORY WINDOW

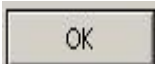
6. In the “WEBSITE CONTENT DIRECTORY WINDOW” click  button to browse for the location where the software is stored and press  in the “Browse For Folder” window as shown below in Fig.34.



FIGURE 28 BROWSE FOR FOLDER

7. Then press  button to continue in the “Website Content Directory” as shown below in Fig.35.

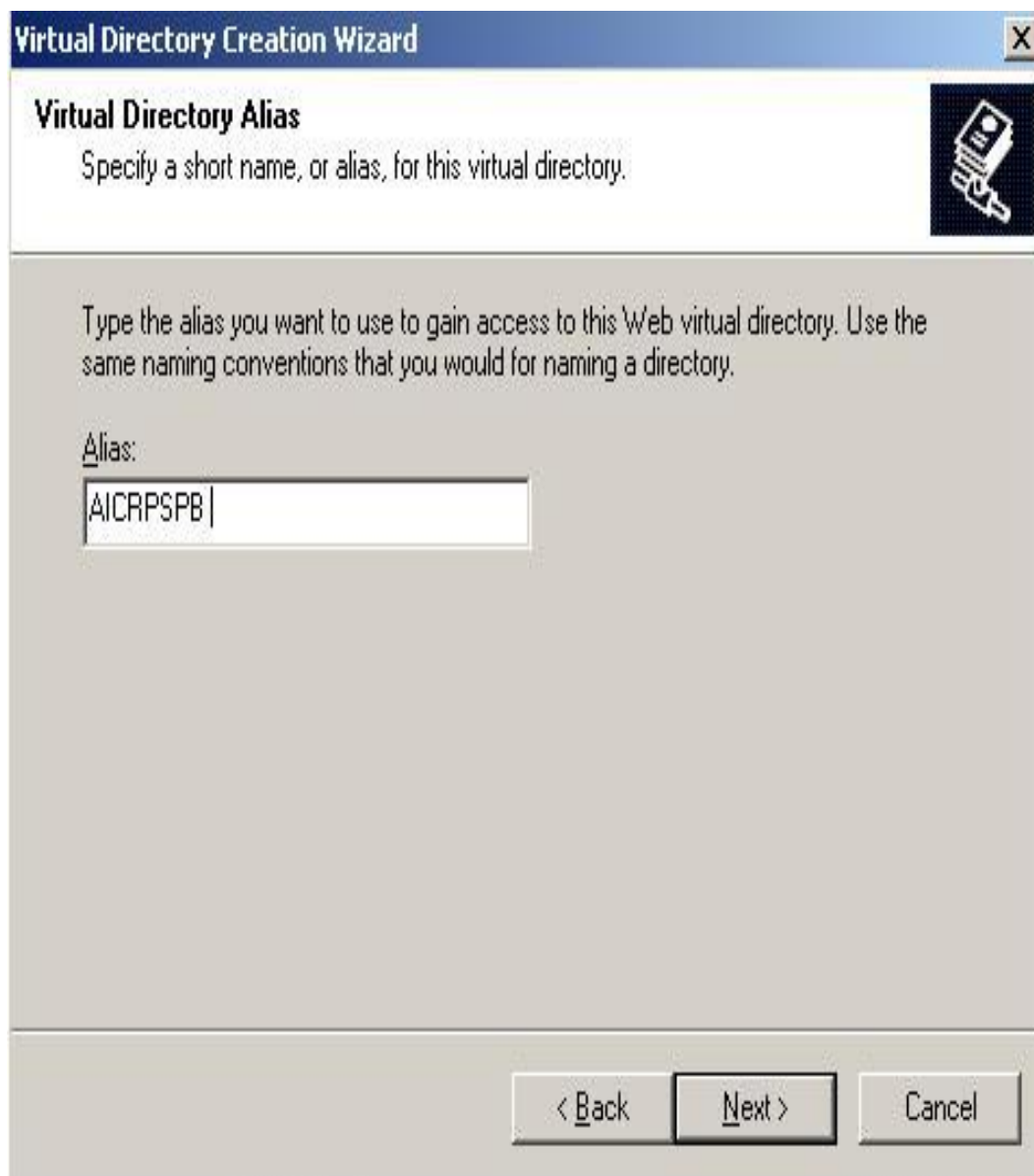


FIGURE 29 VIRTUAL DIRECTORY ALIAS

8. The "VIRTUAL DIRECTORY ACCESS PERMISSIONS" window will open as shown below in Fig.36.

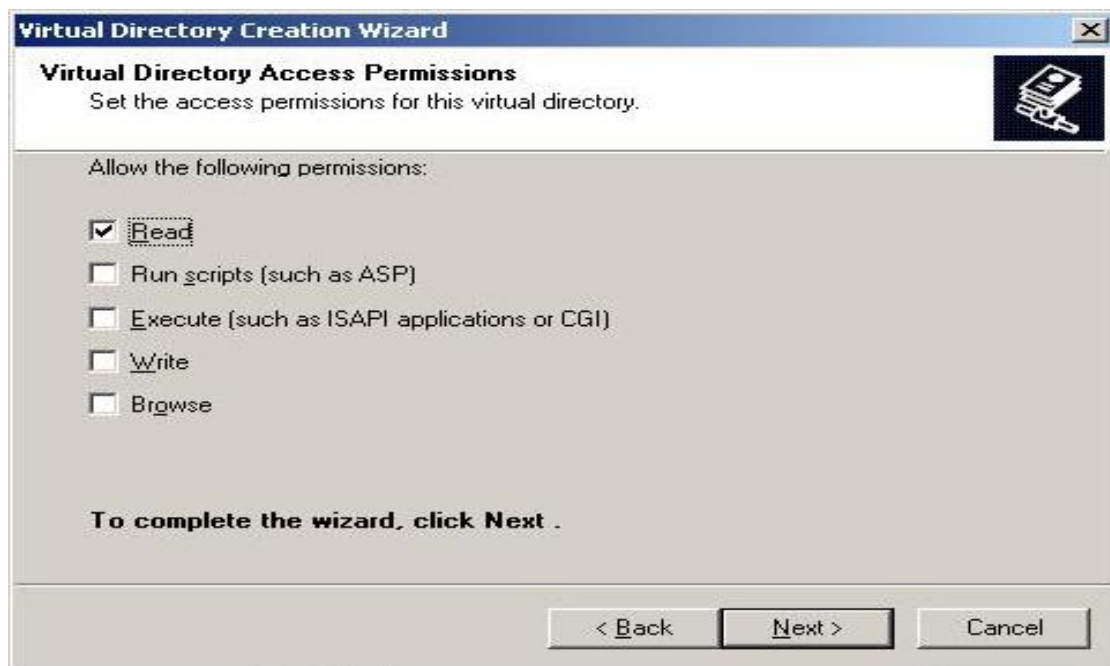


FIGURE 30 VIRTUAL DIRECTORY ACCESS PERMISSIONS

9. Now check Execute, Run and Browse permissions (Important Step) and press

 Default Web Site button as shown below

Note: Don't check write permission otherwise anybody can temper the code.



FIGURE 31 VIRTUAL DIRECTORY

10. Virtual Directory will be created and will appear in listing of “Agro” in the panel on the left hand side of IIS Manager Window as shown below

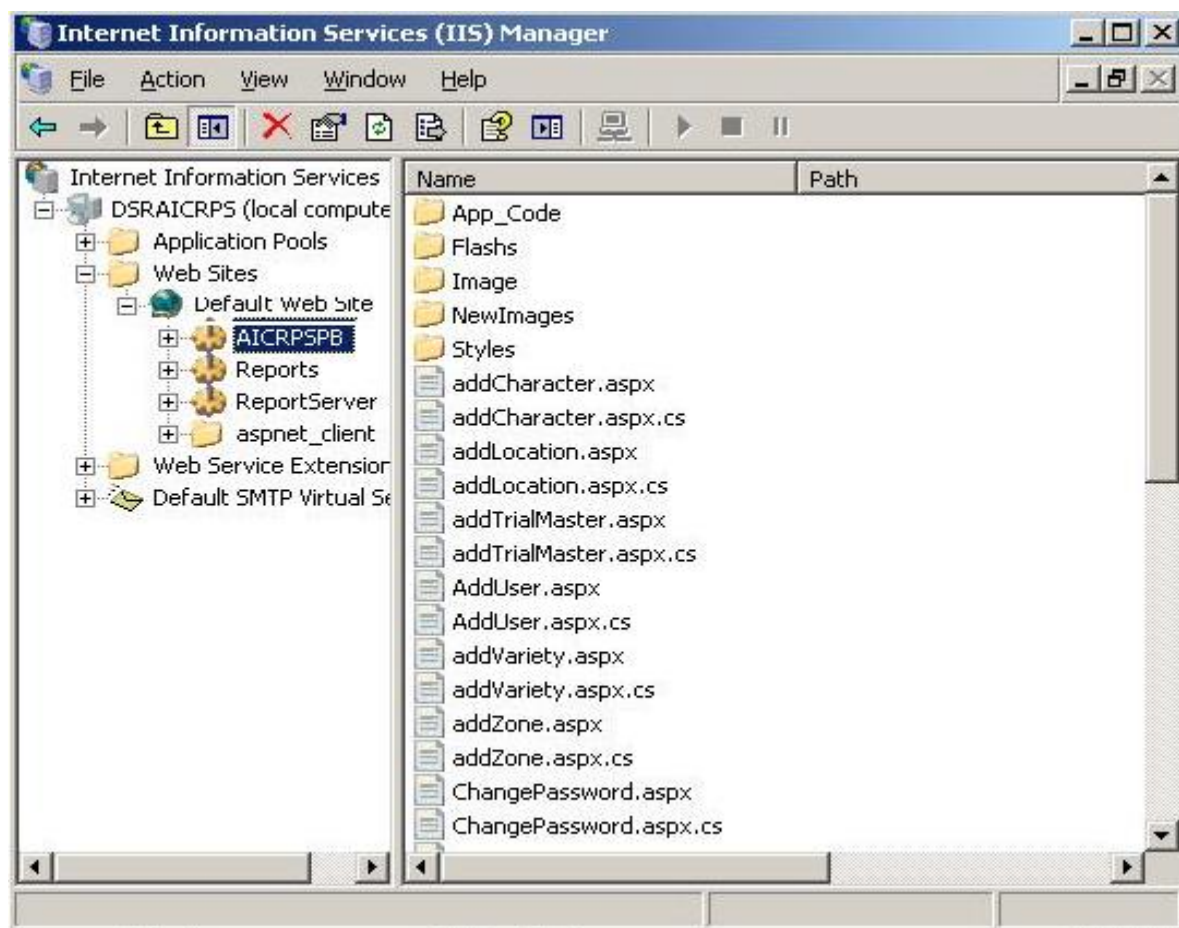


FIGURE 32

11. Create hyperlink at the “homepage of institute website” for accessing the software at client end e.g. **AICRPS Data-Entry NEW!** as shown below in Fig.39.

The hyperlink path should be using this virtual directory name “Agro” and NOT the physical path of the actual file name on computer system e.g <http://202.141.78.206/Agro/login.aspx>



FIGURE 33 HOMEPAGE OF INSTITUTE WEBSITE

12. Change the ASP version 4.2 in the IIS Manager otherwise it will show error msg as shown fig. below....

3 TECHNICAL DETAILS ABOUT THE SYSTEM

3.1 Aims of the System Developed

The AICRPS data management and report generation system was developed with the following objectives.

1. To ensure that the present manual system of processing of sizable data from agronomic trials from cooperative centers of AICRPS and report generation could be replaced with an efficient, effective and user friendly computerized system to eliminate drudgery and component of manual error.
2. To allow safe storage of data including that of previous years and easy retrieval for assessing sustainable performance of generated technology and further to get feedback for their refinement.

3.2 Description of the System

The web based system developed using ASP DOT NET and SQL SERVER 2005 is user-friendly and interactive. It has been designed to enable a person even with limited computer skills to handle it. The database at back end is designed using SQL server 2005. The main user-interface is provided in the form of Menu-bar with menu options viz., ‘Master’, ‘Data-entry’, ‘Report Generation,’ Treatment’ ‘User’, ‘as shown in fig. 28. Each of these menu options contains a few sub-menu options that on click will open a particular form to perform certain task. The logical operation of the system can be described with the Data flow diagram as shown

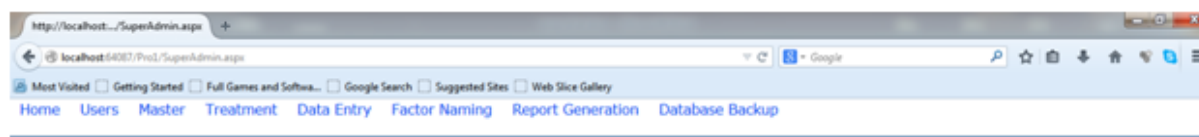


FIGURE 34 HOME PAGES

Start using the system as per guidelines provided in the **“User Reference Manual for Data Management and Report Generation”**

The Logical operations of the system can be described with the data Flow diagram as shown below

The Logical operations of the system can be described with the data Flow diagram as shown below

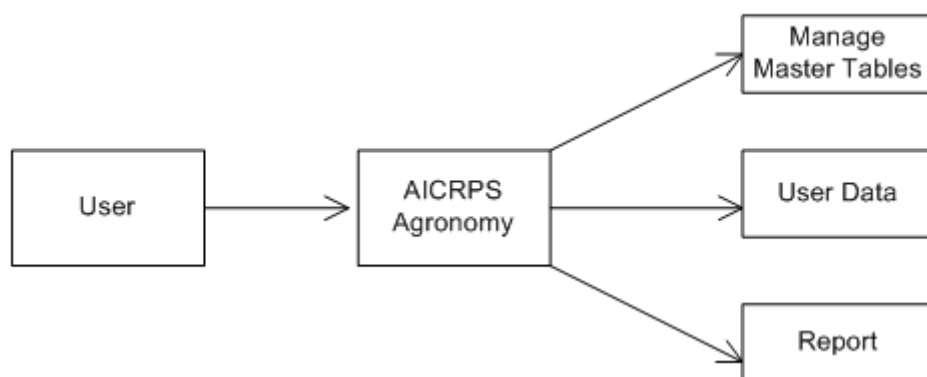


FIGURE: 35 DATA FLOW DIAGRAM Level 0

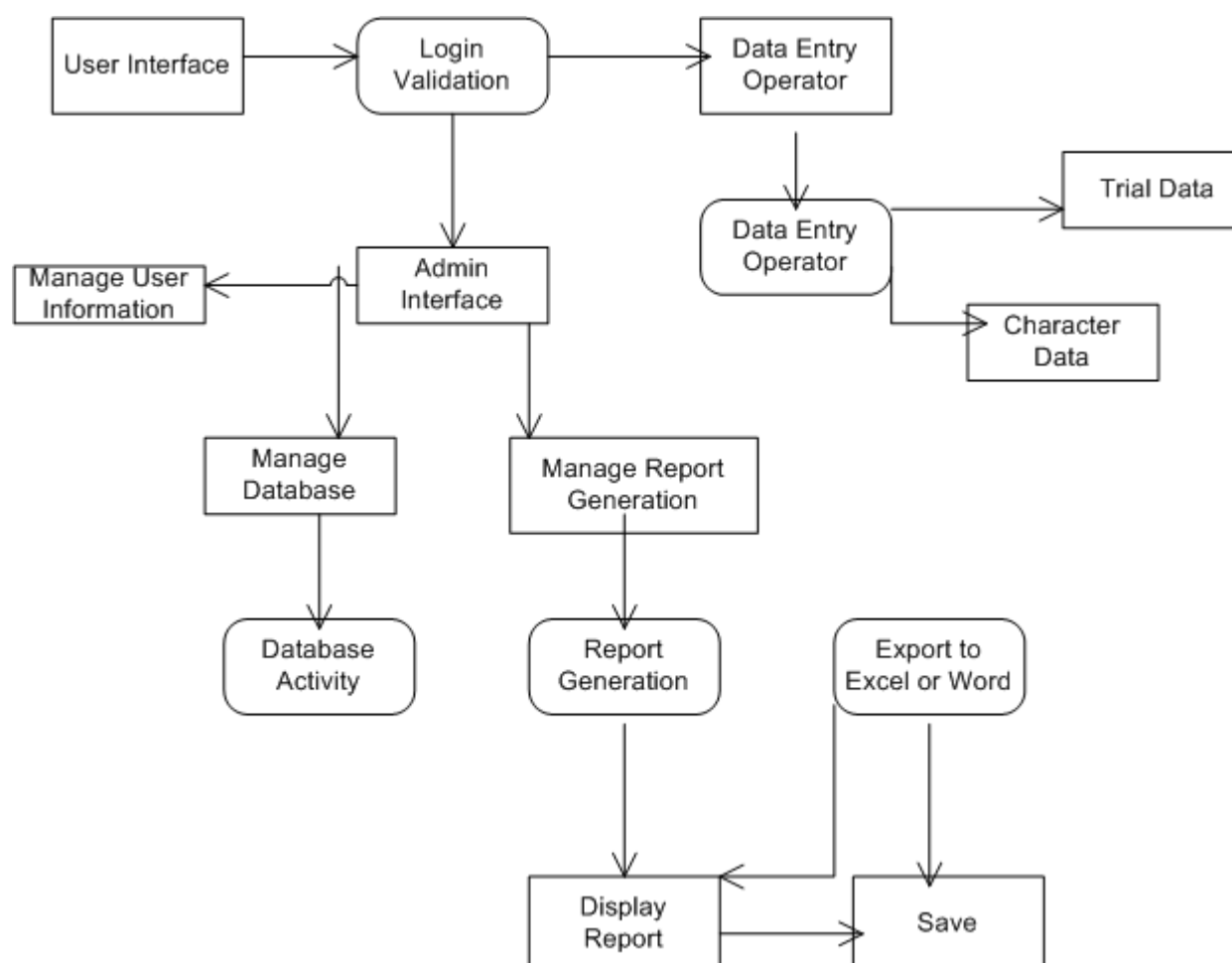


FIGURE : 36 DATA FLOW DIAGRAM Level 1

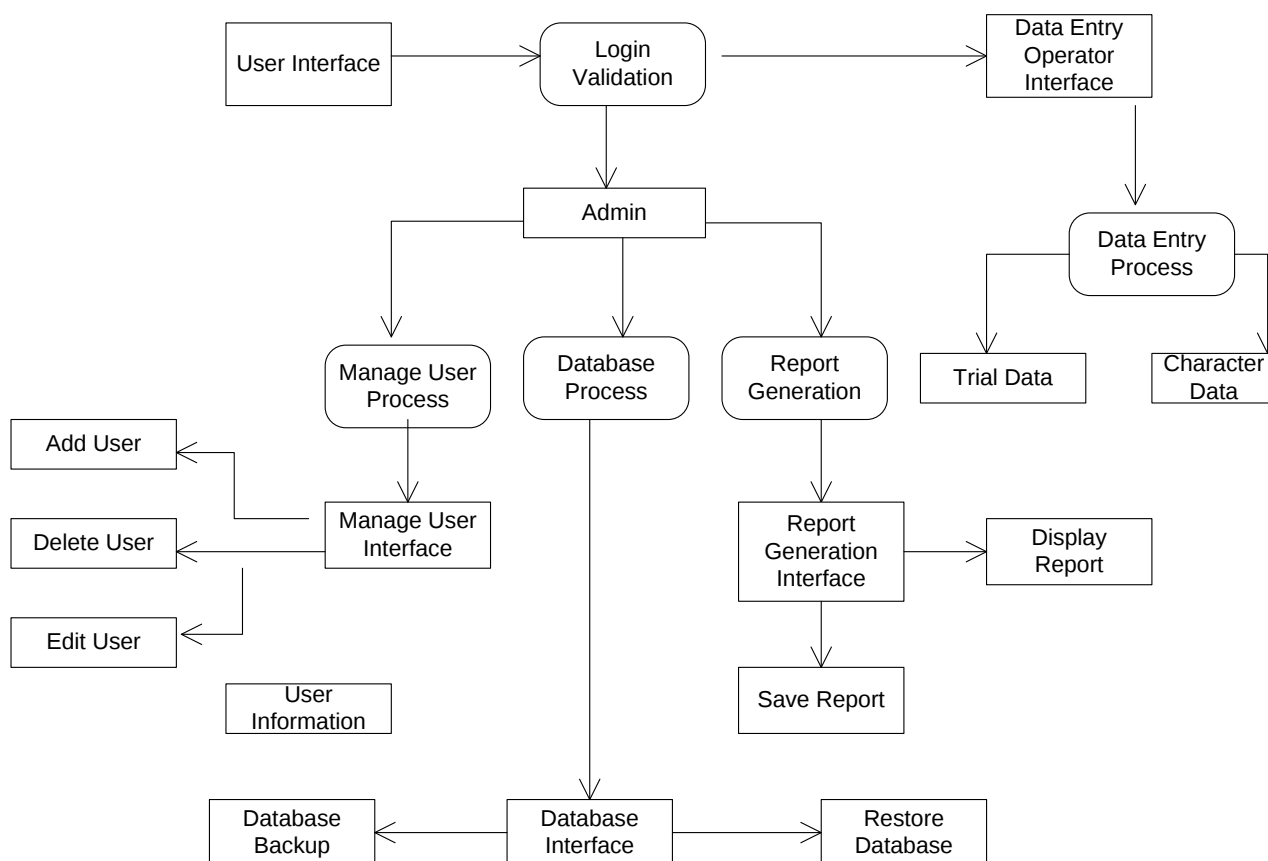


FIGURE: 37 DATA FLOW DIAGRAM Level 2

3.3 Data Collection

The research on development and refinement of production technology with time and space is a continuous process. The data acquisition from the cooperative centers located in different agro-climatic regions of the country (North hill zone, North plain zone, Central zone, Southern zone and North east zone) and processing it for report generation is a cumbersome and time consuming process. The cooperative centers of AICRP on Soybean undertake a number of trials on different aspects of production technology and agronomic evaluation of improved varieties. On the basis of consistent performance over years, the location specific technology/variety is made available to extension agencies for transfer to the farmers. To take the benefit of the technology developed through experimentation, the annual report is generated at Directorate of Soybean Research Indore. The data collected by each cooperative centre received at the centre can conveniently be fed to the developed data management system to generate the report on findings/recommendations.

The whole system design can be viewed with the “Entity- Relationship (E-R) diagram” as shown below in Fig.40. The ER-model is a conceptual data model of the system. The diagram shows the kind and organization of the data that is stored in the

database.

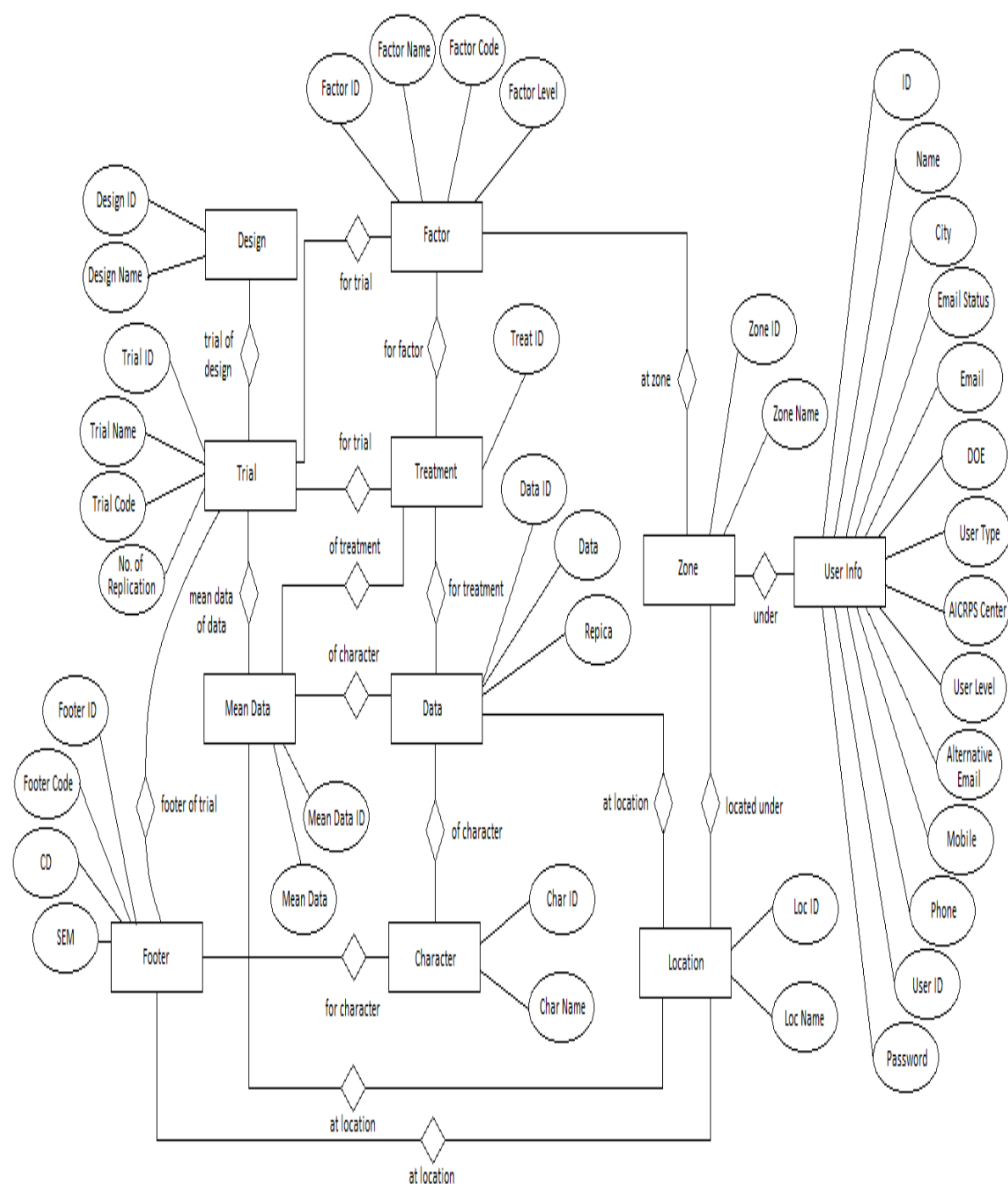


FIGURE 38 ENTITY-RELATIONSHIPS (E-R) DIAGRAM OF THE SYSTEM

3.4 Processing of Data File

Subsequent to the process of data-entry, correction of erroneous data, validation of the final data and before the generation of reports, the data files are processed at the system level for calculation of location-wise mean and zonal mean for each treatment. Based on these means, each treatment is given an increasing Rank (I onwards) from highest mean value to the lowest. The ranks assigned paves the way to decide the suitability of a particular treatment (s) specific to location/zone, which can be indicated in the final report generated.

3.5 Efficient Error Handling

The system has been designed in such a way that data-entry operator is not given any chance to commit any error. The user interface is such that most of the inputs are provided to the system through selections from a list with more than one valid option. Efficient error handling procedures are used so that if, by chance, any wrong entry is done, it will alert the user by promptly producing error messages. Even before every update/delete operation a confirmation message is prompted on user's screen in order to ensure final changes in the database at DSR Indore's server. The user interface is such that even a novice user with less computer skills can also handle the system comfortably.

3.6 Data analysis and Report Generation

Having completed the above steps, the summary table reports for each zone and trials for all the characters are printed out for verification by the concerned staff to ascertain errors that might have incurred at the data-entry level. The erroneous data are edited and submitted for rerunning of the system. After repeated corrections at different levels, final reports are generated in formats specified by the AICRP on Soybean system.

The developed system has versatility for incorporation of more complex and non-standard reports

3.7 Creating History Database Files

The provision incorporated for creating the history database in the system provides easy access to the accumulated data over years for viewing earlier year-wise information. The complete database with all the tables in it is storable in the form of backup files that can be restored and linked to the system, for future reference

3.8 Monitoring all the Phases of the System

The system super administrator has given the rights to provide username and password at different user-levels – super *administrator*, *administrator* and *data-entry-operator*.

The System administrator can give access rights to different users with different permissions as an administrator and data-entry-operator. The administrator monitors every phase of the system from Master table data-entry as per the technical program up to final report generation

4 SOFTWARE DEVELOPMENT STEPS

4.1 Architectural Design

The system architecture is three tier architecture i.e. client tier, application tier and data tier. The architectural design of the system follows three tier architecture. Three tier architecture is a special type of client/server architecture consisting of three well-defined and separate processes, each running on a different platform: The user interface (presentation tier), the functional modules (logic tier), a database management system (DBMS) (data tier).

Presentation Tier: The top-most level of the application is the user interface. The main function of the interface is to translate tasks and results to something user can understand.

Logic Tier: This layer coordinates the application, processes commands, makes logical decisions and evaluations, and performs calculations. It also moves and processes data between the two surrounding layers.

Data Tier: Here the information is stored and retrieved from a database or file system. The information is then passed backed to the logic tier for processing, and then eventually back to the user.

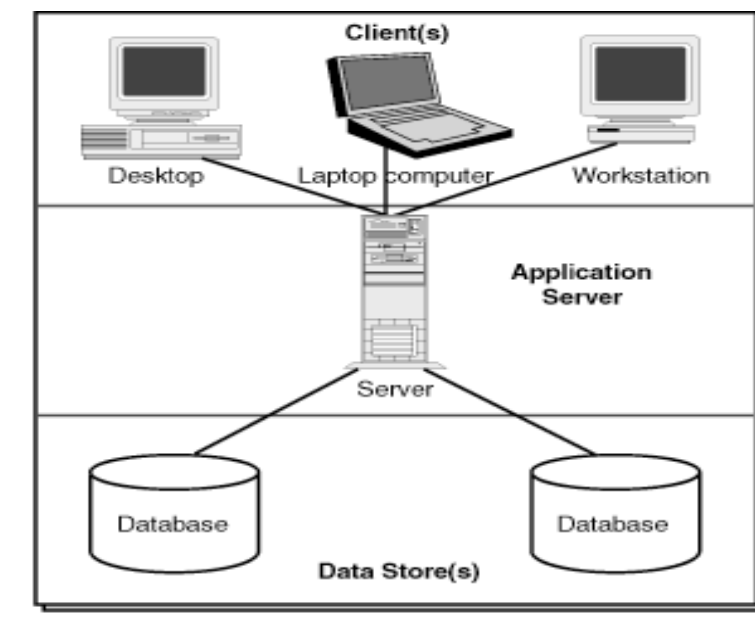


FIGURE: 39 THREE TIER ARCHITECTURE

4.2 Model Used

The framework in which software is designed, developed, and maintained is known as the Software Development Life Cycle (SDLC). It shows the steps, phases, milestones, and evolution of the software development process. There are many types of models used in software design and development. Among them are the spiral models, rapid development model, Evolutionary model, waterfall model, prototyping model, etc.

Prototyping Model has been used to develop this application. The Prototyping model is a technique for quickly building a function but incomplete model of the information system.

Advantages of Prototyping

- Reduces development time and costs
- Requires user involvement.
- Developers receive quantifiable user feedback.
- Facilitate system implementation since users know what to expect.
- Results in higher user satisfaction.

The process of prototyping

- Identify basic requirement: Determine basic requirements including the input and output information desired. Details, such as security, can typically be ignored.
- Develop initial prototype: The initial prototype is developed that includes only user interfaces.
- Review: The customers, end-users, examine the prototype and provide feedback on additions or changes
- Revise and enhancing the prototype: Using the feedback, both the specifications and the prototype can be improved. This method involves a series of iterations and refinement until the prototype product is a fully working system, and the user is satisfied.

4.3 USECASE VIEW

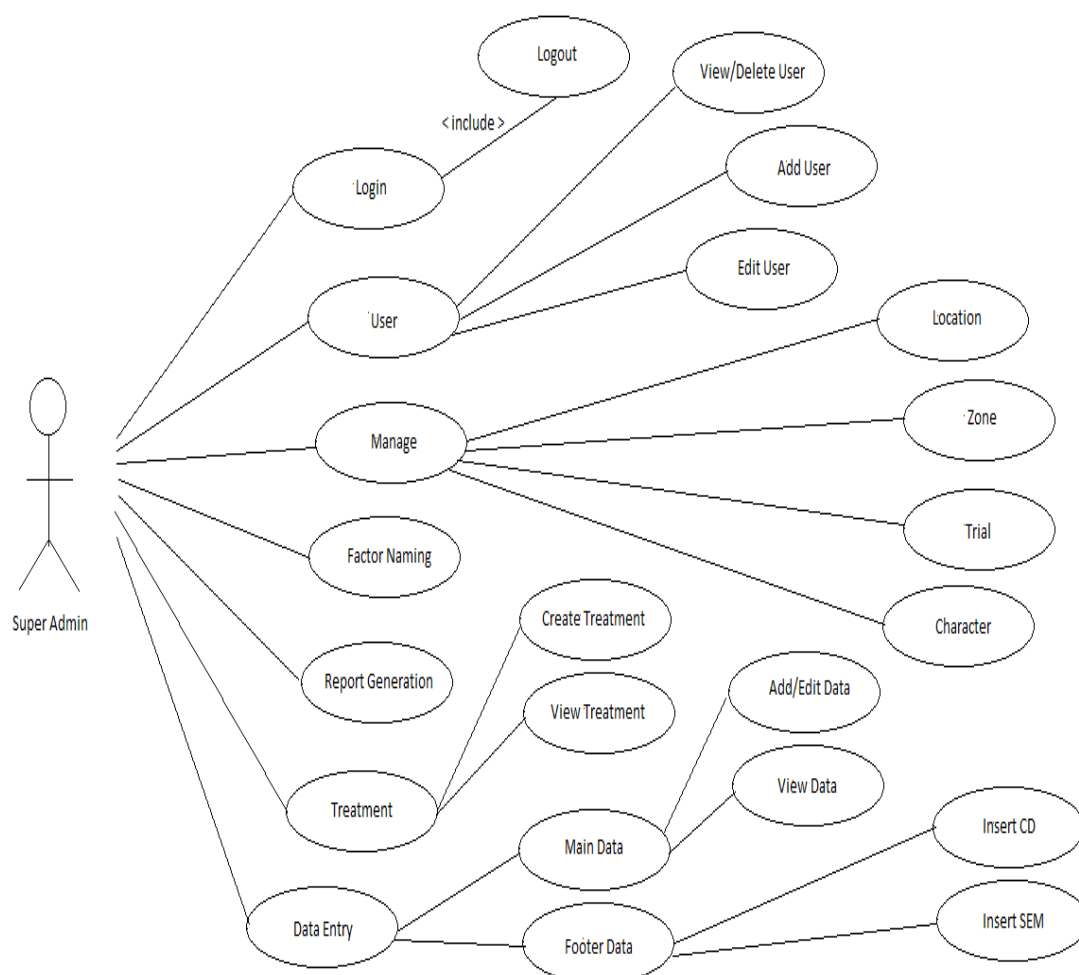


FIGURE :40 SUPER ADMIN USE CASE

1. Use case name: Super Admin
2. Brief Description: Super Admin will grant user Id, password and manage location, Zone, Character, Trial, Create treatments, generate Report and will perform Data Entry
3. Actors: Super Admin
4. Flow of events:

4.1. Basic flows: Super Admin will grant user id and password to the requested users and Super admin can also add, delete or edit any information of the users. After authorization he/she can create or view treatments, can do data entry in main data and footer data

4.2. Alternative flows:

5. Precondition: There is an active network connection, actors must be logged in and must be registered user.

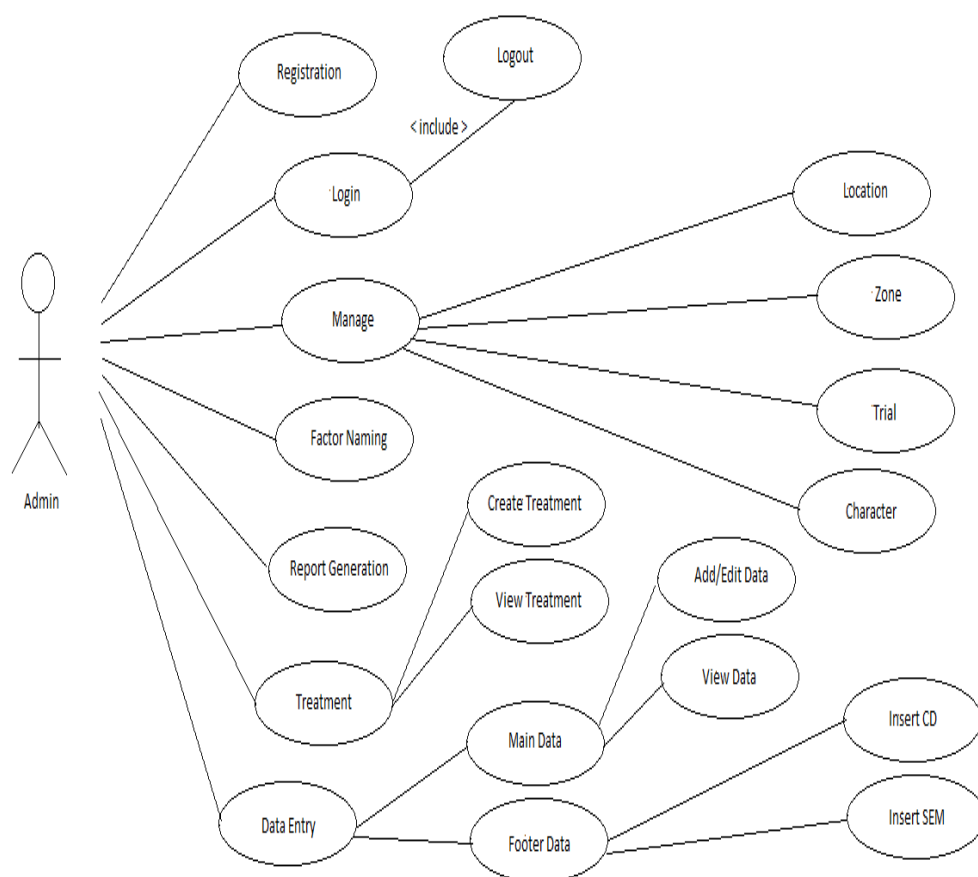


FIGURE :41 ADMIN USE CASE

1. Use case name: Admin

2. Brief Description: Admin can grant user Id, password in the absence of Super Admin and manage location, Zone, Character, Trial, Create treatments, generate Report, will perform Data Entry

3. Actors: Super Admin

4. Flow of events:

4.1. Basic flows: Super Admin will grant user id and password to the requested users and Super admin can also add, delete or edit any information of the users. After authorization he/she can create or view treatments, can do data entry in main data and footer data

4.2. Alternative flows:

5. Precondition: There is an active network connection, actors must be logged in and must be registered user.

6. Post condition: After successful addition of the entry, it is saved in the database.

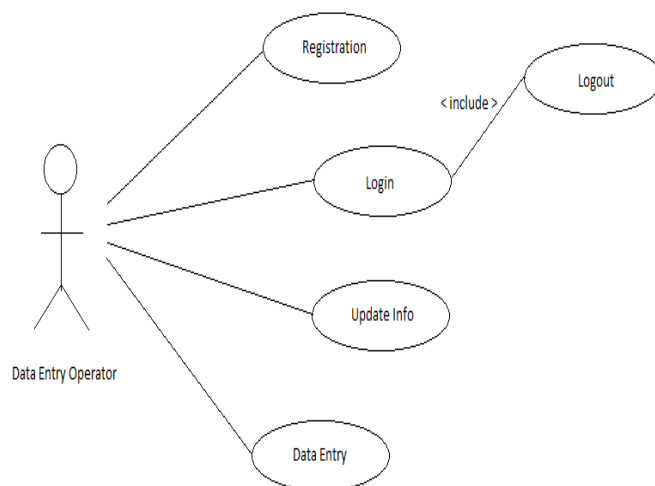


FIGURE: 42 DATA ENTRY OPERATOR USE CASE

1. Use case name: Data Entry Operator

2. Brief Description: Data entry operator will login, update info select trial, character and treatments

3. Actors: Data Entry Operator

4. Flow of events:

4.1. Basic flows: Data entry operator will register himself after registration he/she will get a login Id and Password .After getting a valid User id and Password from Super Admin data entry Operator can perform data entry and can update info.

4.2. Alternative flows:.

5. Precondition: There is an active network connection, actors must be logged in and must be registered user.

6. Post condition: After successful addition of the entry, it is saved in the database.



FIGURE: 43 SYSTEM USE CASE

4.4Data Base Design

✓ Physical Database Design

Database design is the process of producing a detailed data model of a database. The process of doing database design generally consists of a number of steps which will be carried out by the database designer. Usually, the designer must:

- Determine the relationships between the different data elements.
- Superimpose a logical structure upon the data on the basis of these relationships.

One of the main purposes of database design is to eliminate redundancy from the database. To accomplish this task, we use a technique called *normalization*. The design activity is divided into three separate phases: Conceptual Data Modeling, Logical Data Base Design, and Physical Data Base Design.

✓ **Conceptual Design:** It analyzes the overall data requirement of the proposed information system. A conceptual data model identifies the highest-level relationships between the different entities. Features of conceptual data model include it includes the important entities and the relationships among them.

✓ **Logical Design:** It transforms the conceptual data model into a standard relation called relation based on relational database theory and a process called Normalization.

✓ **Physical Tables**

Character Master Table This table stores the information about the character used for evaluating the performance of the treatment

Table - dbo.CharacterMaster			Table - dbo.Footer	Summary
Column Name	Data Type	Allow Nulls		
CharId	int	☐		
CharName	varchar(MAX)	☒		
		☐		

Trial table This table stores the information about trial which will be performed on different design

Table - dbo.Trial			Summary
Column Name	Data Type	Allow Nulls	
TrialId	int	☐	
TrialName	varchar(MAX)	☐	
DesignId	int	☐	
NoOfRep	int	☐	
TrialCode	varchar(MAX)	☐	
		☐	

User Information Table: This tables stores the basic information provided by the users

Primary Key : User Id

Foreign Key: Zone Id, Location Id

Reference: Zone Master, Location Master

Table - dbo.UserInfo			
Summary			
	Column Name	Data Type	Allow Nulls
▶	Id	int	☐
	Name	varchar(MAX)	☒
	City	varchar(MAX)	☒
	EmailStatus	varchar(50)	☒
	CorrespondenceAddress	varchar(MAX)	☒
	PermanentAddress	varchar(MAX)	☒
	Email	varchar(MAX)	☒
	AlternativeEmail	varchar(MAX)	☒
	Mobile	varchar(MAX)	☒
	Phone	varchar(MAX)	☒
	UserId	varchar(MAX)	☒
	Password	varchar(MAX)	☒
	LocationId	int	☒
	ZoneId	int	☒
	DOE	varchar(50)	☒
	UserLevel	int	☒
	UserType	varchar(MAX)	☒
	AICRPSCenter	varchar(MAX)	☒
			☐

Zone Table: This table stores of the list of all zones.

Primary Key: Zone Id

Table - dbo.ZoneMaster			
Summary			
	Column Name	Data Type	Allow Nulls
▶	ZoneId	int	☐
	ZoneName	varchar(MAX)	☒
			☐

Treatment Table: This table consists of treatment for particular zones.

Primary Key: Treatment Id

Foreign Key: Level 1, Level2, Level3, Level4

Reference: Factor Master

Table - dbo.ZTreatment		Summary
Column Name	Data Type	Allow Nulls
Id	int	☐
Level1	int	☒
Level2	int	☒
Level3	int	☒
Level4	int	☒
ZoneId	int	☒
TrialId	int	☒
		☐

Factor Table: This table consists of the information about t the treatments; factor Name According to trial, zones and design.

Primary Key: Factor-Id

Foreign Key: Trial Id

Reference: Trial Master

Table - dbo.ZTryFactor		Summary
Column Name	Data Type	Allow Nulls
FactorId	int	☐
TrialId	int	☒
ZoneId	int	☒
FactorName	varchar (MAX)	☒
FactorLevel	int	☒
FactorCode	varchar (MAX)	☒
		☐

Footer Table: This table stores data of each location, trial and character

Table - dbo.Footer			
Summary			
	Column Name	Data Type	Allow Nulls
PK	FooterId	int	☐
	CD	int	☒
	ACM	int	☒
	CharId	int	☒
	LocId	int	☒
	FooterCode	varchar(MAX)	☒
	TrialId	int	☒
			☐

Data Table: This table stores the data for each replication on the basis trial, location and character

Primary Key: Data Id

Foreign Key: Treatment Id, Location Id, Character Id

Reference: Treatment Master, Character Master, Location Master

Table - dbo.Data			
Summary			
	Column Name	Data Type	Allow Nulls
PK	DataId	int	☐
	Data	decimal(18, 2)	☒
	TreatId	int	☒
	LocId	int	☒
	Replica	int	☒
	CharId	int	☒
			☐

Design Table: This table stores information about the type of design which are used by DSR. Mainly there are four types of designs 1 RBD, Factorial, Split, Strip Plot

Primary Key: Design Id

Table - dbo.DesignMaster			
Summary			
	Column Name	Data Type	Allow Nulls
PK	DesignId	int	☐
	DesignName	varchar(MAX)	☐
			☐

5.LIMITATIONS AND CONSTRAINTS

- The software works better with “Google Chrome browser” and not with internet explorer.
- The “mobile number” must be of 10 digit only.
- Do not Support Spatial Analysis
- No Provision to calculate the performance over the year.

6.IMPORTANT INSTRUCTIONS

1. When we have to change the database Password

(I) Go to web .config File as shown below

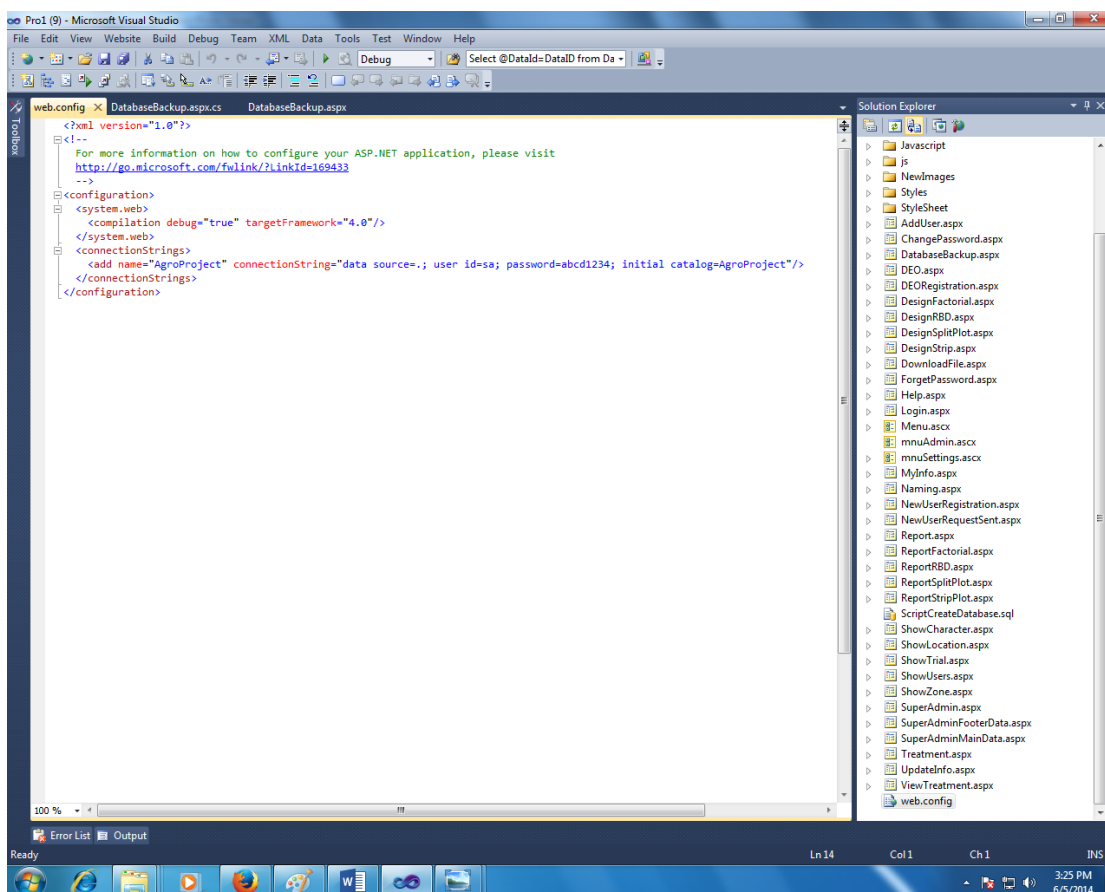


FIGURE: 44 SOLUTION EXPLORER

```
<connectionStrings>
  <add name="AgroProject" connectionString="data source=.; user id=sa; password=abcd1234; initial catalog=AgroProject"/>
</connectionStrings>
```

FIGURE: 45 WEB CONFIG FILE

(ii) In the above FIGURE: 45 replace the Password = "abcd1234" with new password of database.

2. When you change the name of the database following changes have to be done as follows:

(i) Open web.config as shown below.

(ii) In the above fig change database name as shown below

Initial Catalog = AgroProject. Replace Agro Project with new database name.