

BIT field support services

User Guide

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6/14/2015

PLEASE NOTE: This is
final document.

Updated on 14/06/2015.

This is user guide to help the application users understand the process and data flow of BIT services desktop application.

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BIT support services

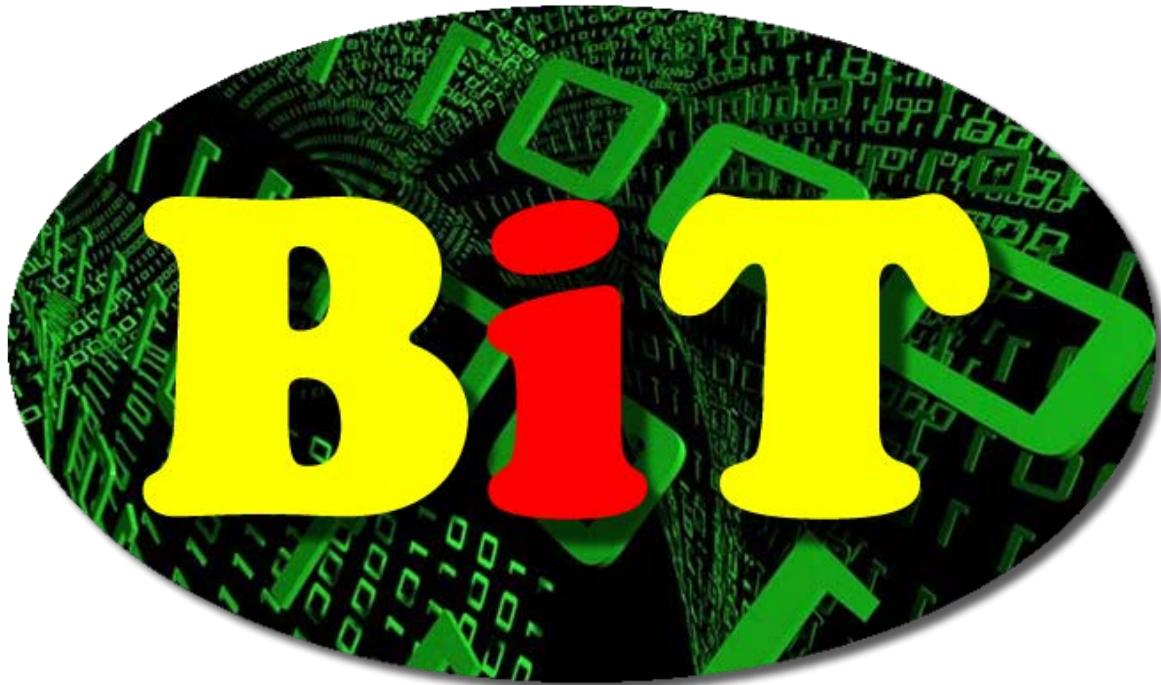
by Arvind Kumar

Version 1.0

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This guide aims serving administrators, coordinators, contractors, clients and to some extent managers by demonstrating a structured documented modestly sized BIT project, which will help communicate the software requirements and design decisions.

Reading this document, Readers will get an insight into how professional Enterprise based BIT project is structured, documented and executed using:

- Microsoft SQL Server 2008 r2/2012/2014 as the data store.
- Windows Form as the view technology.
- N- Layered architecture
 - i. Data Access Layer
 - ii. Business Logic Layer
 - iii. Presentation Layer
 - iv. Entity Layer

The idea of Object-Oriented design & loose coupling among assorted modules has been main focus of this project.

If you have any questions, comments or just feel like communicating, please contact me at arvind.k.developer@gmail.com.

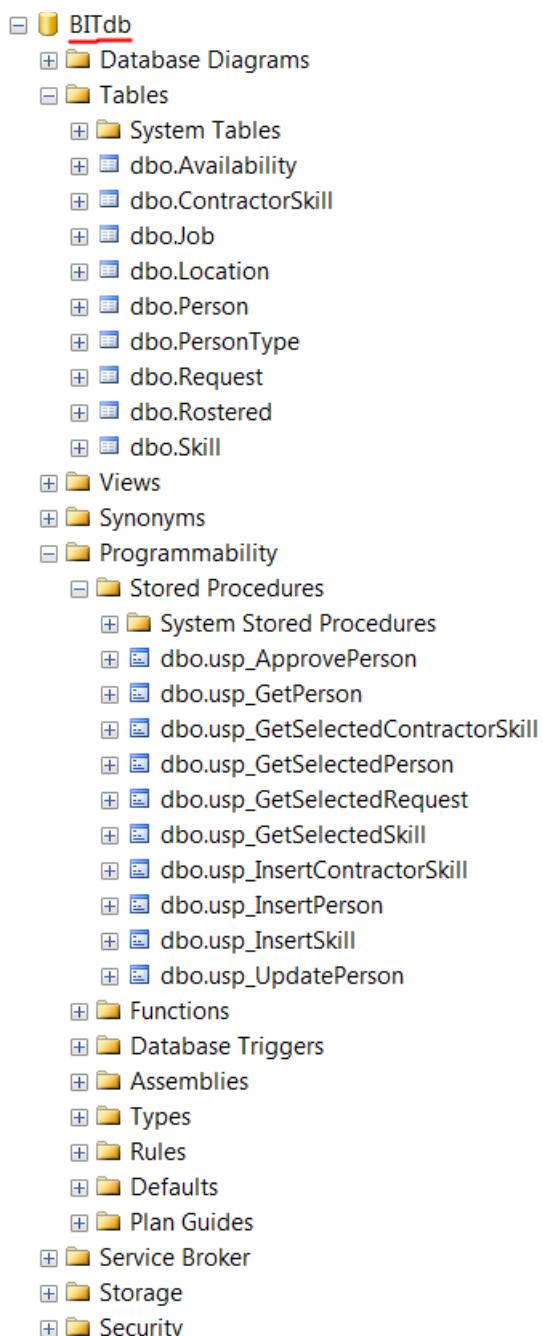
For additional information on this project visit:

<http://www.cosmosbazaar.com/bit>

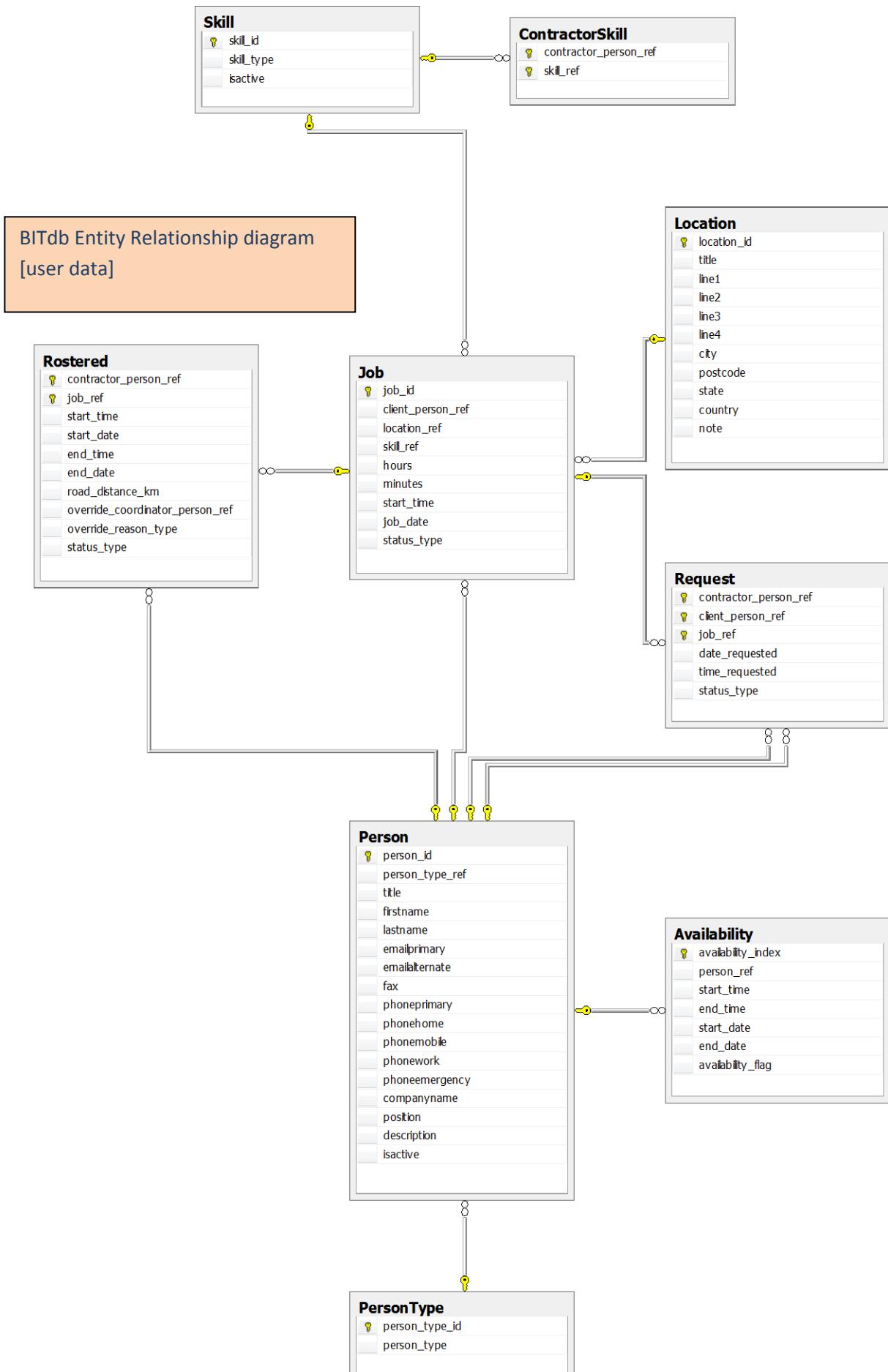
Arvind Kumar

Two databases “BITdb” and “ControlSecurity” are created in MSSQL using the script files provided in ArvindKumar_BIT/Desktop_project\Server_side\database folder.

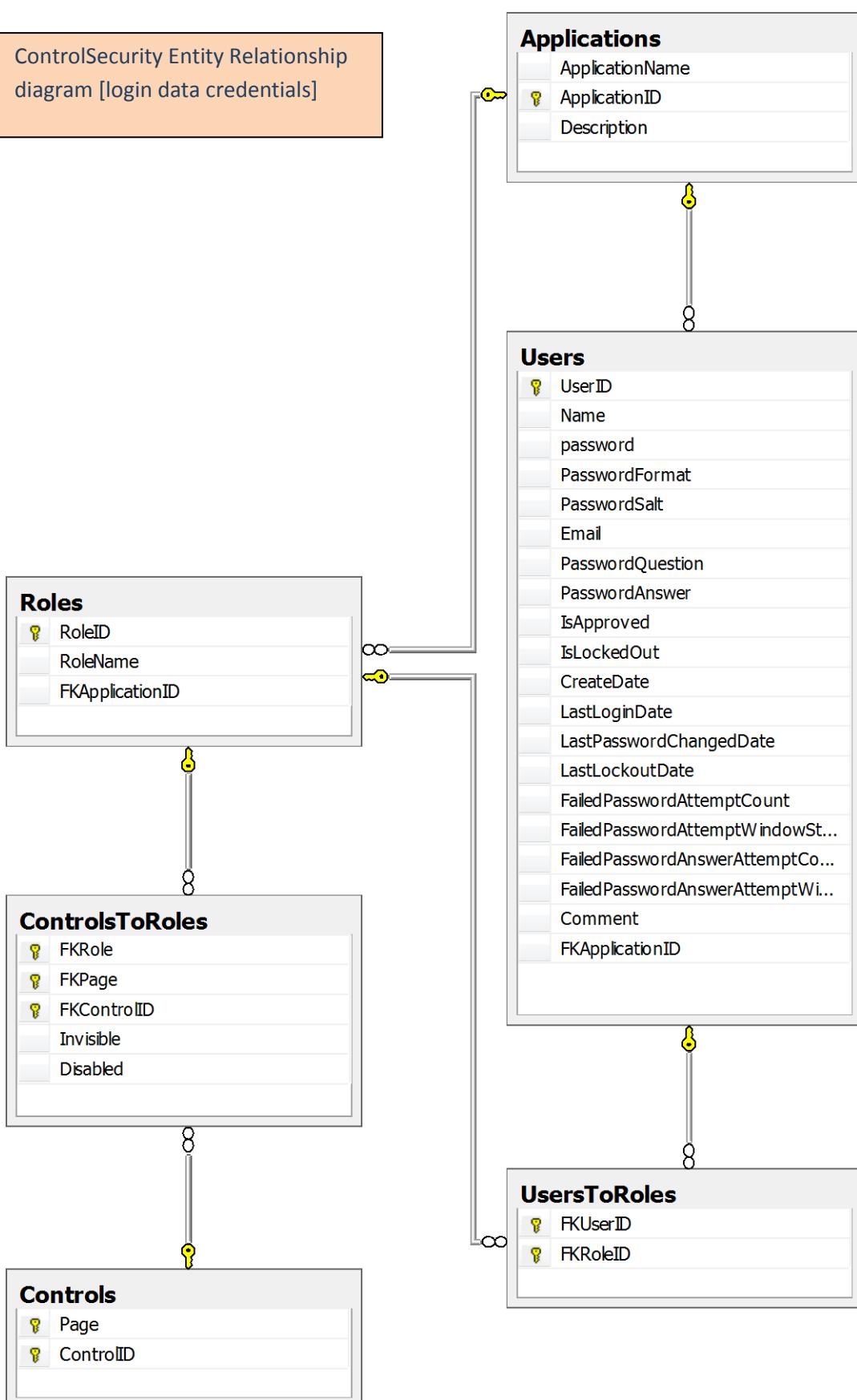
bitdb.sql	12/06/2015 11
controlsecurity.sql	12/06/2015 11



-  **ControlSecurity**
-  Database Diagrams
-  Tables
 -  System Tables
 -  dbo.Applications
 -  dbo.Controls
 -  dbo.ControlsToRoles
 -  dbo.Roles
 -  dbo.Users
 -  dbo.UsersToRoles
-  Views
-  Synonyms
-  Programmability
 -  Stored Procedures
 -  System Stored Procedures
 -  dbo.spInsertNewControlToRole
 -  dbo.spInsertNewUserInRole
 -  dbo.usp_DeactivateUser
 -  dbo.usp_InsertUser
 -  dbo.usp_ValidateUser
 -  Functions
 -  Database Triggers
 -  Assemblies
 -  Types
 -  Rules
 -  Defaults
 -  Plan Guides
-  Service Broker
-  Storage
-  Security



ControlSecurity Entity Relationship diagram [login data credentials]



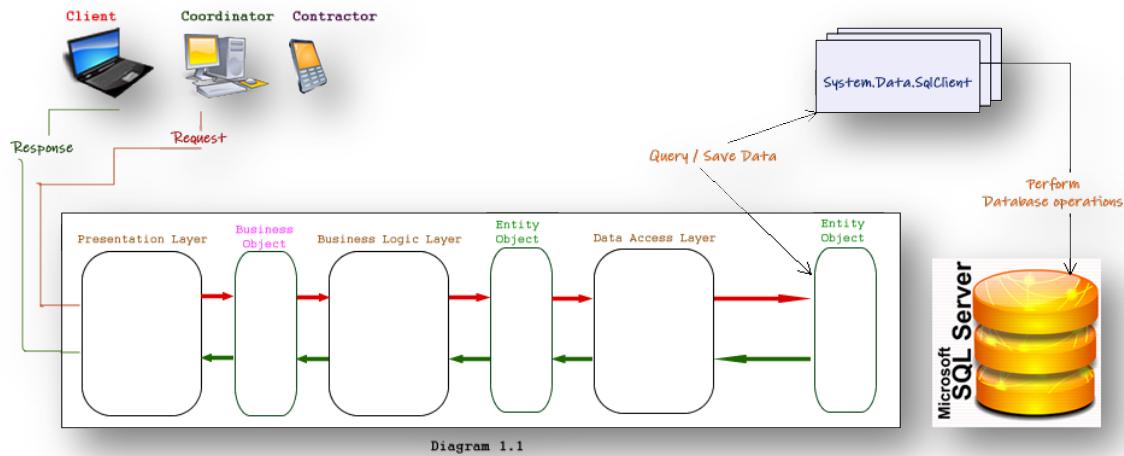
About The Application Architecture

This manual demonstrates developing a C# enterprise application called **BIT Services System**.

The enterprise application is built using:

- Windows Form using C#.
- N- Layered architecture
 - v. Data Access Layer
 - vi. Business Logic Layer
 - vii. Presentation Layer
 - viii. Entity Object
- Microsoft SQL Server 2008 r2/2012/2014.

Diagrammatically, the application's architecture can be represented as shown in diagram 1.1.



About the Project

The Project Case Study

- BIT field support services is a division of Business Information Technology Pty Ltd (BIT) that provides IT support services (hardware and software trouble-shooting, new installations, periodic IT audits, etc.) for approximately 2,500 clients in Australia.
- BIT management team would like to enhance operational effectiveness with its current paper, phone and fax-based field support client requests and contractors management via the adoption of a new integrated electronic solution to streamline all its processes.
- BIT field support services division is staffed with 5 x Coordinators and has ~100 x Field Contractors.
- Client requests are received from a variety of sources; Initial client support needs assessments are generally conducted by coordinators over-the-phone; if a field support activity is required, a coordinator would book the suitable field contractor/s based on the IT skills required, availability (both client and contractor/s) and location/proximity to the site/s where the activity is to be executed.
- Daily roster management is currently mostly manual (paper & fax-based), except for field contractors tele-clocking their km's via an outsourced 1800 phone service after each completed job.
- Rosters prioritise clients' requirements/preferences with time of service.
- Most field contractors are working on a part-time basis, have specific availability periods and specific skills; they all are required to have a smartphone (with visual display capabilities), vehicle and suitable insurances (PI, PL, Car, etc.).
- Field contractors are paid for their services (hourly basis) as well as for km's travelled (km basis).
- Rosters are managed on a daily basis (for Next Business Day on-site service) by each coordinator with a rotating on-call process for week-ends spanning 5 weeks.

The BIT Services team want a Windows application that will act as their Information system to do basic CRUD (Create, Read, Update and Delete) for BIT Services components.

Based on the information given above develop a small CRUD system using C# Windows application that is a multi-form Application. The system is made using a Layered Architecture.

BIT Services would like to have the following features from Windows Application:

1. A login form that allows two types of login. An Admin login and a coordinator login.

This is a basic login form with username and password. The username and password are checked against the database and an authorized username must be able to access the other forms of the system.

2. The admin login allows the Admin To CRUD to the following tasks :

- a. Add (with validation Check) a new coordinator
- b. Update (within given constraints), Delete (only mark them inactive) and Read the details of all the coordinators.
- c. Add (with validation Check) a new contractor
- d. Update (within given constraints), Delete (only mark them inactive) and Read the details of all the contractors.
- e. Add (with validation Check) a new skill for a contractor
- f. Update (within given constraints), Delete (only mark them inactive) and Read the details of all the skills for each contractor.
- g. Add (with validation Check) a new Client
- h. Update (within given constraints), Delete (only mark them inactive) and Read the details of all the clients.

3. A coordinator login allows the coordinator to CRUD to the following tasks:

- a. Add (with validation Check) a new contractor
- b. Update (within given constraints), Delete (only mark them inactive) and Read the details of all the contractors.
- c. Add (with validation Check) a new skill for a contractor
- d. Update (within given constraints), Delete (only mark them inactive) and Read the details of all the skills for each contractor.
- e. Add (with validation Check) a new Client
- f. Update (within given constraints), Delete (only mark them inactive) and Read the details of all the clients.

4. (Extra feature) a login for every person in the system, including Client and Contractor. That allows them to update some of the details.

Assumptions

- Coordinators cannot view or change other coordinators details.
- Contractors cannot view or change other contractors details.
- Clients cannot view or change other clients details.
- Person (Coordinators / Contractors / Clients) cannot change their primary email id automatically. For that they need to contact the admin and go through change management process.
- Every application user needs to login to access BIT support services. i.e.

SuperUser : { **Username:** Admin **Password:** 654321 }

Coordinator : { **Username:** julie.jon@bit.com **Password:** 123456 }

Contractor : { **Username:** miles.davis@server.com **Password:** 123456 }

Client : { **Username:** atul.lal@abb.com **Password:** 123456 }

Data Flow Diagram

The Context level **Data Flow Diagram** [DFD], shown in diagram 1.2 can be helpful to understand the basic functioning of the project. The arrow shows the flow of data from one person to another through various processes.

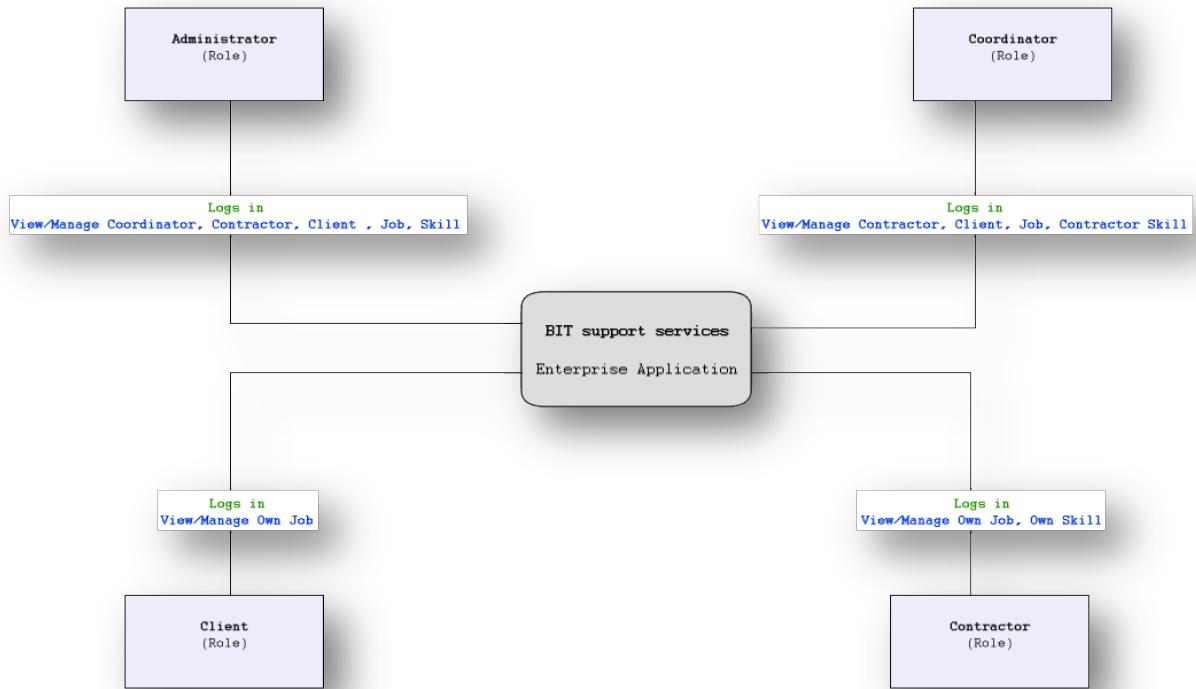


Diagram 1.2: Context level DFD showing flow of data

End User Manual

Backend [Administration]

To use the BIT Support Services System, master records need to be added. The Backend section of this application allows doing this.

- The backend section of this application allows:
 - Logging in
 - Managing [Add/Edit/Delete/View]
 - ❖ Coordinators
 - ❖ Contractors
 - ❖ Clients
 - ❖ Requests
 - ❖ Jobs
 - ❖ Locations
 - ❖ Skills
 - ❖ Contractor Skills
 - ❖ Availability

To be able to use the backend [application administrator], system users [in this case the employees of the BIT support services pty ltd.] need to be created using the Person [Coordinator/ Contractor/ Client] data entry form. The application provides a super user called admin [with the password set to **654321**]. This username can be used to login to the system in order to create system users [Coordinators / Contractors / Clients]. No other system users can delete the admin user.

Administrator

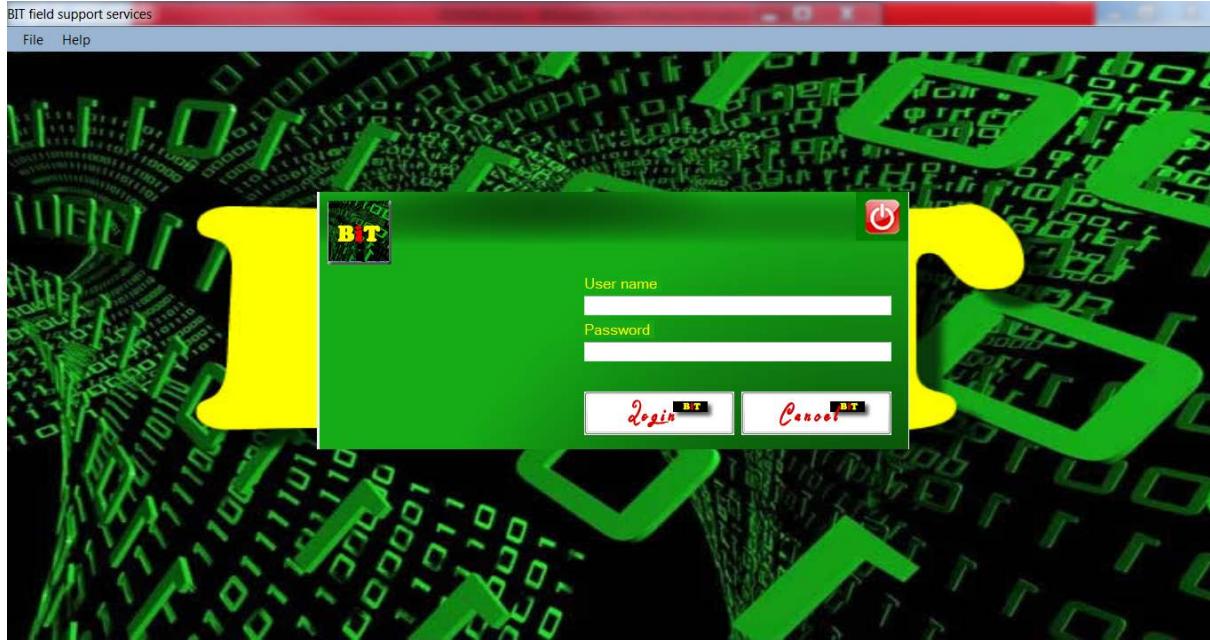
Login Details

Username: **admin**

Password: **654321**

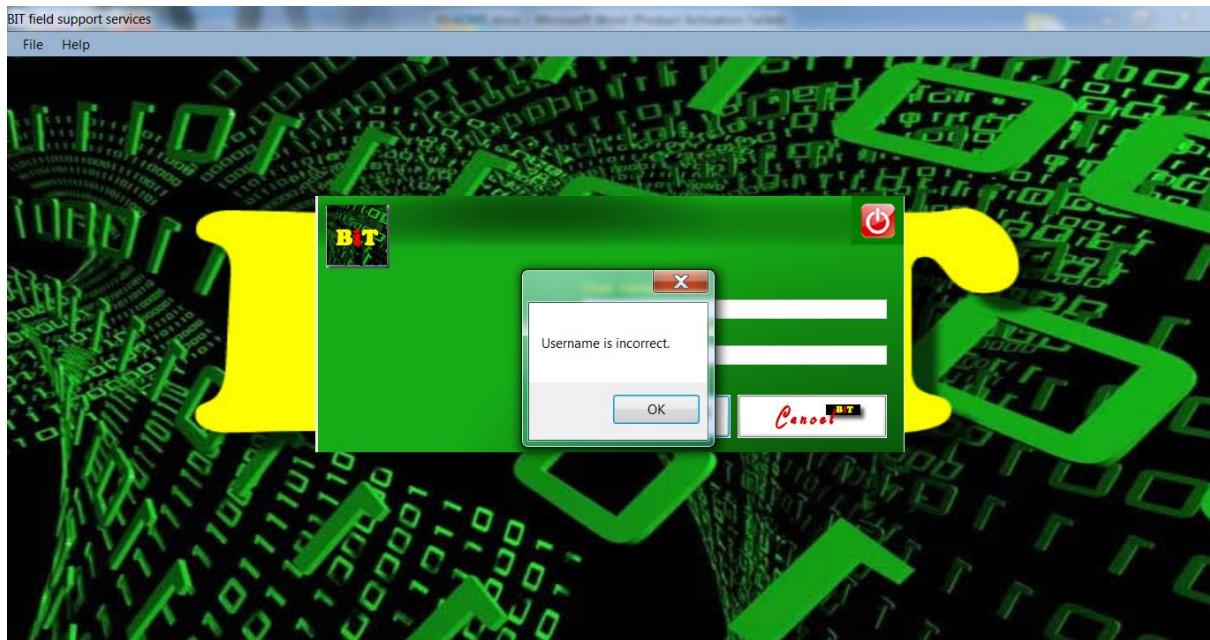
The Application 's Homepage

To begin using the application, invoke it. The application's homepage appears as shown in diagram 1.3 which can be used to login to the **Administration** section.

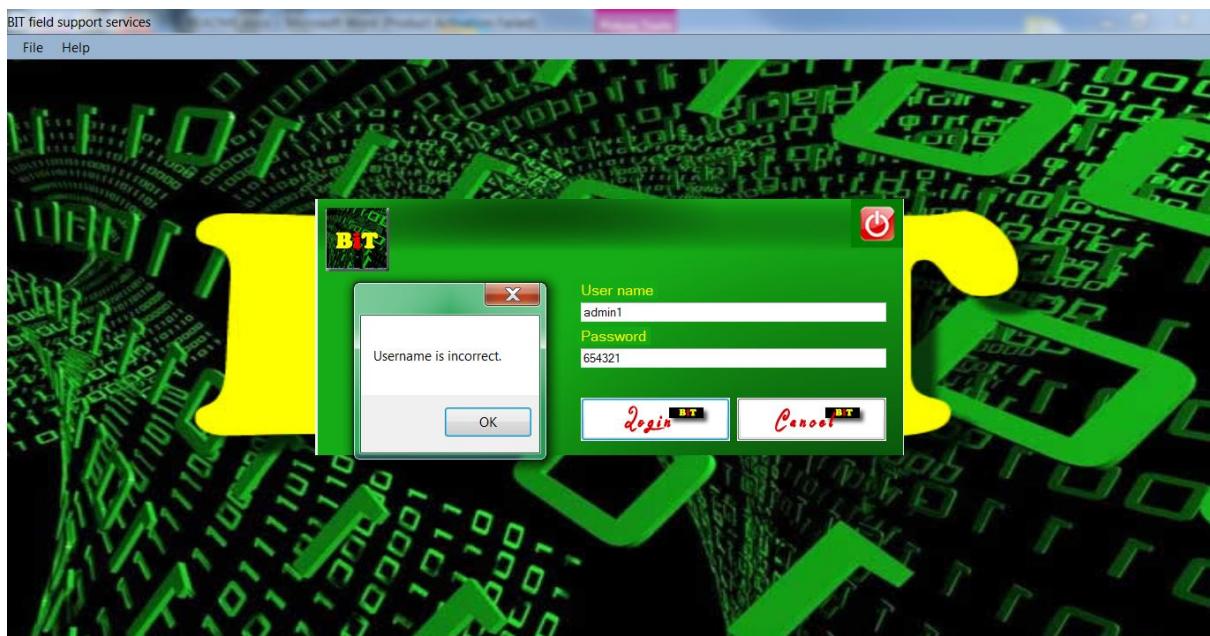
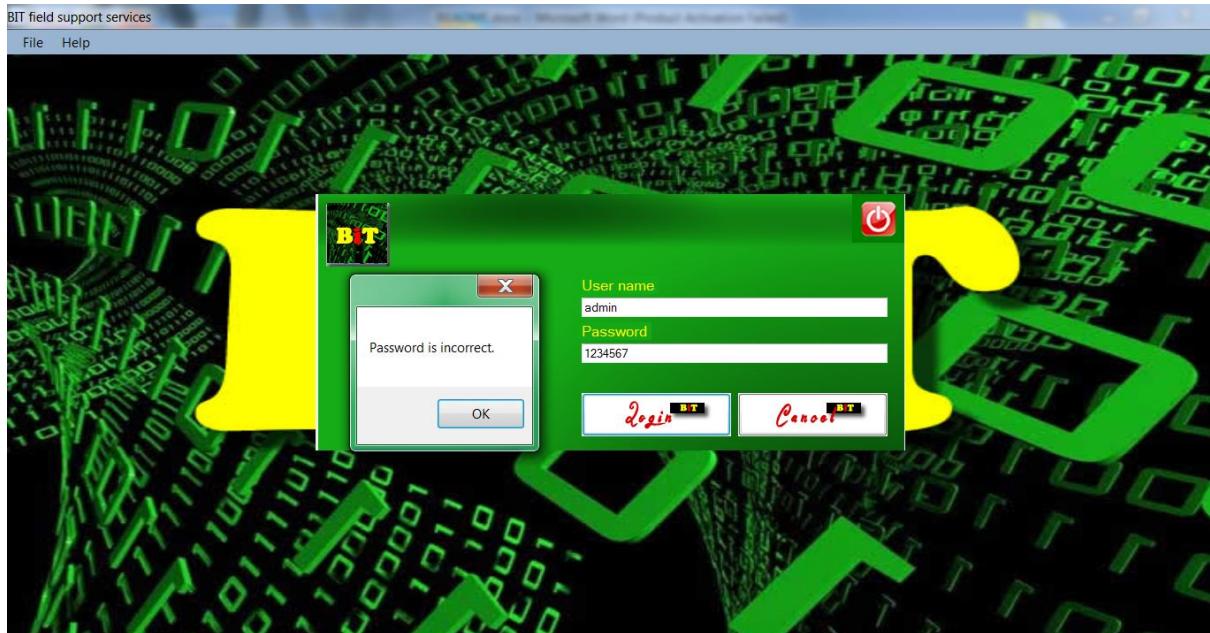


Enter the username as **admin** and password as **654321**. Click [Login]
This is a super admin account with all the privileges.

If either of the inputs [i.e. Username and/or Password] is left blank, an error message indicates the same as shown in diagram 1.4.



If the keyed in Username and/or Password is found invalid, an error message indicates the same as shown in diagram 1.5 and diagram 1.6.



Administrator Backend Homepage

Clicking [Login], authenticates the username and password and, if found valid, delivers the administrator backend homepage, as shown in diagram 1.7.



HINT

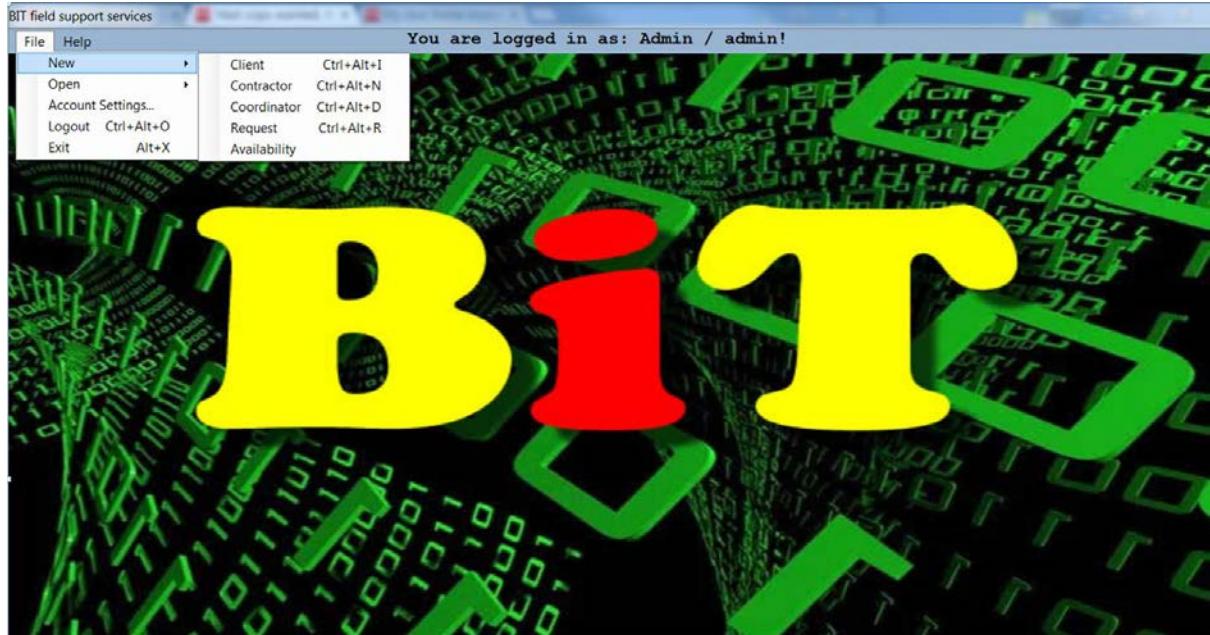
Since this login was attempted using a super admin, all the menu options are available.

Regulate Objects

Add New Client

The Regulate objects form allows managing [add] Coordinator, Contractor, Client, Location, Skill, Contractor Skill, Request, Job, Availability.

Click File > New > Client or Ctrl + Alt + i Doing so delivers the Regulate Objects form as shown in the diagram 1.8 and diagram 1.9.



Reminder

It is mandatory to enter information in all information capture boxes.

To add a new Client record, key in the required form field(s) and click [Save].

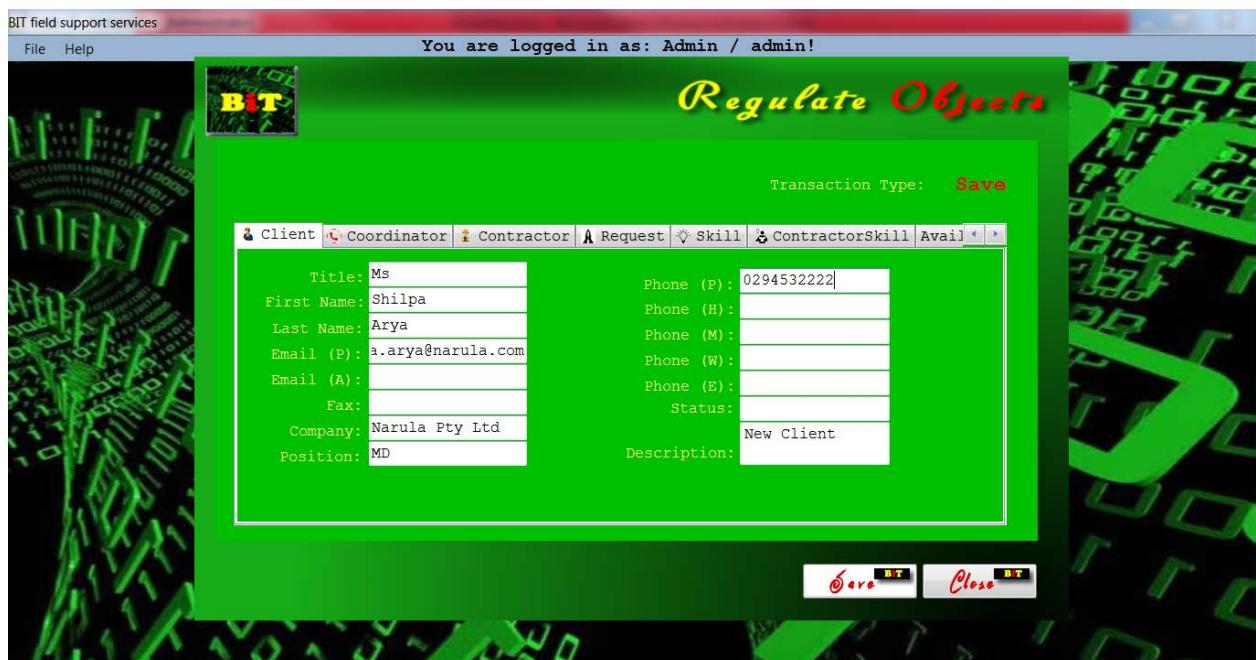
Entering information in capture boxes performs client side validations.

If any of the validations fail, an appropriate error message is displayed as shown in diagram 1.10.



Correct the errors and click [Save] to proceed.

If all the above mentioned validations go through without any errors, the data is saved and the Regulate Objects form is loaded to reflect the newly added data as shown in diagram 1.11 to diagram 1.15.



Click [Save] to create a new Client Record and send for Approval process.



Click [Approve] to approve Client and allow new login details to be created.

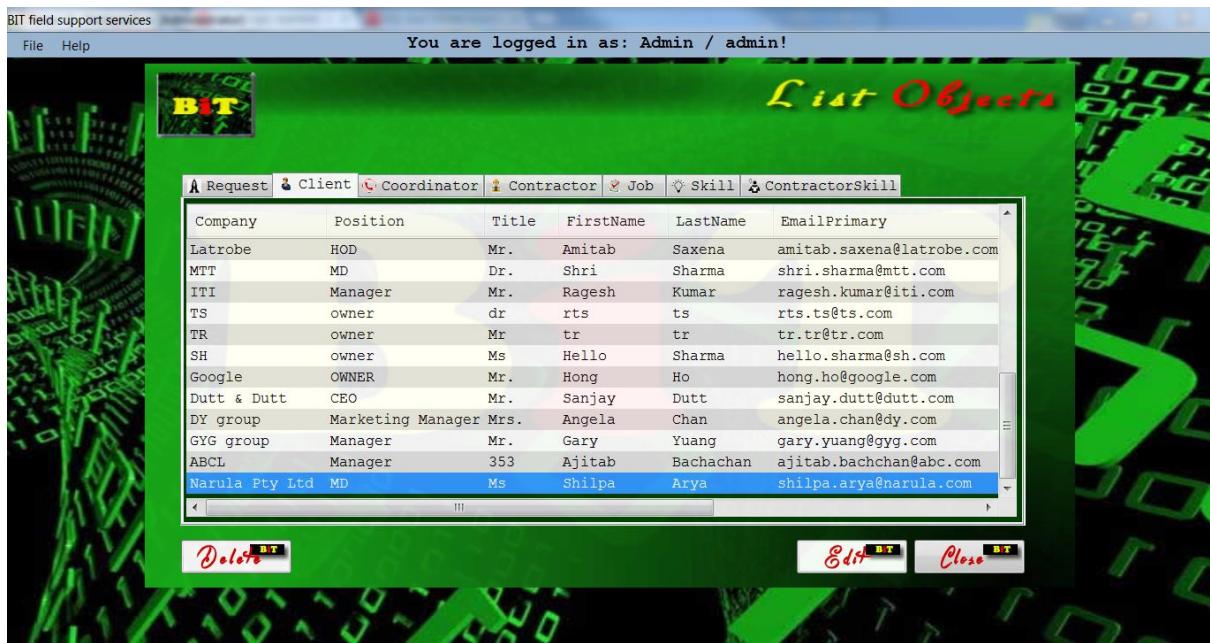


Click [Create User] to create application login details.

A message and green thumb up icon will notify a new Client Record has been created, validated, approved and processed. User can login to the application with their credentials and access their Client Role profile.



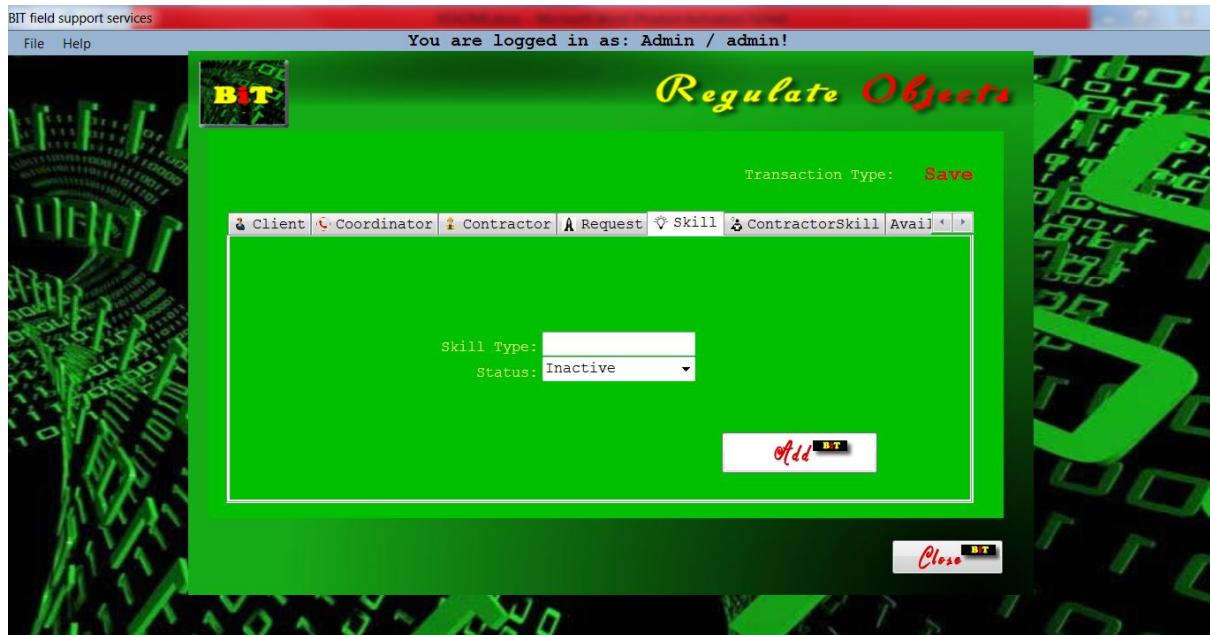
Click File > New > Client or Ctrl + Alt + I to view List Objects form a new Client Record can be seen in the Client Tab.



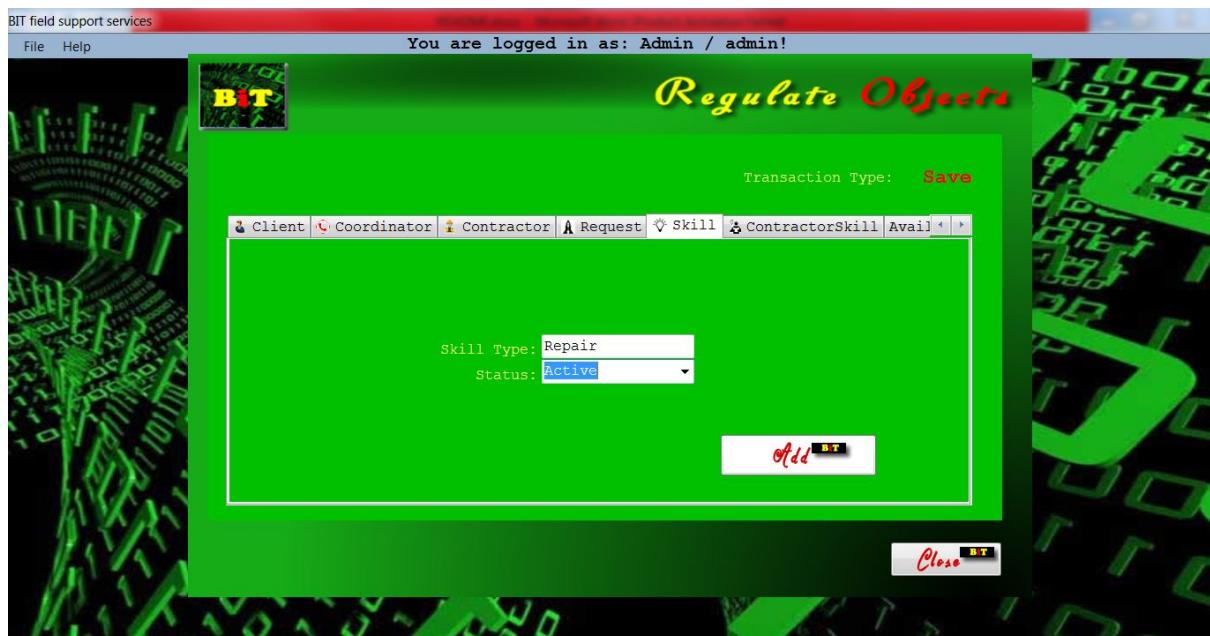
Regulate Objects

Add New Skill

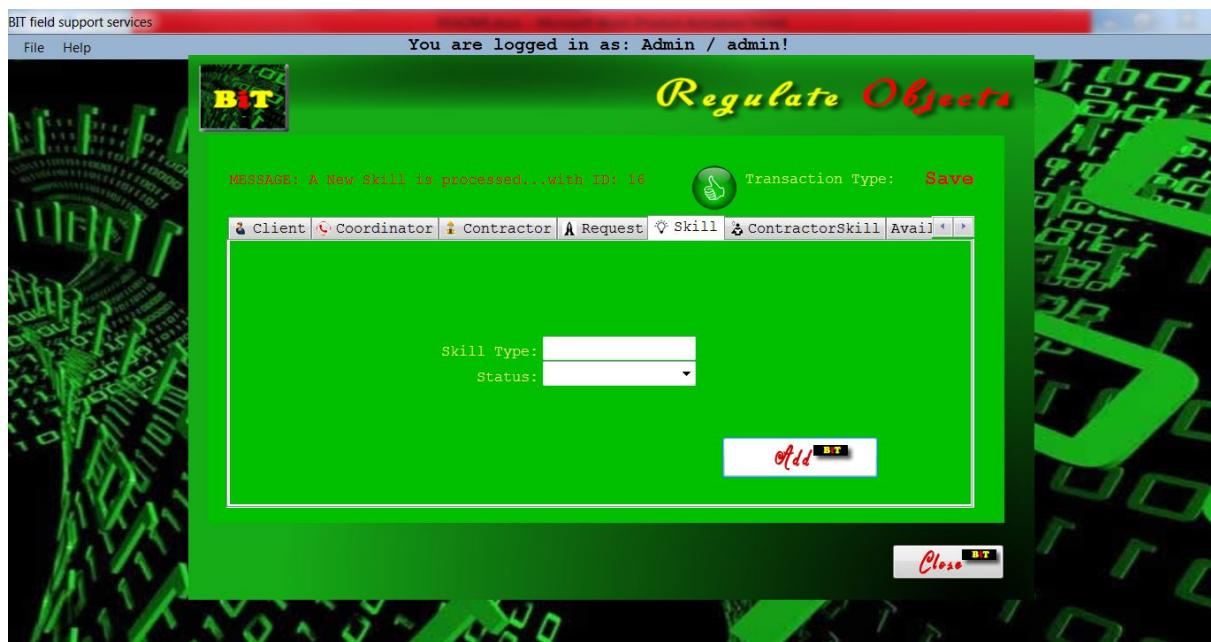
Click File > New > Client or Ctrl + Alt + i Doing so delivers the Regulate Objects form and click on Skill Tab as shown in diagram 1.16.



Enter the correct information for Skill Type and select Status and click [Add] to create a new Skill in the list as shown in diagram 1.17.

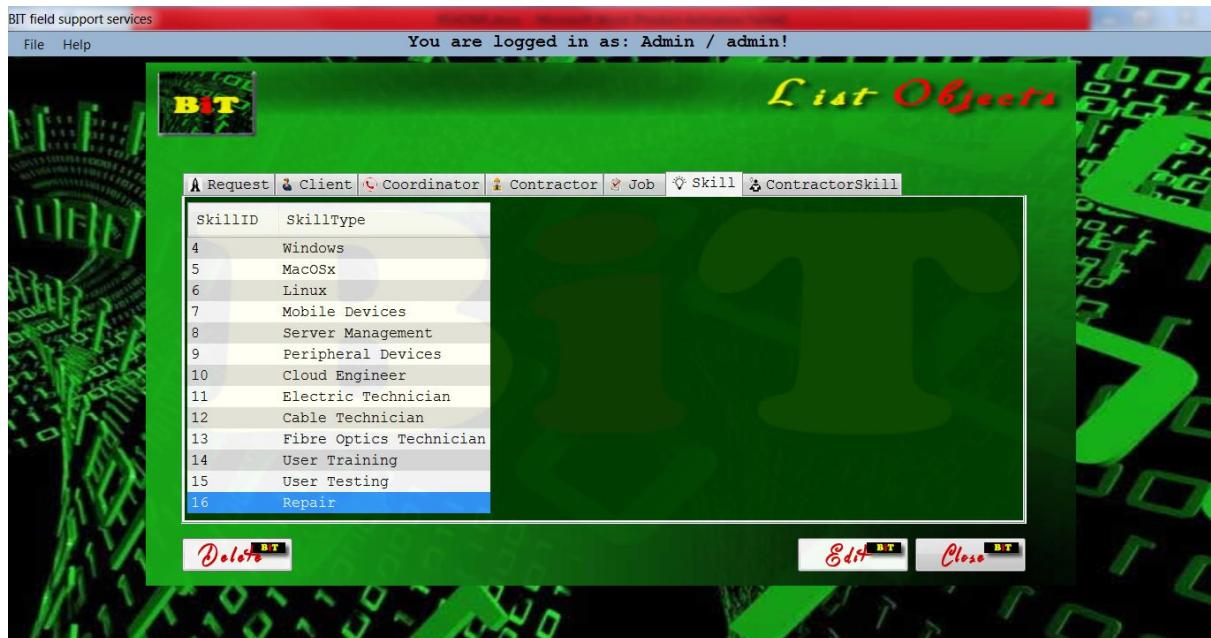


On Click [Add] will notify a new Skill record has been created with green thumb up icon.



Add more Skill in the list following above steps or close the Regulate Objects form by clicking on [Close].

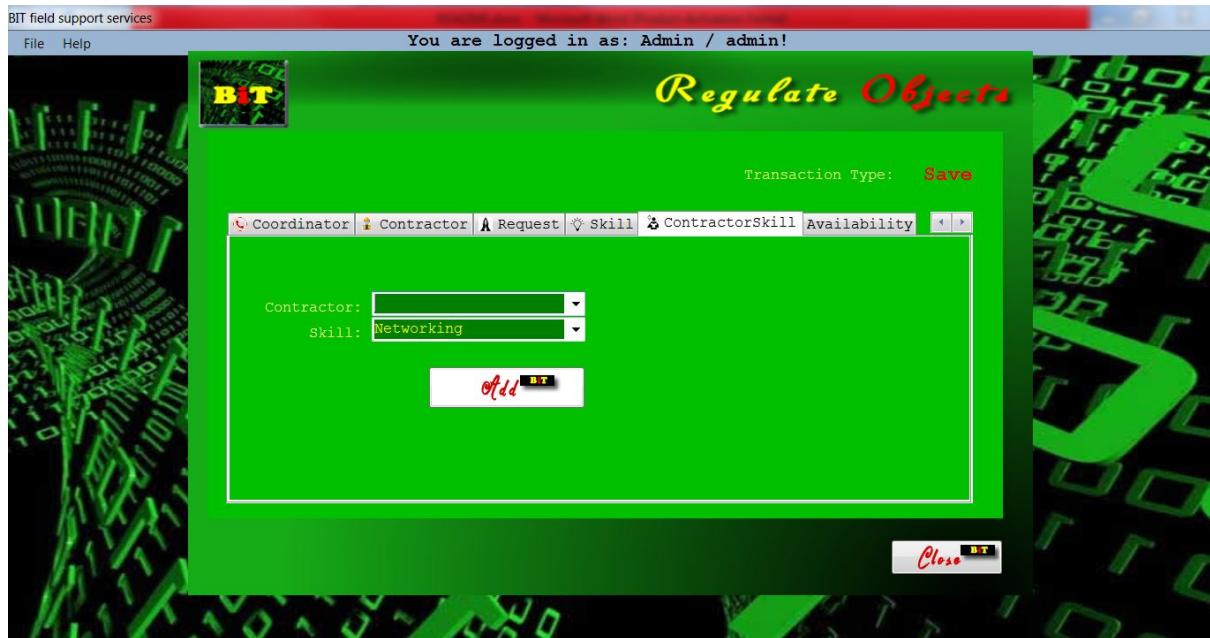
Press Ctrl + Alt + I to view List Objects form a new Skill Record can be seen in the Skill Tab.



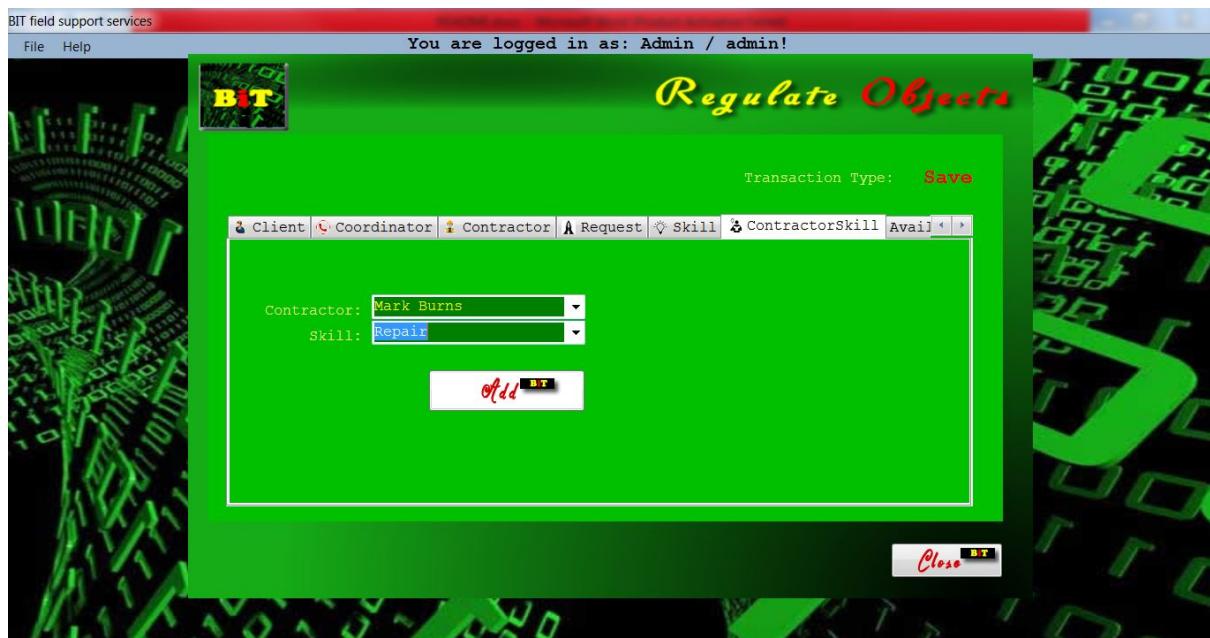
Regulate Objects

Assign Contractor a Skill

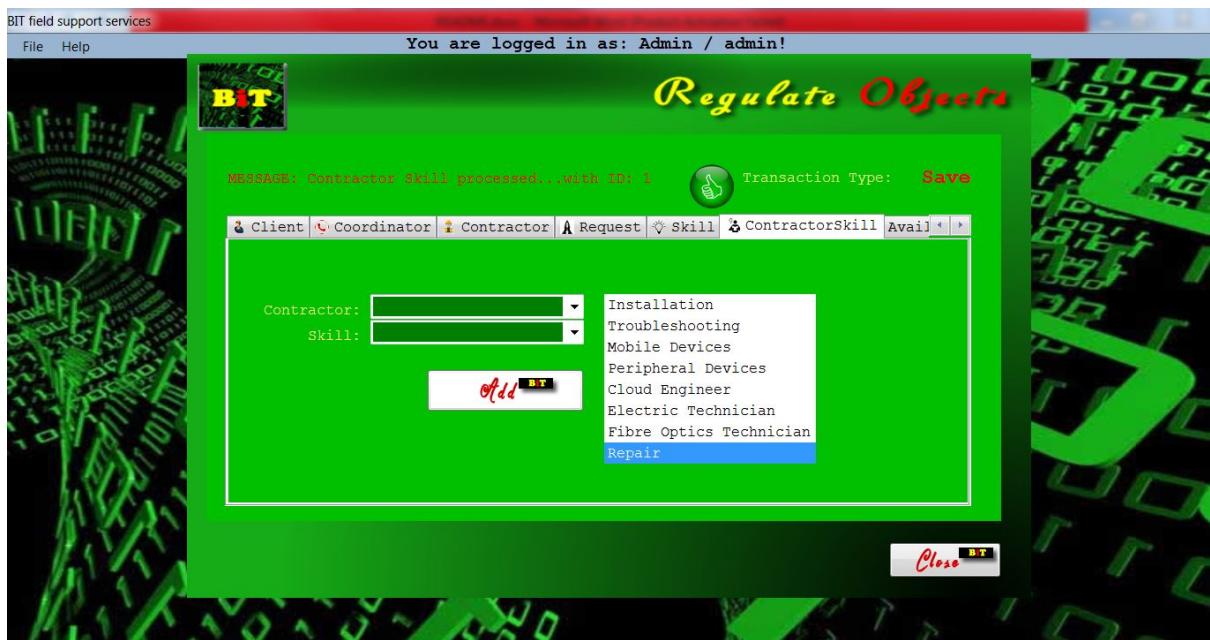
Click File > New > Contractor or Ctrl + Alt + n Doing so delivers the Regulate Objects form and click on Contractor Skill Tab as shown in diagram 1.20.



Select the information for Contractor and Skill and click [Add] to add a new Skill in to the Contractor list as shown in diagram 1.21.



Click [Add] will display all the Skills for the selected Contractor as shown in diagram 1.22.



Application will display a message with green thumb up to notify the new Contractor Skill.

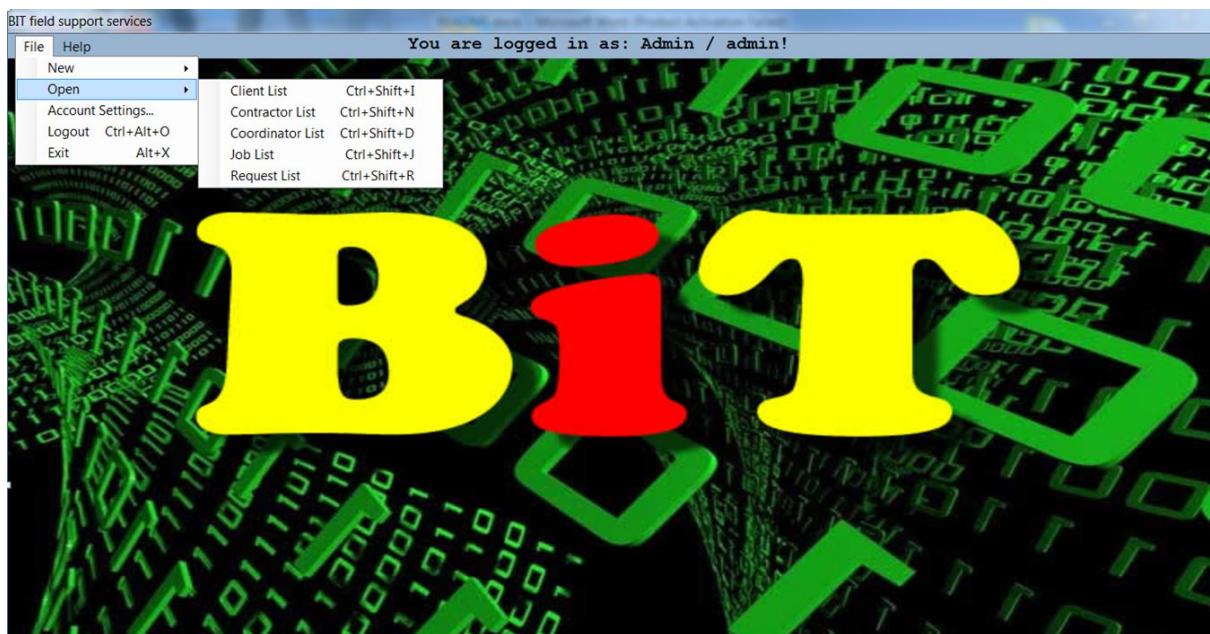
Add more Skills to any selected Contractor using the above steps or click [Close] to close the Regulate Objects form.

List Objects

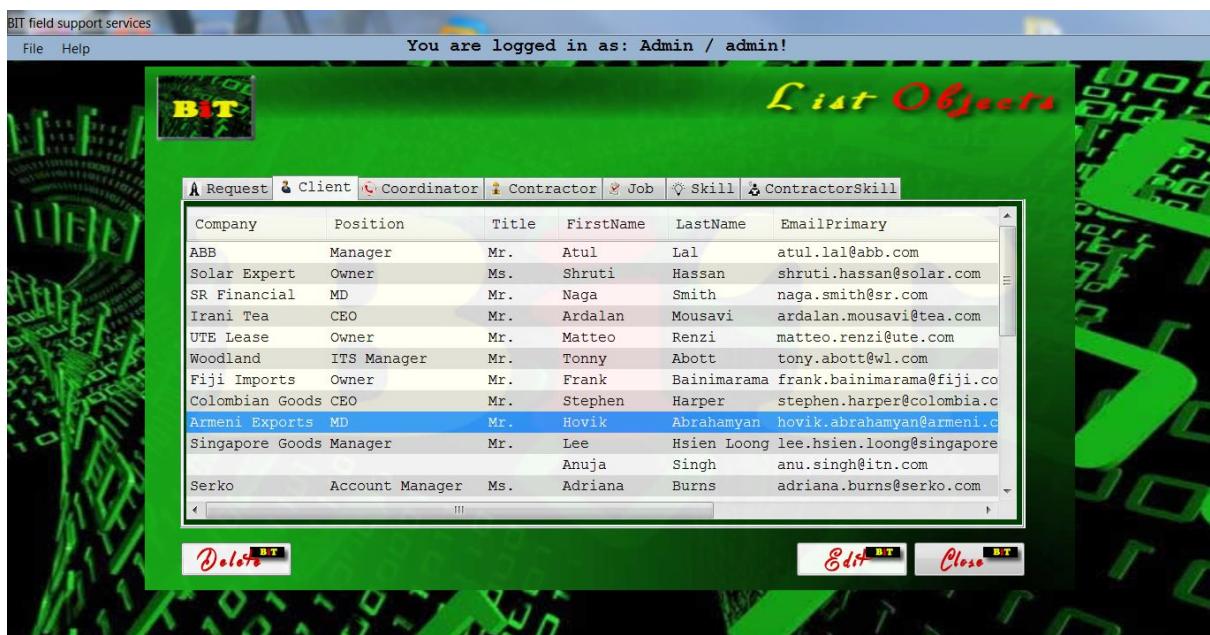
View All Clients

The List object form allows managing [edit/delete/view] Coordinator, Contractor, Client, Location, Skill, Contractor Skill, Request, Job, Availability.

Click File > Open > Client List or Ctrl + Shift + i Doing so delivers the List Objects form as shown in the diagram 1.23 and diagram 1.24.



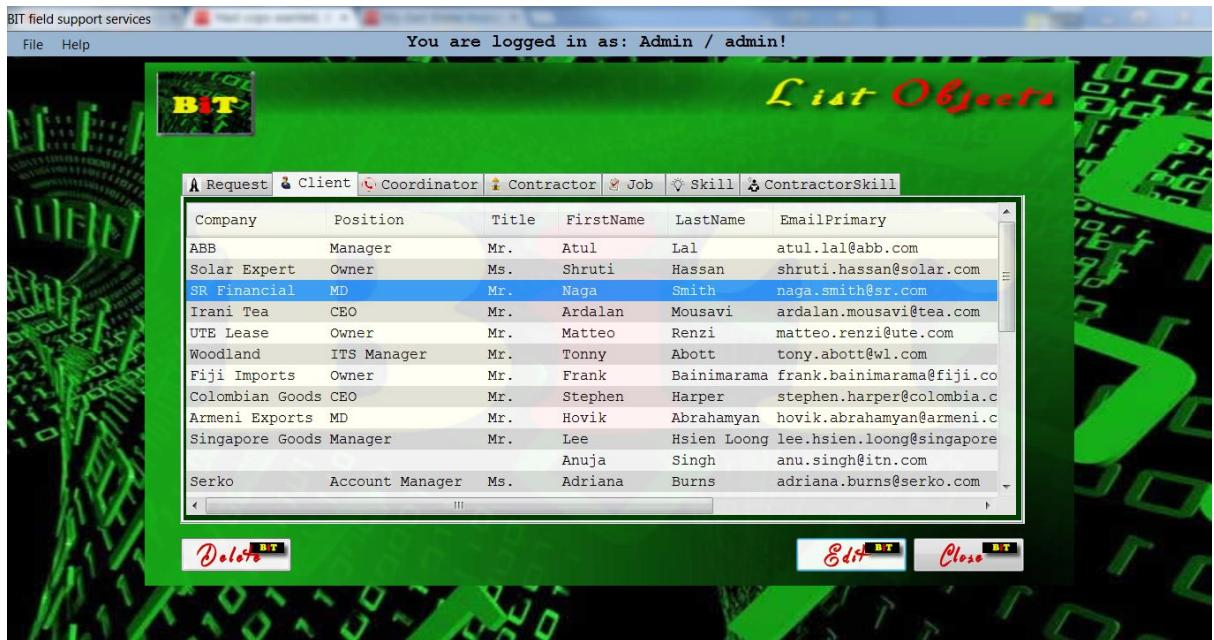
As soon as the List Objects form loads, the existing details are listed in data grid as shown in diagram 1.24.



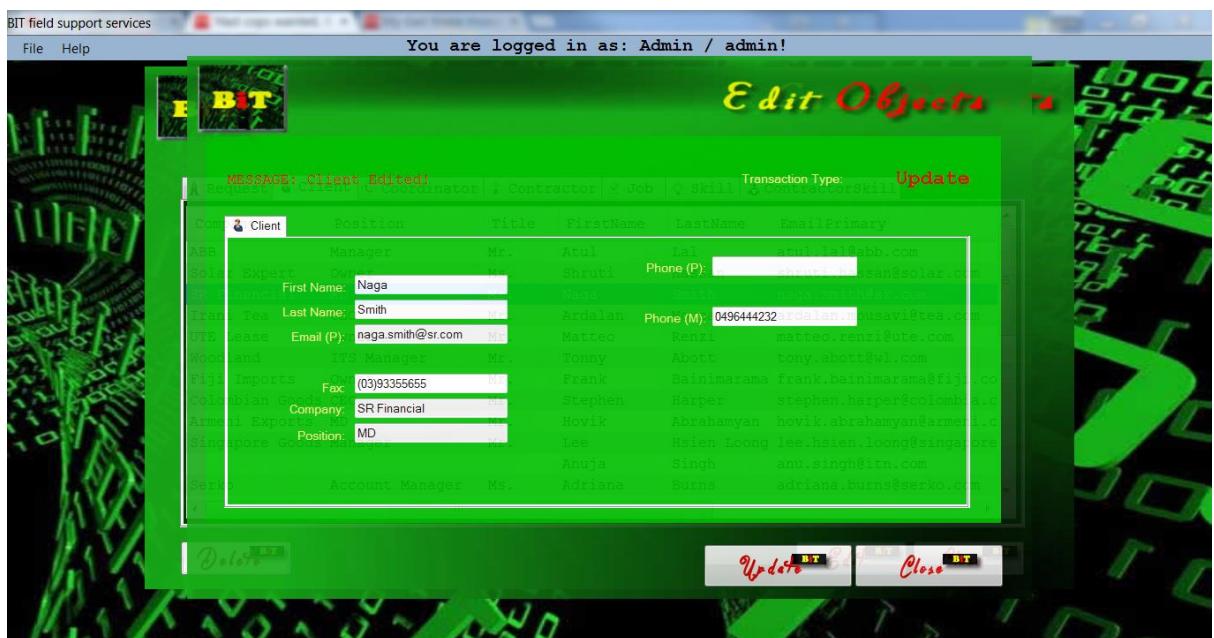
Modifying Existing Record

Edit Client

To modify an already existing Client, click [Edit] after selecting the record that needs to be edited from the data grid in the Client Tab on List Objects form as shown in diagram 1.25.



Doing so populates the chosen record's data in the Edit Objects form to make it available for editing as shown in diagram 1.26.



Make the desired changes and click [Update].

Clicking [Update], performs the following client side validations:

- Primary Email cannot be left blank

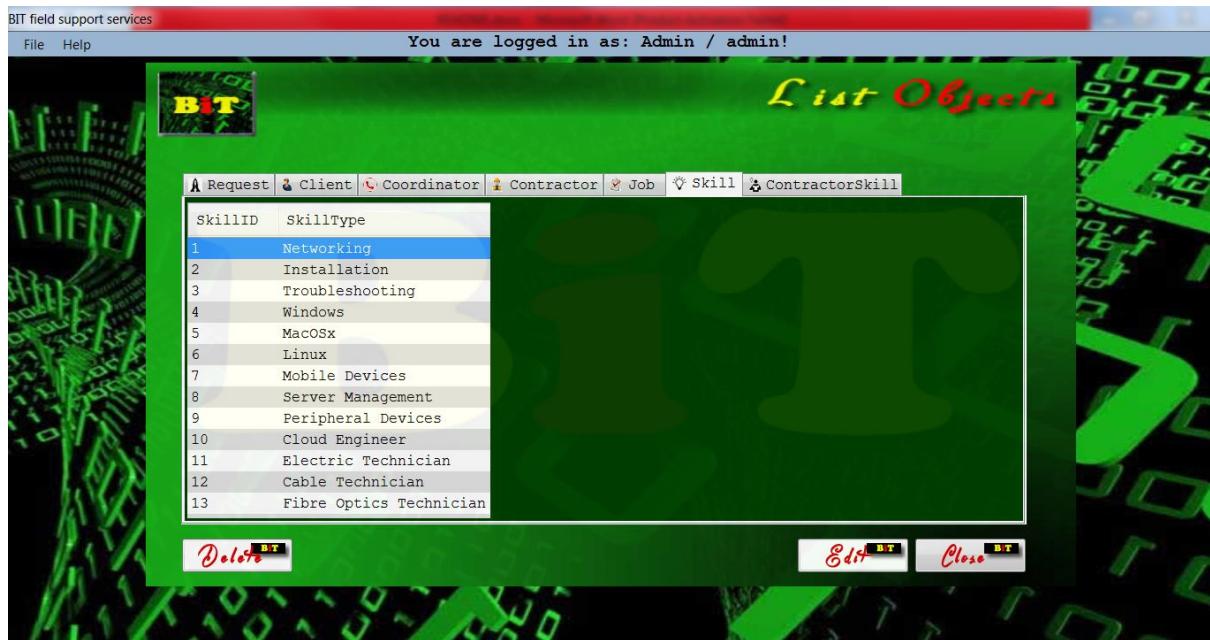
If any of the above mentioned validations fail, an appropriate error message is displayed.

Correct the errors and click [Update] to proceed.

List Objects

View All Skills

Click File > Open > Contractor List or Ctrl + Shift + n Doing so delivers the List Objects form then click on Skill Tab as shown in the diagram 1.27.



HINT

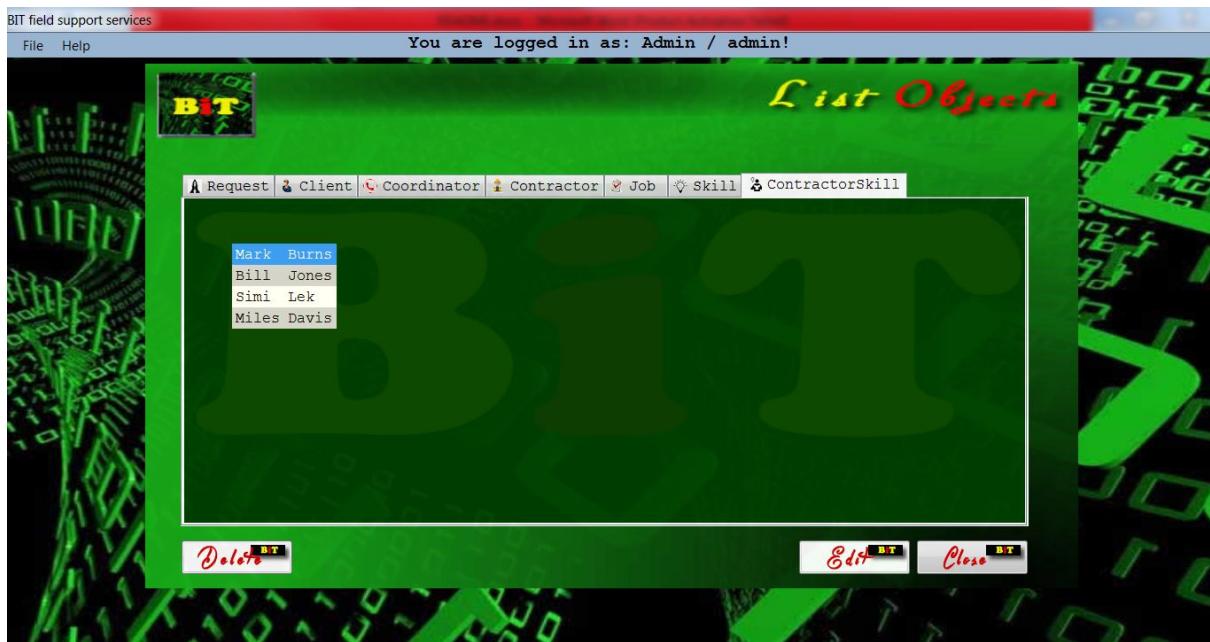
Click inside the list and using Up or Down arrow keys scroll through the whole list.

List Objects

View All Skills for a specific Contractor

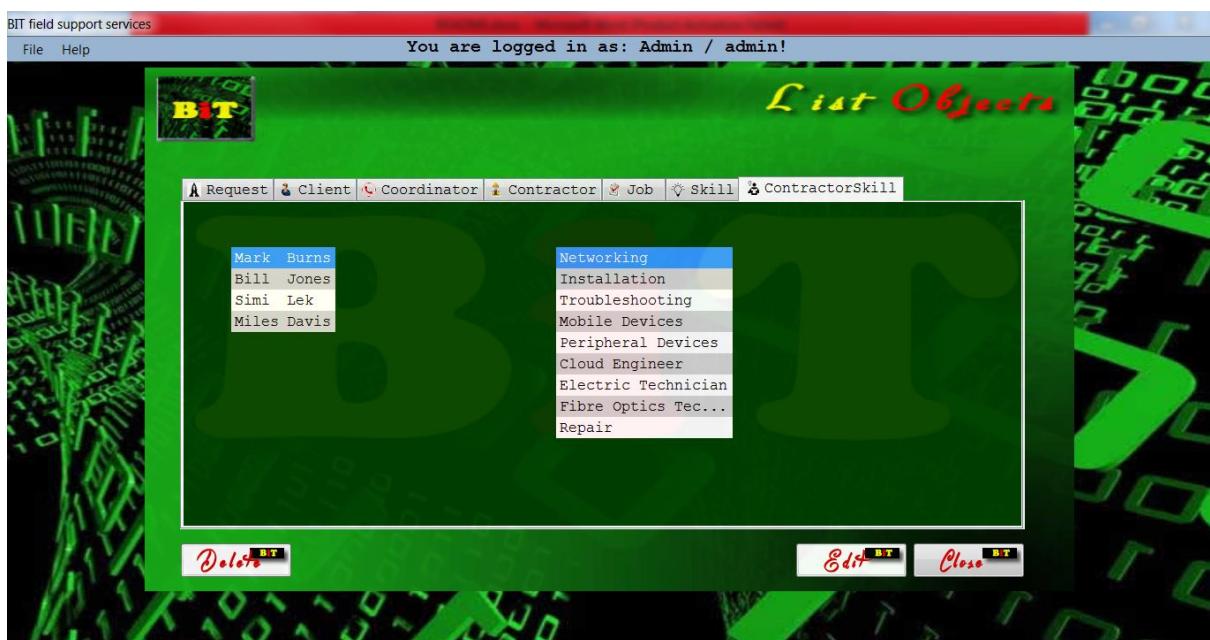
Click File > Open > Contractor List or Ctrl + Shift + n Doing so delivers the List Objects form then click on Contractor Skill Tab as shown in the diagram 1.28.

A list of all active Contractor is displayed by default.



Choose a Contractor from the Contractor name list.

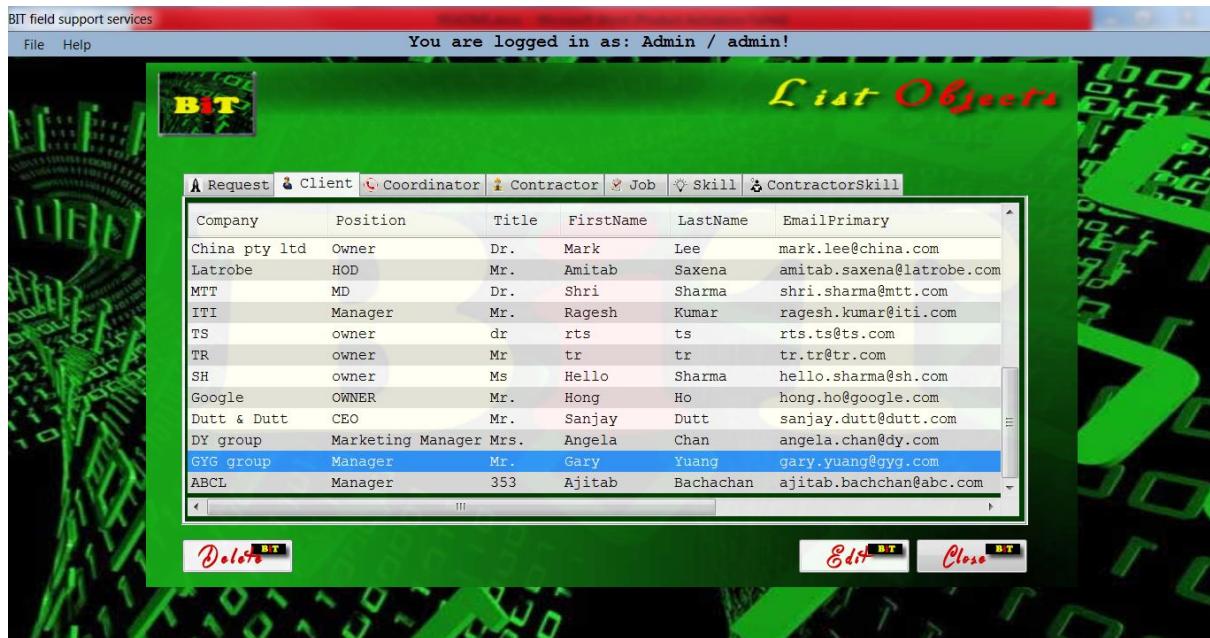
Selecting a Contractor will display the complete skill list of the chosen Contractor as shown in the diagram 1.29.



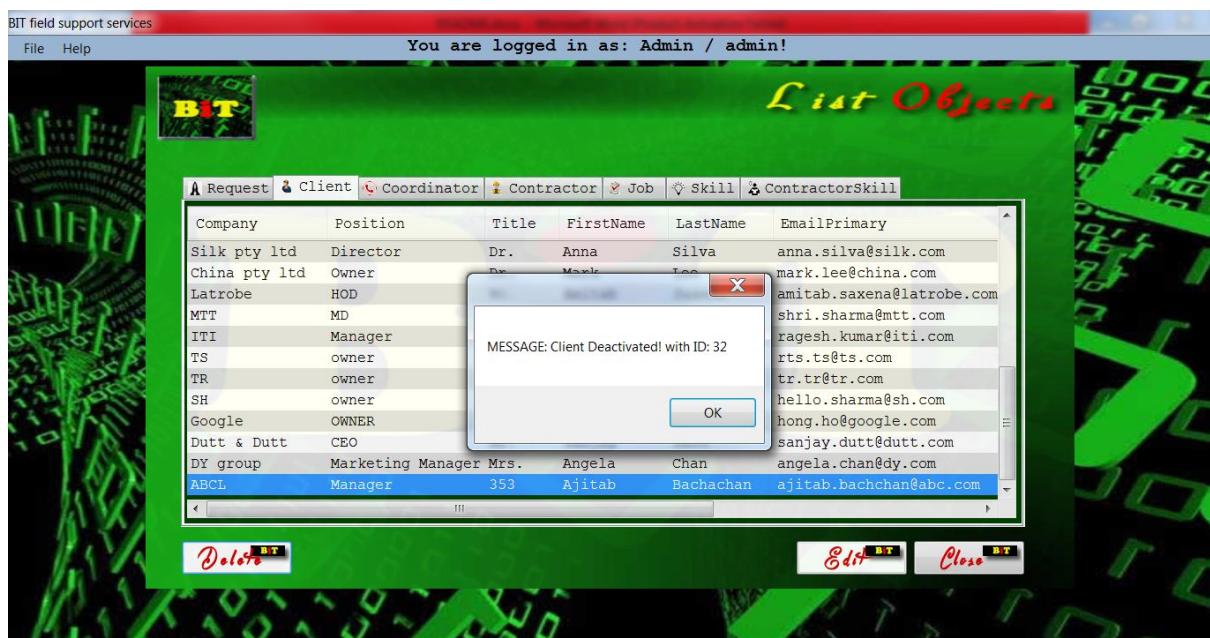
Deleting Existing Record

Delete Client

To delete an already existing Client click [Delete] after selecting the record that needs to be deleted from the data grid in the Client Tab on List Objects form as shown in diagram 1.30 and diagram 1.31.



Clicking [Delete], performs the deactivate operation and reloads the page to reflect the deleted records as shown in diagram 1.31.



HINT:

The Coordinator & Contractor can be Added / Edited / Deleted / Viewed from Regulate Objects form and List Objects form following similar steps as Client.

To perform above mentioned functions to Coordinator & Contractor please follow Client steps as mentioned above.

View Help

Click [Help] from the main menu to view application detail as shown in diagram 1.32.

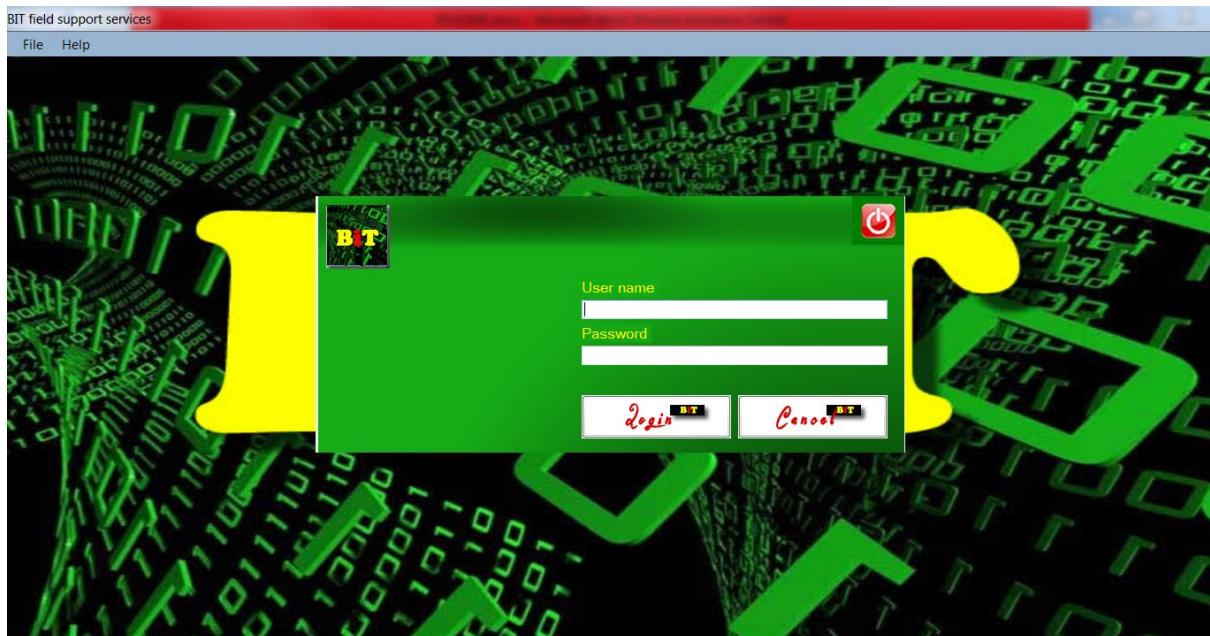


Logout

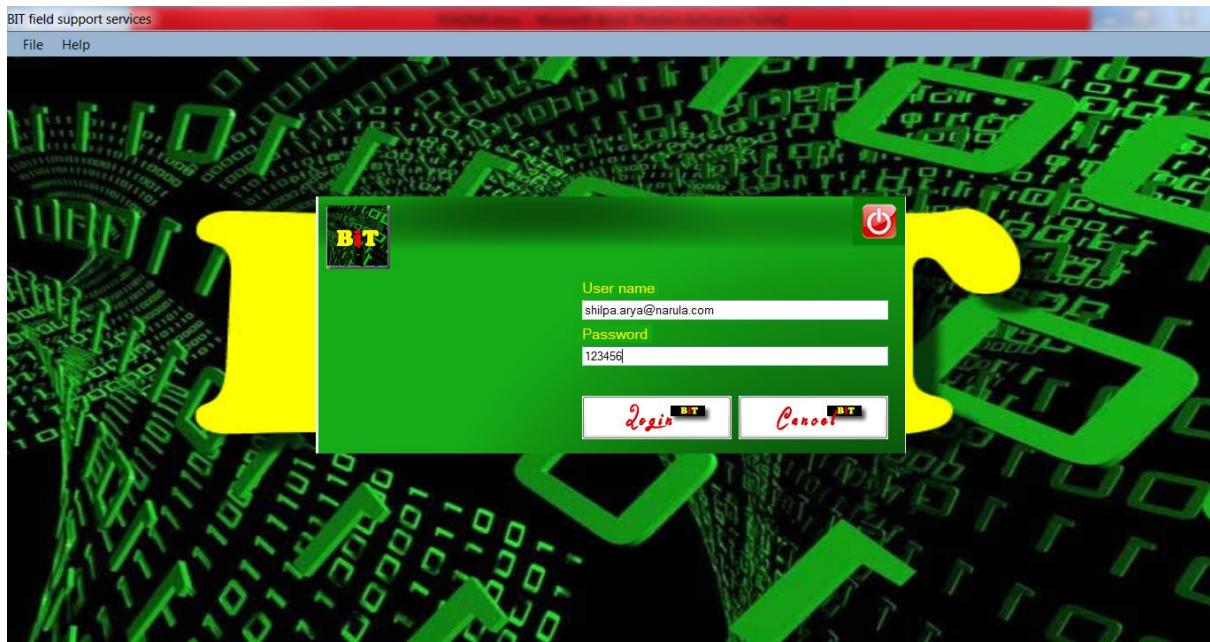
To logout using the application, click File > Logout or Ctrl + Shift + o Doing logout the current application user as shown in the diagram 1.33.



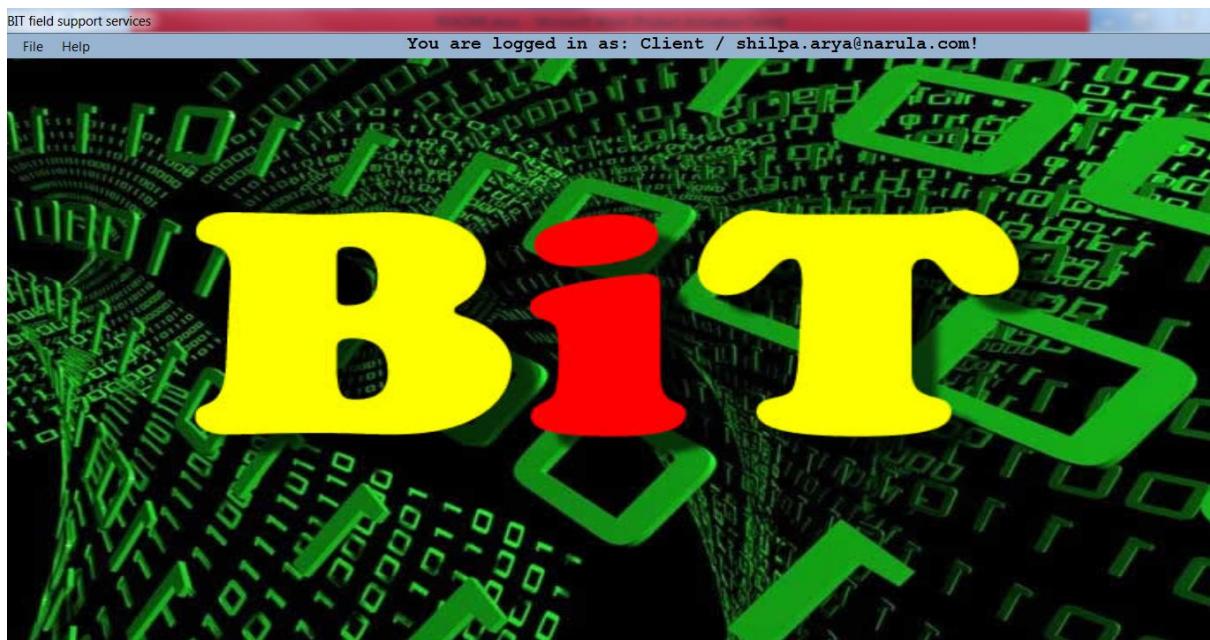
On clicking logout the application redirect to Login form. An application user can either login using approved credentials or close the application using the Red button as shown in digram 1.34.



Another approved user can login in this case Shilpa Arya which was created above page 15 – 19 using Username : shilpa.arya@narula.com and password : 123456.



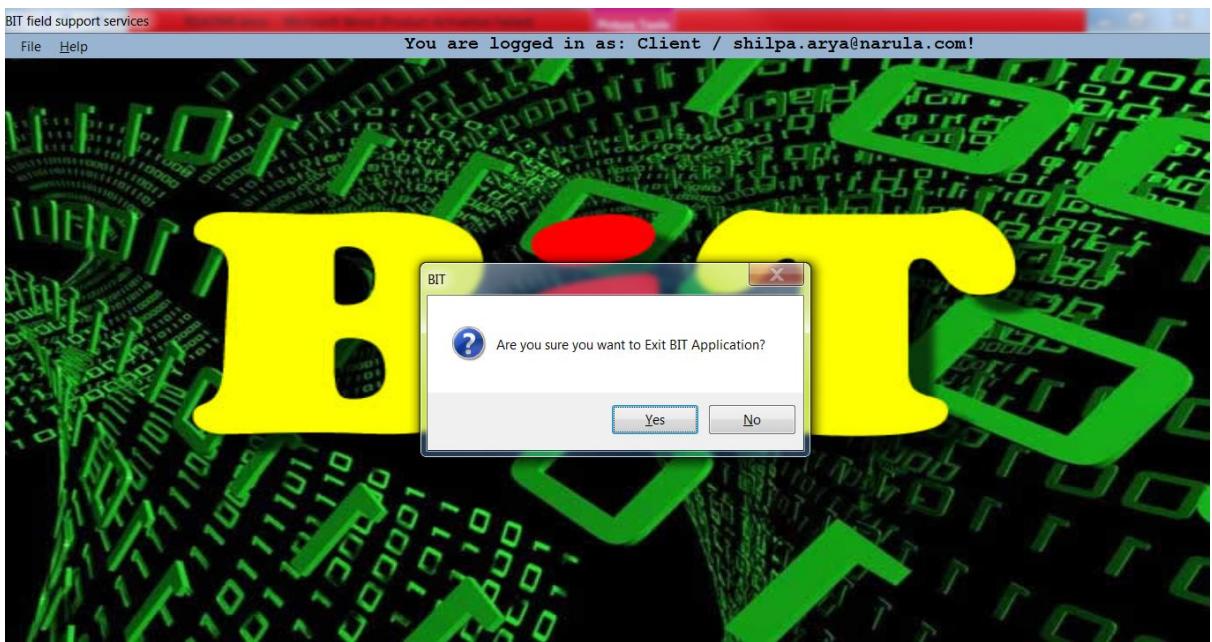
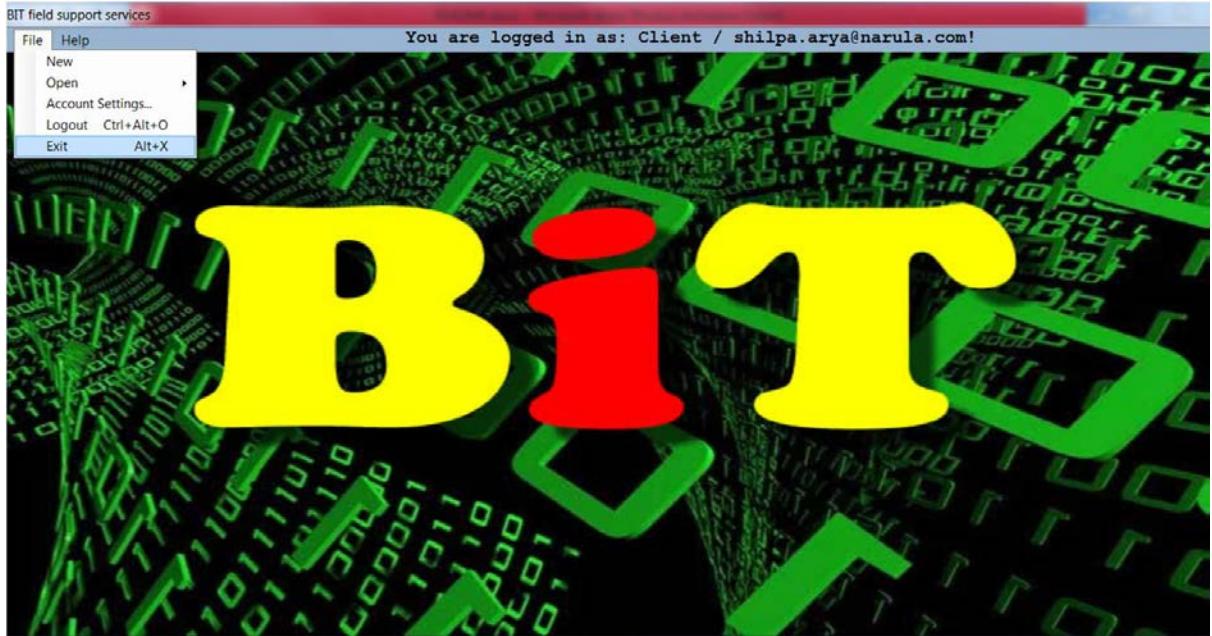
Click [Login]



As Shilpa Arya has Client Role. She can only view her Request List in this case it would be empty as newly created application user.

Shutdown the Application

To exit from the application, click File > Exit or Alt + x. Doing this exit the application as shown in the diagram 1.37.



Clicking [Yes] will close the application where as selecting [No] will keep the application running and logged in with the current profile.

Process Flow

Coordinator / Contractor / Client

When the application user logs in to the BIT support services application.

App.config xml configuration file is first read to establish the database connection with BITdb and ControlSecurity databases.

(Presentation Layer)

Application activates and run the frmMain form which passes the control to the frmLogin form.

If the application user enters the correct login credentials the control is passed back to the frmMain.

If the user selects New Object create form (Regulate Objects) frmNew is given control.

If the user selects Open existing Objects (List Objects) frmList is given control.

If the application user enters incorrect information in information collect boxes an error message is displayed.

(Business Logic Layer)

If the application user selects frmNew and enters correct information in the information collect boxes Coordinator / Contractor / Client object in the business logic layer are populated.

The business logic layer object fills the user entered information into the Entity object.

The business logic layer reads and process the data access layer's return value via Entity object and formats the presentation layer objects including message object.

(Data Access Layer)

The data access layer receives the Entity object with the data filled by business logic layer.

Calls the relevant stored procedure in specific database by populating the stored procedure parameter's with Entity object.

Return the stored procedure result to business logic layer.