

TRAINING REPORT

UNDERTAKEN AT



A Navratna Company

ENGINEERS INDIA LIMITED

IN

ITS DEPARTMENT

ON

Employee Provident Fund Management System (EPFMS)

Using Visual Basic .NET



Visual Basic

Under the guidance of:
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Department: ITS

Submitted By:
Ninaad Arora

CERTIFICATE

This is to certify that Mr.Ninaad Arora of B.tech (CSE) has successfully completed four weeks Training from 30th June 2023 to 30th July 2023.

During this training, he worked on “Employee Provident Fund Management System (EPFMS)” in ITS under the guidance of Mr.Prashant Singh in Information Technology Services Division of Engineers India Limited,1- Bhikaji Cama Place, New Delhi. His overall performance during the training period was

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ACKNOWLEDGEMENT

I express my gratitude to Mr.Niranjan Behera (DGM & Training Coordinator), –Information Technology Services (ITS) department Engineers India Limited, New Delhi for providing me the opportunity to work in such an esteemed organization which has helped in my growth in the IT Industry.

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I am extremely thankful to Engineers India Limited (EIL) for providing me with the opportunity to avail the excellent facilities and infrastructure in completing my vocational training.

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NINAAD ARORA

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About the Organization

● **ENGINEERS INDIA LIMITED**

1.1 EIL Profile

Engineers India Limited (EIL) was established on March 15, 1965, as a joint venture between the government of India and Bechtel Corporation of USA with the following prime objectives:

“To establish, provide, maintain and perform engineering and related technical and consultancy services for petroleum projects including but not limited to, petroleum refineries, oil field development, oil and gas pipelines, petrochemical facilities, chemical intermediaries and all other types of industrial projects”

In addition to petroleum refineries, EIL has diversified into other fields such as pipelines, chemicals and oil and gas processing, etc. EIL provides a complete range of project services in the fields and has emerged as South Asia's leading design and engineering company.

EIL has undergone through more than 4000 assignments, 250 projects worth more than US\$ 35 billion in installed cost, successfully completed and operating smoothly creating an array of satisfied clients and rising the turnover and profits. The major projects undertaken by the company include 30 Petroleum Projects, 6 Petroleum Complexes, 200 Offshore Platforms, 31 Oil and Gas Processing Projects, 25 Mining and Metallurgical Projects, 8 Fertilizers Projects, 31 Pipelines Projects and 11 Ports and Terminals. EIL has also worked abroad credibly in several countries of West Asia, North Africa, Europe and South-East Asia including Algeria, Abu Dhabi, Iran, Kuwait, Malaysia, Norway, Qatar, Saudi Arabia, Sri Lanka, UAE and Vietnam.

1.1.1 Vision Statement

“To become a globally Competitive EPC & Consultancy Organization”

1.1.2 Mission Statement

- ✓ To achieve international standards of excellence with a focus on customer satisfaction.
- ✓ To provide high quality, safe and energy-efficient services in Process Design, Engineering, Procurement, Construction with overall project Management in Hydrocarbon, Metallurgy, Power and Ports & Terminals as well as Information Technology and other selected sectors of Industry.
- ✓ To achieve prominence in developing, adopting and assimilating state-of-the-art technology for competitive advantage.

- ✓ To maximize creation of wealth, value and satisfaction for stakeholders.
- ✓ To foster a culture of participation and innovation for employees' growth and contribution through a climate of fairness and transparency in operation.
- ✓ To acquire and provide technology and services through sustained Research & Development and linkage among Engineering Organizations, Equipment Manufacturers, Operating Companies and R&D Organizations to upgrade technologies on a continuous basis.
- ✓ To cultivate high standards of ethics and quality for a strong corporate identity and brand equity.
- ✓ To help enrich the quality of life of the community and preserve ecological balance and heritage through the services provided with a strong environmental conscience.

1.2 Historical Background

The foundation of the consultancy profession in India was laid soon after independence. The sixties saw the advent of major consultancy and engineering organization in the country with the setting up of a number of design and engineering organizations, in both private sector as well as public sector. Of these, Engineers India Ltd. Was the most prominent which was created in 1965 as a joint venture of the government of India (holding 51% shares) and Bechtel, a U.S. based company (holding 49% shares) to provide engineering and related services for petroleum and other industrial projects. In 1967, EIL became a wholly owned Government of India Undertaking.

Engineers India Limited has been serving the process industry providing a complete range of project services. Initially, it started with engineering work for petroleum refineries and diversified over the years, to add other fields of activity as well as other services. In response to the changing business environment, Engineers India went through several stages of development and has gradually evolved into an engineering company serving a wide range of industries including petroleum refineries, petrochemicals, oils and gas processing projects, pipelines, offshore platforms, fertilizers, chemical fibers and metallurgical industries providing a complete range of project service's.

It provides consultancy in the following fields of operation:

- ✓ Petroleum
- ✓ Pipelines
- ✓ Oil and Gas Processing
- ✓ Fertilizers
- ✓ Power Ports & Terminals
- ✓ Petrochemicals
- ✓ Chemicals

1.2.1 Petroleum Refineries

Engineers India Limited has provided its services for over a dozen projects with a combined refining capacity of 23 million tones/annum (460,000 bbl./day) and is working on several other projects with a total refining capacity of over 25 million tones/annum (500,000 bbls/day). The projects include grassroots as well as expansion revamp projects of all refining companies in India apart from refinery projects abroad. EIL has developed skills to such an extent that barring the process design of a few licensed units; EIL can execute complete petroleum refinery projects on its own. In addition to technologies for the main refinery units, EIL also has technologies for lube refinery complexes.

1.2.2 Fertilizers

Engineers India Limited provides complete services starting with feasibility study up to commissioning for fertilizer plants based on gas, naphtha and fuel oil. EIL has worked with renowned licensors/contractors on various assignments for ammonia, urea and phosphates fertilizer plants, in India and abroad.

1.2.3 Pipelines

Engineers India has the capability to plan and execute long distance cross country and submarine pipelines for transportation of crude oil, petroleum products, gases, two phase fluids and slurries. It provides services such as conceptual scheme, feasibility study, on site investigations and route survey, cathodic protection and telemetry, telecommunication and tele supervisory control for pipeline projects besides other project services such as design and engineering, procurement, construction supervision and project management.

1.2.4 Oil and Gas processing

Engineers India Limited has expertise for Crude Oil processing plants such as:

- ✓ Crude Gathering Stations
- ✓ Multistage Separation
- ✓ Crude Desalting
- ✓ Dehydration and Heavy Oil/Sour Oil Processing.

It also has capabilities for implementing Gas Conditioning and Processing Plants including Gas Collection Systems, Compressor Stations, and Solid/Liquid Desiccant Dehydration, Dew point Depression, Impurities and Acid gases removal and Cryogenic Natural Gas Liquids recovery such as LPG and Ethane / Propane recovery. It has handled a number of such plants for the Oil and Natural Gas Corporation Limited and Gas Authority of India Ltd. It has also provided consultancy for LPG and LNG projects of Sonatrach in Algeria.

1.2.5 Power

In the field of power, EIL has undertaken assignments for captive power plants in large process plants such as petroleum refineries, petrochemical complexes, etc. and has undertaken feasibility studies for refinery residue based power projects.

EIL has association with: -Foster Wheeler Italiana for Residue Based Power Plants Kema, Netherlands for Renovation & Modernization and Life extension studies for Existing Power Plants.

1.2.6 Ports and terminals

The Ports & Terminals Division of EIL takes up projects such as jetties, SPMs, MBMs at waterfronts or near to shore and related submarine pipelines with onshore facilities like terminals, etc. The areas of operation include:

- ✓ Master Plans for Ports
- ✓ Technical assistance in Marine Surveys
- ✓ Port Facilities/Jetties
- ✓ Inland Terminals for receipt, storage and dispatch of liquid cargo in both pressurized and cryogenic conditions

Offshore Handling Facilities including:

- ✓ Single Buoy Moorings ✓ Multi Buoy Moorings
- ✓ Submarine Pipelines

Port based Terminals for receipt, storage and dispatch of:

- ✓ Hydrocarbon products
- ✓ Chemicals & Petrochemicals
- ✓ Dry cargo both in bulk and bagged condition

1.2.7 Ocean Engineering

Engineers India's Ocean Engineering Division was formed in 1971 and has been involved in the development of India's offshore oil and gas fields since then. Engineers India has wide capabilities for providing full range of services needed to plan, design, engineer, construct and commission ocean engineering projects such as oil and gas platforms, offshore oil terminals, oil and fertilizer loading berths, intake structures, SBMs, offshore lighthouses, floating pump houses and fabrication yards.

1.2.8 Chemical

EIL has expertise for chemical plants such as membrane cell technology based caustic soda plants, soda ash, vaccine, insecticides etc., for which complete range of services can be offered.

1.2.9 Metallurgy

In the field of metallurgy, EIL can render a comprehensive range of consultancy and engineering services for zinc, lead, aluminum, copper, cadmium, silver, nickel, magnesium, titanium, etc. and also for sponge iron. In addition, EIL can provide services for mine development and beneficiation plants. The specialized services include Studies for Scaling up

of Pilot Plant to Industrial Plant, Process & Licensor selection, Optimization of the process parameters, Energy Conservation etc. The areas of operation encompass:

- ✓ Exploration data review, Geostatistical Ore reserve estimation and Ore Body modeling.
- ✓ Planning and Design of Open Pit Mines, Pit Optimization Studies and Quality control.
- ✓ Environmental studies for Mines.
- ✓ Ore handling, storage and long distance conveying.
- ✓ Design of Mineral Processing Plant and simulation & Optimization of crushing, grinding and beneficiation circuits including conventional as well as column flotation cells.
- ✓ Hydrometallurgical plants such as alumina refineries and lead smelters.
- ✓ Pyro/electro metallurgical plants such as primary Aluminum and lead smelters. Design of environment friendly tailings disposal/ stacking systems.

1.3 Services Offered by EIL

1.3.1 Feasibility Studies

EIL's experience in a variety of fields is available to clients for expansion or diversification of their activities. Services offered include preliminary studies to examine the viability of project, market potential of products, techno-economic evaluation, capital and operating cost estimates etc

To examine the viability of the project, market potential of products, techno-economic evaluation, capital & operating cost estimates etc.

1.3.3 Detailed Feasibility Studies

EIL also undertakes detailed feasibility studies to form the final cost of the project. These detailed feasibility reports are also bankable to ensure that financial institutions can use them for lending purposes.

EIL's project management services comprise direction and coordination of the activities leading to the completion of a job in accordance with terms of the contract, in compliance with the job schedule and to the satisfaction of the client. The efforts of various agencies such as licensors, subcontractors & EIL's different departments are brought together in a logical pattern to result in fruitful culmination of the project.

1.3.4 Heat and Mass Transfer Equipment Design

Heat and Mass Transfer Division (HTD) specializes in design and revamp of heat & mass transfer equipment & related process package systems as part of overall EIL project or as individual direct assignment to meet the requirement of new as well as existing plants. Experience of HMTD in design and revamp of heat and mass transfer equipment system is unparalleled.

The experienced manpower resources in HMTD carry out a wide range of services for the following heat & mass transfer equipment, process and energy systems:

- ✓ Fired Heaters & Air Preheating System
- ✓ Heat Exchangers
- ✓ Trays
- ✓ Packing & Packed Tower Internals
- ✓ Gas Dehydration System and Oil - Water - Gas Separators
- ✓ Vacuum Ejector System, Process Waste Heat & CO Boiler and Incinerators ✓
Deaerators
- ✓ De salters

1.3.5 Detailed Engineering

The process design package is converted into detailed engineering drawings and documents by specialist civil, structural, mechanical, and electrical & instrumentation engineers. Computer aided design techniques are extensively used as design aides to help develop optimum layout & design to assure maximum construction, operational & maintenance convenience.

Detailed engineering leads to identification & specification of equipment and materials for procurement & needs of construction activities at site.

Specialized Services are provided in the fields of static & dynamic analysis of equipment, structures, geotechnical engineering, rotating equipment & troubleshooting.

1.3.6 Project Management Consultancy

The experience gained in the implementation of complex integrated projects has enabled Engineers India to undertake the role of Project Management Consultant. As Project Management Consultant, EIL provides management services required for smooth implementation of a complex project. It takes full responsibility for the overall co-ordination and integration of functioning of all agencies engaged in the implementation of the entire project and ensures the completion on schedule and within the budgeted cost.

EIL's scope as Project Management Consultant broadly covers the following:

- ✓ Conceptualization of the Project ✓ Technology Selection.
- ✓ Developing Design Basis.
- ✓ Selection of EPC Contractors.
- ✓ Project Management including supervision, co-ordination, planning and scheduling services, etc.

1.3.7 Environmental Services

EIL offers extensive services in the field of environmental engineering such as Environment impact assessment, Waste water treatment, Water treatment, Solids and hazardous waste management, Environmental audits, Resource recovery and recycle, Pollution prevention and Waste minimization, etc. These services are provided for Petroleum Refineries,

Petrochemical Plants, Pipeline Projects, Oil/Gas Installations and Chemical Ports, Terminals, SBM's and Jetties and Non-ferrous Metallurgical projects. EIL's close familiarity with the technologies involved in the process industry gives it a unique advantage for undertaking environment-related assignments.

1.3.8 Planning and Scheduling

EIL ensures effective and timely execution of projects through detailed planning and micro scheduling along with continuous monitoring. For this purpose, the industry standard PRIMAVERA software is used for computerized network analysis (PERT/CPM). Other software packages such as HOST, CPS, MCS, and COSMAS etc. are used for home office scheduling, construction, and planning and material control. Detailed schedules for engineering, ordering, manufacturing, delivery, tendering and construction are developed. These schedules are reviewed and updated and project completion outlook analyzed and corrective actions taken regularly. In addition, physical progress of the project is measured and reported through a well-designed reporting system, which enables complete evaluation of project performance.

1.3.9 Construction Management

EIL's Construction Division provides total construction management services at site including selection of construction contractors, warehouse management, quality control/quality assurance, process monitoring & scheduling, review of heavy erection schemes, safety etc. Depending on client's need, EIL takes total site responsibility from survey & soil investigation to mechanical completion & assistance in commissioning. Use of modern construction techniques, innovative construction procedures, emphasis on QA/QC are some of the hallmarks based on which it has been possible for EIL to reduce construction time of projects yet providing work of highest quality. 1.3.10 Cost Engineering

EIL's cost engineering services help the project management team in exercising practically online control of the costs vis-à-vis project execution budgets through application of latest techniques of Project Cost Management. Large dynamic database & in-house developed programs operating on PC platform are used in estimating costs of work packages prior to their award. A periodic 'Cost-to-Completion' projection is made through in-house developed program "CEMOS" software to assist the Project Manager & Owner in taking timely decisions & actions. The cost engineering systems employed are kept updated through the latest developments in cost management techniques as also through experience gained while working on international projects.

1.3.11 Procurement

EIL offers comprehensive procurement services through a highly professional purchase team, effective monitoring and expediting group, a well experienced and qualified multi-disciplinary inspection force and a specialist group for route survey and planning for multi modal movement of over dimensional consignments.

Following comprehensive procurement services are provided ✓

Vendor identification, evaluation & enlistment.

- ✓ Entire purchase activity, floating of enquiry to placement of order.
- ✓ Order placement
- ✓ Progress monitoring & Expediting
- ✓ Inspection
- ✓ Transportation planning & control
- ✓ Safety certification under Static & Mobile Pressure Vessels (SMPV) rules of the Chief Controller of Explosives
- ✓ Statutory inspection in Europe & Japan under Indian Boiler Regulations.

A databank, providing significant information on capable vendors all over the world, is maintained and constantly updated. EIL's twelve inspection offices in the country provide competitive and prompt services in India. Overseas offices in Tokyo & London offer procurement/inspection services outside India in the Far East & Europe.

1.3.12 Commissioning and Plant Start up

EIL's Commissioning team associates itself with the project right from the process design stage. It reviews process & engineering design documents especially with respect to operability & safety. The team also prepares operation manuals providing instructions for plant start-up, shutdown & handling various emergencies. It provides guidelines and supervises pre commissioning & commissioning activities at site. EIL's responsibility continues till production of specification products has been established to the full satisfaction of the customers. The team assists process department in conducting performance guarantee tests in order to establish plant operation at design throughputs with product of specified quality. EIL also provides technical guidance to customers in the area of troubleshooting.

About the Department

1.4 Information Technology Services Division

1.4.1 Introduction

Information Technology Services (ITS), a division of EIL has a well-knit team of over 100 multidisciplinary professionals who are well qualified and experienced in providing software related and networking design services. Over the last 25 years, ITS has developed a large number of integrated software packages for use within EIL in the areas of process design, engineering, procurement, project management and construction. This experience along with the domain knowledge in various functional disciplines has given an edge to ITS for providing value added services to its clients in Oil Industry in particular and others in general. ITS has spearheaded the task of making EIL a leader both in terms of software usage and having state-of-the-art computing facilities and communication infrastructure leading to enterprise connectivity.

IT'S over the years has executed a number of offshore and onshore software development assignments for clients in India and abroad. The application areas covered are engineering solutions, business applications (viz. materials management, maintenance management, financial accounting, and personnel management), integrated plant information systems, intranet development, operations research etc.

An overview of range of services along with assignments handled and clientele highlighting EIL's IT experience is enumerated hereafter.

1.4.2 Range of IT Services

Preparation of a Master Plan and Its Implementation

EIL has executed a number of assignments in the areas of configuration assessment, evaluation, selection and acceptance testing of computer and communication systems and implementation for clients like:

- ✓ Gas Authority of India Ltd.
- ✓ Bongaigaon Refinery & Petrochemicals Ltd.
- ✓ Electricity Boards etc.

EIL has also executed studies involving preparation of Refinery wide Master Plans taking into consideration the integration of DCS, process functions & management information systems for clients like:

- ✓ Indian Oil Corporation,
- ✓ Cochin Refineries

✓ Bharat Petroleum Corporation Limited.

Customized Software Development for Engineering and Business Application

- EIL has undertaken a number of customized software development and implementation assignments in the following application areas:
- Implementation of Plant Design Systems on PDS & PDMS platforms for Aker Corporation, Norway & PIDEDEC in Iran.
- On-line Integrated Materials Information System covering activities like indents, purchase, stores issues/receipts, material accounting for operating plants namely Indian Petrochemicals Corporation Ltd., Oil & Natural Gas Corporation, Bongaigaon Refinery & Petrochemicals Ltd.
- Computer Aided Maintenance Information System covering preventive & predictive maintenance, work order, maintenance cost & breakdown history for BIPC, Iran. Financial Management Systems including books, ledgers (main & subsidiary), balance sheet, & asset account for major electrical utilities.
- Plant Database Creation & Document Management
- EIL has developed software, which provides for value added transfer of integrated plant information system from EPC contractor to the client on electronic media. This software has been implemented for Panipat Refinery Project and many other jobs are in advanced stage of finalization.
- Internet Application Development and Implementation
- EIL has developed expertise in development of JAVA & HTML based applications for implementation on Intranet. In addition to having Intranet for in-house needs, an assignment has recently been completed for Gas Authority of India Ltd.
- Enterprise Resource Planning (ERP) Implementation
- EIL has trained its software specialists and domain experts on the implementation of ERP solutions. Currently a number of jobs are planned to be taken for Oil Industry in India in association with our business partners M/s RAMCO for their ERP product, namely MARSHAL.
- Operations Research (Linear Programming, Transport Models and Queuing)
- EIL has executed a number of assignments involving OR techniques for the Ministry of Petroleum, Govt. of India and also a study based on queuing model for a port in Malaysia. Major investment decisions have been taken by the clients based on these optimization studies.

INTRODUCTION

ASP.NET

- It is a web development platform, which provides a programming model, a
- comprehensive software infrastructure and various services required to build up robust web applications for PC, as well as mobile devices.
- ASP.NET works on top of the HTTP protocol, and uses the HTTP commands and policies to set a browser-to-server bilateral communication and cooperation.
- ASP.NET is a part of Microsoft .Net platform. ASP.NET applications are compiled codes, written using the extensible and reusable components or objects present in .Net framework. These codes can use the entire hierarchy of classes in .Net framework.

The ASP.NET application codes can be written in any of the following languages:

- C#
- Visual Basic.Net
- JavaScript

ASP.NET is used to produce interactive, data-driven web applications over the internet. It consists of a large number of controls such as text boxes, buttons, and labels for assembling, configuring, and manipulating code to create HTML pages.

The key development tool for building ASP.NET applications and front ends is Visual Studio. In this project, we work with Visual Studio 2013.

Visual Studio is an integrated development environment for writing, compiling, and debugging the code. It provides a complete set of development tools for building ASP.NET web applications, web services, desktop applications, and mobile applications.

A typical ASP.NET application consists of many items: the web content files (.aspx), source files (.cs files), assemblies (.dll and .exe files), data source files (.mdb files), references, icons, user controls and miscellaneous other files and folders. All these files that make up the website are contained in a Solution.

Solutions may contain one or more projects. A project contains content files, source files, and other files like data sources and image files. Generally, the contents of a project are compiled into an assembly as an executable file (.exe) or a dynamic link library (.dll) file.

Typically a project contains the following content files:

- Page file (.aspx)
- User control (.ascx)
- Web service (.asmx)
- Master page (.master)
- Site map (.sitemap)
- Website configuration file (.config)

VB.NET

Visual Basic .NET (VB.NET) is an object-oriented computer programming language implemented on the .NET Framework. Although it is an evolution of classic Visual Basic language, it is not backwards-compatible with VB6, and any code written in the old version does not compile under VB.NET.

Like all other .NET languages, VB.NET has complete support for object-oriented concepts. Everything in VB.NET is an object, including all of the primitive types (Short, Integer, Long, String, Boolean, etc.) and user-defined types, events, and even assemblies. All objects inherits from the base class Object.

VB.NET is implemented by Microsoft's .NET framework. Therefore, it has full access to all the libraries in the .Net Framework. It's also possible to run VB.NET programs on Mono, the open-source alternative to .NET, not only under Windows, but even Linux or Mac OS.

The following reasons make VB.Net a widely used professional language:

- Modern, general purpose.
- Object oriented.
- Component oriented.
- Easy to learn.
- Structured language.
- It produces efficient programs.
- It can be compiled on a variety of computer platforms.
- Part of .Net Framework.

Strong Programming Features VB.Net

VB.Net has numerous strong programming features that make it endearing to multitude of programmers worldwide. Let us mention some of these features:

- Boolean Conditions
- Automatic Garbage Collection
- Standard Library
- Assembly Versioning
- Properties and Events
- Delegates and Events Management
- Easy-to-use Generics
- Indexers

- Conditional Compilation
- Simple Multithreading

TOOLS USED:

1. Microsoft Visual Studio 2013
2. Toad for Oracle 11g
3. .net framework
4. debugger

1. Visual Studio .NET :-

Code editor Visual Studio, like any other IDE, includes a code editor that supports syntax, highlighting and code completion using IntelliSense for not only variables, functions and methods but also language constructs like loops, query, sheets and JavaScript when developing websites and web applications. Autocomplete suggestions are popped up in a modeless list box overlaid on top of the code editor. The code editor issued for all supported languages.

2. Basic introduction of oracle:-

Oracle database is a relational database management system. It is known as Oracle database, Oracle DB or simply Oracle. It is produced and marketed by Oracle Corporation.

Oracle database is the first database designed for enterprise grid computing. The enterprise grid computing provides the most flexible and cost effective way to manage information and applications.

Different editions of Oracle database :

Following are the four editions of the Oracle database.

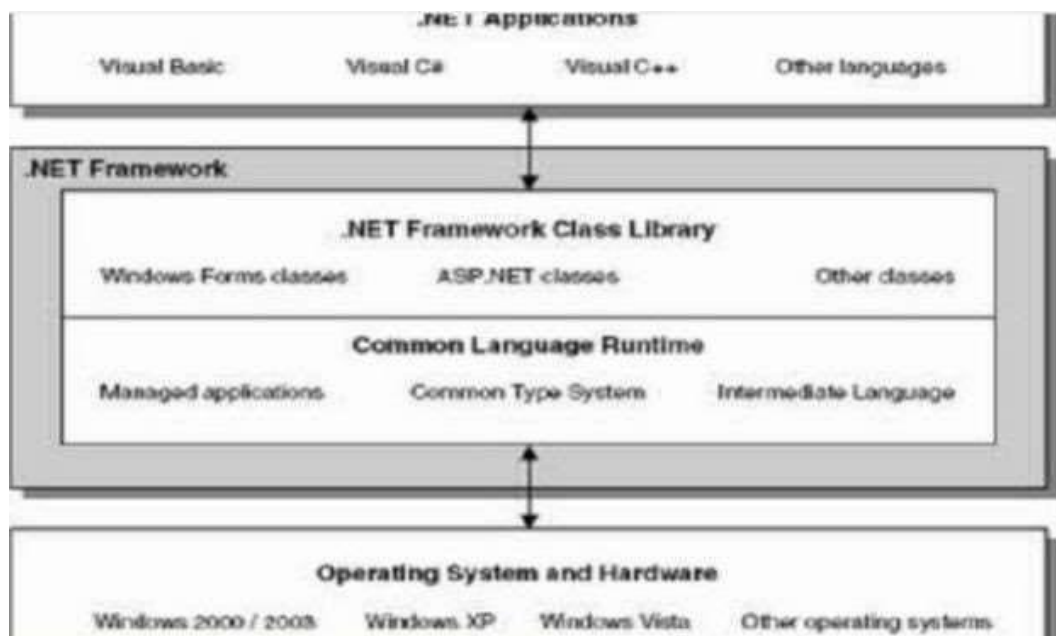
- o Enterprise Edition: It is the most robust and secure edition. It offers all features, including superior performance and security.

- o Standard Edition: It provides the base functionality for users that do not require Enterprise Edition's robust package.
- o Express Edition (XE): It is the lightweight, free and limited Windows and Linux edition.

Toad is a database management toolset from Quest Software that database developers, database administrators and data analysts use to manage both relational and nonrelational databases using SQL.

3. .NET Framework:-

.Net Component:-



.NET Framework is divided into two main components: the .NET Framework Class Library and the Common language Runtime.

Common Language Runtime

The Common Language Runtime is the execution engine for .NET Framework applications' provides a number of services, including the following :

- Code management (loading and execution)
 - o Application memory isolation
 - o Verification of type safety
 - o Conversion of IL to native code
 - Access to metadata (enhanced type information)
 - Managing memory for managed objects
- Common Type System:-

Defines how types are declared, used, and managed in the runtime, and is also an important part of the runtime's support for cross-language integration. The common type system performs the following functions:

- Establishes a framework that helps enable cross-language integration, type safety, and high performance code execution.
- Provides an object-oriented model that supports the complete implementation of many programming languages. Defines rules that languages must follow, which helps ensure that objects written in different languages can interact with each other

.NET Framework Class Library Overview:-

The .NET Framework includes classes, interfaces, and value types that expedite and optimize the development process and provide access to system functionality. To facilitate interoperability between languages, the .NET Framework includes types that perform the following functions:

- Represent base data types and exceptions. Encapsulate data structures.
- Perform I/O, Invoke .NET Framework security checks.

Architecture Design

THE ARCHITECTURE of ADO.NET:

To access the database, the first action you take consists of establishing a connection with the database. To support this, the System.Data.OleDb namespace OleDbConnection class.

Architecture Design

THE ARCHITECTURE of ADO.NET:

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● **Dataset:-**the dataset is disconnected in memory representation data. it can be consider as local copy of the relevant portion of the database. The dataset is persists in memory and the data in it can be manipulated and updated independent of the database. When the use of this dataset is finished changes can be made back to the central database for updating the data in dataset can be loaded from any valid data source like oracle.

● **Data provider:-** the data provider is responsible for providing and maintaining the connection to the database a data provider is a set of related components that work together to provide data in an efficient and performance driver manner Introduction of OLE DB:- OLE DB is a COM based object model used for access to various relational data sources as well as structured, not relational data (such as folders in an email store, or a file system). This ability to access both relational and structured data is one of the major features that set OLE DB apart from ODBC.

● **.Connectionstring:-** Connection string has information required to connect to a database. It generally consists of information of provider, drivers, data source, user name, password etc.

● The data source:- After specifying the provider, an important factor is the name of the database you want to connect to. This information is referred to as the data source. If you are creating a connection string, to specify the data source, assign the complete path of the database to the Data Source factor.

If you had declared an OleDbConnection variable using the other constructor, to specify the data source, you can include its section in the connection String argument of the constructor.

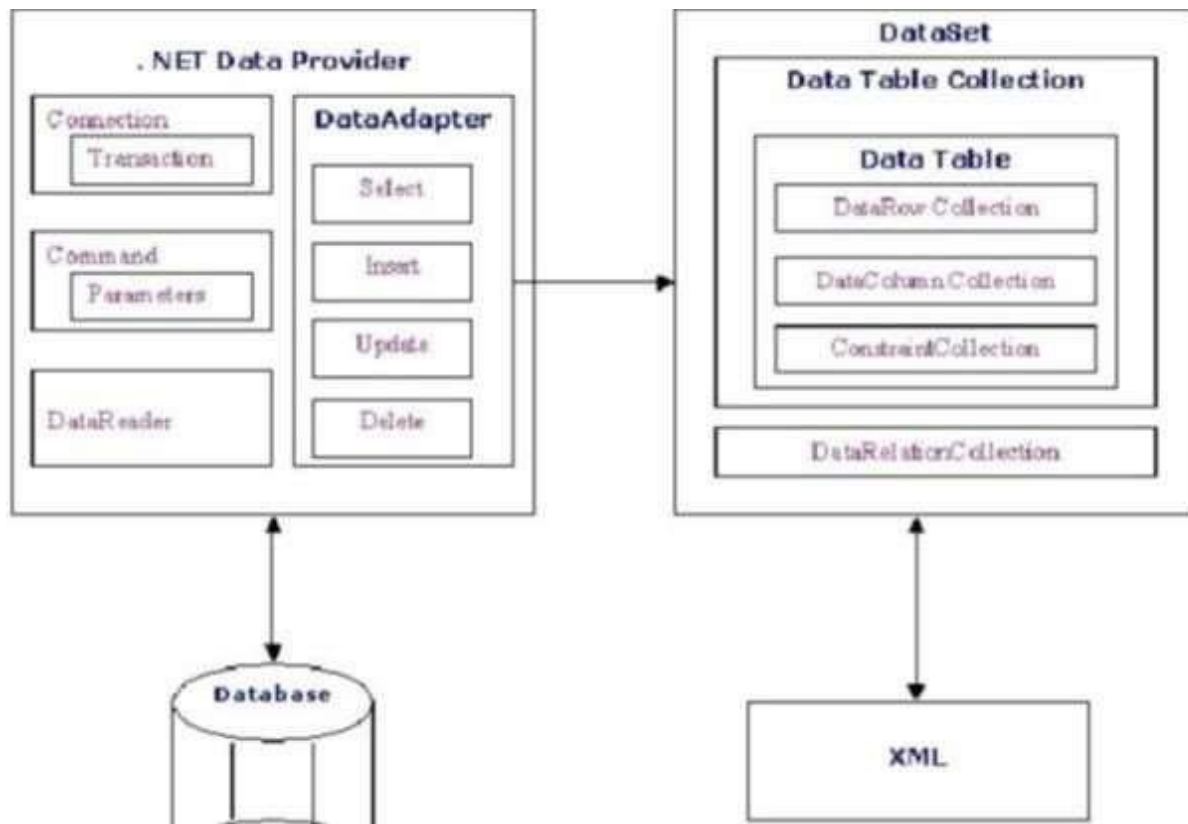


Figure represents System Requirement Specifications

4.Debugger

The debugger allows setting breakpoints (which allow execution to be stopped temporarily at a certain position) and watches (which monitor the values of variables as the execution progresses). Breakpoints can be conditional, meaning they get triggered when the condition is met. Code can be stepped over i.e. run one line at a time. It can either step into functions to debug inside it or step over it i.e. the execution of the function body isn't available for manual inspection.

Basic controls available in ASP.NET

Button Controls

ASP.NET provides three types of button control:

- Button : It displays text within a rectangular area.
- Link Button : It displays text that looks like a hyperlink.
- Image Button : It displays an image.

When a user clicks a button, two events are raised: Click and Command.

Basic syntax of button control:

```
<asp:ButtonID="Button1"runat="server"onclick="Button1_Click"Text="Click"/>
```

Text Boxes and Labels

Text box controls are typically used to accept input from the user. A text box control can accept one or more lines of text depending upon the settings of the TextMode attribute.

Label controls provide an easy way to display text which can be changed from one execution of a page to the next. If you want to display text that does not change, you use the literal text.

Basic syntax of text control:

```
<asp:TextBoxID="txtstate"runat="server"></asp:TextBox>
```

Check Boxes and Radio Buttons

A check box displays a single option that the user can either check or uncheck and radio buttons present a group of options from which the user can select just one option.

To create a group of radio buttons, you specify the same name for the GroupName attribute of each radio button in the group. If more than one group is required in a single form, then specify a different group name for each group.

If you want check box or radio button to be selected when the form is initially displayed, set its Checked attribute to true. If the Checked attribute is set to true for multiple radio buttons in a group, then only the last one is considered as true.

Basic syntax of check box:

```
<asp:CheckBoxID="chkoption"runat="Server"
>
</asp:CheckBox>
```

Basic syntax of radio button:

```
<asp:RadioButtonID="rdboption"runat="Server"
>
</asp:
RadioButton>
```

List Controls

ASP.NET provides the following controls

- Drop-down list,
- List box,
- Radio button list,
- Check box list, • Bulleted list.

These control let a user choose from one or more items from the list. List boxes and drop-down lists contain one or more list items. These lists can be loaded either by code or by the ListItem Collection editor.

Basic syntax of list box control:

```
<asp:ListBoxID="ListBox1"runat="server"AutoPostBack="True"
OnSelectedIndexChanged="ListBox1_SelectedIndexChanged">

</asp:ListBox>
```

Basic syntax of drop-down list control:

```
<asp:DropDownListID="DropDownList1"runat="server"AutoPostBack="True"
OnSelectedIndexChanged="DropDownList1_SelectedIndexChanged">

</asp:DropDownList>
```

Radio Button list and Check Box list

A radio button list presents a list of mutually exclusive options. A check box list presents a list of independent options. These controls contain a collection of ListItem objects that could be referred to through the Items property of the control.

Basic syntax of radio button list:

```
<asp:RadioButtonListID="RadioButtonList1"runat="server"AutoPostBack=
"True"
OnSelectedIndexChanged="RadioButtonList1_SelectedIndexChanged"
">

</asp:RadioButtonList>
```

Basic syntax of check box list:

```
<asp:CheckBoxListID="CheckBoxList1"runat="server"AutoPostBack="True"
OnSelectedIndexChanged="CheckBoxList1_SelectedIndexChanged">

</asp:CheckBoxList>
```

- **DATA BINDING**

Data binding is a general technique that binds data sources from the provider and consumer together and synchronizes them. This is usually done with two data/information sources with different language as in xml data binding. In UI data binding, data and information objects of the same language but different logic function are bound together.

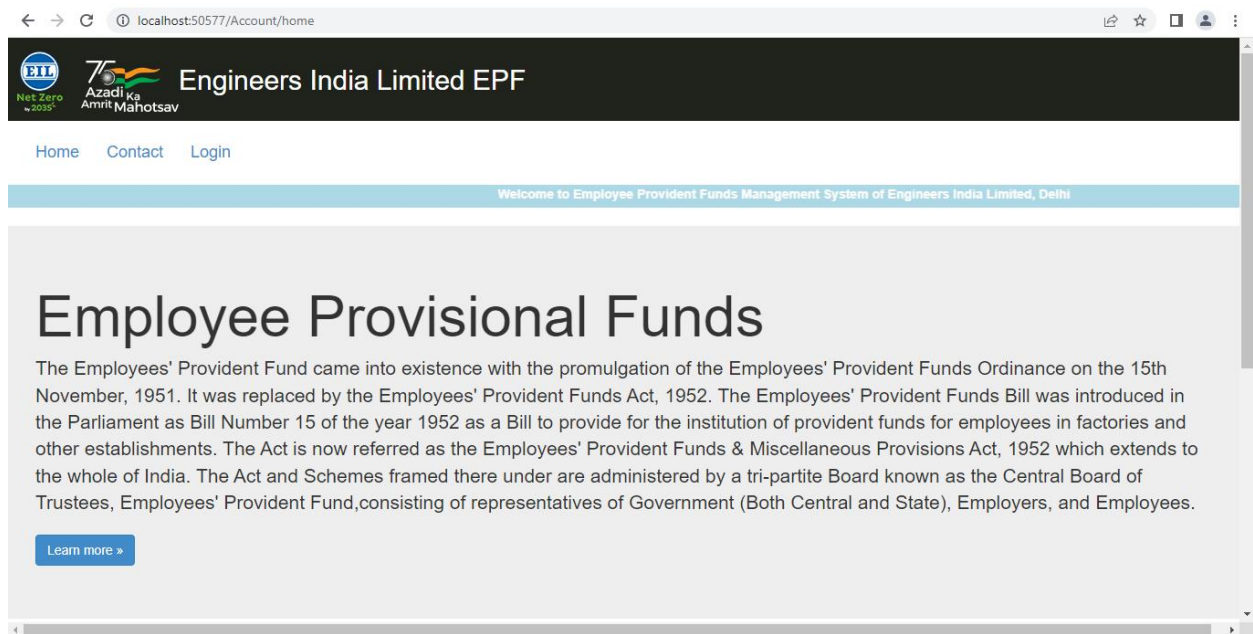
In data binding process, each data change is reflected automatically by the elements that are bound to the data. The term data binding is also used in cases where an outer representation of data in an element changes. As an Example, a change in a text box element could modify the underlying data value.

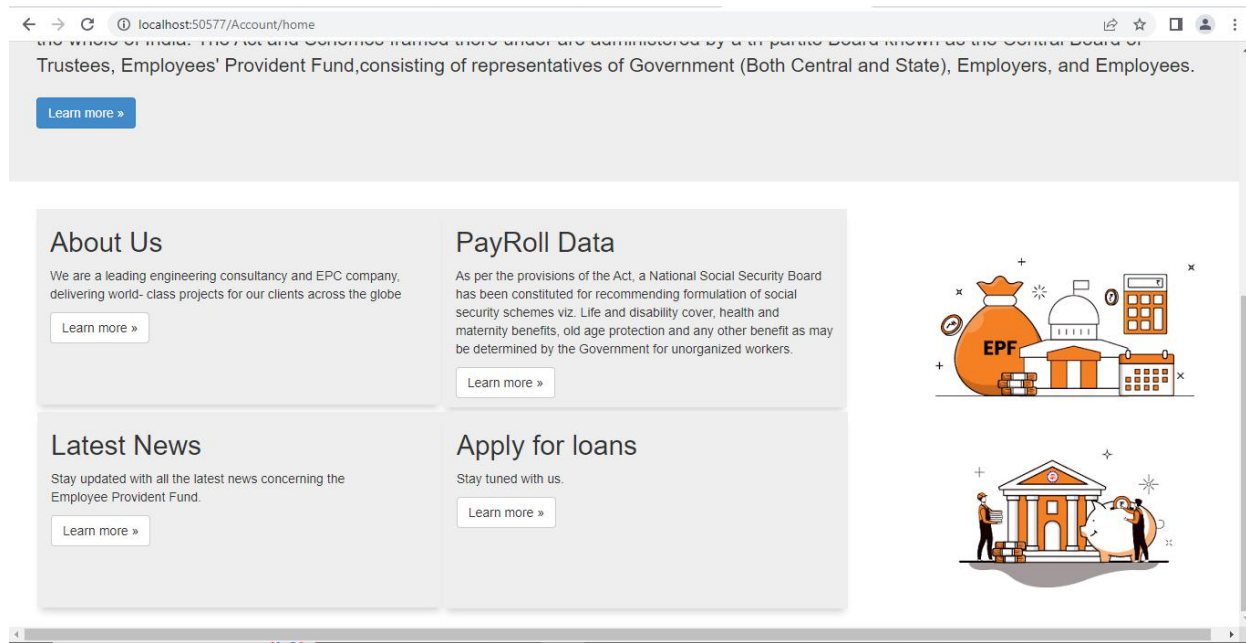
“So, all the things mentioned above are what we learnt during making our own sample website. In a whole, we learnt from designing a website to connection it to the database.”

WEBSITE

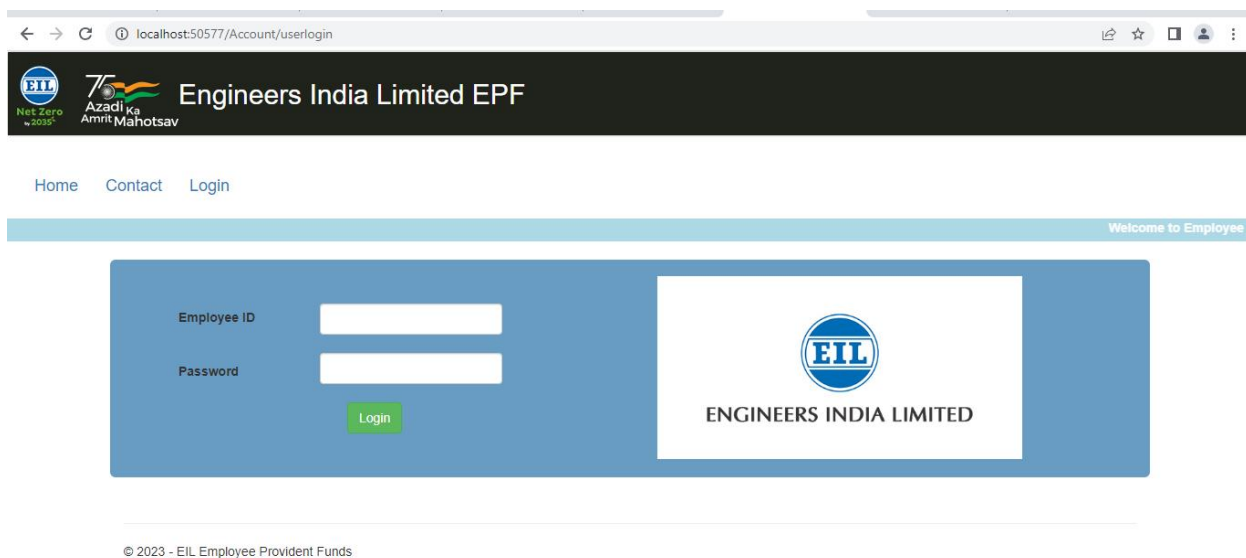
SCREENSHOTS

This is the Landing page of the website.





- By Clicking on Login tab on top left side of landing page you will get redirected to login page
- This is the login Page



- Now after Filling login credentials (i.e the employee id and password)
- You will see User interface of our web application you can calculate your Provident Fund(PF) Amount



The screenshot shows a web browser window with the address bar displaying 'localhost:50577/Account/welcomepage'. The page has a dark navigation bar with links for 'Home', 'Delete', and 'Update'. Below this is a header section titled 'Enter Information of the Employee'. The main content area is light blue and contains the following elements:

- An 'Employee ID' input field with the value '1'.
- A green 'Calculate' button.
- A 'PF Amount' input field with the value '12000'.
- A 'Salary' input field with the value '88000'.
- A green 'save' button.
- A red 'Logout' button.

At the bottom of the page, there is a footer that reads '© 2023 - EIL Employee Provident Funds'.

- The employee can view his PF amount using the following formula after entering his Employee ID and clicking the Calculate button: $\text{Salary} * 0.12$ is the PF Amount. The employee can update his or her pay by entering the updated figure and pressing the Save button, which will save the employee's PFA amount. Finally, the employee will be sent to the Login page by clicking on the Logout page.

localhost:50577/Account/Update




Engineers India Limited EPF

Home Delete **Update**

Enter the Details to be Updated

Employee ID
 Last Name
 D.O.B

First Name
 Salary



July 2023						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

Update

- This is the update page here the employee can update his/her details to get the details updated like Employee ID, First Name, Last name, Salary and date of birth (DOB). While filling the details, we can observe that clicking on the calendar image (small icon), a calendar is popped out. As soon as we select a date the calendar will disappear.
- After filling the respective details, we click on the update button and all the data is stored in the database for which we have done coding in the back end and have set a connection.

If we click on the Delete option on top left side Employee Details button, a new page opens.

localhost:50577/Account/Delete

EIL 75 Azadi Ka Amrit Mahotsav **Engineers India Limited EPF**

Home Delete Update

Enter the Details to be Deleted

Employee ID

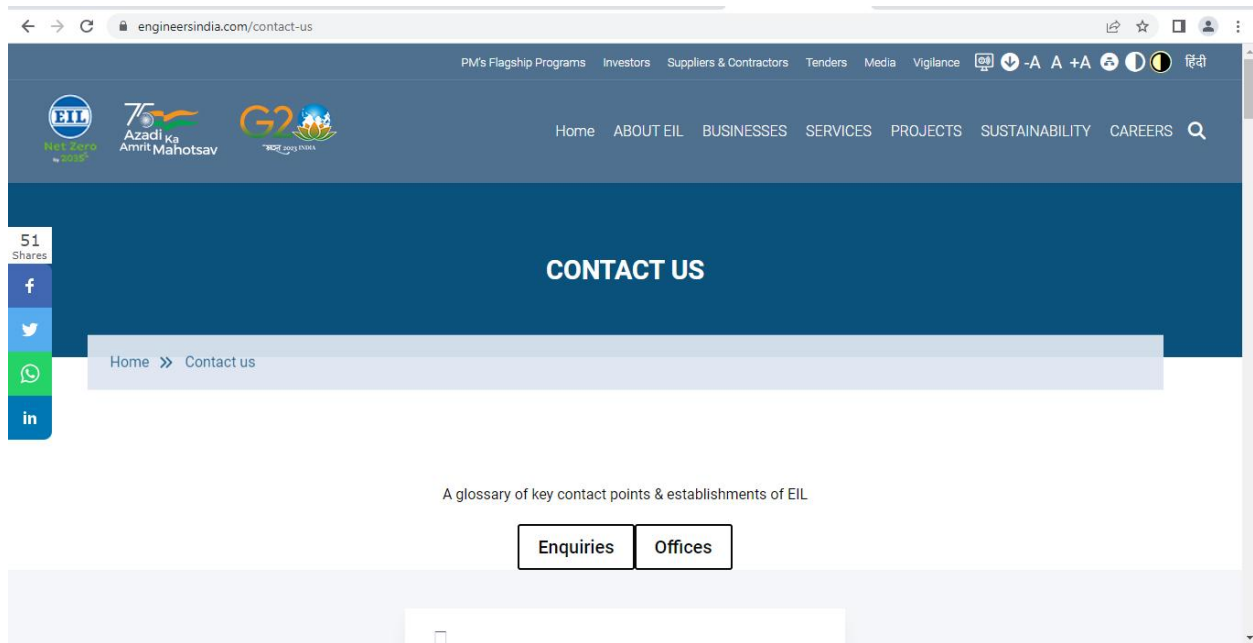
First Name

Last Name

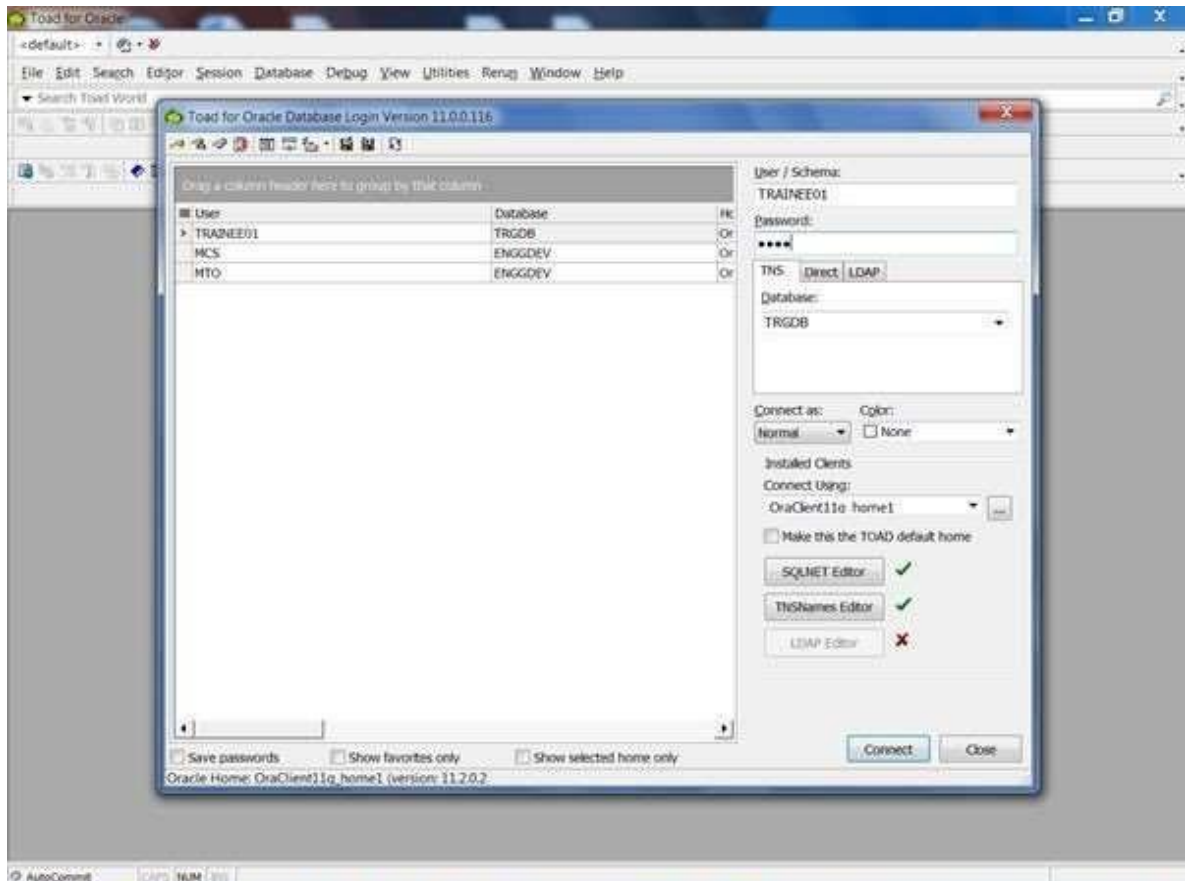
Delete

© 2023 - EIL Employee Provident Funds

- Here the employee can delete his record , by entering his Employee ID, First Name, and Last Name then by clicking the delete button the record will get deleted from the database



- This is Contact Us page here the employee can contact us for any assistance.



- Opening page of Toad for Oracle Database 11g.
Select the user,database and then enter the password. Next click on connect button and we get connected.

- This is how the table of entries looks in the database.
- To get this table , we have to write the following query:
- `select * from TRAINEE01`

The screenshot shows the Toad for Oracle interface. The left pane displays the database schema with the table TRAINEE01 selected. The main pane shows the table's structure and data. The table has 8 columns: PERSONID, FIRSTNAME, LASTNAME, DOB, NOMINEE, SALARY, CITY, CONTRIBUTION, and GROSS_SALARY. The data is as follows:

PERSONID	FIRSTNAME	LASTNAME	DOB	NOMINEE	SALARY	CITY	CONTRIBUTION	GROSS_SALARY
1	mohan	arora	06-07-2004	klio	120000	delhi	12000	88000
2	wef	she	09-05-2023	ghy	200000	patna	24000	176000
3	mohan	arora	06-07-2004	fgyth	120000	patna	14400	105600
4	add	she	31-03-2021	anhu	120000	delhi	14400	105600
5	der	dcr	27-04-2023	hyt	100000	delhi	12000	88000
6	shr	id	04-05-2023	ghy	35000	delhi	4200	30800
7	shekhar	shruti	01-06-2023	klio	800000	patna	96000	704000
8	sder	gty	03-05-2023	hyt	345000	delhi	41400	303600
11	hjtjg	drhkml	16-03-2023	klio	345000	delhi	41400	303600
22	shruti	she	29-05-2023	hyt	990800	mumbai	118896	871904
54	ridhi	ranjan	28/08/2003	Nandini	500000	Delhi		

- In this table named TRAINEE01 we have
PERSONID,FIRSTNAME,DOB,NOMINEE
- SALARY,CITY,CONTRIBUTION,GROSS_SALARY as colomns and rows
are employees details.
- Primary key is PERSON ID

Toad for Oracle - [TRAINEE01@TRGDB - Schema Browser (TRAINEE01.TRAINEE02)]

TRAINEE02: Created: 19-05-2023 10:48:20 Last DDL: 31-05-2023 13:24:07

Primary Key: <none>

Column Name	ID	PK	Index Pos	Null?	Data Type	Default	Histogram	Num Distinct	Num Nulls	Density	Encryption Alg	Salt	Seq/Trigger	Virtual
PERSONID	1			Y	INTEGER	None		11	0	0.09091				
FIRSTNAME	2			Y	VARCHAR2 (255 Byte)	Frequency		10	0	0.04545				
LASTNAME	3			Y	VARCHAR2 (255 Byte)	None		7	0	0.14286				
DOB	4			Y	VARCHAR2 (20 Byte)	None		9	0	0.11111				
NOMINEE	5			Y	VARCHAR2 (20 Byte)	None		6	0	0.16667				
SALARY	6			Y	NUMBER (20)	None		8	0	0.125				
CITY	7			Y	VARCHAR2 (255 Byte)	None		4	0	0.25				
CONTRIBUTION	8			Y	NUMBER	None		7	1	0.14286				
GROSS_SALARY	9			Y	NUMBER (20)	None		7	1	0.14286				

Cnt: 407; Sel: 1 | TRAINEE01@TRGDB

Toad for Oracle - [TRAINEE01@TRGDB - Schema Browser (TRAINEE01.LOGINDETAILS)]

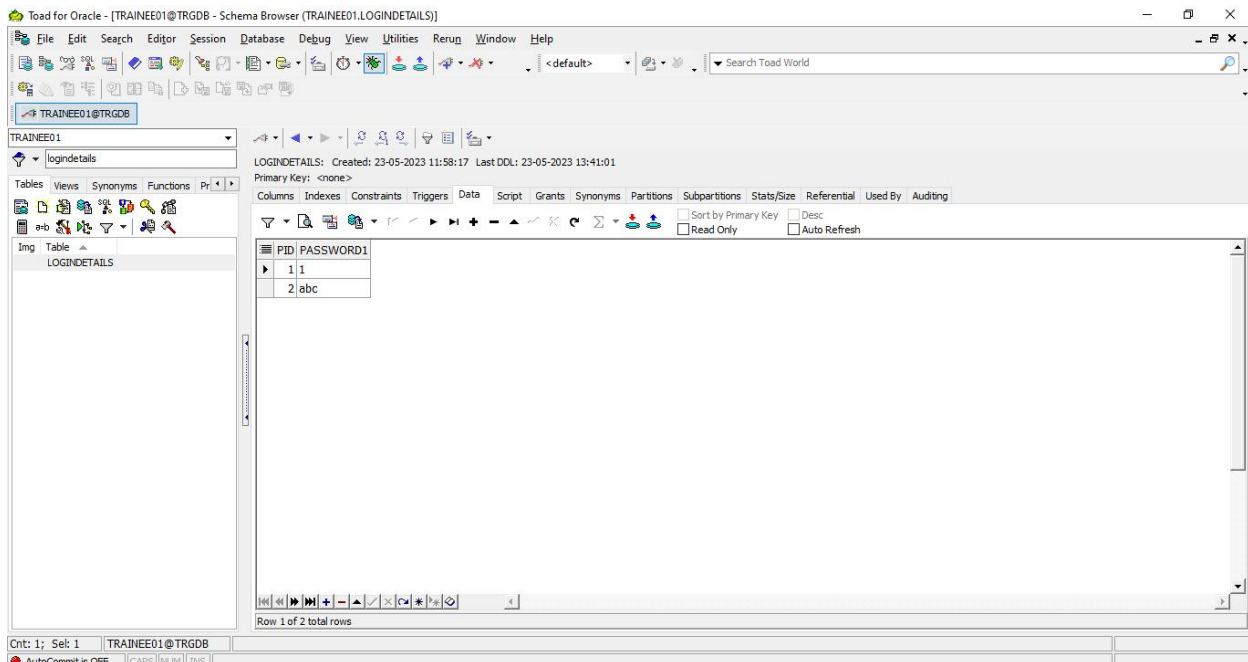
LOGINDETAILS: Created: 23-05-2023 11:58:17 Last DDL: 23-05-2023 13:41:01

Primary Key: <none>

Column Name	ID	PK	Index Pos	Null?	Data Type	Default	Histogram	Num Distinct	Num Nulls	Density	Encryption Alg	Salt	Seq/Trigger	Virtual
PID	1			Y	NUMBER (2)	None		2	0	0.5				
PASSWORD 1	2			Y	VARCHAR2 (10 Byte)	None		2	0	0.5				

Cnt: 1; Sel: 1 | TRAINEE01@TRGDB

AutoCommit is OFF | [CAPS] [NUM] [TNS]



- During the training period we also learnt how to create and execute procedures.
- Procedures are useful for performing repeated or shared tasks, such as frequently used calculations, text and control manipulation, and database operations. You can call a procedure from many different places in your code, so you can use procedures as building blocks for your application. Structuring your code with procedures gives you the following benefits:+

Main Project:-

Employee Provident Fund Management System Project(EPFMS)

- **Problem Statement:** Engineers India Limited (EIL) is a renowned engineering consultancy company with a large workforce. The Employee Provident Fund (EPF) scheme is an essential part of EIL's employee benefits program, providing financial security and retirement benefits to its employees. However, the existing EPF management system faces several challenges that hinder its efficiency and effectiveness.

The current problem statement aims to address the following issues:

- **Manual and time-consuming processes:-** EIL's EPF management relies heavily on manual paperwork, data entry, and record-keeping, leading to delays and errors in processing employee contributions, withdrawals, and other related transactions. This inefficiency can cause inconvenience to employees and administrative staff.
- **Lack of transparency:-** The lack of a centralized and accessible platform for employees to monitor their EPF contributions and account details may result in reduced transparency. This can lead to misunderstandings and queries from employees, consuming additional time and effort from the HR and finance teams.

- **Compliance and regulatory challenges:-** EPF management involves compliance with various labour laws and statutory requirements. Ensuring that EIL remains compliant with the latest EPF regulations and timely submission of required documents is a significant challenge that requires a more streamlined and automated approach.
- **Data security and privacy concerns:-** Handling sensitive financial information of employees necessitates robust data security measures. Ensuring the confidentiality and privacy of EPF data is critical to protect employee trust and prevent potential data breaches.
- **Employee engagement and awareness:-** Many employees may not be fully aware of the benefits and processes associated with the EPF scheme. There is a need to enhance employee engagement and awareness to encourage more active participation and understanding of the EPF program.
- The proposed solution should focus on implementing a comprehensive EPF management system for EIL, leveraging modern technologies such as automation, data analytics, and secure cloud-based platforms. The system should facilitate seamless and accurate EPF transactions, enhance transparency, ensure compliance with regulatory requirements, and prioritize data security. Additionally, the solution should include employee engagement initiatives and resources to educate and empower employees about the EPF scheme and its advantages.

- By addressing these challenges, EIL aims to improve overall employee satisfaction, optimize administrative processes, and strengthen its commitment to providing a secure and reliable EPF program for its workforce.

- Solution:-

The employee provident fund management is a full stack project using .NET and a toad Oracle database is a software application designed to manage employee-related information for a company or organization. It allows administrators or HR personnel to perform various tasks related to employee management, such as adding, updating, and deleting employee records.

Here's an overview of the EMP project architecture and key features:-

- Technology Stack:-

Front-end: .NET Framework (C#, ASP.NET)

Back-end: Toad Oracle Database

- User Interface (UI):-

The user interface is developed using .NET technologies, such as ASP.NET web forms. It provides a user-friendly interface for administrators and HR personnel to interact with the system.

- Authentication and Authorization:

The application ensures secure access to various modules based on user roles. For example, an HR administrator may have full access to all functionalities, while regular employees may have restricted access to view their own information.

- **Role of Employee Provident Fund (EPF) in EIL**

Employees can check their following benefits by creating their account on EPF

- **Employees can plan their Retirement Planning:** EPF helps EIL employees plan for their retirement by creating a corpus of funds over their working years. The EPF contributions made by both the employer and the employee, along with the interest earned, accumulate to form a substantial retirement savings fund.
- **Employees are Financially Secured:** EIL employees who contribute to EPF gain financial security and peace of mind, knowing that they have a reliable savings account that can be accessed during emergencies or retirement.
- **Employees can avail tax benefits:** EPF contributions made by both the employee and the employer are eligible for tax benefits under the Income Tax Act. This helps reduce the taxable income of employees, resulting in lower tax liabilities.
- **Employer Compliance:** As an EIL employee, must comply with the EPF regulations set forth by the Employees' Provident Fund Organization (EPFO). This includes ensuring timely and accurate contributions, proper record-keeping, and adherence to the EPF guidelines.
- **Employee Retention and Satisfaction:** Providing EPF benefits enhances employee retention and satisfaction within EIL. EPF is seen as a valuable employee benefit, contributing to a positive work environment and better employer-employee relations.
- **The employee can plan their long-term savings plan:** EPF encourages EIL employees to cultivate a habit of long-term savings, as it is a mandatory savings scheme. This can be beneficial for

employees' financial well-being beyond their tenure with the organization.

- **Employee Management:**

The core functionality of the EMP project is managing employee records. It allows users to add new employees to the system, update existing employee details (e.g., name, contact information, designation), and deactivate employees who have left the company.

- **Reporting and Analytics:**

The EMP project can generate various reports, such as employee details, attendance reports, leave summaries, and payroll reports. These reports aid in decision-making and provide insights into employee-related metrics.

- **Data Storage and Retrieval:**

The application uses an Oracle database to store all employee-related information securely. The database schema is designed to efficiently store and retrieve data related to employees, attendance, leaves, and other relevant information.

- **Integration:**

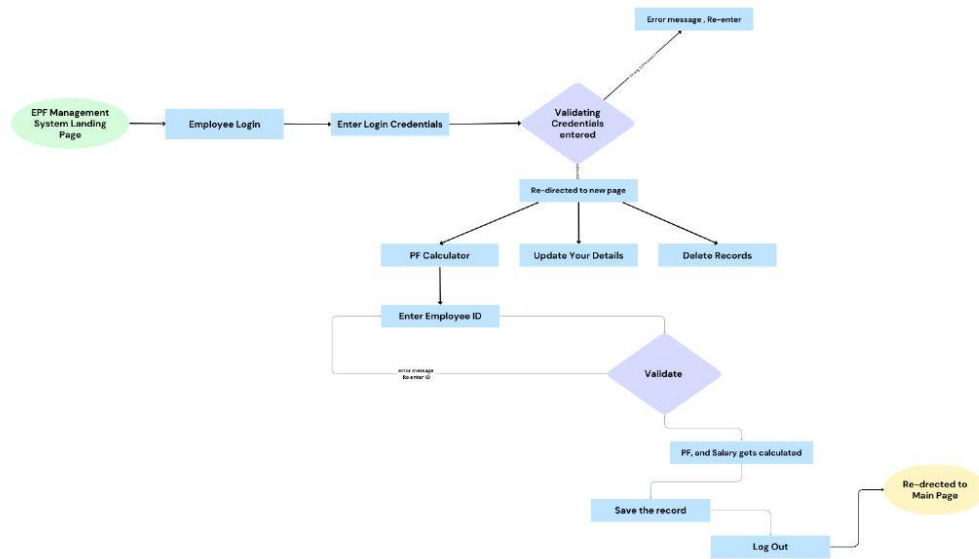
The EMP project may integrate with other systems, such as the company's Active Directory for user authentication or third-party applications for payroll processing.

- **Data Security and Privacy:**

The application ensures data security and privacy by implementing proper access controls, and encryption mechanisms, and adhering to industry best practices for securing sensitive employee information.

Overall, the EMP project streamlines employee management processes, improves data accuracy, reduces manual paperwork, and enhances HR productivity within the organization.

User Flow Diagram



FUTURE SCOPE : -

- Upon further modifications , this project will allow the companies and the interested parties to access information of students from a particular field or a particular college with similar fields or the fields they require. It can also be used to filter results based on some given conditions.
- Submitting information on behalf of students will become easier as they will not be required to visit different pages to fill in their details and instead will be able to submit their details in one single page.
- The parties concerned with the data can use this single database for any data they may require.

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