DATA ACCESS WITH

ADO. Net

What is Ado.net?

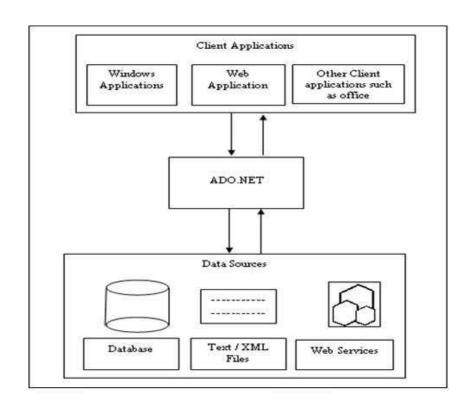
- The full-form of ado.net is ActiveX Data Object.
- ADO.net is the data-access technology that enables applications to connect to data stores and manipulate data contained in them in various ways.
- It is based on the .NET framework and it is highly integrated with the rest of the framework class library.
- Ado.net is a collection of classes, interfaces, structures, enumerated type that mange data access from the relational data stores within the .net framework.

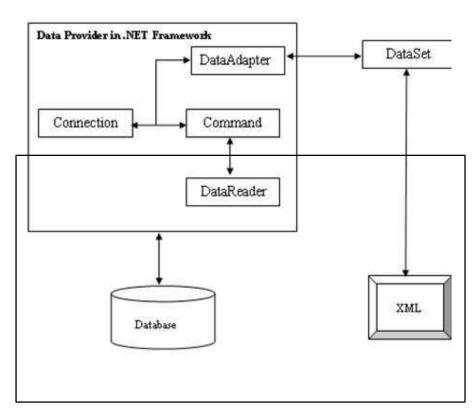
EXAMPLE

Student Form

			St	tudent Na	me	:[
				Stu	ıde	nt Age:			
				Email ID):				
				Pin code	: [100
				Join Da	ate:	dd-mm-y	ууу	У	
			8	are you ag	gree	e terms an	d c	onditions?	
						Registe	r		
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	STUD_NAME -	AGE	*	EMAIL_ID	*	PINCODE	¥	JOIN_DATE	*
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les									

Understanding ADO.net The Ado.net Object Model





Working with Ado.net

 Many of web application development, in many of the developers data situations involves opening data store, making request for specific data, and then populating the table in then browser with the data.

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Working with Ado.net namespaces

The six core Ado.net namespaces are;

- 1)System.Data
- 2)System.Data.Common
- 3)System.Data.OleDb
- 4)System.Data.Odbc
- 5)System.Data.SqlClient
- 6)System.Data.SqlTypes

Type of Architecture

ADO.NET is both Connection oriented as well as Disconnection oriented **Connected:** Forward-only, Read-only, mode.

 Application issues query then reads back results and processes them. DataReader object.

Disconnected:

Application issues query then retrieve and stores results for processing Minimizes time connected to database DataSet object.

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Data Provider:- (Connected Environment)

A data provider is used for connecting to a database, retrieving data, storing the data in a dataset, reading the retrieved data, and updating the database.

- * Connection:-This component is used to establish a connection with a data source such as database.
- *Command:-This component is used to retrieve, insert, delete, or modify data in a data source.
- *DataReader:-This component is used to retrieve data from a data source in a read-only and forward-only mode.
- * DataAdapter:-This component is used to transfer data to and from database.

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Data Set:- (Disconnected Environment)

- The data set is a memory-based relational representation of data.
 - * DataTableCollection:-It contains all table retrieved from the data source.
 - * DataRelationCollection:-It contains relationship and links between table
 - in a dataset.
 - * DataTable:-It represent a table in the datatable collection of a dataset.
 - * DataRowCollection:-It contains all the row in a datatable.
 - * DataColoumnCollection:-It contains all the coloumn in a datatable.

Connection Object

- * → The different Connection classes are in different data provider models.
 - * for e.g.: SqlConnection, OleDbConnection, OracleConnection, etc.
- * 2 The properties of SqlConnection class are:
 - * ConnectionString, DataSource, Database, State.
 - * In above properties DataSource, Database are read-only mode.
- * 2 You can pass necessary connection string information to the SqlConnection in a string format or store in "web.config" file.

Command Object

- → In Ado.net a command is a string of the containing SQL statements that is to be issued to the database. It can also be a stored procedure or the name of the table which return all columns and rows.
- → A Command can be constructed by using the instance of SqlCommand. for e.g. :

SqlCommand cmd = new SqlCommand("Select * from Employee",con);

- → After building the command object you need to execute with any one of the methods:
- **1.** <u>ExecuteNonQuery()</u>: Executes the command but doesn't return any output, Only it will return number of rows effected.
- **2.** <u>ExecuteReader()</u>: Executes the command and returns a type SqlDataReader.
- **3.** <u>ExecuteRow()</u>: Executes the command and returns SqlRecord, (Single row)
- **4. ExecuteScalar()**: Executes the command and returns a single values.
- **5. ExecuteXmlReader()**: Executes the command and returns XmlReader.

- → Some of the important properties of Command object are :
 - * CommandText : Assign SQL statement or stored procedure name.
 - * CommandTimeout : Specifies no of second to wait for executing a Command
 - * CommandType : Possible values are Text, Stored Procedure, Table direct.
 - * Connection : Gets or Sets SqlConnection object.

Data Reader

A data reader(SqlDataReader, etc.,) is a simple and fastest way of selecting some data from a data source but also least capable.

*You can't directly instantiate a data reader object. An instance is returned from appropriate Command object after having call ExecuteReader() method.

*This data reader is forward-only, read-only connected cursor. You can only travels the records in one direction. Database connection used is kept open until the data reader has been closed.

*The DataReader object requires a live connection to the database. So when you are done with DataReader object, be sure to call close(). If not connection stays alive.

*When DataReader object is closed (via an explicit call to close) or the object being garbage collected, the underlying connection(con) may also be closed depending on which of the ExecuteReader() method is called.

* If you call ExecuteReader() and pass CommandBehaviour.CloseConnection you can force the connection to be closed when reader is closed.

- For Data Reader object you have the following methods:
 - 1. Read():Reads record by record in the data reader.
 - 2. Close():Closes the SqlDataReader connection
- 3. Dispose():Disposes the data Reader object.
- → Some of the important properties of Data Reader object are:
 - 1. Connection: Gets the SqlConnection associated with the *SqlDataReader*.
 - 2. HasRows: Gets the value that indicates whether the SqlDataReader contains one or more rows.
 - 3. IsClosed: Retrieves a boolean value that indicates whether the *specified SqlDataReader instance has been closed*.

Data Adapter

- → The Data Adapter classes (Eg:SqlDataAdapter,..) bridges the gap between the disconnected DataTable objects and the physical data source.
- The SqlDataAdapter provides two way data transfer mechanisms:
 - *It is capable of executing SELECT statement on a data source and transferring the result set into a DataTable object.

*It is also capable of executing the standard INSERT, UPDATE and DELETE statements and extracting the input data from DataTable object.

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- → The commonly used properties of SqlDataAdapter class are:
 - *Select Command: Gets or sets an object of type SqlCommand. This command is automatically executed to fill a Data Table with the result set.
 - * Insert Command: Gets or sets an object of type SqlCommand.
 - * Update Command: Gets or sets an object of type SqlCommand.
 - * Delete Command: Gets or sets an object of type SqlCommand.
- This SqlDataAdapter class also provide a method called Fill().
 - *Calling the Fill() method automatically execute the command provided by the Select Command property and retrieve the result set and copies it to DataTable.

Calling a stored procedure—

- In DBMS (database management system), a stored procedure is a set of Structured Query Language i.e. (SQL).
- They are stored in database server (SQL Server).
- Stored procedure is a group of T-SQL statements which performs one or more specific task in a single execution plan.
- We can create group of Transact-SQL statements and Store in SP.

Types of Parameters available in Stored Procedures

Input Parameter: We can pass any number of input parameters to SP function.

Output Parameter: We can output any number of output parameters from SP function.

Return Parameter: But we can return only one/single return parameter from SP function.

PROCEDURE-

```
create or replace procedure epro (eno IN number, insal OUT number, ename OUT Varchar2) as tmpsal number; begin select salary into tmpsal from EMP where emp_id =eno; select Name into ename from EMP where emp_id =eno;
```

insal:=tmpsal+1000;

end;

EMP Table:-

EMP_ID	SALARY	NAME	
	101	25000	Sateksha
	102	30000	Durga
R	103	10000	Vedanta
	row(s) 1 - 3 of 3	

PAGE BEHIND CODE:-

```
using System.Data.OracleClient;
public partial class Default : System.Web.UI.Page
    protected void Page Load(object sender, EventArgs e)
    protected void Button1 Click(object sender, EventArgs e)
        try
            OracleConnection ocn = new OracleConnection(@"user
id=shivratna;password=honrao;");
            OracleCommand cmd = new OracleCommand();
            OracleParameter p1, p2,p3;
            cmd.CommandText = "EPRO";
            cmd.CommandType = CommandType.StoredProcedure;
            cmd.Connection = ocn;
            ocn.Open();
            p1 = new OracleParameter(@"eno", OracleType.Number);
            p2 = new OracleParameter(@"insal", OracleType.Number);
            p3 = new OracleParameter(@"ename",OracleType.VarChar,50);
            p1.Value = Convert.ToInt32(TextBox1.Text);
            p2.Direction = ParameterDirection.Output;
            p3.Direction = ParameterDirection.Output;
            cmd.Parameters.Add(p1);
            cmd.Parameters.Add(p2);
            cmd.Parameters.Add(p3);
            cmd.ExecuteNonQuery();
            Label2.Text = "The Incremented salary of " + p3.Value.ToString() + " IS:=" +
p2.Value.ToString();
            ocn.Close();
        catch (Exception ex)
            Label2.Text = ex.Message;
```

OUTPUT-

Enter EMP ID 101

Button The Incremented salary of Sateksha IS:=26000

ADVANTAGES

- 1. Since SP are located at database server we can call that SP for any of asp.net c# pages for any number of time.
- 2.Stored procedures are faster as compared to normal T-SQL statements. In a single SP execution plan we can execute a bunch of SQL statements.
- 3.Stored procedures are easy to maintain. If any changes occurs just we need to update single stored procedure located at database server, single update will reflect in all pages. Instead of going and changing all queries in all the pages just we need to update a single SP file.
- 4.We can reuse the SP code again and again means we can call SP function again and again without compromising the performance and memory.
- 5.It provides query <u>encapsulation</u> and offer simple sp function. So it means SP provide better security to your data queries.
- 6.SP enhances the security controls means users can be granted permission to execute a stored procedure which makes better security to data

THANK YOU

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