# END TERM MAJOR PROJECT REPORT

(1st February 2021 – 12 May 2021)

On Internship experience as a **Associate Software Engineer** at

**DXC Technology**

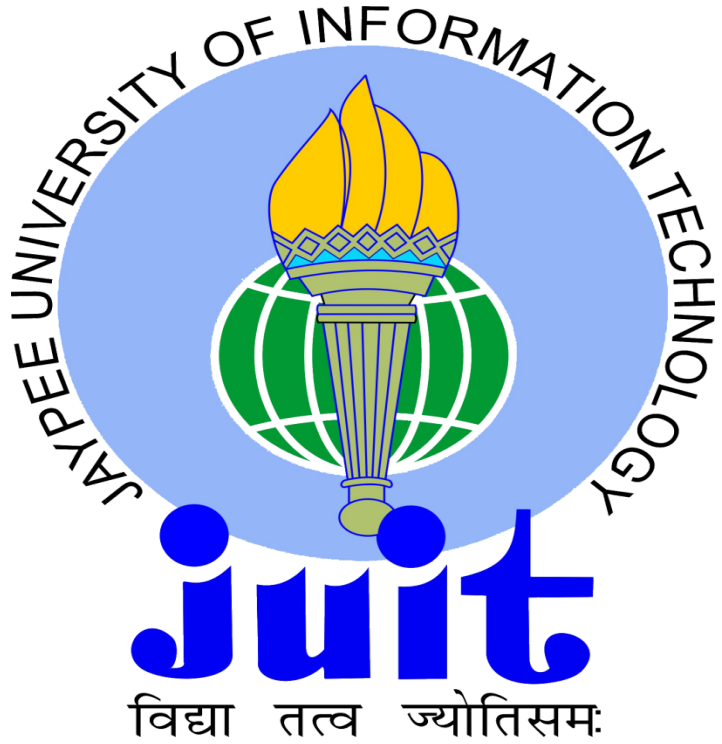
by

**Yukta Puri (171383)**

Under the guidance of

**Prakash Veningandala**

to

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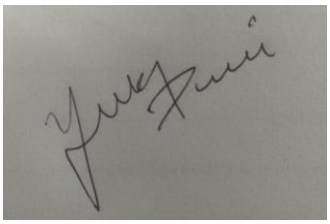
# CANDIDATE's DECLARATION

I hereby declare that the work reported in this report entitled "**Internship experience as a Associate Software Engineer at DXC Technology"** is submitted in partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology in Computer Science and Engineering submitted in the department of Computer Science and Engineering, Jaypee University of Information Technology Waknaghat** is an authentic record of my own work Icertis does not allow the project material to be used beyond the said guidelines, I Yukta Puri am aware of the fact and appropriately created the project report without violating any compliance. The matter embodied in the report has not been submitted for the award of any other degree or diploma.



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This is to certify that the above statement made by the candidate is true to the best of my knowledge.

**Prakash Veningandala**
**Date: 25th May 2021**

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# ABSTRACT

The purpose of this document is to define the console application implementation of the Restaurant Management System. The user can enter the restaurant details like the name, online order status, cuisine and launch date. This restaurant details are stored in the database. All the restaurant details are retrieved from the database and displayed on the screen. A user can search for a particular restaurant by cuisine. On the off chance that we are attempting to adapt to QuickBooks or a progression of Excel Spreadsheets, we are without a doubt spending innumerable hours settling on critical choices with problematic information. On the off chance that we are battling with some other extravagant and confounded type of programming, “Restaurant Management System” will give us something that urgently give us an opportunity to bloom our business. This Console Application will help in organizing the data and records efficiently. Connecting to cloud storage will help to keep the data up-to-date without creating a chaos as long programs are not needed to written just to update the changes in the data.

# CHAPTER -1
# INTRODUCTION

## 1.1 Introduction

On the off chance that we are attempting to adapt to QuickBooks or a progression of Excel Spreadsheets, we are without a doubt spending innumerable hours settling on critical choices with problematic information. On the off chance that we are battling with some other extravagant and confounded type of programming, “Restaurant Management System” will give us something that urgently give us an opportunity to bloom our business.

### 1.1.1 Object Oriented Programming System

Object means real world business like pen, chair, table, computer, clock, etc. Object-oriented programming is a method or condition of programming using classes and objects. It facilitates software development and maintenance by providing specific concepts.

i. Class:- A class can also be thought of as a prototype from which an individual entity can be created. Class doesn't take up any space.

ii. Encapsulation:- Restricting (or wrapping) code and information together into a solitary unit are known as epitome. For instance, a container, it is wrapped with various meds.

A java class is the case of exemplification. Java bean is the completely epitomized class since all the information individuals are private here.

iii. Abstraction:- Hiding internal information and displaying functionality is known as outsourcing. For example a phone, we do not know the internal processing.

In Java, we use an invisible section and a visible connector to achieve the release.

iv. Polymorphism:- Polymorphism occurs where a single operation is done in several forms. To persuade a customer in a certain way, for example, draw a shape, triangle, rectangle, or other object.

To achieve polymorphism in Java, we use function overloading and method overriding.

Another explanation is to say something; for example, a cat meows, a dog barks woofs, and so on.

v. Inheritance:- At the point when one article obtains every one of the properties and practices of a parent object, it is known as legacy. It gives code reusability. It is utilized to accomplish runtime polymorphism.

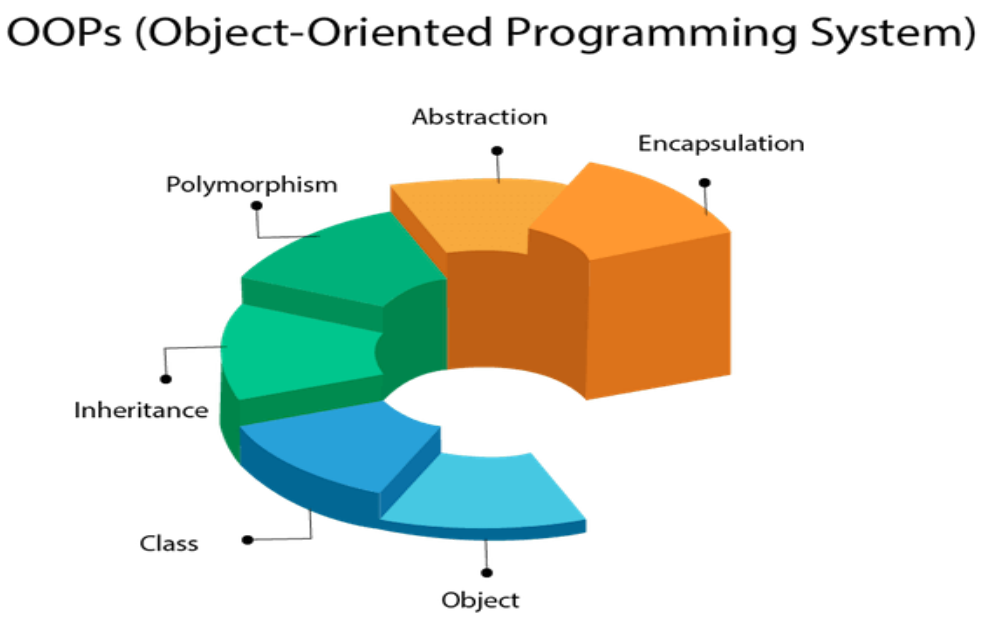


Fig 1.1 Illustration of OOPS

### 1.1.2 .NET Framework

.NET is a framework that supports various languages their respective libraries and helps the developer to develop many types of applications and softwares. It is developed by Microsoft and is Network Enabled Technology.

**.Net Framework components:-**

a. Common Language Runtime:- Abbreviated as CLR, CLR is the basic component and Virtual Machine of the NET framework. It is a natural NET-based operating environment that uses codes and helps to simplify the development process by providing a variety of services such as retrieval, thread management, type security, memory management, durability, etc. is responsible for managing the implementation of NET programs regardless of any language of the NET system. It is also useful for code management, as the code indicating the time of operation is known as the managed code and the code that does not regulate the time of operation is known as unregulated code.

b. Framework Class Library: Abbreviated as FCL, It is the assortment of reusable, object-arranged class libraries and techniques, and so on that can be coordinated with CLR. Likewise called the Assemblies. It is actually similar to the header records in C/C++ and bundles in the java. Introducing .NET structure essentially is the establishment of CLR and FCL into the framework.

Below is the overview of .NET Framework

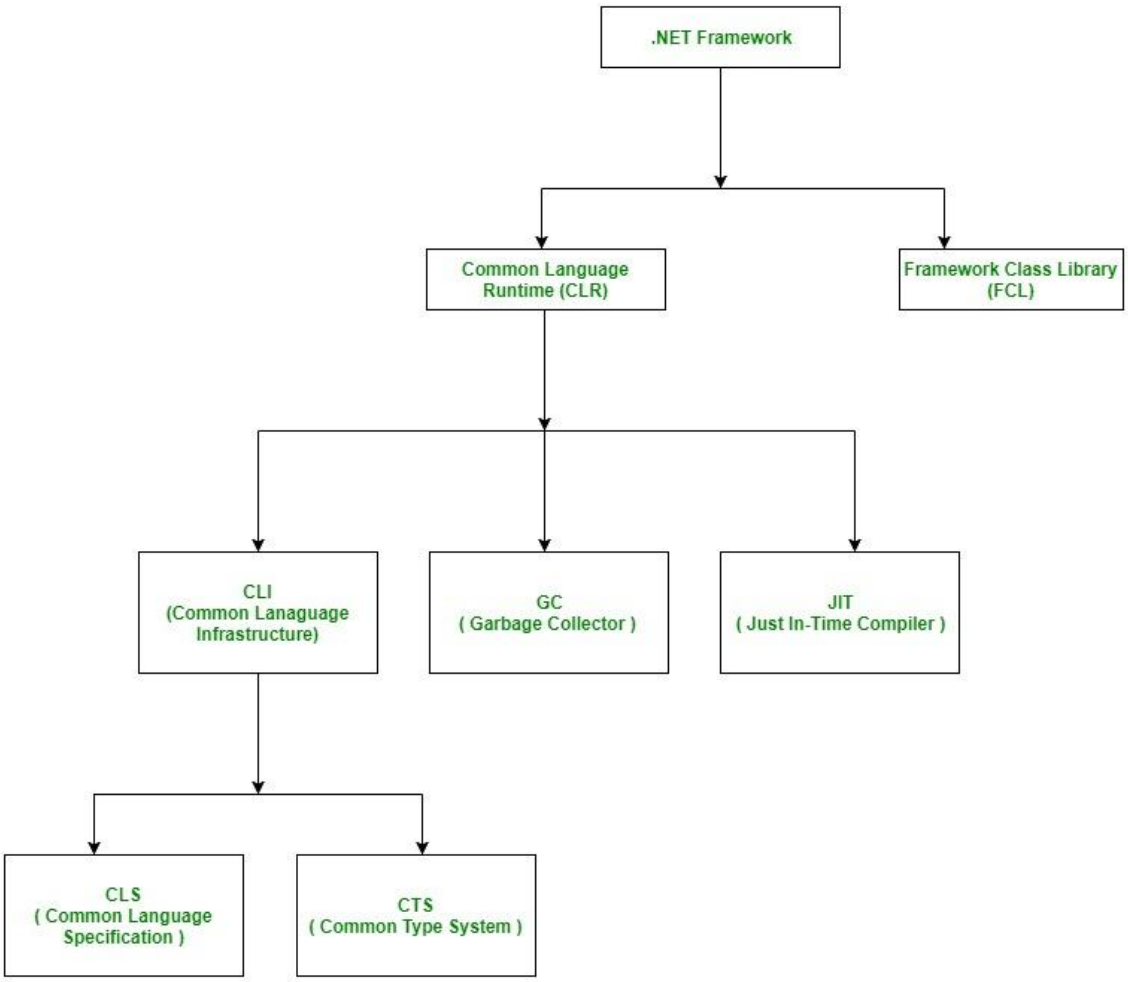


Fig 1.2 Overview of .NET Framework

### 1.1.3 C#

C# is a straightforward, present day, broadly useful, object-arranged programming language created by Microsoft inside its .NET drive drove by Anders Hejlsberg. This instructional exercise will show you fundamental C# programming and will likewise take you through different progressed ideas identified with C# programming language.

It is designed for Common Language Infrastructure (CLI), which contains a portable code and a working environment that allows for the use of a wide range of advanced languages on a variety of computers and structures

The following reasons make it the most widely used language -

- ❏ It is a modern language, which prepares common purposes
- ❏ Focused on the object.
- ❏ Easy to read.
- ❏ Formal language.
- ❏ It produces programs that work well.
- ❏ It can be built into a variety of computer systems.

### 1.1.4 C# language's IDE

The company (Microsoft) gives accompanying advancement instruments to C sharp programming language−

- ❏ Visual Studio (VS) 2010
- ❏ Visual C# Express (VCE) 2010
- ❏ Visual Web Developer

The VCE and visual web developer are uninhibitedly accessible by Microsoft's site. Utilizing these apparatuses, you can compose a wide range of C# programs from straightforward order line applications to more unpredictable applications. You can likewise compose C# source code documents utilizing an essential content tool, similar to Notepad, and accumulate the code into congregations utilizing the order line compiler, which is again a piece of the .NET Framework.

Visual C# Express and Visual Web Developer Express release are managed down variants of Visual Studio and has a similar appearance. They hold most highlights of Visual Studio. In this instructional exercise, we have utilized Visual C# 2010 Express.

### 1.1.5 Unit Testing

Unit testing is a testing method in which different components are checked by the manufacturer to see if there are any flaws. It is concerned with the standalone modules' practical correctness.

The key goal is to separate each component of the structure in order to detect, evaluate, and correct any flaws.

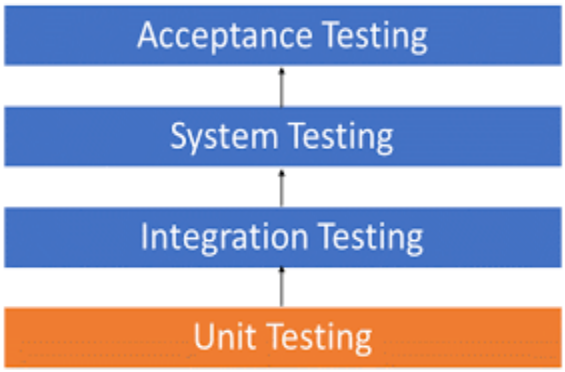


Fig 1.3 Testing Flow Diagram

Advantages of Unit Testing:-

- Reduces glitches by modifying internal code or reducing defects in newly created features.
- Defects are caught early in the testing process, which lowers the cost of testing.
- Enhances code refactoring and improves architecture.
- When unit tests are used in conjunction with the construction process, the build's consistency is improved.

Life Cycle of Unit Testing:-

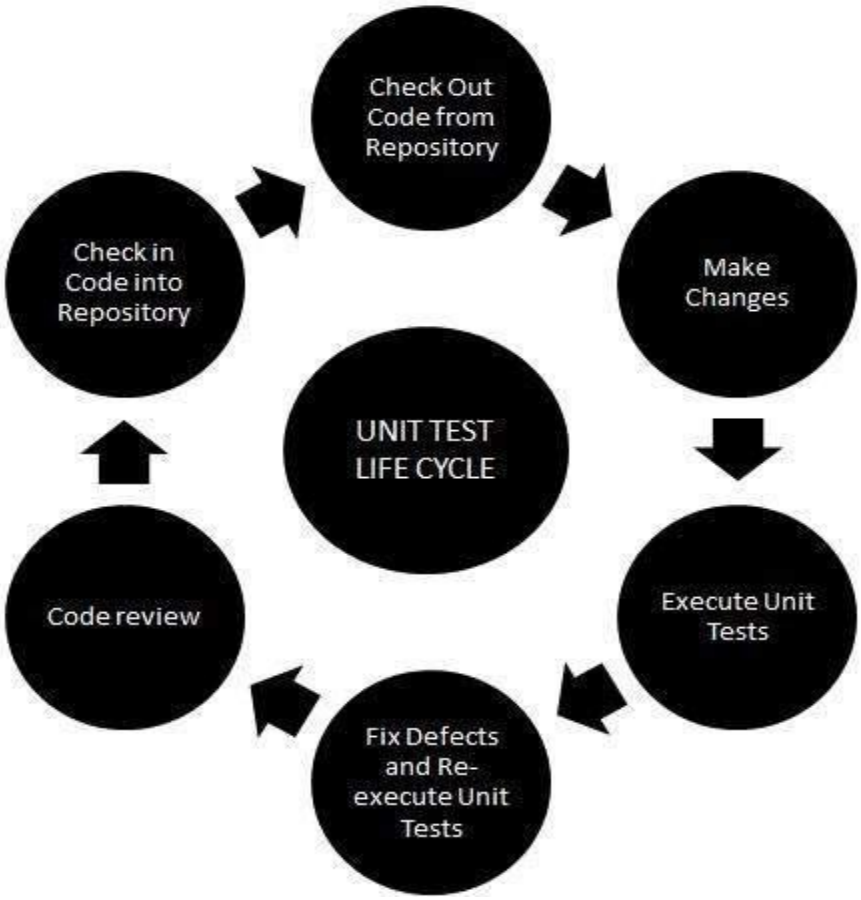


Fig 1.4 Life Cycle of Unit Testing

Different ways of Unit Testing:-

- ❏ Black Box Testing:- Checks the functionality of application.
- ❏ White Box Testing:- Checks internal structure and working of an application.
- ❏ Gray Box Testing:- It is a collaboration of Black and white box testing.

### 1.1.6 Cloud Concepts

Distributed computing is surprising the world. Truth be told, 94% of responsibilities and register occasions will be prepared through cloud server farms by 2021, contrasted with just 6% by conventional server farms, as indicated by research by Cisco.

The guideline of the cloud isn't new, however as an ever increasing number of organizations and organizations change to cloud-based administrations, it's essential to comprehend the subtleties of distributed computing phrasing and ideas.

**What is cloud?**

Layman people can understand the cloud as a scary and amorphous idea. And catch wind of distributed computing constantly, yet it's meaning could be a little clearer.

**How are distributed computing functions?**

Distributed computing varies from customary IT facilitating administrations in that the customer by and large doesn't claim the framework expected to help the projects or applications they use.

All things being equal, those components are claimed and worked by an outsider, amd the client pay just for their use.

At the end of the day, distributed computing is an on-request, utility-based model of processing.

- On-request self-administration

  Clients can get to processing administrations by means of the cloud when they need to without association from the specialist co-op. The figuring administrations ought to be completely on-request with the goal that clients have control and spryness to meet their advancing requirements.

- Expansive organization access

  Distributed computing administrations are generally accessible by means of the organization through clients' favored instruments (e.g., PCs, work areas, cell phones, and so forth)

- Asset pooling

  Perhaps the most appealing components of distributed computing is the pooling of assets to convey registering administrations at scale. Assets, like stockpiling, memory,

preparing, and network data transmission, are pooled and relegated to various customers dependent on request.

- Quick flexibility

  Effective asset designation requires flexibility. Assets should be allocated precisely and rapidly with the capacity to ingest critical increments and diminishes popular without administration interference or quality corruption.

- Estimated administration

  The administration estimation permits specialist co-op that follow utilization and check costs as per their interest on assets.

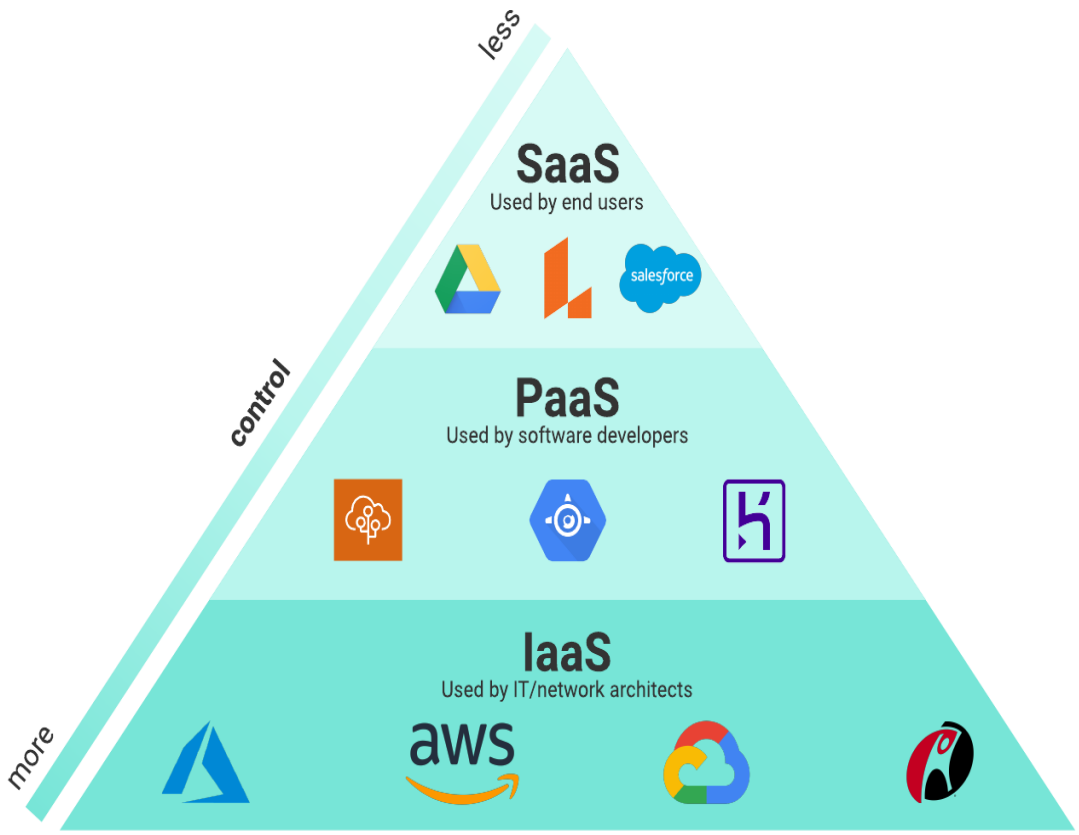


Fig 1.5 Types of Cloud Providers

**Cloud Computing types:-**

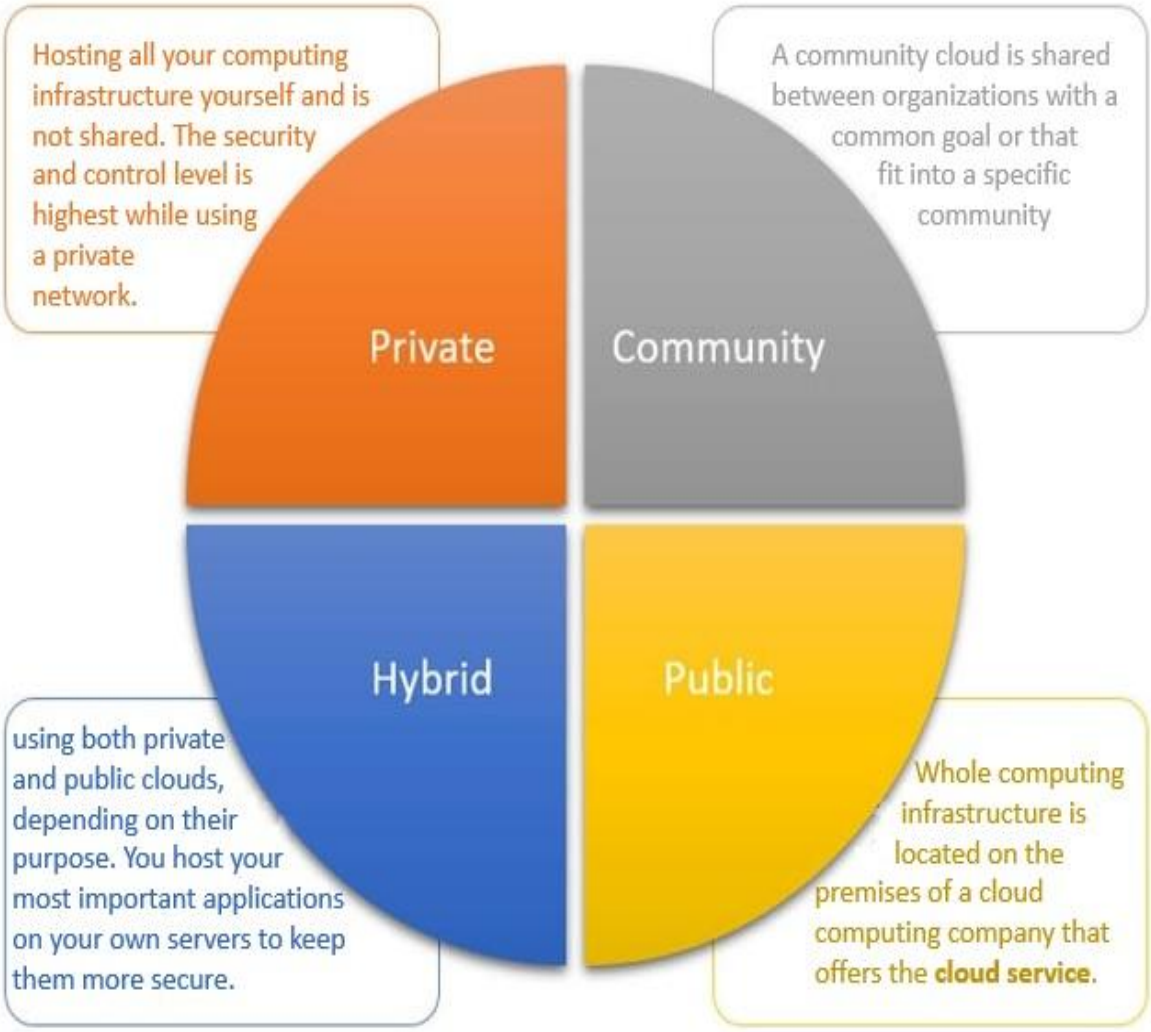


Fig 1.6 Cloud Computing types

## 1.2 Problem Statement

We are adapting technologies that require less manual work like hand written heavy binders to store the data of a library or a restaurant , we are without a doubt spending innumerable hours settling on critical choices with problematic information. In any case we are spending a lot of time on managing the data by

writing the transaction, orders details on a binder, “Restaurant Management System(RMS)” will help us with all that which urgently give us an opportunity to bloom our business.

This intends for staying away from paper-work. Setting aside the cash, time, energy etc, boosting benefit & providing greater security. The project RMS is created to deal with the café all the more adequately and effectively by mechanizing various operations. This Console Application will help in organizing the data and records efficiently. Connecting to cloud storage will help to keep the data up-to-date without creating a chaos as long programs are not needed to written just to update the changes in the data.

## 1.3 Objectives

1. To understand the basics of .NET Framework, C# and OOPS Concepts.
2. To understand Exception Handling, Database Fundamentals, SQL Services
3. To understand the need of Testing, Cloud Concepts.
4. To make a Restaurant Management System using C#, ADO.NET, SQL Server.

## 1.4 Organization

i. The introduction and basic concept used in the project design was discussed in Chapter 1. This chapter contains the project's objectives and methods.

ii. In Chapter 2, a literature review is presented, which contains a number of academic articles on facial recognition that were used to equate our findings to those of others.

ii. System Development is addressed in Chapter 3, which covers programme and hardware configuration, as well as front end and back end systems and their capabilities.

iv. Performance Analysis is shown in Chapter 4 using device screenshots.

v. The project's conclusion and future scope are outlined in Chapter 5.

# CHAPTER - 2

# LITERATURE SURVEY

## 2.1 Difference Between C# and .NET

| S.No | C# | .NET |
|---|---|---|
| 1. | It is a programming language | It is a framework on which language is built. |
| 2 | It is also created by Microsoft after C and C++. | It is created by Microsoft and is Network Enabled Technology.. |
| 3. | It is flexible and very easy to use than Java and C++ | It supports many programming languages and contains libraries of the languages that they will use. |
| 4. | It's vast features allow the developers to create a good number of projects and applications. | It's RunTime Environment is CLR, which is Common Language Runtime. |

Table 2.1 C# and .NET

In paper[1][2][3], Developers write test cases alongside standard code in unit testing, which is a common procedure. Automation systems like JUnit for Java have popularised this approach by allowing unit test suites to be run frequently and automatically. Regardless of how unit testing is perceived in practise, software engineering researchers see room for innovation and are investigating innovative strategies such as automatic unit-test generation. We used a global online marketing research tool to perform a survey of 225 app developers, covering various programming languages and 29-countries, in order to match such research with the needs of practitioners. The results of the survey show that unit testing is an integral part of software production and that there is a need for further research into unit testing automation. The findings assist us in identifying areas of interest for which additional testing is needed (e.g., unit test maintenance), as well as providing insight into the suitability of online marketing research tools for software's enginering survey.

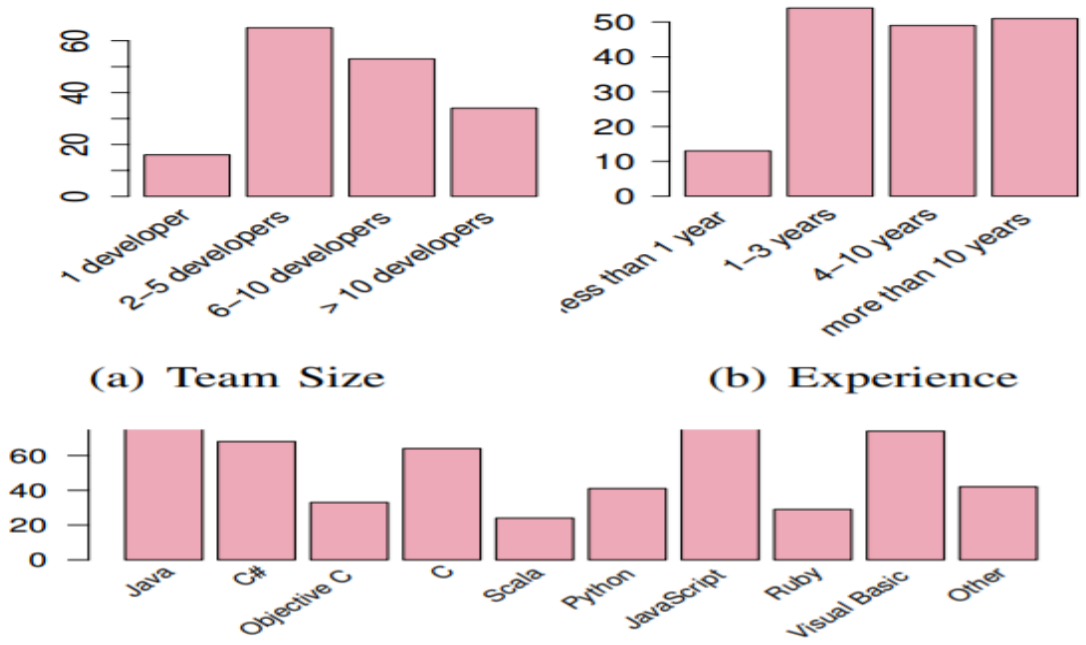


Fig 2.1 Languages and team size for testing

Reasons that developers write Test Cases:-

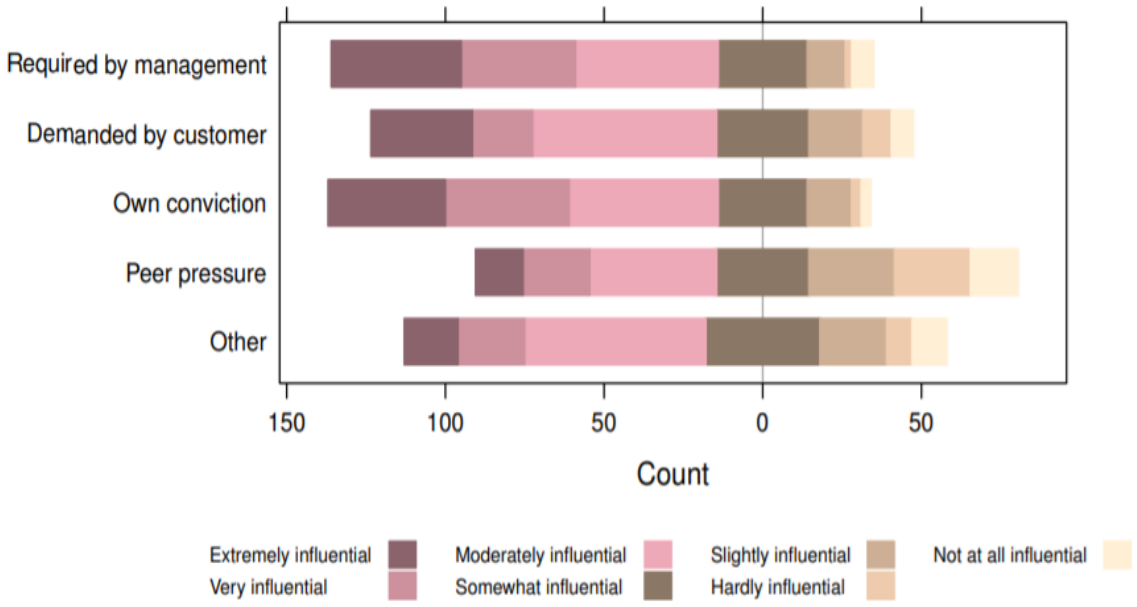


Fig 2.2 Need of Unit Testing

In paper[4][5][6], Dynamic-resource distribution and re-allocation are critical in a cloud computing system for meeting volatile demands and, essentially, contributing to investment's return. We look at how this mechanism works in the sense of distributed clouds, which are platforms that allow application developers to lease geographically distributed services selectively. The key problems inherent in the resource allocation mechanism specific to distributed clouds are highlighted and categorise in this report, which provides a step-by-step view of the process from the initial modelling phase to the optimization-phase.

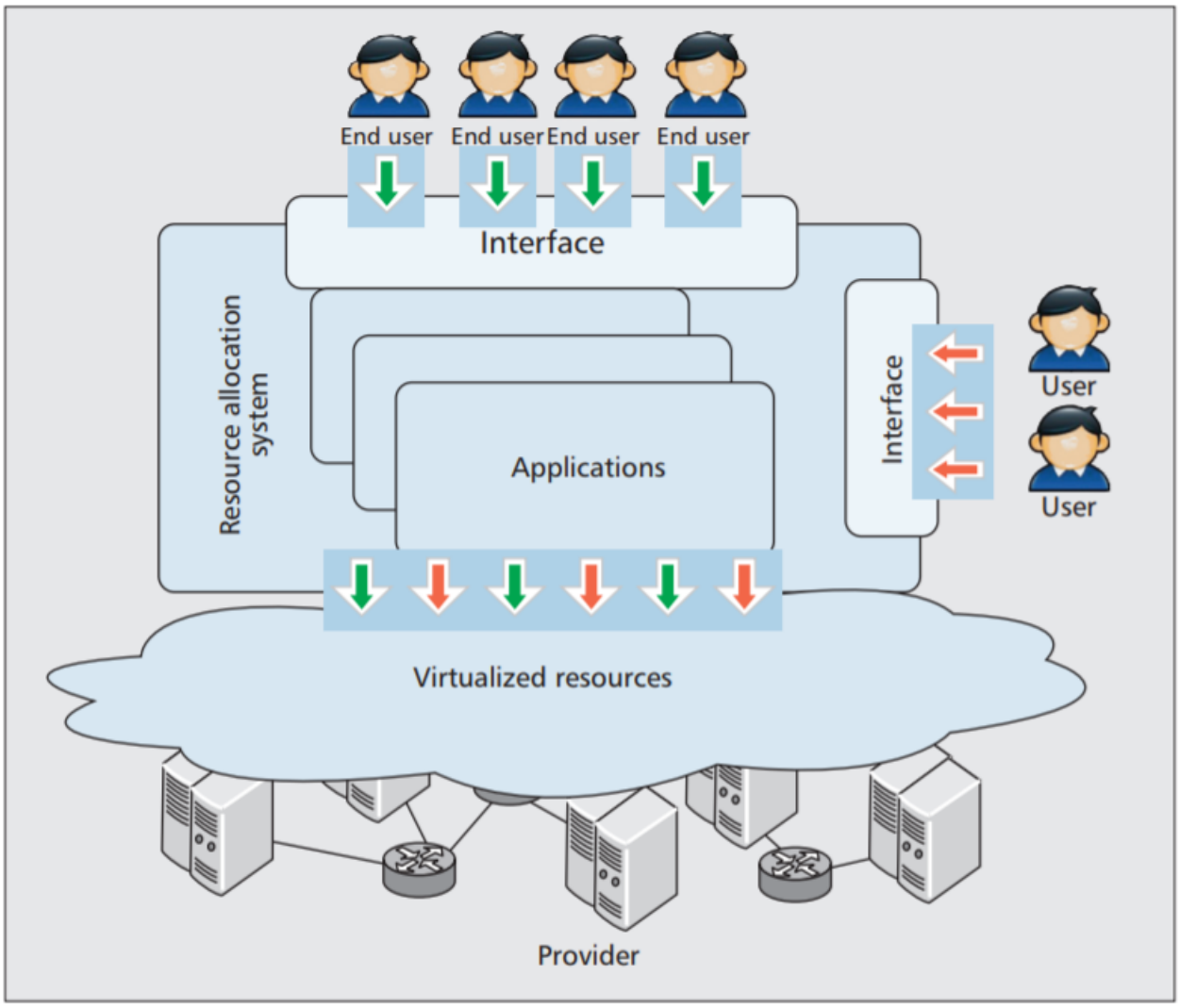


Fig 2.3 Cloud Computing system's Architetcture

In paper[7][8], we discussed about survey on unit testing.

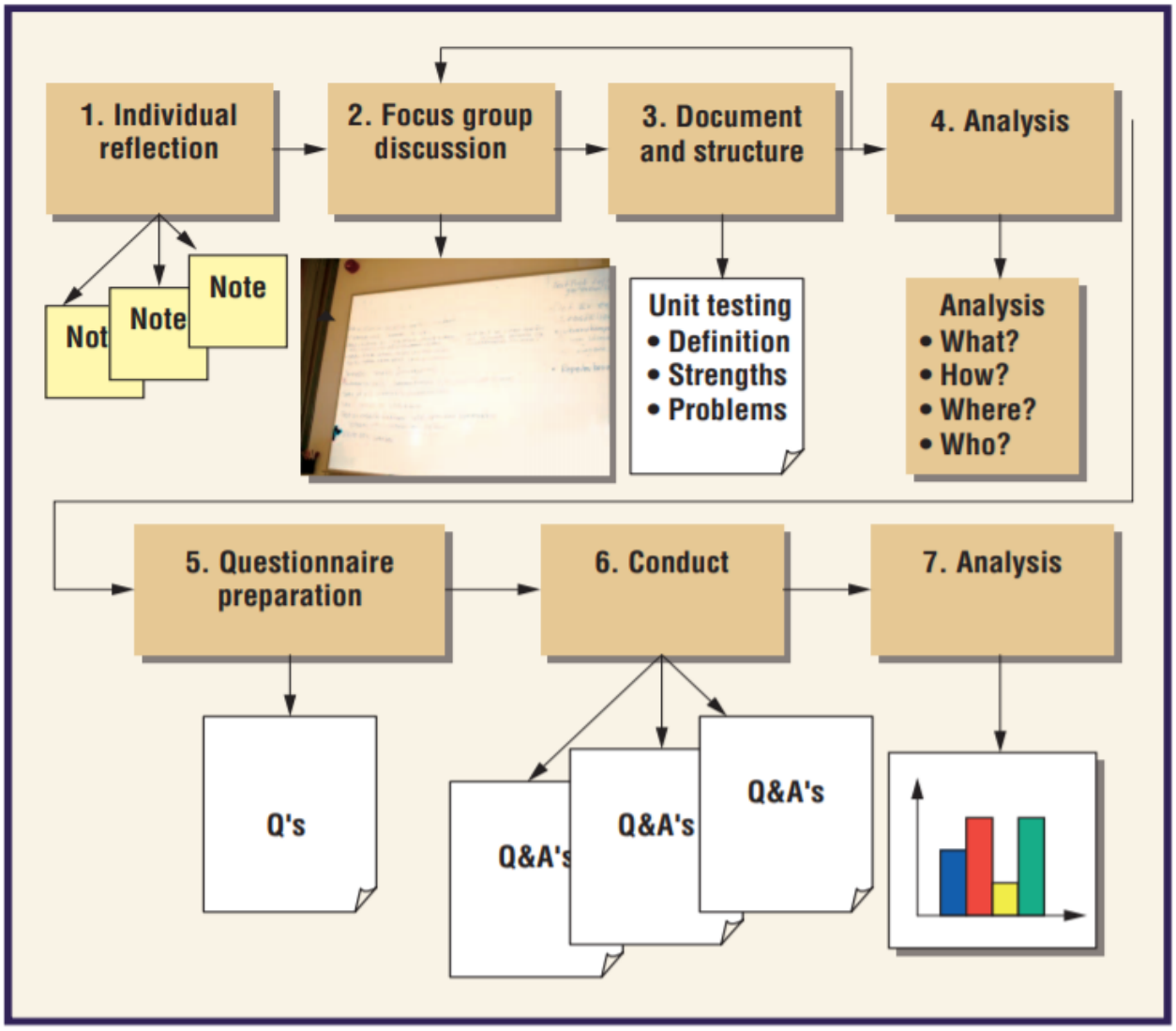


Fig 2.4 Overview of Survey Methodology

In paper [9][10], different types of cloud computing its architecture and applications are mentioned. Types of cloud providers:-

1. Software as a Service (SaaS).
2. Platform as a Service (PaaS),
3. Infrastructure as a Service(IaaS).

These are the three basics types of cloud providers we also have other different types of cloud providers which we can discuss on some other paper.

Applications of cloud:-

i. Client can use its application from any part of world.

ii. Cut the cost of Hardware.

iii. Corporations can rely on it.

iv. It cut the IT support cost for corporation.

In paper [10][12], Cloud security is discussed

Fig 2.5 Phases of cloud security

Some Limitations of cloud computing:-

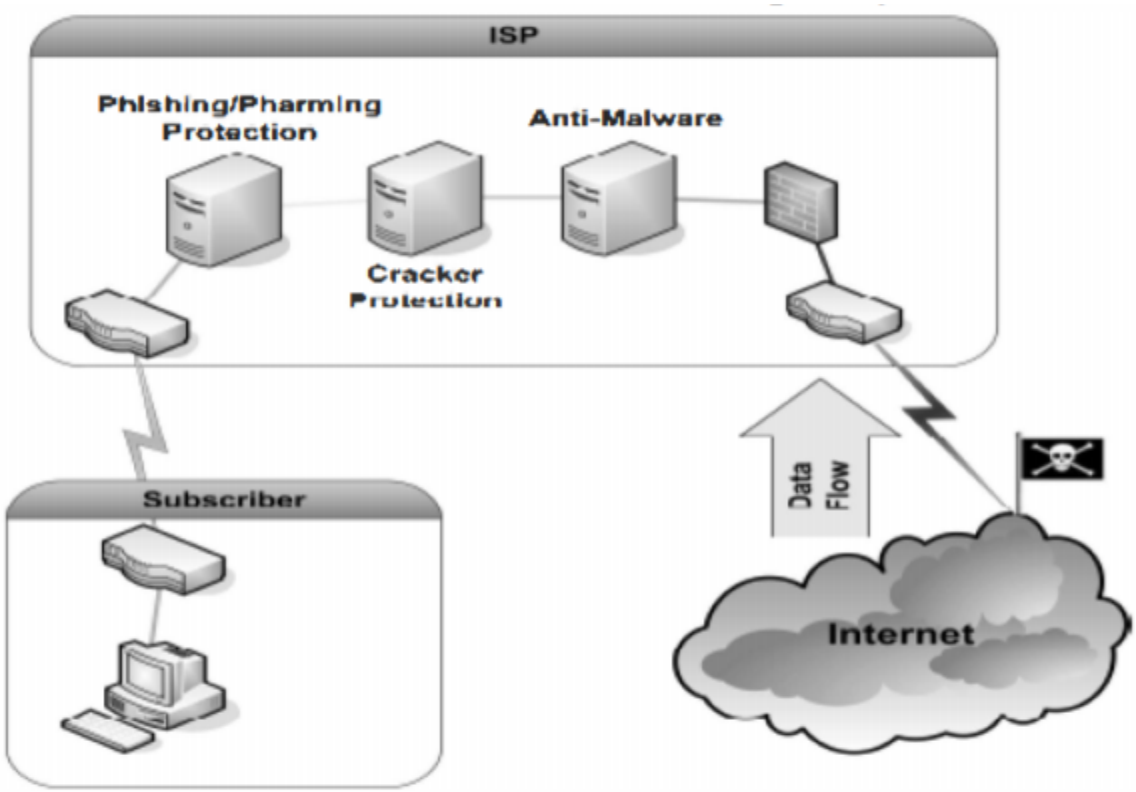


Fig 2.6 Cloud computing limitations

# CHAPTER - 3

# SYSTEM DEVELOPMENT

## 3.1 Programming Languages

### 3.1.1 C# or C Sharp

C# is articulated "C-Sharp".

It is an item arranged programming language made by Microsoft that sudden spikes in demand for the .NET Framework.

C# has roots from the C family, and the language is near other mainstream dialects like C++ and Java.

The principal rendition was delivered in year 2002. The most recent form, C# 8, was delivered in September 2019. C# is utilized for:

- ❏ Portable applications
- ❏ Work area applications
- ❏ Web applications
- ❏ Web administrations
- ❏ Sites
- ❏ Games
- ❏ VR
- ❏ Data set applications
- ❏ Also, a whole lot more!

Why is C # used?

It is one of the most widely used languages in the world. It is simple to learn and use. It has a lot of love from the media. C # is a target language for systems that offers transparency and encourages code reuse, lowering implementation costs. Since C # is more closely related to C, C ++, and Java, it is simpler for the framework to move from C to C # and vice versa.

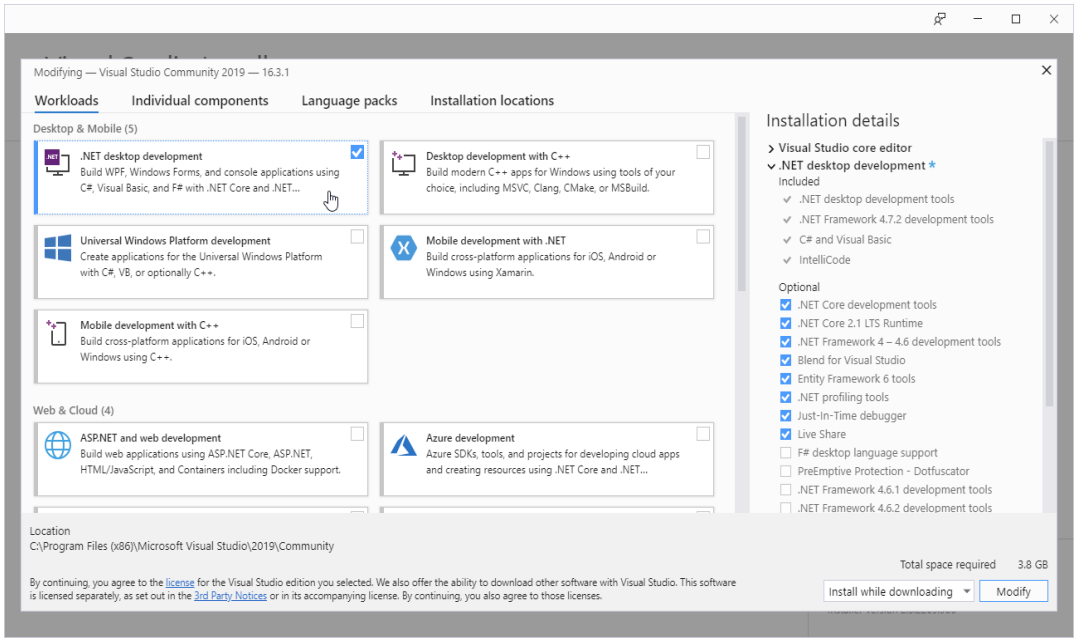


Fig 3.1 Visual Studio start page

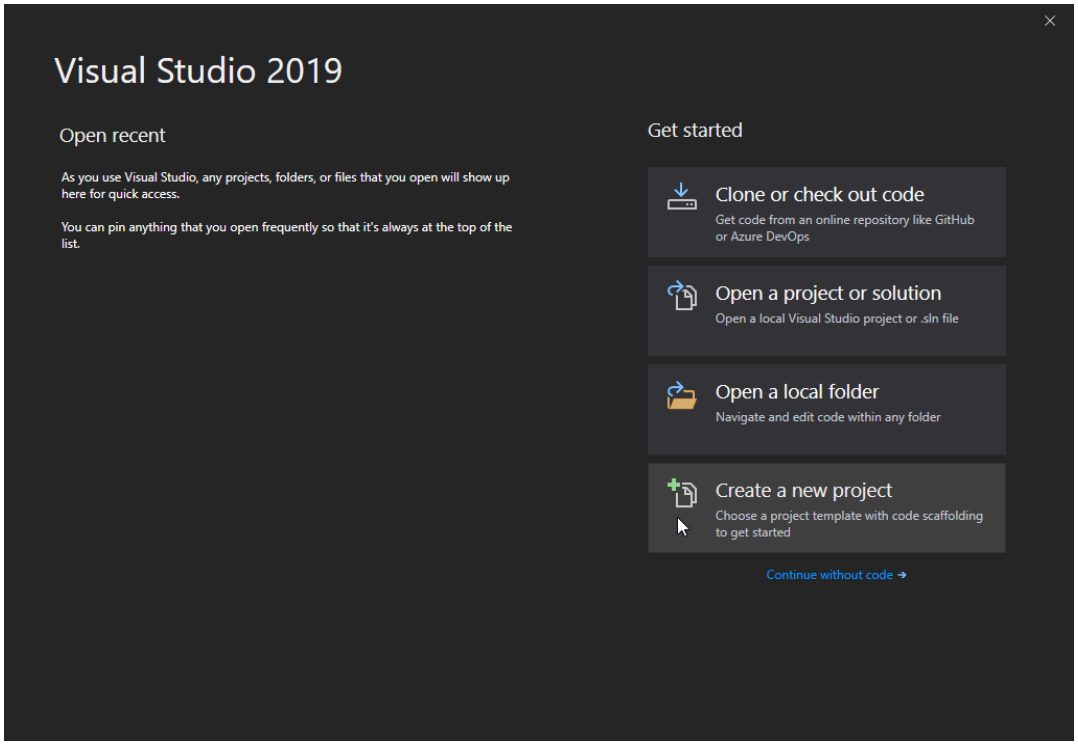


Fig 3.2 Create a project in Visual Studio

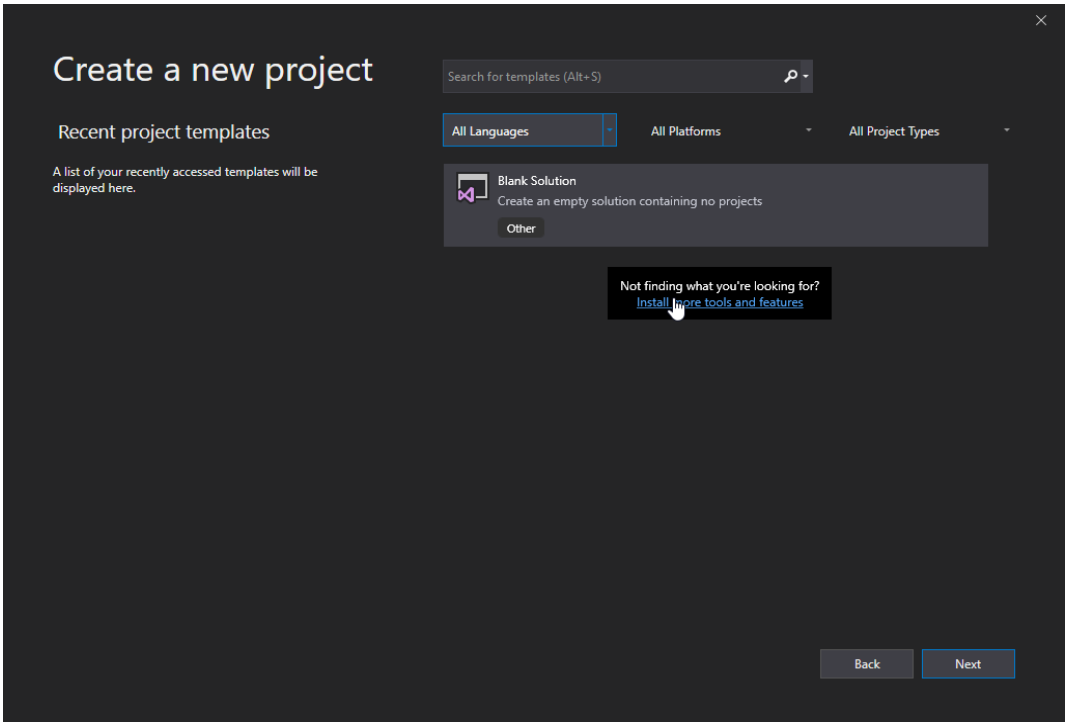


Fig 3.3 Finding languages and frameworks in Visual Studio

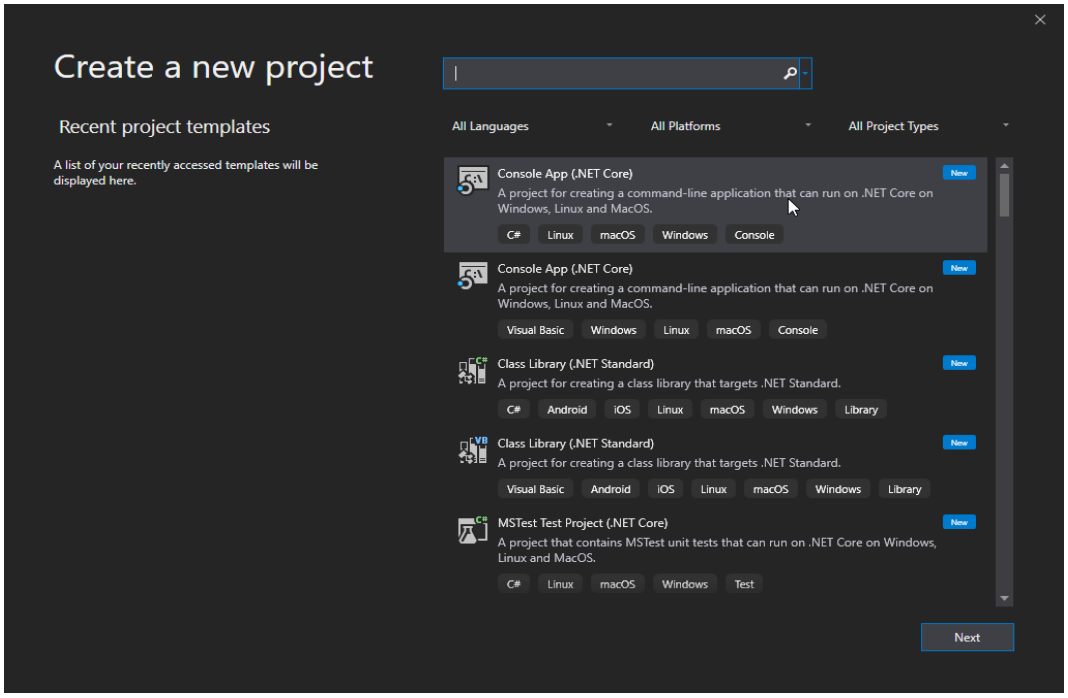


Fig 3.4 Creating Console Application in Visual Studio

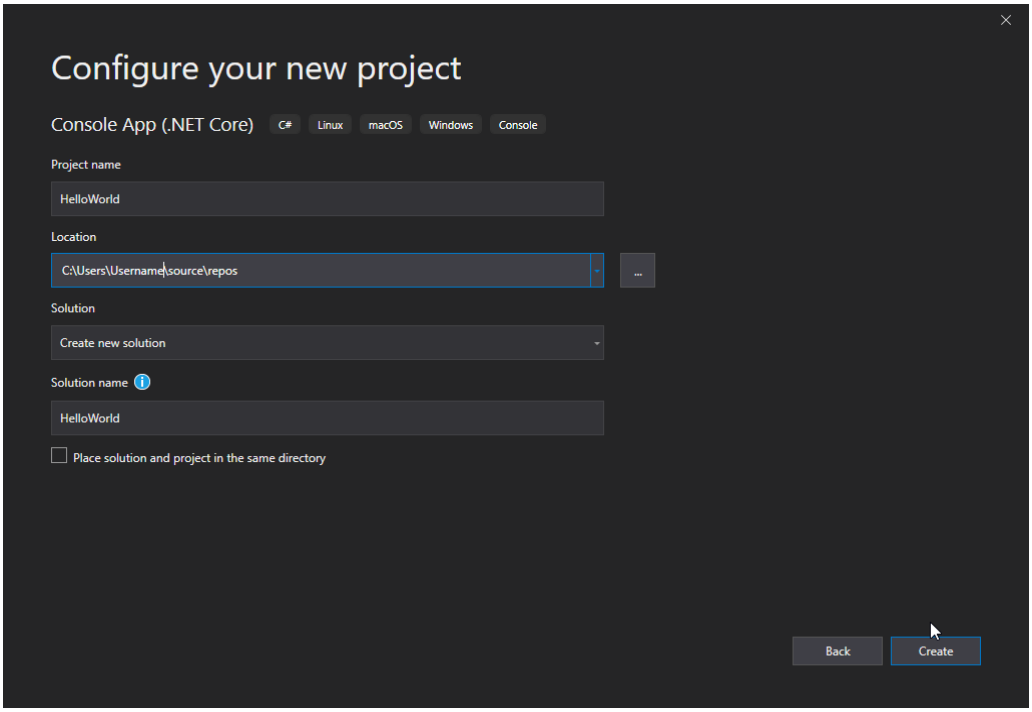


Fig 3.5 Naming a Console Application

### 3.1.2 SQL

Structured Query language abbreviated as SQL.

**How can SQL respond?**

- ❏ SQL helps to store data in a database
- ❏ It can help to get back the information from database
- ❏ We can change records in a database
- ❏ We can delete data in a database
- ❏ Can relate various data's to each other.
- ❏ It can set authorization on tables and systems.

## 3.2 Libraries and Frameworks used

### 3.2.1 .NET Framework

It is a software framework that was designed and developed by the company. The first version of the.Net platform, version 1.0, was released in 2002. In simple terms, it is a

virtual machine for compiling and running programmes written in various languages such as C#, VB.Net, and others.

Form-based software, Web-based applications, and Web services are all built with it. On the, you can choose from a number of programming languages. The most common versions of the Net framework are VB.Net and C-sharp. It's used in building apps, among other platforms. It has a variety of features and even adheres to industry norms.

**Basic Component Stack and Architecture of .NET**

The fundamental architecture of is made up of the first three components from the bottom. After that, Microsoft added more modules to the Net platform, which was released in 2005. The following is the Net Framework:

Kinds of Applications : Mainly the applications which are underlying .Net system is partitioned into the accompanying three classifications :

- WinForms : Form – Based applications are considered under this classification. In straightforward terms, we can say user-based applications goes under this winforms class.
- ASP.NET : ASP.Net is a structure for web and it gives the amazing coordination of HTML, CSS and JavaScript which makes it valuable to foster the web applications, sites and web administrations.
- ADO .NET : It includes applications that operate with data like MS SQL Server, Oracle and so forth comes. It predominantly comprises of classes that can be utilized to interface, recover, embed and erase information.

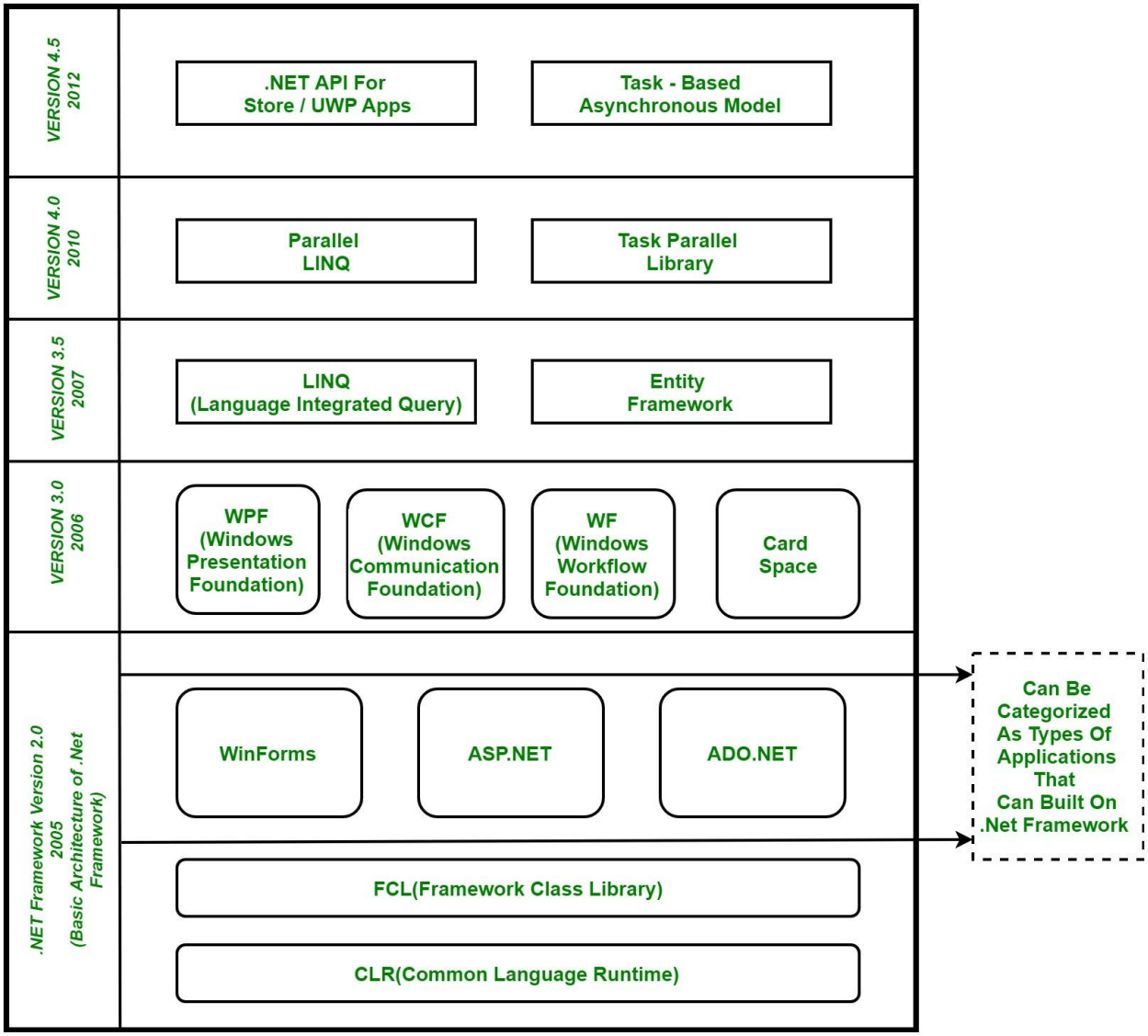


Fig 3.6 Architecture of .NET

## 3.3 Proposed System

The aim of this paper is to describe the Restaurant Management System console programme implementation. The project entails the creation of a restaurant management scheme. The user can enter information about the restaurant, such as its name, status of online orders, menu, and launch date. This restaurant's information is saved in the archive. The database is queried for all restaurant information, which is then shown on the computer. A consumer should look for a restaurant based on

its cuisine. This Console Application will help in organizing the data and records efficiently. Connecting to cloud storage will help to keep the data up-to-date without creating a chaos as long programs are not needed to written just to update the changes in the data.

**Use-Case Diagram:-**

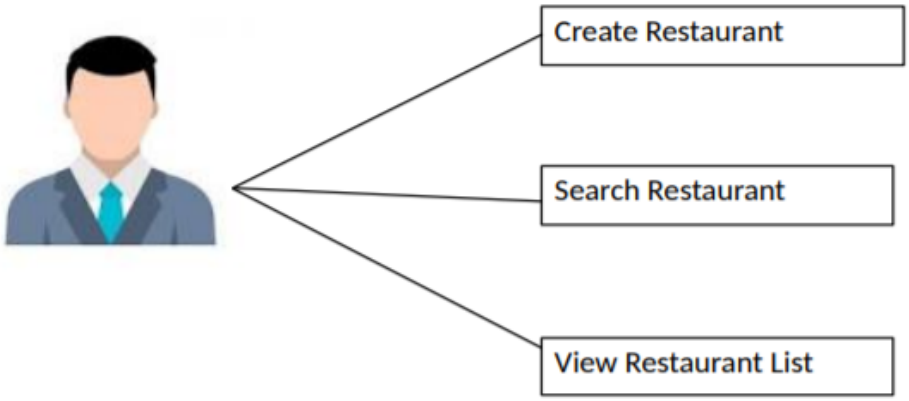


Fig 3.7 Use-Case Diagram of Proposed Project

**System Diagram:-**

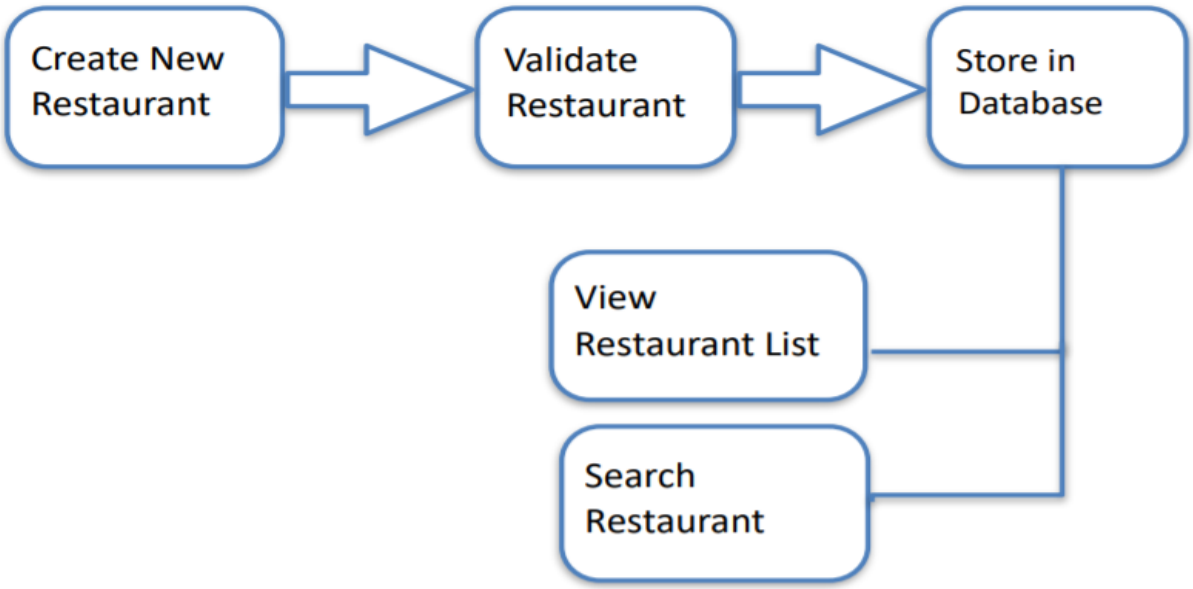


Fig 3.8 System Diagram of Proposed Project

**Technical Guidelines:-**

1. Application Architecture

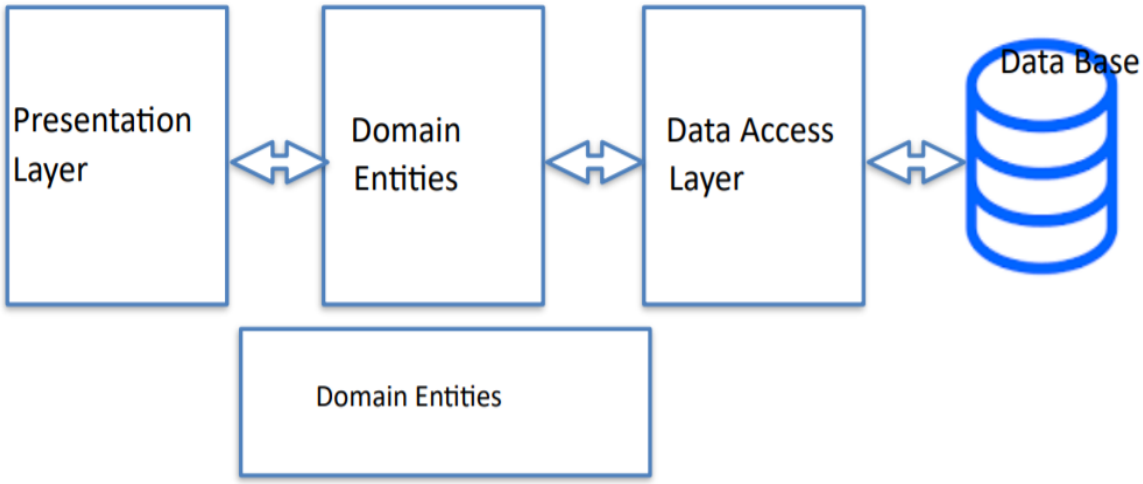


Fig 3.9 Application Architecture of Proposed Project

2. Database Schema

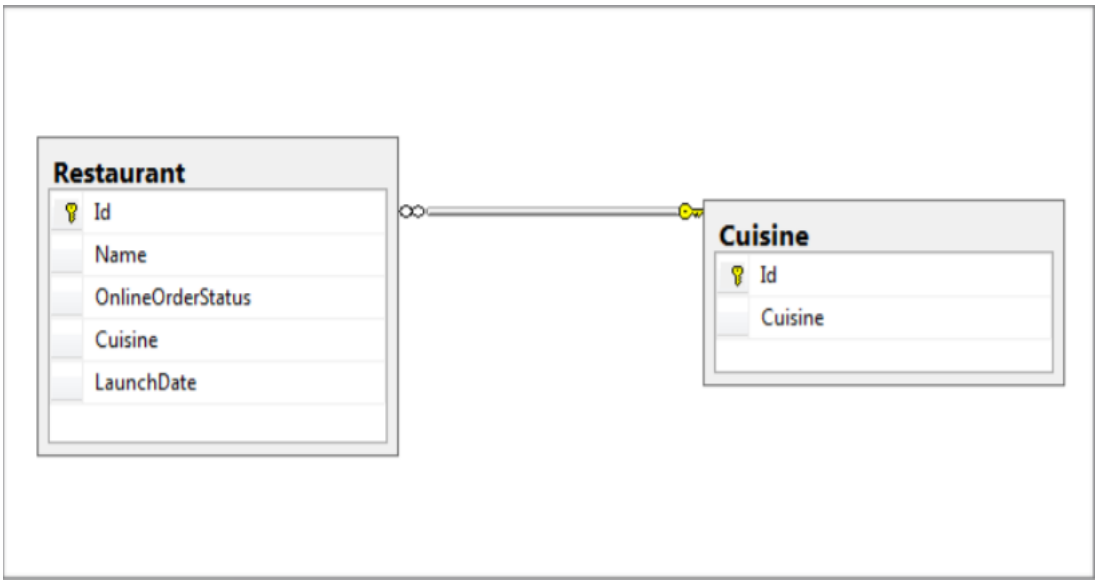


Fig 3.10 Database Schema of Proposed Project

# CHAPTER - 4

# PERFORMANCE ANALYSIS

## 4.1 Flow of Project

### 4.1.1 Steps for Creating Restaurant:-

1. The programme is started by the user.
2. The website appears as in the image below. This is the home page by chance.

Fig 4.1 Start Page

3. When the user selects 1 in the programme, the application will collect the information for the restaurant as displayed.

Fig 4.2 Details from Restaurants

4. The programme verifies restaurant information and saves the information to a folder.

### 4.1.2 Steps for Searching Restaurant:-

1. Step 1 and 2 are same as above.

2. When the user selects option 2, the programme prompts for a cuisine id and, if one is detected, retrieves restaurants that serve that cuisine from the database, as seen below.

Fig 4.3 Selecting Cuisine from Restaurants

3. Otherwise, the message "restaurant not found" appears, as seen below.

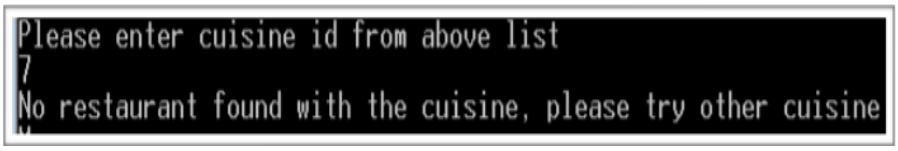


Fig 4.4 Selecting Cuisine id

### 4.1.3 Steps for Viewing Restaurant List:-

1. Step 1 and 2 are same as above.

2. When the user selects option #3, the programme can pull a restaurant list from the database and view it as shown below when the data is available.

Fig 4.5 Viewing Restaurants

3. Otherwise it displays restaurant list is empty as shown below

Fig 4.6 Restaurant List

## 4.2 Solution Structure

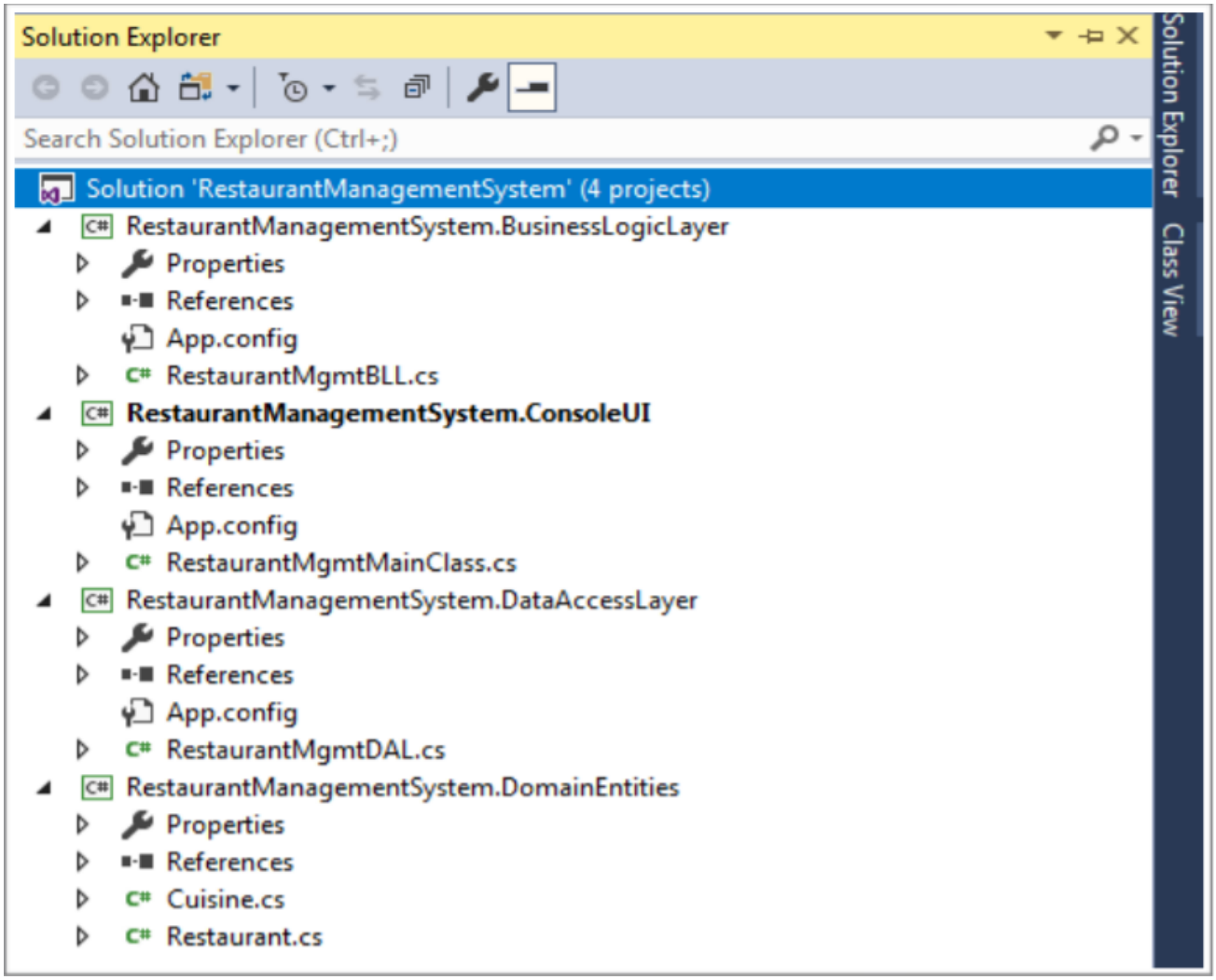


Fig 4.7 Solution Structure in Visual Studio

## 4.3 Domain Entities

1. Create a Restaurant domain entity class.
2. Fill in the blanks with the properties mentioned below.

| Class | Property | Data Type |
|---|---|---|
| Restaurant | Id | Int |
| | Name | String |
| | OnlineOrderStatus | Boolean |
| | Cuisine | Int |
| | LaunchDate | DateTime |

Fig 4.8 Properties of Restaurant

3. Create a class named CuisineType domain entity class.
4. Add the following properties.

| Class | Property | Data Type |
|---|---|---|
| CuisineType | Id | Int |
| | Cuisine | String |

Fig 4.9 Properties of CuisineType

## 4.4 Business Logic Layer

Create a static class named RestaurantMgmtBLL class and add the following methods

| Method | Solution |
|---|---|
| public static bool CreateRestaurant(Restaurant restaurant) | Creates new restaurant |
| public static IEnumerable<DataRow> ReadRestaurantList() | Retrieves restaurant list |
| public static IEnumerable<DataRow> ReadCuisineList() | Retrieves cuisine list |
| public static IEnumerable<DataRow> ReadCuisineList() | Searches restaurants with cuisine |

Table 4.1 Business Logic Layer

## 4.5 Data Access Layer

Create a static class named RestaurantMgmtDAL class add the following methods

| Method | Purpose |
|---|---|
| public static int InsertRestaurant(Restaurant restaurant) | Inserts restaurant record in database |
| public static DataTable SelectCuisineList() | Retrieves cuisine list from database |
| public static DataTable SelectRestaurantsByCuisine(int cuisine) | Retrieves restaurants by cuisine |
| public static DataTable SelectRestaurantList() | Retrieves all restaurants from database |

Table 4.2 Data Access Layer

# CHAPTER - 5

# CONCLUSION

## 5.1 Conclusion

We tried our hardest in our project dubbed "RESTAURANT MANAGEMENT SYSTEM" to meet all of the restaurant's criteria. The project is going smoothly because it is easy and adaptable. Our project's key benefit is that it is easy to use, which draws a large number of people. A inexperienced consumer can comfortably operate it. Various kinds of companies can use our app. By computerising meal ordering, billing, and inventory monitoring, the “Restaurant Management System(RMS)” assists the manager in managing it more accurately. The machine performs the operation and saves the information. This data will be used to produce reports that will assist the management in making the best strategic choices for the restaurant. The manager, for example, will determine if more waiters and chefs are needed based on the no. of customers for a specific time. When this project is completed, it will eliminate all security concerns. There will also be a fast and safe authentication protocol for maintaining documents. Since it immediately pulls info. about the client by the data-base on recent visits, data entry is quick and easy. As a result, our programme will undoubtedly be a fruitful stepping stone in the process of replacing the old manual way of keeping safe documents.

This Console Application will help in organizing the data and records efficiently. Connecting to cloud storage will help to keep the data up-to-date without creating a chaos as long programs are not needed to written just to update the changes in the data.

## 5.2 Future Scope

1. A payment method can be added in future.
2. We can make a web application in future.
3. It can be made more user friendly.
4. We can accommodate various system of taxes.
5. It can be made translational and can support many languages.

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