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ADVANCED WEB PROGRAMMING

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SYLLABUS

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INTRODUCING .NET

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THE .NET FRAMEWORK

- **.NET** - a cluster of technologies.

- designed to help developers build a variety of different types of applications.

- **Console Application**

- **Web Application**

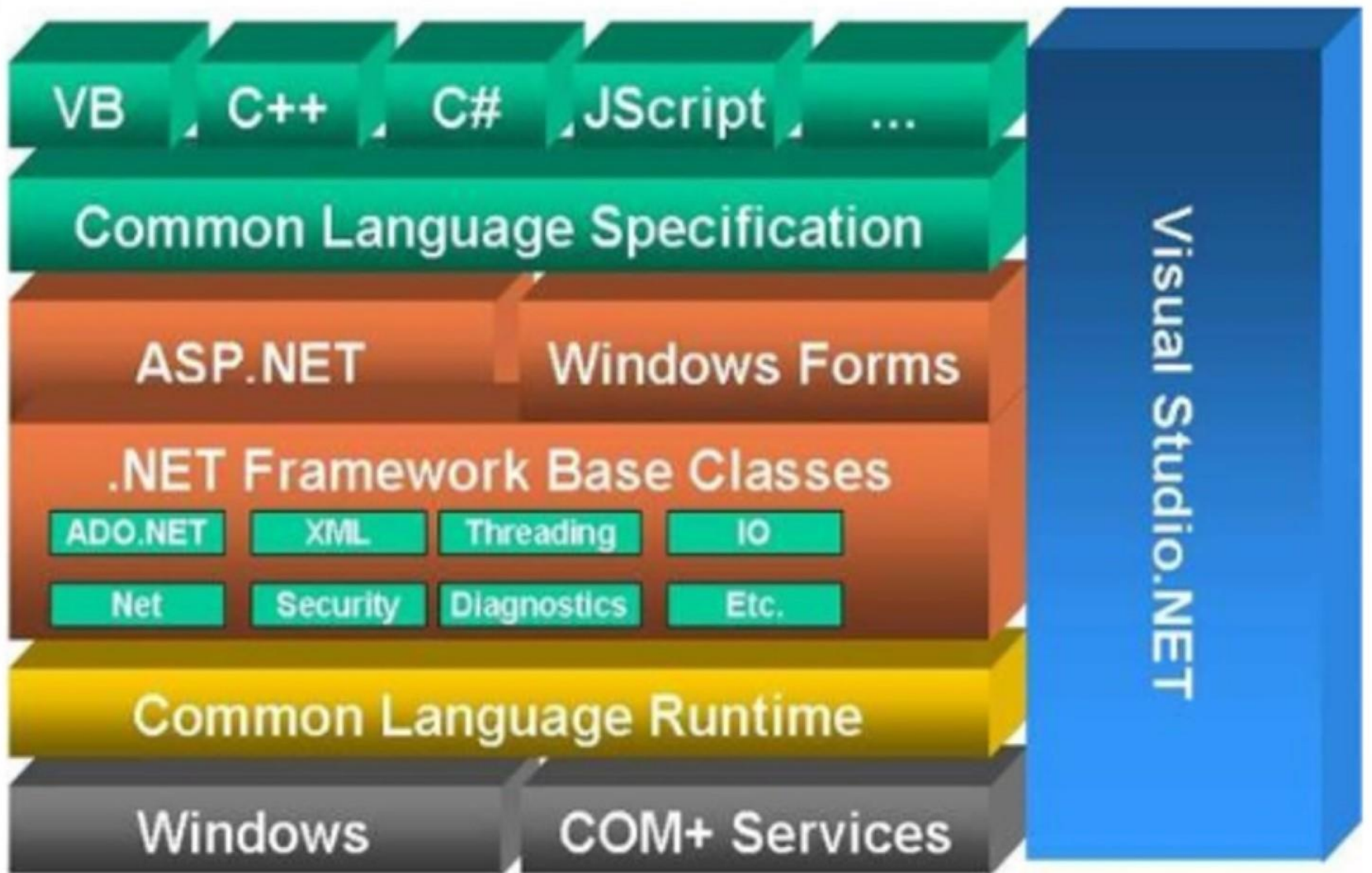
- **Windows Application**

- **Web services, Web API, WPF**

- **.NET Framework** is a software development framework developed by **Microsoft** which supports many languages like C#, Visual Basic, F#, JScript .NET (a server-side version of JavaScript), J# (a Java clone), and C++.

- **One Solution**





THE COMMON LANGUAGE RUNTIME

- Run time environment known as **Common Language Runtime (CLR)**
- To execute the programs written in different languages.
- Manages the execution of programs – Managed Code
- CLR also provides services like security, memory management, exception handling, thread management etc



THE COMMON LANGUAGE RUNTIME

○ The implications of the CLR

○ *Deep language integration :*

- The CLR makes no distinction between different languages.

○ *Side-by-side execution:*

○ *Fewer errors:*

- Whole categories of errors are impossible with the CLR.
- For example, the CLR prevents many memory mistakes that are possible with lower-level languages such as C++.



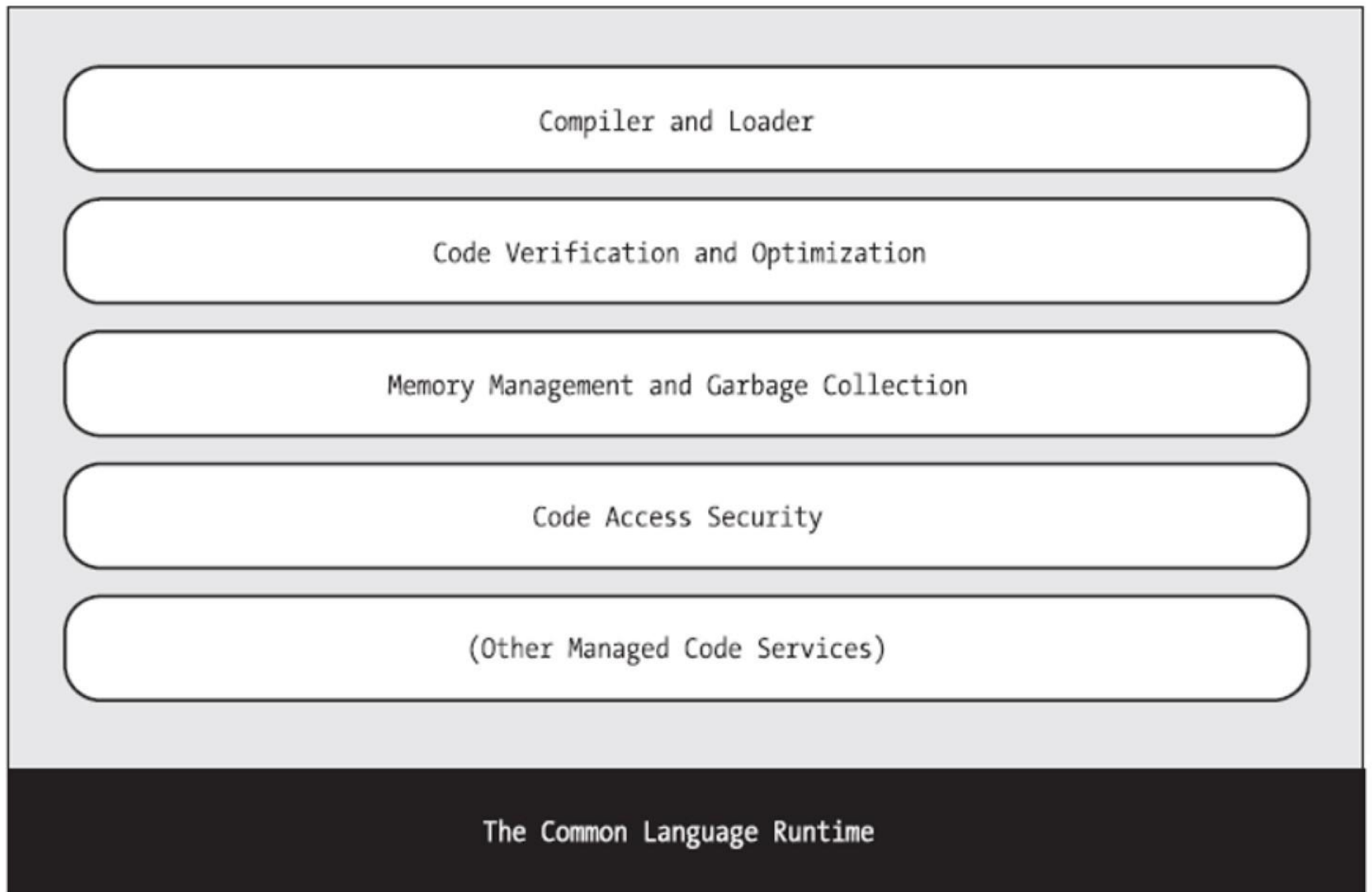


Figure 1-4. *The .NET Framework*

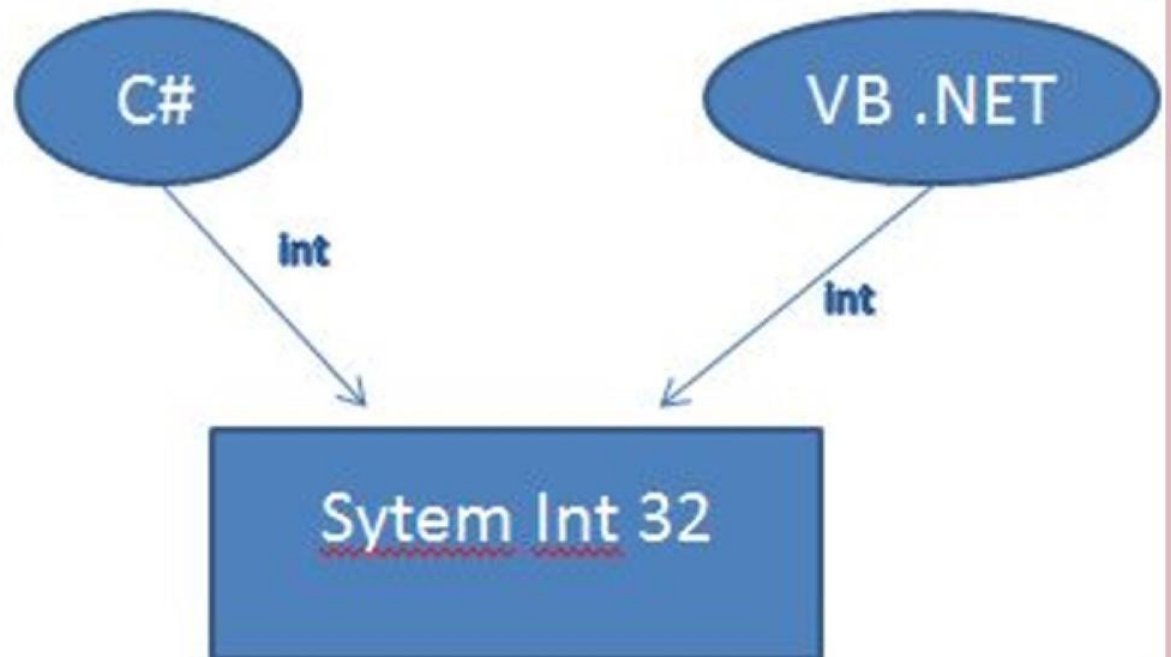
COMMON LANGUAGE SPECIFICATION

- Helps to make .NET languages compliant to .NET framework.
- Rules / Requirements



COMMON TYPE SYSTEM

- Standardizes the data types of all programming languages using .NET under the umbrella of .NET to a common data type for easy and smooth communication among these .NET languages.
- IL understandable language
- Language Interoperability



C#

```
static void Main(string[] args)
{
    int a;
    a = int.Parse(Console.ReadLine());
    Console.WriteLine("Value of a : " + a);
}
```

VB

```
Sub Main()
    Dim a As Integer
    a = Integer.Parse(Console.ReadLine())
    Console.WriteLine("Value of a : " & a)
End Sub
```



.NET CLASS LIBRARY

- **NET Framework** includes a large class library called **Framework Class Library** which provides **language interoperability**.
- ADO.NET (the technology for creating database applications) and Windows Forms (the technology for creating desktop user interfaces).
- System namespace



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ADO.NET
Data Access

Web Forms

Windows Forms

XML

File I/O

(And So On)

Core System Classes (Threading, Serialization, Reflection,
Collections, and So On)

The .NET Class Library

Createu

Create-



- **ASP.NET:** the engine that hosts **the web applications** you create with .NET, and supports almost any feature from the .NET class library. It also includes **a set of web-specific services**, like secure authentication and data storage.
- **Visual Studio:** This optional development tool contains a rich set of productivity and debugging features.



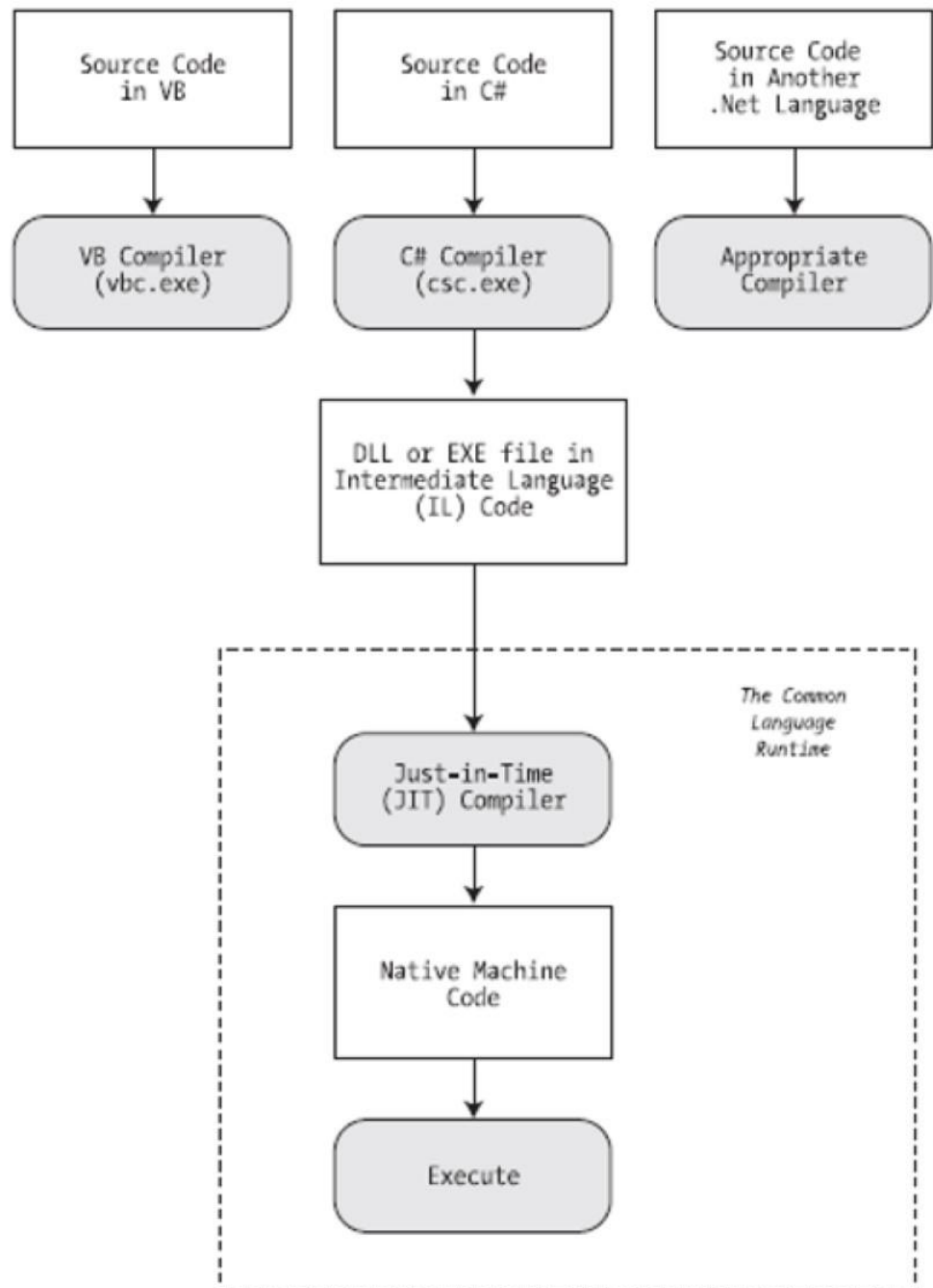
MSIL OR IL

- All the .NET languages are compiled into another lower-level language before the code is executed.
- This lower-level language is the **Common Intermediate Language** (CIL, or just IL).
- **Common Type System (CTS)**- which defines the rules for data types such as strings, numbers, and arrays that are shared in all .NET languages
- **Common Language Specification (CLS)** - specifies a set of rules that needs to be adhered or satisfied by all language compilers targeting CLR.



COMPILATION PROCESS

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Figure 1-5. Language compilation in .NET

C#, VB, AND THE .NET LANGUAGES

- C family language
- C# is a new language that was designed for **.NET 1.0**.
- It resembles **Java and C++** in syntax.
- **VB** and **C#** are actually quite similar.
- Though the syntax is different, both VB and C# use the **.NET class library** and are supported by the CLR.
- .NET is a framework not a language



C#

```
static void Main(string[] args)
{
    int a;
    a = int.Parse(Console.ReadLine());
    Console.WriteLine("Value of a : " + a);
}
```

VB

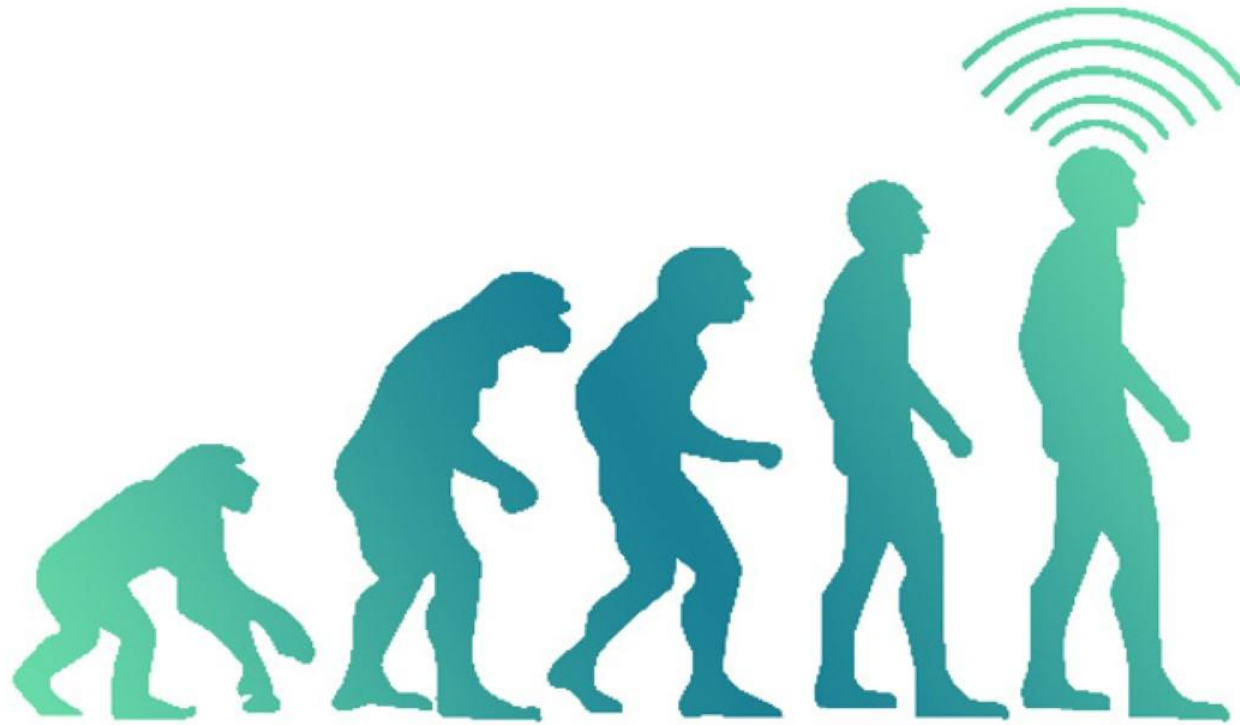
```
Sub Main()
    Dim a As Integer
    a = Integer.Parse(Console.ReadLine())
    Console.WriteLine("Value of a : " & a)
End Sub
```



THE EVOLUTION OF WEB DEVELOPMENT

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A TOUR OF VISUAL STUDIO

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CREATING WEBSITES

○ Creating an Empty Web Application

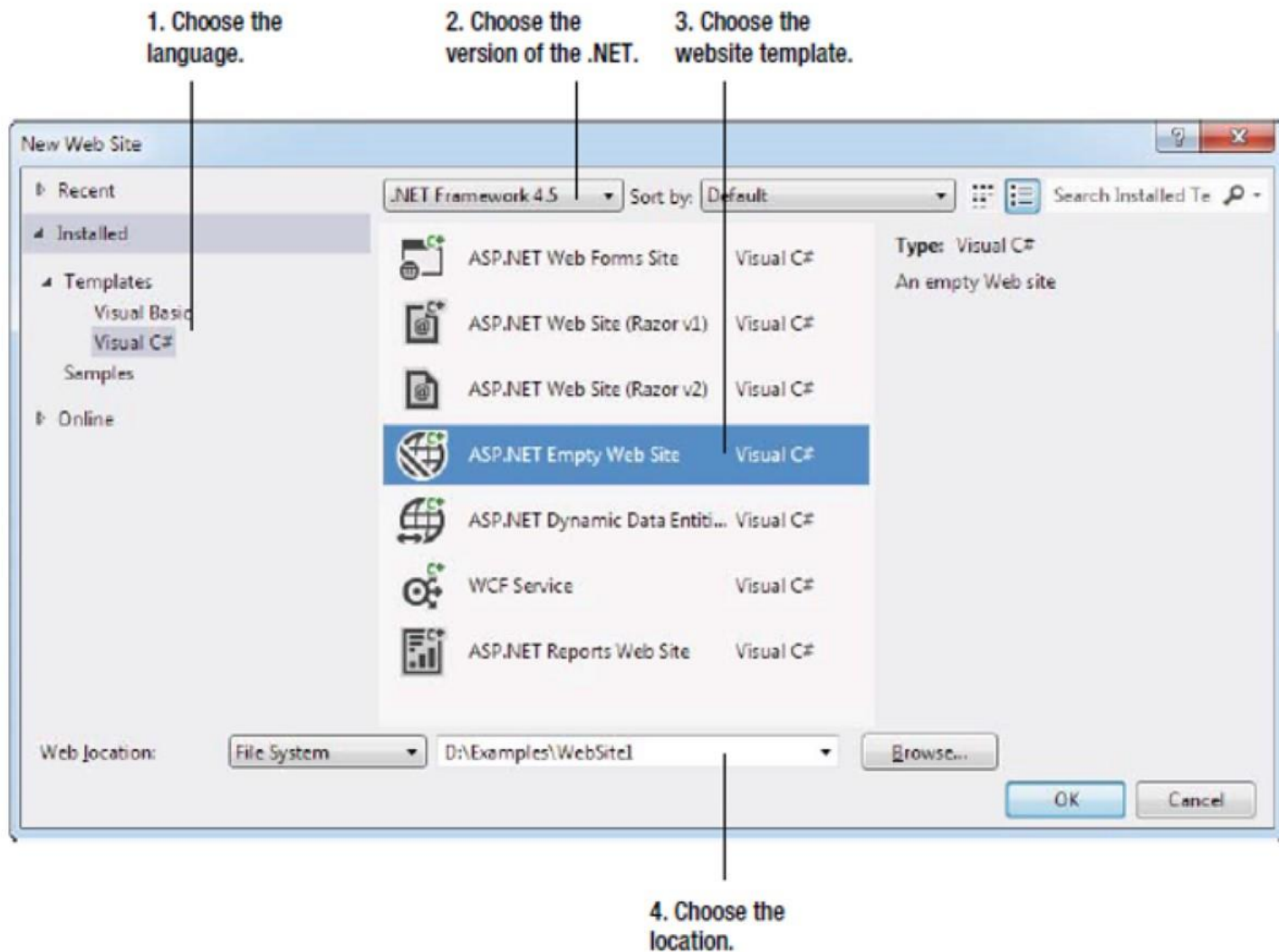


Figure 4-2. The New Web Site dialog box

VISUAL STUDIO

- provides a rich environment where you can rapidly create advanced applications
- **Features of Visual Studio**
- **Page design:** You can create an attractive page with drag-and-drop ease using Visual Studio's integrated web form designer.
- **Automatic error detection:** You could save hours of work when Visual Studio detects and reports an error before you run your application.
- **Debugging tools:** Visual Studio retains its legendary debugging tools, which allow you to watch your code in action and track the contents of variables.
- And you can test web applications just as easily as any other application type, because Visual Studio has a built-in web server that works just for debugging.
- **IntelliSense:** Visual Studio provides statement completion for recognized objects and automatically lists information such as function parameters in helpful tooltips.

