

JAVA Development V/S Microsoft .Net Development Is Really One Better than Other?

Rohit Gupta

Department of Computer Science and Information Technology
Dronacharya College of Engineering, Gurugram, Haryana, India

Abstract: *As the trend of recent programming languages and technologies are being released occasionally impacting numerous domains. it is a tricky task for brand new developers and professionals to settle on their career path. now then there is one question that comes in everyone's minds – "Is One Language Really Better Than Other?". Similarly, we will have a look at two of the foremost known development environments "JAVA" and ".Net" and can try and answer our question by looking a better look on both.*

Keywords: JAVA, .Net

I. INTRODUCTION

Both JAVA and Microsoft .NET are very commonly known and are often considered as an immediate competitor of one another. They both offer some unique benefits and enable large scale application development including building software, websites and web applications and enhances the desktop & server-side application development. But choosing one amongst the technologies for all sorts of applications isn't an easy decision as a .NET based environment may be a far better choice for an enterprise grade application which demands high level of security and data integrity, whereas a Java based environment would be a more robust choice for cross platform operability.

II. JAVA DEVELOPMENT

2.1 History

It was originally designed for interactive television, but for that time it was too advanced for digital cable television. The history of Java team members also referred to as Green Team, initiated this project to develop a language for digital devices like set-top boxes, televisions, etc. But it was best for internet programming. Later, Netscape incorporated Java. It is developed by Oracle Corporation and designed by James Gosling.

2.2 Architecture

Java Architecture is designed as a collection of components, i.e., JVM, JRE, and JDK [Fig: 2]. It integrates the method of interpretation and compilation and defines the processes that are involved in creating a Java program. Java Architecture is explained by using the subsequent steps:

- Both processes of compilation and interpretation takes place in Java [Fig: 1].
- Java compiler converts the Java code into byte code [Fig: 1].
- After that, with the help of JVM it is converted into machine code. Which is then executed by the machine [Fig: 1].

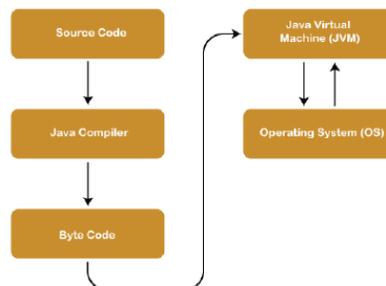


Fig 1: Java Architecture

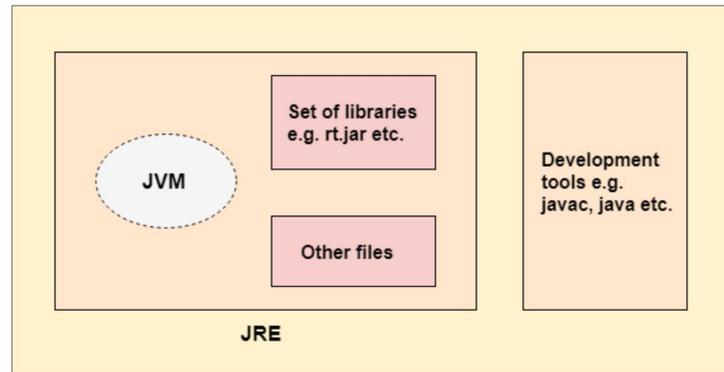


Fig 2: JVM, JRE and JDK

2.3 Applications of Java Programming

Using Java as of today has numerous applications in the tech world. Some of the application domains are mentioned as follows:

- Distributed Applications
- Mobile App Development
- Web-based Applications
- Big Data Technologies
- Cloud-based Applications
- Gaming Applications
- IoT Applications
- Desktop GUI Applications

2.4 Advantages of Java Programming

2.4.1 Simplicity

Java is a simpler programming language as compared to other languages as its syntax is based on C++ language which most developers use as a starting point for their development careers and one of the most important features is automatic garbage collection i.e., unreferenced objects are removed automatically from the memory.

2.4.2 Object Oriented Programming

Java is an object-oriented programming language which is the most practical approach for programming languages and is followed by most languages. OOPS programming enables powerful features such as objects, classes, polymorphism, abstraction, encapsulation and inheritance.

2.4.3 Security

Java is a secure programming language as it avoids using Explicit pointers. And every program works in a virtual machine sandbox. As it separates class packages of local files system and imported from network.

2.4.4 Robust Nature

Java's robust nature is due to its exception handling mechanisms and strong memory management. As discussed before avoiding the use of explicit pointers enable that developer cannot access memory directly.

2.4.5 Platform Independent

Java shines due to its platform independent nature i.e., the compiled code is converted into byte code which can run on any platform, so programmers write the code only once for multiple platforms.

III. MICROSOFT .NET DEVELOPMENT

3.1 History

.NET is an open-source developer platform, created by Microsoft, used for building different types of applications. It was designed to build applications which could run on the Windows platform. Net programming language can be used to develop Forms based applications, Web based applications, and Web services. Microsoft wanted to provide a single platform for any problem. .NET is very popular in the developer community, and it plays a central role in software development industry. The most considered language for programming in .NET is C# (C Sharp) but there are variety of languages to choose from such as F# (F Sharp), Visual Basic.

3.2 Architecture

.NET architecture is based on two components:

3.2.1 Common Language Runtime (CLR)

CLR is the runtime environment provided by .NET. The runtime handles the object layout and manages all references for objects and releases those references when not required. It converts the assembly code from compiler and converts it into machine code using Just in Time Compiler [Fig: 3].

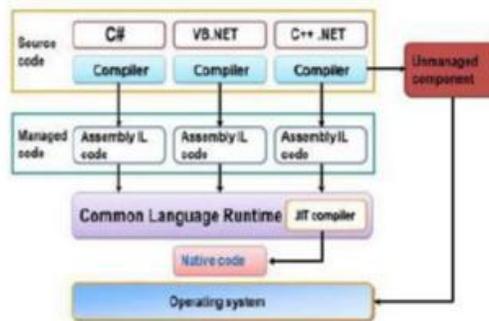


Fig 3: CLR Execution Model

3.2.2 NET Framework Base Class Library

Class libraries are the collections of reusable types which has integration with CLR they are used in performing day to day operations like data type manipulations, database connections and input output operations etc. BCL is a subset of FCL (Framework Class Library) [Fig: 4].

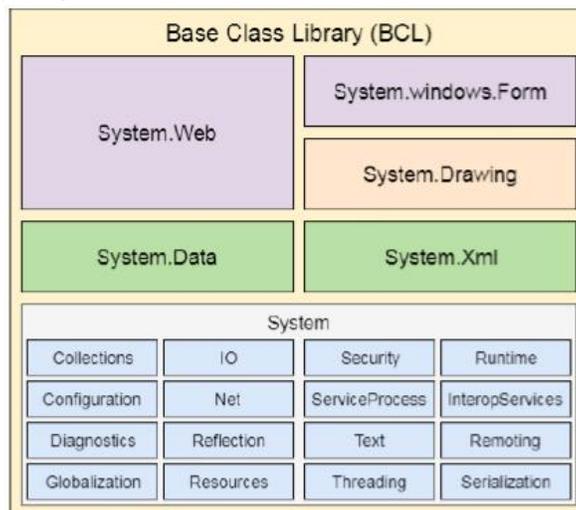


Fig 4: BCL Components

3.3 Applications of .NET

.NET libraries offer support for different types of applications such as:

- Machine Learning Applications
- Mobile App Development
- Web-based Applications
- Cloud-based Applications
- Gaming Applications
- IoT Applications
- Desktop GUI Applications

3.4 Advantages of .NET

3.4.1 Object Oriented

.NET is based on Object-Oriented Programming Module. Object-Oriented Programming Module simplifies by making the code manageable, respond to recurring issues and easier to test. It makes it possible to reuse components and code, thereby saves time and cost of development.

3.4.2 Visual Studio IDE

Visual Studio is an Integrated Development Environment by Microsoft which is designed for building, debugging and publishing applications across various platforms, including Android and iOS. It's one IDE for all .NET application. The IDE comprises debugging and integrated compilation features. The result will be utilized for applications that are supported code written in several languages.

3.4.3 Cross-Platform

.NET code can run on Windows, Linux and OS X thus making it a cross platform environment within which wide development community can contribute. Whether C#, Visual Basic or F# your code will run each of the compatible operating systems. this allows companies to reach numerous platforms staying within the .NET ecosystem.

3.4.4 Deployment & Maintenance

.NET will be installed either as a component of the application you are developing or separately as well. The modular design allows including all the dependencies that you just need. And even the deployment is as simple as copying a file. Another benefit is that you simply can have numerous .NET Core versions running side by side on the very same machine.

3.4.5 Performance

With each released version, Microsoft added some percentages on the performance of the appliance. Paired with the correct database and architecture, .NET framework is the perfect solution for any business which is required to be scaled eventually.

3.4.6 Community

.Net has an outsized community to assist regarding the problems and having many online forums to assist for any queries. There are many companies involved at either the small, medium or large context for .net. There are many resources available which will help to get you started as fast as possible. The beginners in the .Net framework can get the web courses and plenty of other ways of learning the .net framework due to its wide use across the organizations and resources availability.

IV. WHICH IS BETTER?

Up till now we have taken a closer look on each of the technologies and understood what they are based on and how they function with their advantages and applications, but these are not enough to answer the question that which is a better development environment? For that now we must compare them both side by side to see where they shine and try reach a conclusion.

4.1 Differences

Java fetches most syntax from C and C++. Since it is a platform-independent language, you can run Java on various platforms .Net works on a common language infrastructure, supports arrays, type checking, checks variables and garbage collection. Hence, it provides durability, productivity and robustness. Initially, Java was the topmost language with many developers believing that the future of web development relied on Java itself. However, the preference gradually changed after ASP.NET.

4.2 Similarities

4.2.1 Languages

Java works smoothly with Groovy, Clojure, Scala and Kotlin. At the same time, .Net is great with C#, F# and Visual Basic

4.2.2 Environment

Both platforms have their environment. In the .Net application, visual studio is one such IDE. Java comes with four IDEs: Eclipse, IntelliJ IDEA, Oracle NetBeans and Oracle JDeveloper

4.2.3 Portable

Java is recognized for its backward compatibility, which can migrate code between Java platforms. .NET can also run on various versions of the Windows operating system

4.2.4 Heavy Lifting

Both platforms are perfect as enterprise-level technologies. They work fantastically well with high-loaded systems and large-data applications. Both offer reliable solutions for little to large-scale projects.

V. SITUATIONAL CHOICES

When we have certain situations then taking the decision becomes much easier and one can choose between the two technologies such as:

5.1 When to choose JAVA?

- You want an enterprise-grade application
- Seeking Portability & Platform independence
- Your application attracts high user volumes
- 5.2 When to choose .NET?
- Develop web services
- Highly secure application
- Feature-packed, intuitive application with a rich GUI

VI. CONCLUSION

As discussed, we compared both technologies side by side and took a deeper look at the similarities and differences between them. Now finally it is time to answer the question that “Which Development Environment is better than other?”. And the answer is “None”. Both platforms are nearly equivalent in terms of functionality and target the same market audience. The final decision depends on precise development choices, underlying infrastructure, interoperability and end user environment for working.

REFERENCES

- [1]. Java vs .NET: Core Features And Differences Between The Two <https://www.rishabhsoft.com/blog/dot-net-vs-java>
- [2]. Advantages and Disadvantages of Using .NET <https://graffersid.com/advantages-and-disadvantages-of-using-net/>

- [3]. Introduction to Uses of .Net educba.com/uses-of-net/
- [4]. Java (programming language) [https://en.wikipedia.org/wiki/Java_\(programming_language\)](https://en.wikipedia.org/wiki/Java_(programming_language))
- [5]. .NET Framework https://en.wikipedia.org/wiki/.NET_Framework
- [6]. .NET documentation <https://docs.microsoft.com/en-us/dotnet/fundamentals/>
- [7]. The Java™ Tutorials <https://docs.oracle.com/javase/tutorial/>
- [8]. Java Documentation <https://docs.oracle.com/en/java/>
- [9]. Who will Dominate in the future: .Net or Java? <https://stackify.com/who-will-dominate-in-the-future-net-or-java/>
- [10]. What is Java? <https://www.javatpoint.com/java-basics>
- [11]. .NET Framework <https://www.javatpoint.com/net-framework>
- [12]. .NET CORE <https://www.c-sharpcorner.com/technologies/dotnetcore#:~:text=FOLLOW-,,Linux%20and%20OS%20X%20platforms>.