

# A Comprehensive Study of SOA Support in J2EE and .NET – A Developer's Perspective

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**Abstract** - In a late overview it was discovered that great rate of IT organizations was uninformed of SOA or they never knew why they were actualizing SOA in their tasks. To separate and have the ability to acclimate to the quickly changing requests from the market is the greatest challenge for organizations today. The problem is that numerous IT environments of today are unpredictable in that they are made by a few different frameworks, actualized by different technologies, and which has been coordinated with hard-coupled point-to-indicate organizations in place meet changing requests from the business. This form of joining has led to that IT can't be changed quickly enough to backing the business. Selection between J2EE and .NET[6] is a strategic venture platform decision and ought not to be dealt with as just a strategic innovation decision. The future effect of expenses, adaptability and risk are huge and regularly exceed the beginning interest in one architecture or an alternate. Considering the aggregate expense of proprietorship, improvement cost, application execution, current foundation and future business patterns, Microsoft .NET is the platform of decision[14]. In this paper depicts the idea of Service Oriented Architecture (SOA), its advantages, SOA with Web Services, selecting a platform to execute SOA and other related pertinent relationships. It prescribes implementing SOA at this time to survive in this aggressive world.

**Keywords** - *Web Services, Service Oriented Architecture-SOA, J2EE and .NET*

## 1. Introduction

As indicated by about every industry, joining of frameworks is discriminatingly vital for generally undertakings. The ability to rapidly absorb and total a lot of data from dissimilar frameworks can mean the distinction in the middle of life and passing for an association. Straightforward entry by clients and seamless supply chain management with business accomplices are rapidly turning into the main recognizing elements in an inexorably commoditized marketplace. One of the problems with incorporating machine frameworks is the amazing unpredictability and related expense of doing so. Numerous frameworks are old and insufficiently recorded; still others are restrictive with no characteristic guides into their information. Also these are simply problems that exist inside an organization's firewall. Envision how the unpredictability increments as an endeavour start

incorporating its frameworks with those of its business accomplices and clients, with the included security implications brought by Internet correspondences.

SOA offer a clean answer for this coordination mess. As opposed to needing to see each framework's profound fundamental information structures, or needing to compose point-to-point application joining code, organizations can basically include an administrations layer around individual frameworks that uncovered essential data and usefulness in a standard manner. Coordination then turns into a push to coordinate business.

Still, the business world is extensive, and there is positively space for a few SOA improvement instruments. Sometimes it will be clear whether Microsoft .NET or J2EE (or some other innovation) is suitable, for instance, when an organization has existing interests in a specific engineering, is encountering asset requirements, or has constraints focused around programming it is utilizing. As a rule, be that as it may, Microsoft .NET will offer an extensive focal point focused around time-to-market, execution, and general expense of arrangement. This paper depicts the idea of Service Oriented Architecture (SOA) which involves how a business can compose and structure's IT surroundings so as to manage the problems said above. SOA is a business idea of how IT usefulness can be arranged, planned and conveyed as administrations that ought to help the methods of the business and that of SOA help utilizing .NET and J2EE.

## 2. Importance of the Service Oriented Architecture

SOA is a blueprint that speaks to programming usefulness as discoverable administrations on the system. An unadulterated design meaning of a SOA may be "an application structural planning inside which all capacities are characterized as autonomous administrations with decently characterized inviolable interfaces, which can be brought in characterized successions to structure business forms". Administration arranged architectures are nothing but the same old thing new; the Common Object Request Broker

Architecture (CORBA) and the Distributed Component Object Model (DCOM) have since quite a while ago gave comparable usefulness. These current methodologies to administration introduction, in any case, experienced a couple of troublesome problems like hard coupled situations. The mix of Web Services and SOAs determines the problems of CORBA and DCOM methodologies to SOAs. Presently Web Services have uprooted an alternate obstruction by permitting applications to interconnect in an article model-nonpartisan way. For instance, utilizing a basic XML-based informing plan, Java applications can conjure Microsoft .NET applications or agreeable any other applications.

### 3. Web Services and SOA

#### 3.1 XML: A Brief History

Like HTML, the Extensible Markup Language (XML) was a W3c creation got from the prominent Standard Generalized Markup Language (SGML) that has existed since the late 60s. This broadly utilized meta dialect permitted organizations to add sagacity to crude record information. The XML information representation structural planning speaks to the establishment layer of SOA. Inside it, XML makes the configuration and structure of messages going all through administrations. XSD compositions save the respectability and legitimacy of message information, and XSLT is utilized to empower correspondence between different information representations through construction mapping. At the end of the day, can't make a move inside SOA without including XML.

#### 3.2 Web Services

Before long, partnerships and programming vendors started by expanding upon the restrictive free Internet correspondences skeleton. This at last prompted the thought of making an unadulterated, Web-based, appropriated engineering one that could influence the idea of an institutionalized interchanges system to extension the colossal difference that existed between and inside organizations. This idea was called Web Services[4]. The most paramount piece of a Web Service is its open interface. It is a focal bit of data that appoints the administration a character and empowers its conjuring. In this way, one of the first activities in backing of Web Services was the Web Service Description Language (WSDL).

#### 3.3 SOA is reshaping XML and Web Services

Likewise with any structural planning, SOA presents limits and guidelines. Despite the fact that contemporary SOA is made conceivable by the XML and Web Services engineering platforms, these platforms are obliged to experience various changes in place for their

separate advances to be legitimately situated and used inside the bounds administration arranged architectures. Conventional conveyed application situations that utilization XML or Web Services are subsequently in for some rewiring as administration arranged outline standards oblige a change in both innovation and attitude.

Taking after are a few illustrations of potential problems may be confronted with when needing to retrofit existing usage.

- a) SOA obliges that information representation and administration demonstrating measures now be kept in arrangement
- b) SOA depends on Cleanser informing for all between administration correspondence.
- c) SOA institutionalizes the utilization of a report style informing.

### 4. Benefits of SOA

Compositionally, the advanced venture construction modelling configuration could include: Administration Arranged , Occasion Driven, Approximately coupled, adjusted to life cycle help forms, ready to help get together and incorporation, and ready to influence existing applications and base.

SOAs offer the accompanying favourable circumstances over customary methodologies to appropriated processing:

- a) They offer business benefits over the platforms
- b) They give area autonomy
- c) Administrations require not be at a specific framework or specific system
- d) Totally inexactly coupled methodology
- e) Validation and approval backing at each level
- f) The hunt and integration to different administrations is dynamic.

### 5. SOA Architecture

The view that have inspected at is an essential to contemplating the sort of construction modeling obliged and the skylines of investment, obligation and respectability.

For SOA there are three essential compositional points of view as underneath:

**The Application Architecture.** This is the business confronting arrangement which devours administrations from one or more suppliers and incorporates them into the business forms.

**The Service Architecture.** This gives a scaffold between the executions and the expending applications, making a consistent perspective of sets of

administrations which are accessible for use, conjured by a typical interface and administration building design.

**The Component Architecture.** This depicts the different situations supporting the executed applications, the business objects and their usage.

These architectures can be seen from either the shopper or supplier viewpoint. Key to the structural planning is that the customer of an administration ought not be keen on the execution subtle element of the administration simply the administration gave. The execution building design could differ from supplier to supplier yet still convey the same administration. Thus the supplier ought not be occupied with the application that the administration is devoured in. New unforeseen applications will reuse the same set of administrations. The consumer is centered around their application structural engineering, the administrations utilized, however not the point of interest of the part building design. They are intrigued at some level of subtle element in the general business protests that are of common enthusiasm, for instance supplier and shopper need to impart a perspective of what a request is. In any case the buyer does not have to know how the request part and database are executed.

Also, the provider is centered around the part building design, the administration construction modeling, yet not on the application structural planning. Once more, they both need to comprehend certain data about the essential applications, for instance to have the ability to set any sequencing controls and pre and post conditions. Yet the supplier is not keen on every subtle element of the devouring application.

## 6. J2EE and .NET comparison

Comparison of SOA regarding both theoretically and practically between J2EE and .NET[3] is as follows:

### a) Vendor Neutrality



The .NET platform is not vendor impartial "in this way", it is attached to the Microsoft and introduced different levels of partner programs[12] with different levels of engagements with its business and technology. There is on going progress that started on late 2000's to port .NET to non-Microsoft platform, e.g. Ximian[2]. In 2012, numerous vendors were J2EE licensees and numerous sold J2EE perfect application servers[16]. Cross-vendor portability for J2EE is definitely not the imaginary "write once, run anywhere" scenario[7]

### b) Platform Maturity



The principal J2EE particular turned out in 1998 and first beta item in 1999.

The principal Microsoft .NET comparable "Microsoft DNA and MTS" turned out in 1996. Microsoft .NET was the advancement of the Microsoft DNA. Microsoft .NET have delivered high volume and high reliable web sites such as Reuters, DELL and many others[8].

### c) Interoperability



Sun's interoperability strategy for J2EE is based on the communications protocol called IIOP and the current specification of IIOP is inadequate to the ensure interoperability[11]. The .NET platform has a much stronger technology neutral e-Collaboration strategy such as SAP Connector, EDI Connector and others[12] than does J2EE.

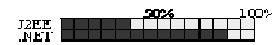
### d) Scalability&Performance



**Scalability:** the ability to include more workload and accomplish most extreme throughput.

**Performance:** the pace of a solitary unit of work under diverse workloads. All current J2EE benchmarks - true frameworks could possibly have the ability to really attain. In view of the J2EE portability, it happens to run on diverse sets of equipment that ought not be a variable in measuring platform scalability. On the off chance that an unit of work expenses 10 pennies on .NET platform, that same unit of work will most likely cost 50 pennies to a dollar on J2EE/Unix[15].

### e) Framework & Productivity Tools



The .NET Frame - a huge system libraries (called Namespaces) combined with the unique development tool (Visual Studio .NET) dramatically reduce development time and thus cost[21]. J2EE's best development tool IBM's WebSphere is out of competition[22].

### f) Programming Language

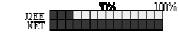


J2EE supports Java, and just Java. Although both IBM's WebSphere and BEA's WebLogic help other languages not one or the other does it through their J2EE technology. Two official ways in the J2EE platform to access other languages,

- through the Java Native Interface
- through CORBA interoperability

Microsoft .NET platform helps many well known programming languages including Java[20], and open to third-parties to add more .NET empowered programming languages

**g) Development Skills Required**



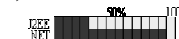
In general, Java programmers are paid around 25% higher pay rates than equivalent .NET or Cobol programmers- This will build the development cost for J2EE solutions over .NET. Additionally, retraining of existing .NET or Cobol programmers on Java constitutes very high cost, - the other alternative will be outsourcing.

**h) Portability**



J2EE server applications supports operating system portability – remain with a given J2EE vendor and a given database vendor because of contrasts in vendor’s implementations augmentations of the J2EE specification. Microsoft .NET server applications just run on Windows Server operating systems.

**i) Client Device Independence**



J2EE Java Applets/Microsoft ActiveX packages: are bundled code that run in browser and consequently installed on client (if enabled by client)[5]. J2EE Java Servlets and Java Active Pages / Microsoft Active Server Pages - the programmer’s responsibility to focus a definitive end browser and how to generate HTML to best exploit that thin client system.

**J) Software Licensing Cost**



The Cost of the licensing requirements to deploy J2EE is higher than deploying .NET solutions [21] Estimated software purchase cost in deploying web services on a single server with full authenticated per-user access in .NET/Visual Studio .NET is \$5998 USD and that of J2EE/IBM Web Sphere is \$64000USD (approximately).

**7. Which is Best Suitable for SOA: .NET OR J2EE**

Now investigate SOA backings provided by both J2EE and .NET platforms[10]. The next two sections comprise of the following sub-sections through which each platform is talked about. Because are investigating platforms from the perspective that they are comprised of both standards and the vendor manufactured technology that actualizes and expands upon these norms, specify sample vendor items that can be utilized to acknowledge parts of a platform[18]. Despite the fact that each exertion has been made to give an adjusted and equivalent documentation of every platform, it ought to be noted that the distinction in vendor support required that obliged that a percentage of the documentation be approached in an unexpected way. For instance, in light of the fact that J2EE is a platform upheld by various

vendors, numerous vendor products are specified. Since .NET is a platform gave by a solitary vendor, just that vendor’s supporting products are referenced[13].

**7.1 SOA Support in J2EE**

The Java 2 Platform is a advancement and runtime environment focused around Java programming language. It is a standardized platform that is upheld by numerous vendors that provide advancement tools, server runtimes, and middleware products for the creation and deployment of Java solutions.

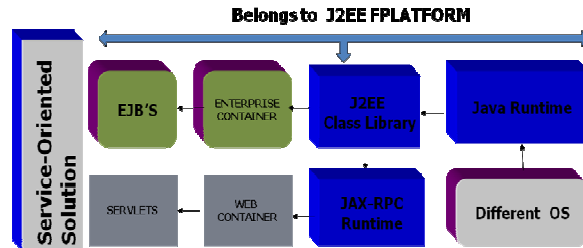


Figure 1: SOA Support in J2EE-Related layers of the J2EE platform as they relate to SOA

The Java 2 Platform is partitioned into three noteworthy advancement and runtime platforms, each one tending to an alternate kind of solution. The Java 2 Platform Standard Edition (J2SE) is intended to backing the formation of desktop applications, while the Micro Edition (J2ME) is designed toward applications that run on mobile devices. The Java 2 Platform Enterprise Edition (J2EE) is built to support huge-scale, distributed solutions.

J2EE has been in presence in excess of years and has been utilized broadly to construct conventional n-tier applications with and without Web technologies. Should investigate at some of the technologies more relevant to Web services. The Servlets + EJBs and Web + EJB Container layers identify with the Web and Component Technology Layers. They don’t map to these layers because to what extent component and Web technologies are incorporated is largely dependent on how a vendor chooses to implement this piece of a J2EE architecture. The components demonstrated in the figure above inter-relate with different parts of the general J2EE environment ( in the figure) to give a platform equipped for acknowledging and realizing SOA[17].

**7.2 SOA Support in .NET**

The .NET framework is a proprietary solution runtime and advancement platform intended for utilization with Windows operating systems and server products. The .NET platform can be utilized to convey a variety of applications, extending from desktop and portable systems to distributed Web solutions and Web services.

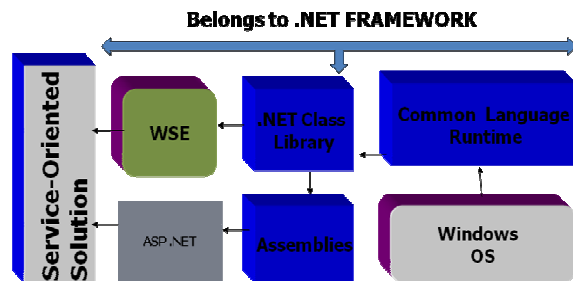


Figure 2: SOA support in .NET-Relevant layers of the .NET framework, as they relate to SOA

An essential part of .NET relevant to SOA[19] is the ASP.NET environment, used to convey the Web Technology layer inside SOA (and further supplemented by the Web Services Enhancements (WSE) augmentation).

**API's in .NET for SOA** - .NET provides programmatic access to numerous framework (operating system) level functions via the .NET Class Library, a large set of APIs organized into namespaces. Each namespace must be explicitly referenced for application programming logic to utilize its underlying features.

**Service Providers in .NET** - NET service providers are Web services that exist as a special variation of ASP.NET applications, called ASP.NET Web Services. can recognize a URL pointing to an ASP.NET Web Service by the ".asmx" extension used to identify the part of the service that acts as the endpoint. ASP.NET Web Services can exist solely of an ASMX file containing inline code and special directives, but they are more commonly comprised of an ASMX endpoint and a compiled assembly separately housing the business logic.

## 8. Conclusion

Microsoft gives more establishment and easy to use environment to the developer in numerous ranges as contrast with J2EE. Undoubtedly, both have numerous likenesses and every technology manage different tasks in its own specific manners. Both backing to create segment improvement either nearby or conveyed yet EJB have three sorts of the parts which are hard to comprehend for an amateur developer.

During the paper, contrasted both technologies firstly with theoretically and then practically and discover advantages that lead to the .NET[24] for a developer's perspective, advantages are :

- Visual studio is more capable and easy to understand IDE & .NET supports various multiple programming languages.
- ASP.NET has more peculiarities for web development & Easy to work and comprehend .NET component advancement.

- Less source code, Time sparing and Documentation accessible in generally structured.

In other hand, J2EE also have few advantages:

- The greater advantage of J2EE is portability and it can run in numerous platforms including Windows, Sun, IBM, Unix
- Java is old language so it's quite mature and
- Many free, open source and third party segments are accessible.

In this paper, attempted to compare both platforms for SOA[17] support for developer perspective. Theoretically both platform are just about comparable and provide same concepts however practically[14] don't hesitate to work with .NET platform. Considering the aggregate cost of ownership, advancement cost, application execution, current infrastructure and future business trends, Microsoft .NET is the platform of decision than the J2EE implementation[16].

While working with both platforms, all experienced was very good. Had no past experience with both platforms so realized many new things. In future, can compare in details both the technologies while implementing MVC and LINQ technologies. JSF is trying to competing ASP.NET so can stretch our research area in these fields as well, also need to analyze deeper research on both platform components.

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