



BENEFITS OF WEB APPLICATIONS

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1 Benefits of Web-Based Systems



- Web-based applications used to be very limited in functionality. However, advances in technology, security, and internet speeds have greatly increased the potential scope of web-based systems.
- Today, we have web-based business accounting systems, web-based CRM systems, a web-based Microsoft Office, and more.
- Web-based applications offer some significant advantages over native, client-based software. Here are just some of the benefits of web-based apps for business.





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What is a Web-Based System?

- A web-based system is an application that is accessed via HTTP. The term web-based is usually used to describe applications that run in a web browser.
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- It can, though, also be used to describe applications that have a very small component of the solution loaded on the client's PC.
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- The host server for a web-based system could be a local server, or it could be accessed via the internet.



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Lower Development Costs

- A web-based application runs in a web browser. That means that a single, responsive web application can be used across multiple device types.
- Although web apps will need to be tested on different browsers, there is no need to test them on different operating systems.
- This makes development and testing much easier. It cuts development costs and reduces development time.





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Easy Installation and Maintenance

- Unlike traditional software that is Loaded on each device, web applications run from a host server. There is no installation on Local machines.
- Software upgrades are all completed centrally. That reduces the costs of installing and upgrading software.
- It also ensures that all users are always using the same version of the software.

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Accessible Anywhere

- Users can access a web-based system anywhere. So long as they have an internet connection, a web browser, and the appropriate Login details.
- This means that users can access the data they need when they are away from the office. It also brings the possibility of staff working from home.





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Easy Data Sharing and Collaboration

- The sharing of data and collaborating on projects is made much easier with web-based systems.
- Data is stored in one central Location, so users can share data and work together on projects.
- It is also easier to integrate web-based systems than isolated desktop applications.

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Centralized Security

- As web apps are installed on web servers, security is controlled by an IT professional. That avoids sensitive corporate information being held on many Local client PCs, which are not as secure.
- Employees can access data when they are away from the office via a web application. So, it is not necessary for data to be held anywhere other than the secure central Location.





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Reduced Hardware Costs

- Web-based systems can eliminate the need for powerful client PCs. Processing is carried out on the host server.
- The host server can be engineered to efficiently service simultaneous, peak demand.
- So, the storage, processor, and memory requirements for client PCs can be reduced.
- Taken across an entire organization, this can represent a large cost saving for some businesses.

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Increased Efficiency

- In most businesses, the deployment of web-based solutions leads to the streamlining of business processes.
- Often, paper-based processes can be replaced by workflow-based solutions. Business process improvements can lead to higher employee productivity and lower costs.





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Adaptable to Changing Workloads

- The deployment of web-based applications requires no software loading on the client's PC.
- All that is needed is the setting up of a new user and the relevant secure access controls.
- This can be a major benefit, for growing businesses, or for seasonal businesses. Users can be added or removed very quickly.

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Greater Availability of Information

- Although this is the case in developed Western countries, it is not the case worldwide. In some countries, internet access is unreliable.
- So, major deployment of web-based applications may still not be possible. International organizations with overseas offices may not yet be able to take full advantage of web-based solutions.
- For domestic organizations, though, web-based systems have a promising future. From web-based office applications, like content management systems and productivity applications, to custom web-based software developed specifically for your organization, the foundation of many future software solutions is likely to be web-based.



WEB ARCHITECTURE MODELS :

- Web application architecture is a mechanism that gives us a clarification that how the connection is established between the client and the server. It determines how the components in an application communicate with each other. It doesn't matter what is the size and the complexity level of the application is, they all follow the same principle only the details may differ.
- In technical terms, when a user makes a request on a website, various components of the applications, user interfaces, middleware systems, databases, servers, and the browser interact with each other. Web Application Architecture is a framework that ties up this relation together and maintains the interaction between these components.
- When a user interacts with a website and gets the response back from the server's end, the whole process executes within a few seconds. The most important thing we need to notice here is the code which has been passed to the browser. This code may or may not have particular instructions telling the browser how to respond with respect to the different types of user inputs. That's why a web application architecture includes all the sub-components and external applications interchanges for an entire software application. A web application architecture has to deal with the reliability, scalability, security, and robustness due to a large amount of global network traffic.

Model 1 and Model 2 (Model-View-Control)[MVC] Architecture

1. Model 1 and Model 2 (MVC) Architecture
2. Model 1 Architecture
3. Model 2 (MVC) Architecture

Before developing the web applications, we need to have idea about design models. There are two types of programming models (design models)


1. Model 1 Architecture
2. Model 2 (MVC) Architecture

MODEL 1 ARCHITECTURE

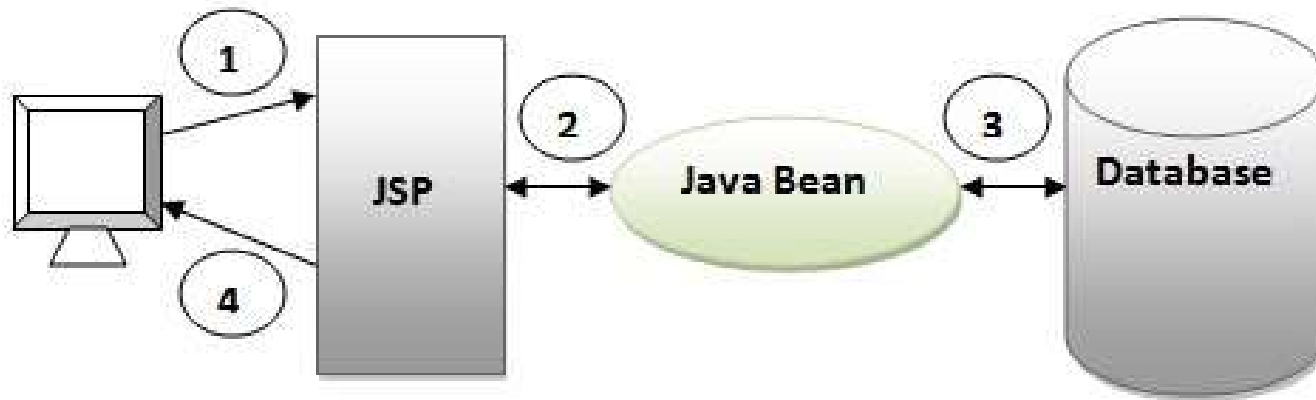
Servlet and JSP are the main technologies to develop the web applications.

Servlet was considered superior to Common Gateway Interface(CGI). Servlet technology doesn't create process, rather it creates thread to handle request. The advantage of creating thread over process is that it doesn't allocate separate memory area. Thus many subsequent requests can be easily handled by servlet.

Problem in Servlet technology Servlet needs to recompile if any designing code is modified. It doesn't provide separation of concern. Presentation and Business logic are mixed up.



JSP overcomes almost all the problems of Servlet. It provides better separation of concern, now presentation and business logic can be easily separated. You don't need to redeploy the application if JSP page is modified. JSP provides support to develop web application using JavaBean, custom tags and JSTL so that we can put the business logic separate from our JSP that will be easier to test and debug.



As you can see in the above figure, there is picture which show the flow of the model1 architecture.

Browser sends request for the JSP page

JSP accesses Java Bean and invokes business logic

Java Bean connects to the database and get/save data

Response is sent to the browser which is generated by JSP

ADVANTAGE OF MODEL 1 ARCHITECTURE

Easy and Quick to develop web application

Disadvantage of Model 1 Architecture

- **Navigation control is decentralized** since every page contains the logic to determine the next page. If JSP page name is changed that is referred by other pages, we need to change it in all the pages that leads to the maintenance problem.
- **Time consuming** You need to spend more time to develop custom tags in JSP. So that we don't need to use scriptlet tag.
- **Hard to extend** It is better for small applications but not for large applications.

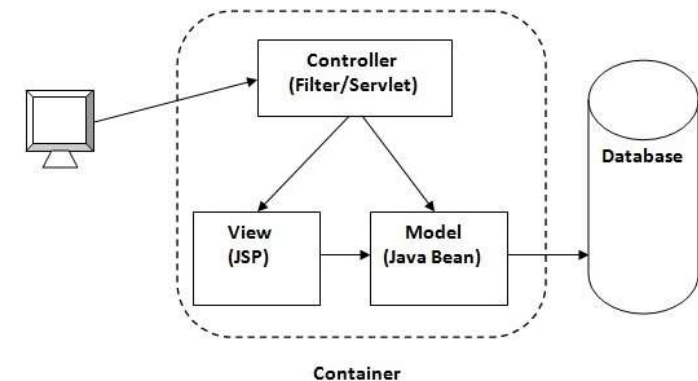
MODEL 2 (MVC) ARCHITECTURE

Model 2 is based on the MVC (Model View Controller) design pattern. The MVC design pattern consists of three modules model, view and controller.

Model The model represents the state (data) and business logic of the application.

View The view module is responsible to display data i.e. it represents the presentation.

Controller The controller module acts as an interface between view and model. It intercepts all the requests i.e. receives input and commands to Model / View to change accordingly.



ADVANTAGE OF MODEL 2 (MVC) ARCHITECTURE

- **Navigation control is centralized** Now only controller contains the logic to determine the next page.
- **Easy to maintain**
- **Easy to extend**
- **Easy to test**
- **Better separation of concerns**

DISADVANTAGE OF MODEL 2 (MVC) ARCHITECTURE

- We need to write the controller code self. If we change the controller code, we need to recompile the class and redeploy the application.

SOLUTION OF MODEL 2 ARCHITECTURE: CONFIGURABLE MVC COMPONENTS

It uses the declarative approach for defining view components, request mapping etc. It resolves the problem of Model 2 architecture. The Struts framework provides the configurable MVC support. In struts 2, we define all the action classes and view components in struts.xml file.



Thanks