**Applications Of AJAX**

* **Web Forms:** One common application of AJAX is in web forms. Instead of submitting the entire form and waiting for a response from the server, AJAX allows the form to be submitted asynchronously. This means users can continue interacting with the page while the form data is being processed in the background.
* **Live Updates and Notifications:** With AJAX, websites can fetch new data from the server periodically without requiring the user to refresh the page manually. This is commonly seen in social media feeds, chat applications, and news websites where new content is constantly being added.
* **E-commerce:** E-commerce websites also make use of AJAX for features like product filtering and sorting. Instead of reloading the entire page every time a filter or sorting option is applied, AJAX allows the website to fetch and display the updated results instantly, providing a smoother and more seamless shopping experience.

**Advantages of AJAX**

* **Enhanced Interactivity:** AJAX enables developers to create web applications with rich, interactive features that rival traditional desktop applications.
* **Improved Performance:** By fetching and updating only the necessary data, AJAX reduces bandwidth usage and server load, leading to faster response times.
* **Reduced Server Load:** AJAX minimizes the need for full page reloads, resulting in reduced server load and increased scalability of web applications.
* **Smoother User Experience:** With AJAX, web pages can update content seamlessly in the background, providing a smoother and more responsive user experience.

**Limitations of AJAX**

* **Complexity:** Implementing AJAX functionality requires a solid understanding of [JavaScript](https://www.geeksforgeeks.org/javascript), asynchronous programming, and server-side technologies, which can be challenging for new developers.
* **SEO Challenges:**Search engine optimization (SEO) can be challenging for AJAX-powered websites, as search engine crawlers may have difficulty indexing dynamically generated content.
* **Security Risks:**AJAX can introduce security vulnerabilities such as cross-site scripting (XSS) and cross-site request forgery (CSRF) if not implemented properly, potentially compromising user data and system integrity.
* **Browser Compatibility:** While modern web browsers support AJAX, older browsers may have limited or inconsistent support, requiring developers to implement fallback mechanisms for compatibility.

[UpdatePanel](https://learn.microsoft.com/en-us/dotnet/api/system.web.ui.updatepanel?view=netframework-4.8.1) controls are a central part of AJAX functionality in ASP.NET. They are used with the [ScriptManager](https://learn.microsoft.com/en-us/dotnet/api/system.web.ui.scriptmanager?view=netframework-4.8.1) control to enable partial-page rendering. Partial-page rendering reduces the need for synchronous postbacks and complete page updates when only part of the page has to be updated. Partial-page rendering improves the user experience because it reduces the screen flicker that occurs during a full-page postback and improves Web page interactivity.

What is the role of Script Manager in Ajax?

The ScriptManager controls client script for ASP.NET AJAX pages. It also registers the script for the AJAX Library.  
  
Script Manager, as the name suggests is used to manage the client side script of Ajax. Since Ajax uses Java Script, there needs to be a mediator to manage this script and restrict a particular version to a browser. A Script manager is present on every page where Ajax is used to enable the Ajax Libraries. These Libraries in turn helps to implement the core Functionality of Ajax: Partial rendering.

JavaScript is a client-side script, used to control a web page at the client side once it has downloaded. The validations in case of JavaScript will be handled particularly on client’s browser and no server side requests will be handled. AJAX allows JavaScript to communicate with the remote script and receive the response from the server, without the need to reload the entire page. JavaScript is the base on which Ajax works.  
  
Ajax is Asynchronous Java Script and XML. Here on sending request to the server, one needn’t wait for the response. Other operations on the page can be carried out. Hence, Asynchronous. On the other hand, Java script sends an HTTPRequest to the server and waits for the XML response.  
  
E.g. populating State field. Using JavaScript we need to use the “Onchange” event where as using ajax, the request is just sent to populate the state list. Other operations can be carried out on the page.  
  
Ajax is a part of Java Script programming. Java Script is used to manage and control a web page once downloaded. Ajax does not need to wait for the whole page to download.  
  
Use of Ajax can reduce connections to the server since the script has to be requested once.

https://www.tutorialspoint.com/asp.net/asp.net\_ajax\_control.htm