**NodeJS:**  Node.js is an [open-source](https://en.wikipedia.org/wiki/Open-source_software), [cross-platform](https://en.wikipedia.org/wiki/Cross-platform) [JavaScript](https://en.wikipedia.org/wiki/JavaScript) [run-time environment](https://en.wikipedia.org/wiki/Runtime_system) that executes JavaScript code [server-side](https://en.wikipedia.org/wiki/Server-side). Historically, JavaScript was used primarily for [client-side scripting](https://en.wikipedia.org/wiki/Client-side_scripting), in which scripts written in JavaScript are embedded in a webpage's HTML and run client-side by a JavaScript engine in the user's web browser. Node.js lets developers use JavaScript for [server-side scripting](https://en.wikipedia.org/wiki/Server-side_scripting)—running scripts server-side to produce [dynamic web page](https://en.wikipedia.org/wiki/Dynamic_web_page) content *before* the page is sent to the user's web browser. Consequently, Node.js represents a "JavaScript everywhere" paradigm,[[5]](https://en.wikipedia.org/wiki/Node.js#cite_note-5) unifying [web application](https://en.wikipedia.org/wiki/Web_application) development around a single programming language, rather than different languages for server side and client side scripts.

Though .js is the conventional [filename extension](https://en.wikipedia.org/wiki/Filename_extension) for JavaScript code, the name "Node.js" does not refer to a particular file in this context and is merely the name of the product. Node.js has an [event-driven architecture](https://en.wikipedia.org/wiki/Event-driven_architecture) capable of [asynchronous I/O](https://en.wikipedia.org/wiki/Asynchronous_I/O). These design choices aim to optimize [throughput](https://en.wikipedia.org/wiki/Throughput) and [scalability](https://en.wikipedia.org/wiki/Scalability) in web applications with many input/output operations, as well as for [real-time Web](https://en.wikipedia.org/wiki/Real-time_Web) applications (e.g., [real-time communication](https://en.wikipedia.org/wiki/Real-time_communication) programs and [browser games](https://en.wikipedia.org/wiki/Browser_game)).

**RESTful API:** A RESTful API is an application program interface ([API](https://searchmicroservices.techtarget.com/definition/application-program-interface-API)) that uses [HTTP](https://searchwindevelopment.techtarget.com/definition/HTTP) requests to GET, PUT, POST and DELETE data.

A RESTful API -- also referred to as a RESTful web service -- is based on representational state transfer ([REST](https://searchmicroservices.techtarget.com/definition/REST-representational-state-transfer)) technology, an architectural style and approach to communications often used in [web services](https://searchmicroservices.techtarget.com/definition/Web-services-application-services) development. REST technology is generally preferred to the more robust Simple Object Access Protocol ([SOAP](https://searchmicroservices.techtarget.com/definition/SOAP-Simple-Object-Access-Protocol)) technology because REST leverages less [bandwidth](https://searchenterprisewan.techtarget.com/definition/bandwidth), making it more suitable for internet usage. An API for a website is [code](https://whatis.techtarget.com/definition/code) that allows two software programs to communicate with each another. The API spells out the proper way for a developer to write a program requesting services from an [operating system](https://whatis.techtarget.com/definition/operating-system-OS) or other [application](https://searchsoftwarequality.techtarget.com/definition/application).

The REST used by [browsers](https://searchwindevelopment.techtarget.com/definition/browser) can be thought of as the language of the [internet](https://searchwindevelopment.techtarget.com/definition/Internet). With cloud use on the rise, APIs are emerging to expose web services. REST is a logical choice for building APIs that allow users to connect and interact with [cloud services](https://searchcloudprovider.techtarget.com/definition/cloud-services). RESTful APIs are used by such sites as [Amazon](https://whatis.techtarget.com/definition/Amazon), [Google](https://searchcio.techtarget.com/definition/Google-The-Company), [LinkedIn](https://whatis.techtarget.com/definition/LinkedIn) and [Twitter](https://whatis.techtarget.com/definition/Twitter).

**.NET Framework** (pronounced *dot net*) is a [software framework](https://en.m.wikipedia.org/wiki/Software_framework) developed by [Microsoft](https://en.m.wikipedia.org/wiki/Microsoft) that runs primarily on [Microsoft Windows](https://en.m.wikipedia.org/wiki/Microsoft_Windows). It includes a large [class library](https://en.m.wikipedia.org/wiki/Class_library) named [Framework Class Library](https://en.m.wikipedia.org/wiki/Framework_Class_Library) (FCL) and provides [language interoperability](https://en.m.wikipedia.org/wiki/Language_interoperability) (each language can use code written in other languages) across several [programming languages](https://en.m.wikipedia.org/wiki/Programming_language). Programs written for .NET Framework execute in a [software](https://en.m.wikipedia.org/wiki/Software) environment (in contrast to a [hardware](https://en.m.wikipedia.org/wiki/Computer_hardware) environment) named [Common Language Runtime](https://en.m.wikipedia.org/wiki/Common_Language_Runtime) (CLR), an [application virtual machine](https://en.m.wikipedia.org/wiki/Process_virtual_machine) that provides services such as security, [memory management](https://en.m.wikipedia.org/wiki/Memory_management), and [exception handling](https://en.m.wikipedia.org/wiki/Exception_handling). (As such, computer code written using .NET Framework is called "[managed code](https://en.m.wikipedia.org/wiki/Managed_code)".) FCL and CLR together constitute .NET Framework.

FCL provides [user interface](https://en.m.wikipedia.org/wiki/User_interface), [data access](https://en.m.wikipedia.org/wiki/Data_access), [database connectivity](https://en.m.wikipedia.org/wiki/Database_connection), [cryptography](https://en.m.wikipedia.org/wiki/Cryptography), [web application](https://en.m.wikipedia.org/wiki/Web_application) development, numeric [algorithms](https://en.m.wikipedia.org/wiki/Algorithm), and [network communications](https://en.m.wikipedia.org/wiki/Computer_networking). Programmers produce software by combining their [source code](https://en.m.wikipedia.org/wiki/Source_code) with .NET Framework and other libraries. The framework is intended to be used by most new applications created for the Windows platform. Microsoft also produces an [integrated development environment](https://en.m.wikipedia.org/wiki/Integrated_development_environment) largely for .NET software called [Visual Studio](https://en.m.wikipedia.org/wiki/Microsoft_Visual_Studio).

**jQuery**  is a [cross-platform](https://en.wikipedia.org/wiki/Cross-platform) [JavaScript library](https://en.wikipedia.org/wiki/JavaScript_library) designed to simplify the [client-side scripting](https://en.wikipedia.org/wiki/Client-side_scripting) of [HTML](https://en.wikipedia.org/wiki/HTML). It is [free, open-source software](https://en.wikipedia.org/wiki/Free_and_open_source_software) using the permissive [MIT License](https://en.wikipedia.org/wiki/MIT_License). [Web](https://en.wikipedia.org/wiki/World_Wide_Web) analysis indicates that it is the most widely deployed JavaScript library by a large margin.

jQuery's syntax is designed to make it easier to navigate a document, select [DOM](https://en.wikipedia.org/wiki/Document_Object_Model) elements, create [animations](https://en.wikipedia.org/wiki/Animation), handle [events](https://en.wikipedia.org/wiki/Event_(computing)), and develop [Ajax](https://en.wikipedia.org/wiki/Ajax_(programming)) applications. jQuery also provides capabilities for developers to create [plug-ins](https://en.wikipedia.org/wiki/Plug-in_(computing)) on top of the JavaScript library. This enables developers to create [abstractions](https://en.wikipedia.org/wiki/Abstraction_(computer_science)) for low-level interaction and animation, advanced effects and high-level, theme able widgets. The modular approach to the jQuery library allows the creation of powerful [dynamic web pages](https://en.wikipedia.org/wiki/Dynamic_web_page) and Web applications.

The set of [jQuery core features](https://en.wikipedia.org/wiki/JQuery#Features)—DOM element selections, traversal and manipulation—enabled by its *selector engine* (named "Sizzle" from v1.3), created a new "programming style", fusing algorithms and DOM data structures. This style influenced the architecture of other [JavaScript frameworks](https://en.wikipedia.org/wiki/Comparison_of_JavaScript_frameworks) like [YUI v3](https://en.wikipedia.org/wiki/YUI_Library) and [Dojo](https://en.wikipedia.org/wiki/Dojo_Toolkit), later stimulating the creation of the standard *Selectors API*.

[Microsoft](https://en.wikipedia.org/wiki/Microsoft) and [Nokia](https://en.wikipedia.org/wiki/Nokia) bundle jQuery on their platforms.[[7]](https://en.wikipedia.org/wiki/JQuery#cite_note-2008-09-28-7) Microsoft includes it with [Visual Studio](https://en.wikipedia.org/wiki/Microsoft_Visual_Studio)[[8]](https://en.wikipedia.org/wiki/JQuery#cite_note-8) for use within Microsoft's [ASP.NET AJAX](https://en.wikipedia.org/wiki/ASP.NET_AJAX) and [ASP.NET MVC](https://en.wikipedia.org/wiki/ASP.NET_MVC) frameworks while Nokia has integrated it into the Web Run-Time widget development platform.

jQuery, at its core, is a [Document Object Model](https://en.wikipedia.org/wiki/Document_Object_Model) (DOM) manipulation library. The DOM is a tree-structure representation of all the elements of a Web page. jQuery simplifies the syntax for finding, selecting, and manipulating these DOM elements. For example, jQuery can be used for finding an element in the document with a certain property (e.g. all elements with an [h1](https://en.wikipedia.org/wiki/HTML_element#heading) tag), changing one or more of its attributes (e.g. color, visibility), or making it respond to an event (e.g. a mouse click).jQuery also provides a paradigm for event handling that goes beyond basic DOM element selection and manipulation. The event assignment and the event callback function definition are done in a single step in a single location in the code. jQuery also aims to incorporate other highly used JavaScript functionality (e.g. fade ins and fade outs when hiding elements, animations by manipulating [CSS](https://en.wikipedia.org/wiki/Cascading_Style_Sheets) properties).

**JSON: JavaScript Object Notation** is an [open-standard](https://en.m.wikipedia.org/wiki/Open_standard) [file format](https://en.m.wikipedia.org/wiki/File_format) that uses [human-readable](https://en.m.wikipedia.org/wiki/Human-readable_medium) text to transmit data objects consisting of [attribute–value pairs](https://en.m.wikipedia.org/wiki/Attribute%E2%80%93value_pair) and [array data types](https://en.m.wikipedia.org/wiki/Array_data_type) (or any other [serializable](https://en.m.wikipedia.org/wiki/Serialization) value). It is a very common [data](https://en.m.wikipedia.org/wiki/Data) format used for [asynchronous](https://en.m.wikipedia.org/wiki/Asynchronous_I/O) browser–server communication, including as a replacement for [XML](https://en.m.wikipedia.org/wiki/XML) in some [AJAX](https://en.m.wikipedia.org/wiki/Ajax_(programming))-style systems.

JSON is a [language-independent](https://en.m.wikipedia.org/wiki/Language-independent_specification) data format. It was derived from [JavaScript](https://en.m.wikipedia.org/wiki/JavaScript), but as of 2017 many [programming languages](https://en.m.wikipedia.org/wiki/Programming_language) include code to generate and [parse](https://en.m.wikipedia.org/wiki/Parsing) JSON-format data. The official Internet [media type](https://en.m.wikipedia.org/wiki/Media_type) for JSON is application/json. JSON filenames use the extension. json.

JSON's basic data types are:

* Number: a signed decimal number that may contain a fractional part and may use exponential [E notation](https://en.m.wikipedia.org/wiki/E_notation), but cannot include non-numbers such as [NaN](https://en.m.wikipedia.org/wiki/NaN). The format makes no distinction between integer and floating-point. JavaScript uses a [double-precision floating-point format](https://en.m.wikipedia.org/wiki/Double-precision_floating-point_format) for all its numeric values, but other languages implementing JSON may encode numbers differently.
* [String](https://en.m.wikipedia.org/wiki/String_(computer_science)): a sequence of zero or more [Unicode](https://en.m.wikipedia.org/wiki/Unicode) characters. Strings are delimited with double-quotation marks and support a backslash [escaping](https://en.m.wikipedia.org/wiki/Escape_character) syntax.
* [Boolean](https://en.m.wikipedia.org/wiki/Boolean_datatype): either of the values true or false
* [Array](https://en.m.wikipedia.org/wiki/Array_data_structure): an [ordered list](https://en.m.wikipedia.org/wiki/List_(abstract_data_type)) of zero or more values, each of which may be of any type. Arrays use [square bracket](https://en.m.wikipedia.org/wiki/Square_bracket) notation and elements are comma-separated.
* Object: an unordered collection of [name–value pairs](https://en.m.wikipedia.org/wiki/Attribute%E2%80%93value_pair) where the names (also called keys) are strings. Since objects are intended to represent [associative arrays](https://en.m.wikipedia.org/wiki/Associative_array),[[12]](https://en.m.wikipedia.org/wiki/JSON#cite_note-ecma2013-12) it is recommended, though not required,[[13]](https://en.m.wikipedia.org/wiki/JSON#cite_note-rfc7519-13) that each key is unique within an object. Objects are delimited with [curly brackets](https://en.m.wikipedia.org/wiki/Braces_(punctuation)#Braces) and use commas to separate each pair, while within each pair the colon ':' character separates the key or name from its value.
* [null](https://en.m.wikipedia.org/wiki/Nullable_type): An empty value, using the word null

**XML:**

In [computing](https://en.m.wikipedia.org/wiki/Computing), Extensible Markup Language (XML) is a [markup language](https://en.m.wikipedia.org/wiki/Markup_language) that defines a set of rules for encoding [documents](https://en.m.wikipedia.org/wiki/Electronic_document) in a [format](https://en.m.wikipedia.org/wiki/File_format) that is both [human-readable](https://en.m.wikipedia.org/wiki/Human-readable_medium) and [machine-readable](https://en.m.wikipedia.org/wiki/Machine-readable_data). The design goals of XML emphasize simplicity, generality, and usability across the [Internet](https://en.m.wikipedia.org/wiki/Internet). Although the design of XML focuses on documents, the language is widely used for the representation of arbitrary [data structures](https://en.m.wikipedia.org/wiki/Data_structure)such as those used in [web services](https://en.m.wikipedia.org/wiki/Web_service).

Several [schema systems](https://en.m.wikipedia.org/wiki/XML_schema) exist to aid in the definition of XML-based languages, while programmers have developed many [application programming interfaces](https://en.m.wikipedia.org/wiki/Application_programming_interface) (APIs) to aid the processing of XML data.

## XML Simplifies Things

* It simplifies data sharing
* It simplifies data transport
* It simplifies platform changes
* It simplifies data availability

Many computer systems contain data in incompatible formats. Exchanging data between incompatible systems (or upgraded systems) is a time-consuming task for web developers. Large amounts of data must be converted, and incompatible data is often lost.

XML stores data in plain text format. This provides a software- and hardware-independent way of storing, transporting, and sharing data.

XML also makes it easier to expand or upgrade to new operating systems, new applications, or new browsers, without losing data.

With XML, data can be available to all kinds of "reading machines" like people, computers, voice machines, news feeds, etc.

## **AJAX**

AJAX = **A**synchronous **J**avaScript **A**nd **X**ML. AJAX is not a programming language. AJAX just uses a combination of:

* A browser built-in XMLHttpRequest object (to request data from a web server)
* JavaScript and HTML DOM (to display or use the data)

AJAX is a misleading name. AJAX applications might use XML to transport data, but it is equally common to transport data as plain text or JSON text.

AJAX allows web pages to be updated asynchronously by exchanging data with a web server behind the scenes. This means that it is possible to update parts of a web page, without reloading the whole page. AJAX is a developer's dream, because you can:

* Read data from a web server - after the page has loaded
* Update a web page without reloading the page
* Send data to a web server - in the background

The HTML page contains a <div> section and a <button>. The <div> section is used to display information from a server. The <button> calls a function (if it is clicked).

## **How AJAX Works**



An event occurs in a web page (the page is loaded, a button is clicked).

An XMLHttpRequest object is created by JavaScript.

The XMLHttpRequest object sends a request to a web server.

The server processes the request.

The server sends a response back to the web page.

The response is read by JavaScript.

Proper action (like page update) is performed by JavaScript.

**React.js**

In [computing](https://en.wikipedia.org/wiki/Computing), React (sometimes React.js or ReactJS) is a [JavaScript library](https://en.wikipedia.org/wiki/JavaScript_library)[[2]](https://en.wikipedia.org/wiki/React_(JavaScript_library)#cite_note-react-2) for building interfaces. It is maintained by [Facebook](https://en.wikipedia.org/wiki/Facebook), [Instagram](https://en.wikipedia.org/wiki/Instagram) and a community of individual developers and corporations.

React can be used in the development of [single-page applications](https://en.wikipedia.org/wiki/Single-page_application) and mobile applications. It aims primarily to provide speed, simplicity, and scalability. As a user interface library, React is often used in conjunction with other libraries such as [Redux](https://en.wikipedia.org/wiki/Redux_(JavaScript_library)).

MongoDB is a free and open-source cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with schemas. MongoDB is developed by MongoDB Inc., and is published under a combination of the GNU Affero General Public License and the Apache License.