

Position Statement – Peter Rushforth – Technology Advisor – Canada Centre for Mapping and Earth Observation – GeoConnections

HTML is the foundation of the Web, and society, because it can be indexed and consequently, searched. You do not have to ‘execute’ HTML in order to derive meaning. The “meaning” is pre-programmed into how its “tags” are rendered. HTML tags mostly deal with human language, but over time, graphics and interactive tags have been added, in response to diverse needs. Indexing of content is vitally important; without indexing, content cannot be searched, or found. If content cannot be found, it loses its value. Web maps and location information are devalued by not being indexable. Governments spend taxpayer money creating geospatial information for their citizens; volunteers spend their time and resources creating geospatial content for shared public geospatial databases. The public, especially people of different abilities and socio-economic advantages, are badly served by the continued lack of integration of geospatial information into the Web. We need to extend HTML to include maps and foundational geospatial concepts, in order to better serve society by maintaining the value of the geospatial content we have created.

Another reason that HTML is foundational, is because it provides a standardized client-side API for programmers. This API is known as the Document Object Model, or DOM, and is the foundational standard used by Web designers in applying styling rules in the form of Cascading Style Sheets (CSS), and by JavaScript developers, who use the DOM and other standard APIs to provide the rich experiences that people find on the Web today, including maps. Taken together, HTML, CSS and JavaScript can achieve virtually any computer experience imaginable. JavaScript is a powerful modern rapidly evolving dynamic programming language, that comes with many built-in application programming interfaces (APIs), even beyond those provided by the HTML DOM. In the case where a standard interface for a function does not already exist, JavaScript is powerful enough to allow the user to define their own APIs.

When programmers do their work, they do so by building upon the work of others, primarily by using APIs. When a programmer uses an API, they are to a certain degree committing to use that API forever. To some extent, the APIs learned and used by a programmer define their programming world. When a programmer works, their time costs money. It costs money to change APIs. It is a long-standing technique in software industry to provide APIs to make programmers work more efficient. A consequence of investing time and money into using a programming API is that the program, and the programmer, become “coupled” or locked into to the API.

In the case where an API for a feature is provided by the DOM, there is no API beneath that, there is only the bedrock of the HTML. Writing code that links to the DOM API is therefore a solid investment, because being coupled to the DOM is reasonable, given the foundation of HTML.

However, where there exists no HTML DOM API for a feature, such as is the case for maps and location, it is a requirement to compose an API using the generic building blocks of non-semantic HTML and CSS. The logic of the application that consumes this API becomes coupled to a feature that is synthesized in the JavaScript layer, and the programmers who use the API become coupled to the provider. This includes, potentially, children and learners of all ages.

There is nothing inherently wrong with that, it is how business, including open source software business, makes money. But it is not good enough for society at large. There needs to be a standard “API” for maps and location information, to which society can “bind”, permanently and without fear of lock in.

That standard needs to be how children and learners of all ages are educated in maps and geographic information technology. That standard should be HTML, and the HTML DOM. There is nothing inherent in maps in HTML that threatens the business model of either open source software or private geospatial content providers.

A Global Commons

HTML is a miracle of vendor-neutrality in today's world. Although it is maintained by the big browser vendors, not much gets added. Sometimes features are removed even, especially if nobody steps up to express interest in doing the work. The euphemism for this is "implementer interest". Most often, the justification for removing a feature of HTML is that it represents a risk to the browser going forward (because there is no community to maintain it). Moreover, the justification for removal goes, the same effect can usually be accomplished in JavaScript, by rendering and styling piles of more neutral HTML elements to simulate that feature.

JavaScript is both a blessing and a curse. On the one hand, standard, browser-provided APIs are a solid and quasi-permanent foundation upon which to build your application. On the other hand, if important abstractions, such as maps, are built exclusively in the JavaScript layer, the Web becomes bloated. A tragedy of the commons ensues, because user attention, bandwidth and processor power are finite resources consumed by JavaScript.

The tragedy of the commons is an economic problem in which every individual has an incentive to consume a resource at the expense of every other individual with no way to exclude anyone from consuming. It results in overconsumption, under investment, and ultimately depletion of the resource. As the demand for the resource overwhelms the supply, every individual who consumes an additional unit directly harms others who can no longer enjoy the benefits. Generally, the resource of interest is easily available to all individuals; the tragedy of the commons occurs when individuals neglect the well-being of society in the pursuit of personal gain.

<https://www.investopedia.com/terms/t/tragedy-of-the-commons.asp>

If we leave it up to others to implement maps in HTML, nobody will do so. There is no "they" who will step in and do the work, there is only "us", whatever community can be brought together to speak up for our own needs. Mapping libraries are well-lit [cow paths](#). Together, let's realize their benefits for [everyone](#), with none of their shortcomings.

The good news is that we are "[allowed](#)" to maintain HTML. Nobody "owns" it; the global commons of the Web is our birthright. There are high barriers to change, however, and for good reason. Changes to HTML are permanent: the HTML Web is the infrastructure on which society operates. The investments we make in HTML are very like investing in public infrastructure. You can still use [the first Web site](#) today, thirty years later. I expect that will still be the case 100 years from now.

The OGC and W3C exist for different reasons, but one of the principal reasons is to allow entities which might otherwise be competitors, or even regulators, to work together to standardize stuff. The reason that standards require an explicit neutral space for development is that they (standards) would not be

possible otherwise. We need to be able to put aside competition in order to build a common framework for the good of society. Together we can and should take this opportunity to extend the Web.

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