

The World Wide Web is the brainchild of Sir Tim Berners-Lee. In 1989 and 1990 he developed the basic technologies of the internet: HTML (hyper-text markup language), URI (uniform resource identifier or URL), and HTTP (hyper-text transfer protocol). (History of the Web 2008-2019) In the thirty years since he first put his ideas into practice, it seems that everyone and everything can be found on a website. The World Wide Web has become a ubiquitous part of our daily lives. Upon reviewing any number of websites, it seems they grow like mushrooms: quickly and randomly and with often with non-specific direction. Conventions have developed but changing technologies and the desire to stand out from the crowd mean many websites are at best confusing, and at worst, entirely unusable.

Eleven years after the birth of the internet, Jesse James “J.J.” Garrett developed what he called The Elements of User Experience as a model for product development aimed at bringing consistency to the process of designing and building websites in order to make them more usable. (Garrett 2011) Garrett’s model consists of five “planes” of decision making that “provide a conceptual framework for talking about user experience problems and the tools we use to solve them.” (Garrett 2011, p.21) Decisions made at each plane inform the options available at the planes above and below.

The five planes of The Elements of User Experience are:

- The Strategy Plane – decisions made on this plane relate to the objectives of the site and who the site will serve.
 - The Scope Plane – this plane is where functional specifications and content requirements are defined. Using the decisions made at the Strategy level, this plane sets out the limits of what the site will and won’t do.
 - The Structure Plane – this is where decisions are made about how users will interact with the site, and how the information will be arranged.
 - The Skeleton Plane – the Skeleton plane is where interface design, navigation systems, and information design are mapped out to conform with the Strategy, Scope, and Structure levels. Often, issues uncovered at the Skeleton Plane will require some rethinking and retooling of the previous planes.
 - Surface Plane – this is the visual design of the site, how it looks and how it communicates the objectives of the lower planes.
- (Garrett 2011)

To further illustrate how these planes interact with each other in the process of site development, the website for the Greensboro Public Library (<https://library.greensboro-nc.gov>) will be evaluated against the requirements of Garrett’s model. (Greensboro Public Library n.d.)

The Strategy Plane is not entirely obvious from the completed site. However, the Greensboro Public Library provides their mission statement on the About Us page of the site, which broadly outlines their goals as an organization, and which can be used to infer strategic goals for the site. According to the mission statement, the Library, “in partnership with the community”, will:

- “provide free and equal access to information”
- “foster lifelong learning”
- “inspire the joys of reading”

(Greensboro Public Library n.d.)

From these, we can surmise that the information provided on the website will need to be widely and easily accessible, offer community resources and services, provide learning opportunities, and encourage a love of reading.

The users that make up the community with which the Library will partner can be grouped into library users, volunteers, and donors. The needs of library users provide the base of the website's functionality. Library users need to have access to community resources, be able to search the collection catalog, access a calendar of events, and locate branch information such as hours and addresses. Volunteers need to be able to find volunteer opportunities, apply for those opportunities, and have access to guidelines and policies. Donors need to be able to access the donor groups: Friends of the Library and The Greensboro Public Library Foundation.

Without the availability of underlying documentation, this sketch of users and goals must suffice for providing the elements of the Strategy Plane. These elements are used to define the functional specifications and the content requirements of the site in the Scope Plane. This plane sets the limits of the site – what it will ultimately do, and sometimes what it specifically won't do. The first thing most users need to be able to do upon visiting the Library site is to search the collection, and possibly also the site itself. The next thing many users will need to be able to do is to locate library services, including event information, and educational opportunities. Community support services such as job search help, workshops for interview skills and resume writing, and city resources also need to be made available. Users need to be able to communicate with librarians remotely, and to find information such as hours of operation and location and upcoming events. In the interest of promoting a love of reading, information about events like story times and book club meetings needs to be available.

Each element of the Strategy Plane should be aligned with areas of information and service in the Scope Plane. As these alignments and definitions are formulated, content requirements for each area need to be addressed. In most of the items discussed here, text-based documents containing information and resource links are the most commonly used form of content on the Greensboro Public Library site. A calendar tool is required for organizing community events for best access. The group of Library Users can be broken down into sub-groups of adult users, parents, teenage users, and children. Content requirements at each sub-group are tailored to the specific audience of users.

Defining the Structure of the site involves taking the ideas, specifications, and requirements of the Strategy and Scope planes and sketching out how users will interact with the site – what types of navigation are needed, how the information will be organized and how comprehensive the menus need to be. The Greensboro Public Library site designers opted for a matrix style architecture, where users can get to any page in multiple different ways. The information on the site is organized into a few broad categories (Services, Books and Media, Resources, etc.), and then under those is further categorized based on type of information or user group. As an example, under the Services menu the following categories are among those offered: Calendar, Programs, Children and Parents, Teens, Getting a Library Card, and Job & Career. Throughout the site, there does appear to be consistent use of language, and

though the search function seems comprehensive, there are no metadata entries on any of the pages. Metadata would help the search engine provide more relevant and specific search results.

The Skeleton Plane is where the functionality outlined in the Structure is given form in the interface and navigation systems. The Library site includes a main entry page highlighting services and current information, and persistent navigation on every page means that wherever a user comes into the site, they can navigate anywhere else. Search options are clearly located and defined. On content pages, contextual menus offer navigation to related items. Content pages generally have a uniform look, with left hand contextual menus and right-side content areas being the most frequently used template. Some of the pages offer text links to resources, some use a grid of icons. Pages that don't require the contextual menu use a smaller right-side content area to display information and a calendar. The differences in the pages that require deviation from the main content template are not obvious. While too much uniformity is dull, the information architecture could be better used to delineate what content takes what form.

The persistent global navigation system is comprehensive – each page is listed individually in the menus, as if the global navigation system were a site map. While the main page offers not only the persistent navigation at the top of the page, it also provides an icon-based menu at the bottom of the slideshow allowing access to commonly used content and also the global navigation is included in the footer at the bottom of every page. The contextual menus on content pages echo the persistent navigation lists. To top it all off, a site map/index page is also provided. This level of redundancy has the benefit of creating multiple avenues of information access, however, given the volume of information available on the site, it is decidedly overwhelming. Considering the effort put into the organization of the information and the availability of a site search function, less detailed menus would be more efficient. Redundant navigation systems means extra effort must be expended when updates are required – to ensure that new items are included in all the navigation options.

The form and function of the Skeleton Plane flows into the Surface Plane, where the visible layer of user experience is fleshed out. The overall visual design of the Library's main page does not provide much in the way of flow – there is no logical pattern of progression for the eye. A large photo slideshow dominates the page, bordered by two different navigation systems that generally lead users to the same places. Below the fold some upcoming event information is provided, and the footer provides hours of operation, social media links, and as mentioned, global navigation. The search function is obvious in that it is at the top of the persistent navigation menus and offset with the Library's logo. The global navigation menus are very responsive – they open immediately when your mouse gets close to the text, but they don't close quite so fast and often obscure the page content. Some pages include breadcrumbs to let you know where you're located in the site, but the use is not consistent. While the typography across the site is clear and consistent, leading to easily readable content, the colors used on the site do not reflect the City of Greensboro branding, which is visible on the city resource sites to which the Library is linked. The colors, though pastel, are used to good effect, but do not fit with the brand. The background image on every page is the same low-contrast image – an opportunity to show off the library itself has been missed here. Images of different areas in the library could be used to subtly reinforce and define each content area.

From an overall usability standpoint, the Greensboro Public Library website provides a wealth of information to its users. Given the amount of information, it is well organized into logical categories and sections. In regard to the inferred objectives of the site in the Strategy and Scope planes, the site does, in many ways, meet those objectives. The Structure of the site is a little shaky given the matrix style architectural approach. Everything seems to be accessible from everything else with little clear mapping of how one got there. Problems begin to be obvious as we get to the Skeleton plane and the navigation systems. Redundant navigation systems on the surface seem to be useful for making information accessible. However, the user must wade through a huge amount of text to find what they need. Logical information design should allow the site designers to create slimmer, more efficient, and more specific navigation systems with less redundancy and still achieve the same level of accessibility. Closely following Garrett's model from start to finish would likely have illuminated some of the issues with this site while it was in development. Even now, a review like this one, evaluating the site in the context of the model, is useful in highlighting some of the more glaring usability issues. The availability of tools like The Elements of User Experience means that many developers have the opportunity to take a more structured and deliberate approach to website design and perhaps stem the tide of organic development of websites.

References

- Garrett, Jesse James. 2011. *The Elements of User Experience: User-Centered Design for the Web and Beyond*. Second. Berkeley: New Riders.
- n.d. *Greensboro Public Library*. Granicus. Accessed October 2019. <https://library.greensboro-nc.gov>.
- 2008-2019. *History of the Web*. Accessed October 20, 2019. <https://webfoundation.org/about/vision/history-of-the-web/>.