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The web design challenge

Web design is the art of creating websites that are attractive and easy to use. But it's complicated by the different browsers and devices visitors have. Learn about the principles that will keep everyone happy.

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You can find resources for this book at www.ineasysteps.com or www.sean.co.uk

The goal of this book

The most exciting thing about the internet is not the way it's transformed virtually every industry, nor the way it's enabled us all to be better informed about the world and more in touch with our family and friends than ever before.

It's the fact that anyone can join in. If you've got something to share, the world is waiting.

You don't need anyone's permission to set up a website. You don't even need that much money: you can host a site for less than \$10 or £10 a month, including a free domain name. Of course, you might want to pay more for hosting with advanced features, such as more storage or databases.

If you're promoting your business, you might prefer to commission professional designers, and maybe even pay someone to help promote your site. If you're doing it all yourself, it will cost less but you'll need to spend more time on it.

In this book, I'll teach you the key principles of web design, which is the art and science of building effective and attractive websites. This book will introduce you to the key technologies of the web, and the design principles that underpin successful sites.

Whether you're a budding designer who plans to build your own site, or you just want to be able to talk to professional designers in their own language, this book will give you an understanding of how websites are designed so that you can make the right decisions in launching your own site. You'll also be able to build your own simple website using HTML and CSS. When you find useful code snippets and templates online, you'll know how to edit them and integrate them into your website correctly.

I won't claim that you'll be a website design professional by the end of this book. The best websites are built using a combination of technical and artistic skill, and a solid understanding of how people use the internet. It takes time to develop these. Above all, it takes practice to learn how to make the most of the technologies the web offers.

But, as the philosopher said, every journey begins with a single step. And this book will ensure you set off in the right direction, with robust knowledge of the technologies and techniques that will deliver the best experience for your visitors.

The diversity of devices

One of the skills a web designer needs is the ability to put themselves into the shoes of the website visitor. Web designers have to think about what their visitors know, what they will expect the website to do, and how they will expect it to work.

The most basic part of this is understanding the range of different devices that people might use to view your website.

These include:

- A desktop computer or laptop.
- An Android phone, iPhone or other handheld device.
- A tablet device, such as an iPad.
- A games console, such as the PlayStation or Xbox.
- A smart TV.
- A screen reader, which reads web pages aloud to blind people.
- A refreshable Braille display, which a blind person can run their fingers along to read the website content.

When we use the word “design”, we tend to think of something visual. But, in its purest sense, a website isn’t necessarily a visual medium. Somebody using a screen reader might experience it as a stream of spoken text.

While you do need your website to look appealing, it’s a mistake to think that you can (or should) focus purely on the look of a website. Some of the most important work in web design goes on behind the scenes, where the visitors can’t see it. It’s about adding information so that people can use your web page easily even if their device doesn’t support all the features available on a desktop computer.

The challenge of web design is to create a site that is engaging and easy to use, whatever is used to access it. Visitors want the flexibility to use whichever device they prefer. Sometimes they will switch devices, using a desktop during their lunch break at work and a mobile on the way home, for example. All they care about is whether the site works or not. It’s your job to make sure it does.



Websites can be viewed using a number of different devices. Shown above, from the top: Apple iPhone; Xbox games console; Alva refreshable Braille display.



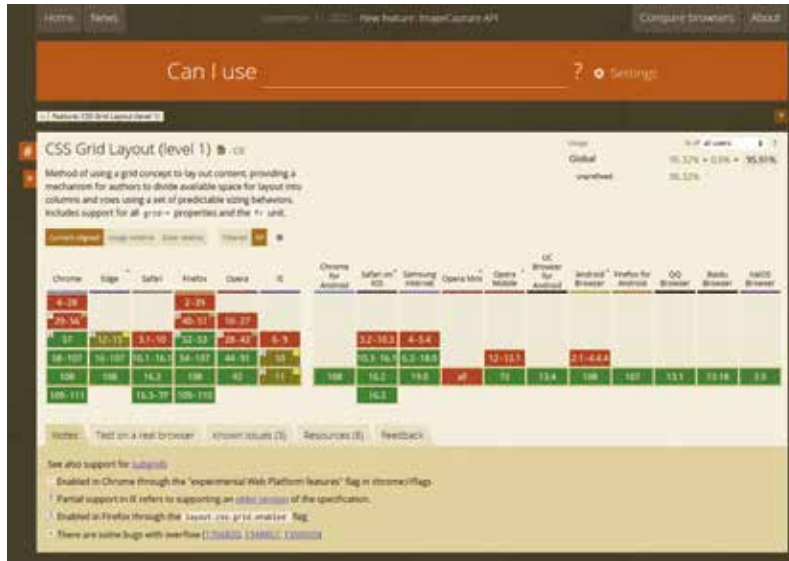
Web browsers are mostly free of charge, so why not download a few of the popular ones so that you can try them out? You'll get a taste of how they differ from your browser of choice, and can use them for testing your website design as it evolves.

How devices affect design

Different devices have different capabilities, and this should inform the decisions you make while designing your website. For example:

- There might be no support for pictures (or “graphics”) on the device. A screen reader and Braille display can't show images, and some browsers (including Google Chrome) enable users to switch them off to speed up their browsing.
- There might be no conventional keyboard. It puts everyone off if they have to type in lots of information to use a website, but those who have to use a virtual keyboard on their touchscreen might be especially deterred.
- Animation might not be supported or usable. Non-visual devices (such as screen readers) can't render it. Users of smaller screens risk missing something important if the screen display is changing out of their view. Users with poor vision can use screen magnifiers to massively enlarge a small part of the screen. If people are zoomed in on one part of the page, they can't see any updates you make to a different part of it.
- There might be no mouse. Some users struggle to use a mouse because of physical impairment, and some devices (including games consoles and laptops) don't have a mouse. If you demand precise use of a mouse, you might lose visitors.
- There is a wide range of screen sizes. Even on a desktop computer, people will have different-sized monitors and will open the browser window to different widths, depending on what else they're doing at the same time as web browsing. Designs that look good on a small screen won't necessarily look good on a huge one. A Buy button might be easily visible at a glance on a large display, but out of view on a small screen. Designers tend to have large monitors, but they shouldn't forget that most of their audience have to settle for smaller screens.
- A screen reader user can't get a quick overview of what's on the page by skim-reading it – while a screen is two-dimensional, a screen reader has a one-dimensional interface: a stream of audio reading the web page aloud. Using clear headings helps screen reader users navigate the page quickly.

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Left: The website caniuse.com enables you to search for an HTML or CSS feature and see which browsers support it. Hover over a browser version to see more information about its level of support for the feature and the browser's market share.

The web browser challenge

As well as the differences in hardware used to visit websites, people often have a choice over which software they use.

The most popular web browser is Google Chrome. While estimates of Chrome's market share vary, they're typically between 60% and 70%. Safari is the next most popular browser, largely because it's the default on Apple's mobile devices. Other popular browsers include Microsoft Edge, Firefox and Opera.

The variety of browsers is another reason website design is a challenge: web designers have to build sites that work with a wide range of different browsers, and each browser has its own quirks. In recent years, a lot of progress has been made in standardization. However, new features are sometimes available earlier in some browsers than others, and some people still use old browser versions that don't support the latest features.

You can choose to ignore browser versions with a small market share, but are you willing to turn away those customers? The cheapest way to acquire customers is to serve people who are already visiting your website.

It's better to create a site that works for everyone, and let your visitors decide how they want to experience it.



Use your web analytics software to identify the most popular browsers among people who visit your website. Bear in mind, though, that anyone who can't use your website easily might just leave. See Chapter 14 for more on analytics.



Take every opportunity to try out your website on unfamiliar devices. It's impractical for most people to own every device available, but if you come across one in a shop or at a friend's house, don't miss the chance to see how your site performs.

Degrading gracefully

You might be thinking that the solution is to create a different website for all the different user groups you have. You're not the first to think of this.

In the past, many organizations created separate websites for mobile device users and for screen reader users. These users have requirements that are extremely different from the typical PC user, so many companies thought it would be easier to make a separate site for them than to reconcile their needs with those of mainstream website visitors.

There were several problems with this approach:

- It was time-consuming and costly to maintain separate sites.
- The accessible sites, in particular, often became neglected and out of date. Visitors couldn't access the latest news, although it was available on the main site. The organization's attempt to look after blind visitors by specifically catering for their needs ultimately resulted in them being discriminated against.
- Some screen reader users felt they were missing out because the organization had stripped out all the visual content. Although they couldn't see the content, they were still interested in what was in it and what its message was.

One site for all

Today, it's not necessary to create a separate website for specific audiences. There are too many different devices and configurations for you to cater for them all anyway.

Instead, you should aim to create a single website design that adapts to the device that is viewing it. Many organizations use a "mobile first" strategy, building a phone-friendly website and adding enhancements for larger screens.

The site should degrade gracefully. That means that it can still be used if particular features aren't available on the visitor's device or browser. For example, if somebody can't see a photo, you should provide text that explains its content. If the web browser doesn't support content created using JavaScript, visitors should still be able to navigate the site and use the rest of its content.

A well-designed website will work on any device and web browser.

Understanding accessibility

Accessibility is all about making sure your website can be used easily by everybody. When people talk about accessibility, they often think of blind people using screen readers. But it's not just about those who use completely different technologies to visit your website.

There are lots of people who have more subtle needs that you can help or hinder through the way you design your website. A lot of these people wouldn't consider themselves to have any special needs at all. They'd just find your website hard to use, and give up. For example:

- Can somebody who is color blind understand the availability of tickets, or is it shown only as different-colored blobs?
- Can somebody who has impaired vision increase the font on your web page so that it's easier to read?
- If somebody can't use the mouse, can they navigate your site using the keyboard?
- Can a visitor with impaired hearing get the same information that you've included in an audio file?
- Can somebody with a mental impairment understand your content, or is it too jargony and long-winded?

Most professional website designers today understand the importance of accessibility, but it's the least visible aspect of a website design project, so it can be overlooked. Much of the important work is to do with how a website is coded, and when you visit it using a conventional desktop PC, you can't easily tell whether it's been well designed for other devices or not.

Accessible websites tend to be easier for everybody to use. They work well on mobile devices, and are easier for search engines to index, too. If you need to convince colleagues of the importance of accessibility, you could argue that you want to reach as many customers as possible, or could point out that your business might contravene disability discrimination laws if you don't.

Most websites strive for accessibility because they want to be as inclusive as possible, though. It's not hard to make most websites accessible, and it doesn't cost any more, as long as you plan to make your site accessible from the start.



If you outsource your design, take particular care to make sure the designers are creating an accessible design. If you're never asked to provide any alternative text for images, ask yourself whether they're making it up, or not bothering with it at all.



Try navigating the web by keyboard for yourself, especially your own site when it's ready for testing. In Google Chrome, click a web page and then use the **Tab** key to move through the links. Press **Enter** to visit a link and **Alt + Left arrow** to go back. Use the **Up** and **Down arrow** keys to scroll the page.



Make sure your alternative text conveys the same information that it is replacing, but keep it brief. You can say “close up of clock tower”, or “the gold detailing of Big Ben shines on a sunny day”. Ask yourself what the purpose of the image is, and try to articulate that. You don’t have to mention the blue skies or where the big hand is pointing unless it’s important.



Don’t provide alternative text for purely decorative images. Make these background images so that assistive technology can ignore them.

Top accessibility principles

I’ll share some tips for making your site accessible when we look at HTML later, but there are some basic principles that can go a long way toward making your site easy to use.

- 1** Provide alternative text for anything that isn’t text, such as an image or video. This does not necessarily appear on screen. When you add an image to a web page, for example, you can also provide alternative text that is only presented to the user if the image isn’t available.
- 2** Make sure that your site still works when JavaScript is switched off. When this is impossible, provide the same information in text form on an accessible web page.
- 3** If users have to respond within a certain time limit, make sure that they are warned and have enough time to request more time, if they need it. Give users controls to start and stop content that moves or updates itself.
- 4** Use clear and consistent navigation. Make sure that users can easily understand where each link will take them, and give each page a unique title that describes its purpose.
- 5** Make sure the website can be used with the keyboard, and that users can see which link or element they are focused on.
- 6** Make it easy to skip straight to the content. If your web page has a long list of links or header information, provide a link that enables people to jump straight to where the article starts. This is particularly important for screen reader users.
- 7** Don’t open pop-up windows, or change the window the user is in, without warning. This is confusing if you can’t see the screen, and it stops the **Back** button working, the most important navigational tool on the internet.

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- 8 Use the simplest language appropriate for your site's subject matter. Complicated language is harder to understand, especially if you can't easily flick your eyes back to the previous line for a refresher on what it said.
- 9 Give users control over how they view your content. Make sure your site works, for example, if people enlarge the default text size in their browser.
- 10 Make sure that any information conveyed by color can also be understood in other ways. For example, it's okay to use different colors to draw attention to different icons, but you might also make them different shapes or put them in different columns to indicate their meaning.
- 11 Make sure there is enough contrast in the foreground and background colors you choose for everything to be legible on a black and white screen.
- 12 Avoid overcomplicated page layouts. If there are too many different sections or boxes, it can be overwhelming for visitors to try to navigate.
- 13 Test whether your website code has any errors in it. Desktop browsers can be quite forgiving, but assistive technology might struggle to understand your web page if it includes technical errors in the HTML or CSS code.
- 14 Use the accessibility features available in your HTML code to help people navigate tables and forms. They enable you to provide a context that might otherwise be communicated by the position of things on the screen.
- 15 Don't use a picture of text unless it's essential. It's a good way to show a company logo, for example. But don't create an image for a paragraph of text just because you like a particular font.



For detailed guidance, see the Web Content Accessibility Guidelines (WCAG) published by web standards body W3C (www.w3.org/TR/WCAG22/). Section 508 (www.section508.gov) outlines accessibility requirements for US government agencies, and includes good advice for all websites.



There are several automated accessibility checkers online, including Wave (<http://wave.webaim.org/>). This tests your website against the WCAG guidelines. It helps to identify problems, but accessibility is about whether people can use your site, not whether it appears to tick a particular box. Use your own judgment and feedback from users, too.



Your website will also include a file for each image, and might also include files for audio recordings, videos and downloadable files like brochures in the printer-friendly PDF format.

Introducing key technologies

A website is made up of several different coding languages. Here's a summary of the role they play in your website:

HTML

HTML is the main language used for writing web pages. When somebody downloads one of your web pages, the first thing they are sent is an HTML file. HTML describes the structure of your text content, and tells the web browser where it can find the other files for the web page, including its images and CSS files.

CSS

CSS is used for the design and layout of your web page. It contains instructions for colors, fonts and layout.

JavaScript

JavaScript enables you to update your web page after it has downloaded, and to respond to user actions on it. Some people have written sophisticated games using JavaScript, but it's typically used for simple effects like refreshing the screen with the latest news. JavaScript is often used to check that a form has been completed correctly and provide immediate feedback. Not all devices support JavaScript, so you need to ensure that your site (especially its navigation) also works without it.

Server scripting languages (PHP/MySQL)

There are a number of different server scripting languages, and they tend to go through fashionable phases. The most popular one today is PHP, but others include ASP. These languages enable you to write programs that run on the server so that web pages can be customized for each visitor. This is particularly useful if the site needs to offer personalized content, such as a social networking site that serves a different homepage to each person depending on who their friends are.

Server-side scripting languages are also used for sites with lots of pages. Their content can be stored in a database, and when somebody wants to look at it, the program on the server makes the web page HTML and sends it out. It saves you having to maintain hundreds of web pages, because you can just take care of one template, the scripting program, and the database of content. We don't have space to cover scripting languages in this book, but Chapter 11 covers content management systems (CMSs), which also enable you to create a database-driven website.



MySQL is the name of the database software most often used with PHP. Hosting companies sometimes charge a bit more for servers that support PHP and MySQL, but can usually help you to set up the database. You can find lots of free PHP scripts you can install on your server to offer features like forums.

DIY or outsource?

Should you design your site yourself or pay somebody else to do it for you? It depends on what you want to achieve with your website design project.

The strengths of DIY

Creating your own website can be an extremely satisfying creative project. People build websites for the same reason they write novels and sing songs: it's fun, and it's rewarding to increase your expertise over time. Building websites has an added dimension because what you make can be easily found by others, so you can get feedback. It's also a cost-effective approach, compared to hiring a team of professionals.

If you want to build your own website, you can take one of two paths. Firstly, you can learn how HTML and CSS work and code your site by hand. These technologies aren't too hard to learn, and this book includes a quick tour around their most important features to get you started. Hand coding your site gives you maximum control and flexibility.

Once you know how to create websites, you could buy a template and adapt it to accelerate your web design process.

Alternatively, you could use a visual design package. These enable you to build a website in the same way you might make a newsletter with a word processor. They make it much easier to get started with website design, although it can take a lot of effort to build something impressive.

Outsourcing your design

Working with a web design firm is likely to lead to more professional-looking results first time. You can benefit from the firm's experience of designing perhaps hundreds of websites. You can focus on your content and the site's purpose and don't have to worry too much about technical details.

That said, it's still *your* website, and you need to take responsibility for managing the designers. You need to understand enough about web design to know whether their proposals are a good idea or not, and what the technical limitations might be on any designs they propose.

You might also want to learn enough HTML and CSS to be able to edit the design after the project has ended.



If you commission somebody else to build your website, make sure you have the ability to update it easily later.



Make sure you plan enough time for the designers to do a good job on your website. Design is a process, with designers suggesting ideas and you providing feedback until you reach the design you want.



If you want to practice your web design skills but don't have any content available, there's an exercise on my website, www.sean.co.uk, you could try. It provides a pack of text and photos for the fictional Castle Fictoria hotel.



There are often multiple ways to do the same thing using software. I can't show you them all in this book, so feel free to experiment if you spot a shortcut or alternative approach that you prefer.

How to set up your website

Now that you understand the design challenge, you're ready to take it on! Here is an outline of the process, although your own project might include extra steps, such as getting the CEO to approve the content:

- 1 **Planning.** Time invested in planning at the start will avoid rework later. In particular, a clear understanding of the site's purpose should inform the whole process.
- 2 **Content creation.** You need to write your text and gather your pictures so that the website can be designed to present them in the best way.
- 3 **Web design.** This involves many small steps. You'll need to structure your content, and design how it is presented. You also need to think about how people will move between different parts of your website. You can commission a web design firm, or you can learn the technologies to design it yourself.
- 4 **Testing.** To make sure your design works, you need to test it at regular intervals. Design is often an experimental process, with the designer implementing an idea, testing it with prospective site visitors, and using the feedback to refine the design.
- 5 **Launching the website.** To make your website available to the public, you need to copy it onto a web server, which will send the web pages to your site visitors over the internet. You will need to rent web server space from a hosting company.
- 6 **Promoting the website.** Attract visitors by making it easy for people to find your site through search engines, adverts and links.
- 7 **Measuring your success.** Find out how well your site is fulfilling its purpose, and use that information to refine it.