

## UNIT IV TOOLS AND WORKFLOW

### KNOWING YOUR COMMAND LINE:

The command-line interface of your operating system can be very intimidating at first, however, it can also be extremely powerful. There is a wide range of benefits that can be gained by learning how to use the command line:

1. A large number of web development tools now reside as command-line utilities.
2. It allows you to do batch file processing, such as the renaming of files, which may not be achievable using the normal graphical user interface (GUI).
3. The same interface is used when you secure shell (SSH) into servers, so the skills are transferable if you later want to manage your own hosting server.

### Preparing the command line:

#### Mac OS X:

The easiest way to install the command-line tools is to download them from the Apple developer web site at <https://developer.apple.com/downloads/index.action>. You will need to sign in using an Apple Developer account that you can register for, for free, and then download the latest “Command Line Tools” for your particular operating system. Once downloaded, you can simply run the installer to load the tools. Once the installation is complete, you can install the Homebrew package manager, which is a command-line tool that allows you to install packages like Node.js. To install Homebrew, you need to run the command:

```
ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/homebrew/go/install)"
```

#### Windows:

To prepare the command-line tools on Windows, you will need to install both Git and Bash. These can be downloaded together from <http://msysgit.github.io/>. When downloading the msysgit package, it will advise you to download the latest version. During the installation, you can use the default installation options. When asked which method you wish to use for installation, select “Use Git Bash only.” Once the installation is complete, you can simply click Finish. Rather than use the built-in Windows command line, you will use Git Bash as the command-line interface. To open Git Bash, simply find it in the Git folder on the Start menu.

### Commanding Your Command Line:

#### Traversing Directories

One of the basic actions you might want to perform when working in the command line is navigating between and looking at the content of directories. There are two main commands you can use to achieve this: ls and cd.

**ls:** The ls command will allow you to list all the files and directories within the current directory.

**Cd:** The cd command will allow you to change a directory. You can pass either an absolute path (starting with a /).

#### Simple File Manipulation:

- **mkdir :** The mkdir command allows you to make a new directory within the current directory. This is achieved by entering mkdir dirname.  
command:  
mkdir project\_name
- **Touch :** Sometimes when you are setting up a directory structure you might want to create placeholder files in your directories. Rather than have to open up the text editor and create each file, you can simply create them using the touch command.  
command:  
touch index.html

- **cp:** The cp command allows you to copy an existing file. To use the command, you simply provide the relative or absolute path to the original file, followed with the path of where you want to copy it to.

command:

```
cp original-file-path new-file-path
```

- **mv:** The mv command is similar to the cp command in that you simply provide the relative or absolute path to the original file, followed by the path of where you want to move it to.

command:

```
mv original-file-path new-file-path
```

- **rm:** If you want to delete files that you have created, you can use the rm command.

command :

```
rm file-to-be-removed-path
```

**Note:** The rm command does not place a file in the trash, but rather will permanently remove it from your system.

### Other Useful Commands:

**Sudo:** The sudo command is used to run any command as the system super user (often known as root), the purpose being that if you wanted to modify files that the current user does not have permission to, you can do this by using sudo.

**Cat:** The cat command allows you to read the contents of a file.

**Tail:** The tail command allows you to simply output the final few lines of a file into the command line.

### VERSION CONTROL WITH GIT:

One of the core concepts to using Git is that it is a distributed VCS, which means that locally you will have a copy of the repository that you can use to perform all the main VCS actions like commit, branch, and merge.

- **Initializing a Repository**

To initialize a new repository on your local machine, you can simply run the command:

```
git init
```

What this does is create a hidden .git directory that will be used by Git to manage the versioning of the files in the directory. At this point the repository is still empty because there haven't been any files added to it.

- **Adding Files**

To add a single file, you simply run the command git add along with the name of the file you want to add. An example of adding a JavaScript file would be:

```
git add scripts/main.js
```

- **Making a Commit**

Once you have added the files, you are ready to make the initial commit. You do this by using the git commit command. You can use the -m flag to set a commit message.

```
git commit -m 'initial commit'
```

- **Adding a Remote**

To add a new repository, you need to use the git remote add command, providing both a name and the URL to the repository. An example of this would be:

```
git remote add origin git@github.com:jonathan-fielding/repo.git
```

- **Pushing a Commit**

To push a commit to the remote server, you use the git push command.

```
git push -u origin master
```

- **Pull Changes**

Pulling changes from the remote server can be achieved using the git pull command.

- **Cloning a Repository**

Cloning a remote repository is achieved using the git clone command followed by the URL to the repository.

```
git clone git@github.com:h5bp/html5-boilerplate.git
```

## **CSS PREPROCESSORS:**

A CSS preprocessor is that it is a language that compiles down to being normal CSS.

Some of the key features of a CSS preprocessor are:

1. Variables
2. Nesting
3. Import external files
4. Extend existing styles
5. Mixins

### **Variables:**

Variables are one of the major reasons CSS preprocessors exist at all. The ability to set a variable for something like a color, use that variable throughout the CSS we can write and know it will be consistent, DRY and easy to change is useful.

CSS variable inherit their values from their parent elements by default. This means that if a CSS variable is defined on a parent element, it will be inherited by all of its child elements unless the value is overridden.

### **Nesting:**

CSS nesting provides the ability to nest one style rule inside another, with the selector of the child rule relative to the selector of the parent rule. To nest a selector, you simply separate them with a space. This will make paragraph tags inside main have one font size, and paragraph tags inside either header or footer have another font size. Descendant selectors target all elements inside the other, no matter how deeply nested it is.

### **Import external files:**

We can import additional CSS files inside another CSS declaration. The import rule is used for this purpose as it link a stylesheet in a document. Then is generally used when one stylesheet in a dependent upon another. It is specified at the top of the document after @charset declaration inside<head>.

### **Extend existing styles:**

Having written some styles to target a particular element, we might find that you have a similar element elsewhere on your site. Rather than redeclare the CSS rule set again or adding the class name to the existing selector, what you can do is simply extend the existing styles using the preprocessor.

### **Mixins:**

Mixins helps to make a set CSS properties reusable i.e. it saves one code and use it again and again. It can be included other CSS rules by using @include directive. Mixins can also take variables as arguments. The values are passed while including them in the CSS rules.

### **BOWER:**

Bower is a package manager from the developers at Twitter that allows you to install front-end packages. The main benefit of using a package manager is that rather than download the package manually from GitHub or the packages web site, you can simply add it to your project from your command line. In addition, alongside downloading the package, Bower will download any dependencies it might have.

**Installation :** Bower is a Node package and therefore requires Node to be installed to work. It can be installed using the Node package manager using the command:

```
npm install -g bower
```

There are two type of dependencies:

1. General dependencies: These are the core dependencies used by your web site or web application in production. It is also assumed you will use these dependencies in production as well.
2. Development dependencies: These are the dependencies used specifically when you are developing your site, which might include unit testing, packaging scripts, and documentation generation.

### **GRUNT:**

Grunt is another tool that is built using Node.js. It is sometimes called a build tool, however, this is slightly inaccurate as the sole purpose of a build tool is to convert some source code into the final product. Instead, Grunt is a task runner; the key difference being that while one of the tasks could be to build your code, it also can be used to run any series of tasks that you want to automate including unit testing, regression testing, and code quality checking.

**Installation:** The Grunt interface is split into two components: the first is the command line interface component, which is installed globally. The second component is a local Grunt installation that is installed onto your project.

```
command: npm install -g grunt-cli
```

**Usage** To get started with using Grunt, you need to first set up a package.json file if you do not already have one, achieved by simply running the command: `npm init`

After running this command, there will be some informations. They are

1. Name: This is the name of your project, which should not contain spaces or any special characters.
2. Version: The current version of your project.
3. Description: The description of your project (optional).
4. Entry point: This is not applicable if you are just using Grunt on a project. It is used when you are writing a Node.js package (optional).
5. Test command: A command used to run tests on your project, for a Grunt project you can point this to a Grunt task (e.g., `grunt test --verbose`) (optional).
6. Git repository: The URL to the repository used for your project (optional).
7. Keywords: The keywords about your project.
8. Author: Your name.
9. License: If you are distributing the code, what license does it fall under.

### **GULP:**

Gulp is a similar tool to Grunt in that it is a task runner that can be used to run a series of tasks. The tasks themselves are added by adding plug-ins to Gulp. Unlike the configuration-based approach that Grunt takes, Gulp takes the approach that you write the code that is run to complete your task. The way in which it does this is that it can take some files, then you are able to pipe these through different tasks that need to be run to process them.

There are a variety of different plug-ins available to use with Gulp. Some of the popular ones are:

1. gulp-uglify: The Uglify plug-in can be used to minify JavaScript files.
2. gulp-concat: The Concat plug-in allows you to concatenate multiple files into a single file.
3. gulp-jshint: The JSHint plug-in allows you to lint your JavaScript files for common errors.

### **SCAFFOLDING:**

Website application scaffolding is a framework that provides the minimal setup these components. The scaffolding enables developers a tool to quickly create a running web-based environment for the internet. System architects work on processes that can improve development productivity.

Graphic organizers ,picture and charts can all serve as scaffolding tools. There are three types of scaffolding , they are

- Suspended scaffolding
- Supported scaffolding
- Aerial lifts

When starting a new project, it can be very time consuming to pull together the initial template, as it usually includes:

1. Putting together the base HTML
2. Pulling together any JavaScript libraries you want to use
3. Adding any CSS frameworks or CSS grids you want to use.

### **Yeoman :**

Yeoman is a project scaffolding tool that allows you to quickly scaffold a project based on predefined generators. There is a wide range of generators available, although if there is not one that fits your needs, you can even write one of your own. Some of the generators that are available include:

1. webapp
2. angular
3. ember
4. backbone
5. chromeapp
6. chrome-extension
7. bootstrap

### **Grunt-init:**

The alternative command-line tool (grunt-init) enables you to quickly scaffold your project.

Installation : To get started with grunt-init, run the command line:

```
npm install -g grunt-init
```

### **Other Useful Tools:**

#### **jshint**

The tool jshint enables you to detect errors and potential problems from within your JavaScript code. It is relied upon by developers across the world at companies including Mozilla, Facebook, and Twitter to ensure the issues it detects are not in its codebase.

#### **Serve**

The server serve is a simple Node server that will serve the current folder you are using in terminal. This means if you need to quickly throw something up on a server on your local machine, and you can use serve and then navigate to localhost:3000 in your browser to see your site.

#### **ios-sim**

One of the main complaints about the Apple iOS Simulator is how much effort it takes to open it. First, you have to open Xcode, then go to the menu bar and select the Simulator from the developer tools. Luckily someone has developed a small tool that allows us to quickly, and easily, open the iOS Simulator from the command line, and that tool is called ios-sim.

## Mixture

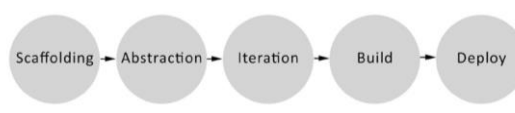
Mixture is a tool that brings together scaffolding, preprocessors, testing, templating, building, and deploying into one interface.

Mixture will watch your files and if you make any changes, it will process the compilation of the CSS from the CSS preprocessor and automatically reload the page for you. This means that you can use your text editor side by side and quickly see the changes you are making as you make them.

## WORKFLOW:

There are some tools while building a web site. It is when you start integrating them into a workflow that they can become really powerful and help you build your web sites more efficiently. There are five in workflow. They are

- Scaffolding
- Abstractions
- Iteration
- Build
- Deploy



### Scaffolding:

When you first start a new project, you will usually take time to set up the project directories and base files and download the standard libraries like jQuery and respond.js. This process is called scaffolding and is normally the first step in the development process.

It includes Yeoman, grunt-init, initializer.

### Abstraction:

When developing, an abstraction is a way in which you write code that will ultimately be compiled down to another form. abstractions aim to do is make your development more efficient. They do this in multiple ways, including adding functionality and sometimes even simplifying the original form. The reason this is part of the workflow is because you are developing in the abstraction rather than the original form.

### Iteration:

As you build a site, you iterate by regularly switching between your text editor and your browser, checking the changes you have made. This typically involves switching to the browser, refreshing, checking the changes, going back to the text editor, making changes, and then repeating.

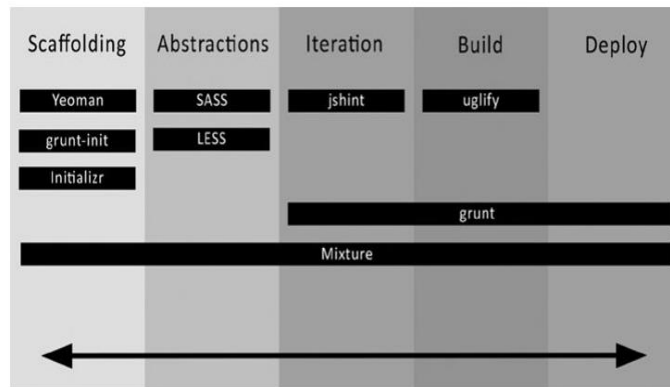
### Build:

After you have built your site, you will want to be able to build your code ready for a live deployment. This might include running unit tests, building your abstractions, minifying your CSS and JS, and compressing your images. It can be time consuming to perform these build tasks manually, so this is where it is important to have build tools set up.

### Deploy:

The final step with site development is to deploy it to the production environment; historically, this could be a very manual process especially on servers that you could only access through FTP.

Workflow diagram:



## MAKING THE USER JOURNEY RESPONSIVE:

### ADAPTING YOUR CONTENT:

If you are building a web site, the HTML, CSS, and JavaScript that make up the site allow you to present the content to the user. If you were to open an HTML page alone in your browser without any CSS or JavaScript applied, you would simply see the site with the browser's default styling applied, and, if structured correctly, it should still have a meaningful flow.

When choosing to adapt the content of your responsive site, there are a variety of different things you will need to consider. We will now look at the key considerations we will need to make when adapting our content.

- **The Size of the Viewport:**

With the devices used to view the site coming in such a wide variety of different shapes and sizes, it can have a major impact on how you choose to adapt your content, as you will need to consider the user's experience across a wide range of different viewport sizes. When responsive design first started to become popular, two methods for adapting content based on the size of the viewport became popular, the first being hiding content that is deemed less important and the second being to stack the content on top of each other.

- **User Input Methods:**

An example of where you might use different interactions dependent on the input method used would be for a carousel. In the case of the user using a keyboard to navigate through the carousel panels, they would be able to traverse the content using the left and right keys. When using a mouse, they could instead use buttons to navigate forward and backward. For touch input, you might instead choose to allow the users to use a swipe gesture between the different panels.

- **The Content Itself:**

When building a responsive site, your content will fall into one of two situations: you will be starting with existing content that will need adaptation in order to work responsively, or you will be fortunate enough to be able to start from scratch with your content.

### ADAPTING EXISTING CONTENT:

- **Building Content for a Responsive Site:**

When building new content for a responsive site, we can build your content specifically for your smaller devices first and then, instead of adapting it to work on smaller devices, adapt the content to work better on larger viewports.

- **Prioritizing Content:**

While building new content for the responsive site, it is important to prioritize the content.

Example: a restaurant.

When users are using a desktop computer, they are likely wanting to find out information about the restaurant, perhaps browse menus, see what kind of atmosphere the restaurant has, and view information about the area the restaurant is in, like local theaters and other things to do.

To prioritize the content in this way, you can use the order property of the CSS Flexbox specification. To start, we put together some HTML with a simple wrapper div containing three blocks that will show in a different order at different viewport sizes.

## ADAPTING THE USER'S JOURNEY:

- **Common Site Interactions:**

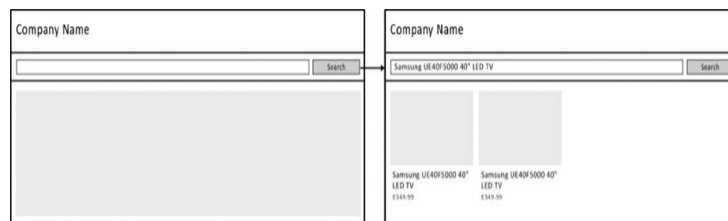
There are a wide variety of site interactions that make up the parts of a user's journey, and when building a responsive site, is important to examine each of them to determine if they will work well responsively.

- **Modal Windows:**

The first common site interaction is the modal window. A modal window is a method in which you can show new content in a container on top of the content on the page the user is currently viewing. Originally intended to show larger versions of images, its use has since expanded and is used across a large number of web sites for a number of different purposes. With this flexibility to show content on top of the page the user is currently viewing, it can allow you to show content related to the current page without navigating the user to a new page.

- **Product Search:**

If our site is dedicated to one product, it would be easy for your users to quickly find information about your product; however, for larger retail sites that sell a variety of different products, it is incredibly important that the users can quickly and easily find the product and information about it they are looking for. A typical journey for a user searching for a product on a large retail site would be to enter the product name in the search box and then be taken to a search results page.



- **Tabbed Containers:**

One way to organize content on a web site is to separate it into containers toggled with tabs. These enable you to divide your content into meaningful sections, allowing the users of the site to directly find the content they are looking for by displaying a clear title for the content on the tab.

- **Menu Drop-Downs:**

It is common for web sites to include drop-downs as part of the main navigation, and usually these are activated by the user hovering the mouse cursor over the drop-down. This functionality doesn't translate well to mobile devices where users are using a touch screen instead of a mouse.

- **Parallax:**

Parallax is a technique that scrolls the elements of the page at different speeds as the user scrolls up and down. This technique allows you to show animations as the user scrolls down in order to add more depth to the page.



- **Social:**

With the increased popularity of social networks, there has been a trend toward including buttons that enable users to share content with their friends and followers at a click or touch of a button. There are a large number of these different buttons for sharing content available. Notable ones include the Facebook “Like” button, the Twitter “Tweet” button, the Google+ “Plus one button,” and the Pinterest “Pin” button.

## **USER TESTING YOUR RESPONSIVE SITE:**

### **Carrying Out User Testing:**

#### **Focus Groups:**

A focus group is where you gather a group of individuals, preferably no more than ten, who are part of your target market and have them test the site. After testing the site, you then bring them together as a group with a moderator and have them discuss their thoughts about the site. The aim of the focus group is to gather a variety of different people’s thoughts on the way in which a web site works.

#### **Usability Testing:**

Usability testing is a one-on-one session between a member of the target market and a facilitator. The role of the facilitator is to run the user through tasks you want them to perform and then analyses how the user performs on each of the tasks.

#### **Friends, Family, and Work Colleagues:**

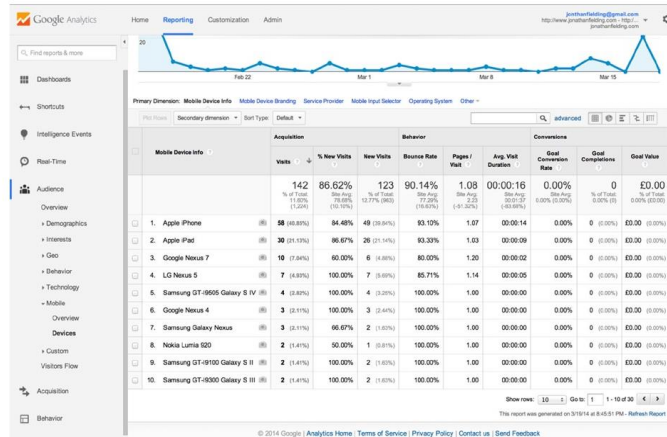
If both focus groups and usability testing are not suitable options due to the cost involved, it is likely that you know friends, family, and even work colleagues who would be happy to give your site a run through and give you their thoughts. The process you would take with testing with these users would be to sit them in front of a device and get them to use your site, potentially by giving them a simple task to achieve during the use of the site. During the testing, you should note how long they take to complete the given task, as this will help you to determine if the journey is too complicated.

## **WEB ANALYTICS TOOLS:**

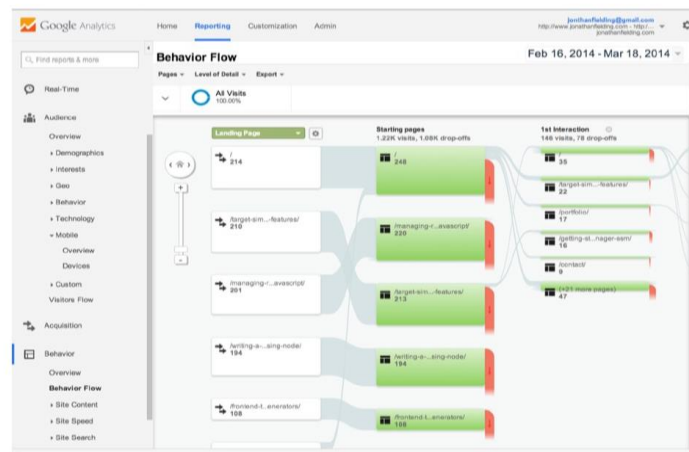
Web analytics tools are tools that can be installed on web sites that enable you to measure the web traffic with the aim to assess and improve the effectiveness of a site. They do this by tracking how users are using the site, with the kind of tracking depending on the individual analytics tool used.

#### **Google Analytics:**

- Google Analytics is a free analytics web site available from Google that allows you to track information about the users of your site.
- The information is completely anonymized, but it can give you a clear indication of the type of users who are visiting your site.
- When it comes to providing information about browsers, Google Analytics can offer a lot.
- To access the browser section of Google Analytics, you would click on the Audience menu item, then you should click Technology, and then Browser & OS.
- This will then present a table of all the browsers used to visit the site, sorted by the most popular. Included is information about the number of users visiting from that browser along with information about their behavior.



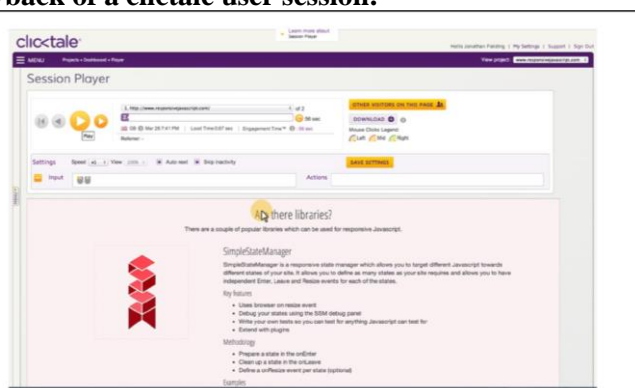
## Behaviour flow of site in google analytics



## ClickTale:

- ClickTale is a different type of analytics tool that focuses on measuring information about how many visitors are visiting a site, looking instead at the behavior of the visitors.
- One of the core features of ClickTale is its ability to record how a user interacts with a web site, which it does by tracking the actions the user performs on the page and recording them.
- What this means to developers is that we can easily see where users are struggling when they are navigating through a site.

## Playback of a clicktale user session:



- In addition to recording the users viewing the web site, ClickTale can use these data to generate heatmaps.
- Heatmaps are graphical representations of data that show the correlations in the data, which in this case is how the users interact with a site.
- ClickTale allows you to look at a series of different heatmaps, each focusing on a different metric: mouse movement, where users click, where users place their attention, and where users typically scroll to on the page.
- The benefit of ClickTale's implementation over that of Google Analytics is that it allows you to filter much more easily without having to do a lot of configuration, and it is focused on looking at where users drop out of your site before reaching the end goal. The interface is also a lot cleaner and easier to use.
- Although ClickTale is a commercial service, it offers a free account that is able to record 5,000 pageviews. Although this is only a small sample, you can make it fairer by providing ClickTale with estimates of how many pageviews you expect to receive, so it can record a random sample. For example, if you expect 50,000 pageviews, ClickTale can be set up to record one in ten of those users.