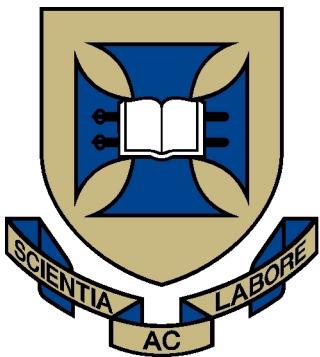


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University of Queensland
DECO1400 – Introduction to Web Design

Design Report

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Glossary

API Application Programming Interface. 1

Bootstrap HyperText Markup Language (HTML)/Cascading Style Sheets (CSS) framework for rapidly making mobile and desktop friendly websites. ii, 23, 24

Byte Most common type of datatype in an electronic system, also sometimes considered the smallest. iii

CSS Cascading Style Sheets. iii

Git A popular version control system for tracking a change history of code and providing easily collaboration between developers. Git is commonly used with an online public repository such as GitHub or GitLab. ii, 1, 3, 4, 12, 15, 21, 22, 24, 27, 28

Heroku Platform as a Service for hosting of web applications. ii, 23

Hex A number system of base 16, commonly used in computer systems because a group of two hex numbers makes up a Byte. 16

HTML HyperText Markup Language. iii, 16, 23, 24

HTTP HyperText Transfer Protocol. iii, 25

HTTPS HyperText Transfer Protocol (HTTP) Secure. 25

JavaScript Browser scripting language used to provide interactive features. 1

Open Source Associated with a project where all code and content required for the project is accessible publicly and can be contributed to with respect to any associated licensing. 16

OS Operating System. 16, 25

PayPal Payment service for handling of bank card details online, a largely trusted site with strong integrity claims. 25

React JavaScript framework which utilizes the virtual DOM and component based tree structure to improve application performance and reduce code duplication. 1

SmartHome An environment in which a series of different devices communicate and interact together to provide an end user with a more automated housing experience. 1

TypeScript Adds static type checking to JavaScript. 1

UQ University of Queensland. ii, iii

UQMS UQ Medical Society. ii, 22

UX User Experience. 18

WCAG Web Content Accessibility Guidelines. 22

Chapter 1

Design and Details

1.1 Introduction

This design report is used to describe the process used to design and develop a website for teaching and instructing people of how version control systems work and the typical process flow of Git.

1.1.1 Introduce Yourself

I am currently studying in my fifth year of Engineering majoring in Software at the University of Queensland. My expertise is in low level computing as well as website application development, using modern frameworks such as React and TypeScript. I have completed my thesis under the supervision of Alex Pudmenzky where I designed and constructed a website and mobile application which interfaced with a series of different SmartHome applications. I am currently working as a developer at Aurecon where my knowledge of React and JavaScript are used to develop applications and work extensively with industry Application Programming Interface (API)s.

Learning Strategy

Even though I have quite strong experience in JavaScript and website development, a lot of my experience has been through using frameworks and early release technologies. So my strategy is to create a well document which has good accessibility design and is supported incredibly well across all system. All features as well as most bonus features should be usable on all platforms.

Across my development I have not had much experience with the design phase of a project either, so it a goal of mine to embrace the design and learn as much as I can about the processing and thought procedures involved with designing and a website and not just jumping in immediately and developing.

1.2 Getting to Know Stakeholders

1.2.1 Target Audience

It is always essential to pick a target audience for a project before beginning, this will help to identify relevant content and ideas that should or should not be used. For this project the target audience is centred around people just beginning to learn about code or beginning to enter a professional environment where their code or actions will be marked and versioned. These sorts of people are typically around 18 to 22 years old and have some basic experience with computers and know how to work their way around the system. However they are still incredibly new to the environment and if content is not broken down in an understandable way then they can be easily confused and lose interest.

Personas

Jane

Age: 21

Gender: Female

Goals:

- Has been applying for jobs but her skill set isn't wide enough to make it past the first round
- Wants to gain more confidence with computer science
- Would like to see how this can be applied directly in industry

Pain Points:

- She gives up incredibly easily
 - Can be overwhelmed quite easily
 - Can only consume content in small, easy to process blocks

David

Age: 23

Gender: Male

Goals:

- Wants to move into a more software development role in his company
 - Wants to see immediate improvements with himself and his work
 - Has extensive knowledge already with Information Technology Support roles, but wants to extend on that knowledge

Pain Points:

- Easily distracted and ends up losing track of current task
 - Very industry oriented
 - Time is money, so give me everything as fast as possible mentality

John

Age: 17

Gender: Male

Goals:

- Has an assignment coming up and has heard how Git can help him keep track and control his code
 - Would like to learn something he can use across all of this assignments
 - Needs to be able to recover from his night before breaking changes

Pain Points:

- Has mentality of "Why learn this if my old thing can do a similar job"
 - Not really a software focussed person (knows some basic Python code)
 - Wants the answer now, doesn't want to take the journey to the answer

Bob**Age:** 19**Gender:** Male**Goals:**

- The rest of his team wants to use Git for an assignment and he is the only one in the team that doesn't know it
 - Doesn't want to fall behind the rest of the team and get marked down
 - Just wants a place he can copy paste the commands and use them

Pain Points:

- He doesn't want to learn, he is just being pressured by the rest of his team
 - Just wants to be able to copy paste the commands and have them work
 - Being pressured by the team has left him already frustrated by the use of Git

Goals

With the target audience specified it can now be import to outline goals that should be followed to ensure the target audience is engaged.

Consumable Chunks: The target audience require information to be broken down into consumable chunks in which they can learn, reflect, and then use before moving on to the next chunk.

Direct Content Flow: Content chunks should also logically flow from one section to the next without large gaps in presentation. Not following this goal will ultimately result in the consumer losing track and becoming disinterested.

Simplistic Graphics: Following design patterns released by large web driven companies, such as Google and Facebook, content should be shown in a way that is not overcrowded and can be confusing. If graphics are used to illustrate a point they should be vector based to help provide a more defining and clean look.

Defined Website Theme: In order to engage the users and not make them lose interest, the website must have a clear and engaging theme that is applied site wide. This will help to reduce confusion about different sections of the site.

Clean and Polished: The site as a whole should be clean and usable site. This means performance should remain consistent and have an expected behaviour across the entire site. As well all graphics should be presented in a high quality and consistent manor, this can be achieved using vector graphics and rendering on the client side. Finally the site should function across all modern browsers and devices, as well as having accessibility support.

1.2.2 Chosen Educational Content

For this website, the goal is to be a resource for people wanting to learn about Git the version source control system. Git allows people to track and mark changes they are making to code as well as easily allowing other people to integrate and edit the code together. Git fits well into the target audience because it is becoming more and more essential programming jobs and is becoming assumed knowledge for every programmer. Therefore people just starting in industry might not have knowledge about this tool and therefore need to upskill quickly and efficiently.

1.2.3 Chosen Story

Reference Character

The chosen character which this story is based off is Dr. Henry Walton Jones Jr, or more commonly referred to as Indiana Jones. This character fits into the target audience as most people growing up either watched one of the many movies or side television shows, or just know about the character from their friends. Indiana Jones also has a number of books and novels covering his adventures

which helps in finding source materials.

The Story

The story being portrayed is based around Indiana Jones and his adventures through caves and tombs. This adventure has Indiana Jones in search of the sacred “Scroll of Lost Truths”, he will venture out to wild jungles in search of a cave where this scroll is said to be hidden amongst a long set of winding and mind boggling tunnels. The “Scroll of Lost Truths” is said to provide its wielder with the ability to recover any lost information and the history behind the information. In order to help Indiana Jones through the tunnels, he will be keeping a record of all the actions he completes as well as the effects these actions have on the mystical tunnel.

How It Relates

In order to tie the story (Section 1.2.3.2) and the educational material (Section 1.2.2), many references need to be drawn in the story. Achieving this will help to create an understanding and flowing story line that will entice and draw users in to follow through to the end.

The different ties between Git and Indiana Jones are:

The History: In order to tie together the whole history aspect of Git, remarks will be made between the ancient carvings in the walls of the tunnel and how Git keeps track of all the code changes created.

Branching: The tunnels will be used to illustrate how in Git you can branch out and take a different route if it requires.

Single Source of Truth: Git can sometimes be referred to as the single source of truth. The scroll will demonstrate that by showing that once you master Git, you have the ability to traverse through history and create new history.

1.3 Navigation and Organisation

1.3.1 Card Sorting

The Plan

To begin there were three main areas of content were identified: Git Reference Summary, Main storyline/tutorial, Interactive Quiz. These areas were then assigned a rank and associated keywords:

- **Git Reference Summary**

- Shows all the commands and a basic overview of what they do
- This will be visited most by people coming back because they forgot something or wanted to know more outside of the main storyline
- **Rank:** 2
- **Keywords:** Advanced, Reflection, Quick

- **Main storyline/tutorial**

- This will be most frequently visited by new comers and people just visiting the site
- **Rank:** 1
- **Keywords:** Beginner, Interesting, Interactive

- **Interactive Quiz**

- Some of this will also be embedded inside the storyline
- People wanting a challenge and to learn more
- **Rank:** 3
- **Keywords:** Self Learning, Interactive, All Levels

For this survey I chose to go with an Open Card Sort because I wanted to observe how they thought about grouping and what is easier or more important to sort before arriving at a final decision. After the users had finished with sorting the cards, a couple of follow up questions/discussions would be had around why they named the groups they did.

Execution

In order to execute the card sorting, Trello was used for the physical moving of cards around. This decision was made because it best allows people to move the cards around like they would physically, while still providing them with the ease of changing the names of the groups.

Results

Person 1

Difficulty	Learnability	Fun factor	how in depth
Beginner	Interactive	Interactive	Quick
Advanced	Self Learning	Interesting	+ Add another card
All Levels	Reflection		+ Add another card
+ Add another card	+ Add another card		

Figure 1.1: Person 1's Card Sorting Result

How did you group the tags?

Beginner and advanced are varying difficulties, I don't know if that is something I can choose. All levels are associated, can I filter by difficulty level on the side.

Grouped them because the concepts are the same, but on the site I wouldn't expect beginner and advance to be together.

How did you name the groups?

- Difficulty
 - When you play a video game you pick your difficulty level
- Learnability
 - Self learning, learnability makes sense
 - Interactive is key to learning
 - Reflection is key to learning, gauge how successful you were
- Fun Factor
 - Interactive website's are fun, reading a static page can be quite passive and boring
 - It's interesting because I am curious and it feels more tactile
- How in Depth (*mean not very in depth*)
 - I would go through the site really quickly
 - So the level of detail in the website is probably really shallow

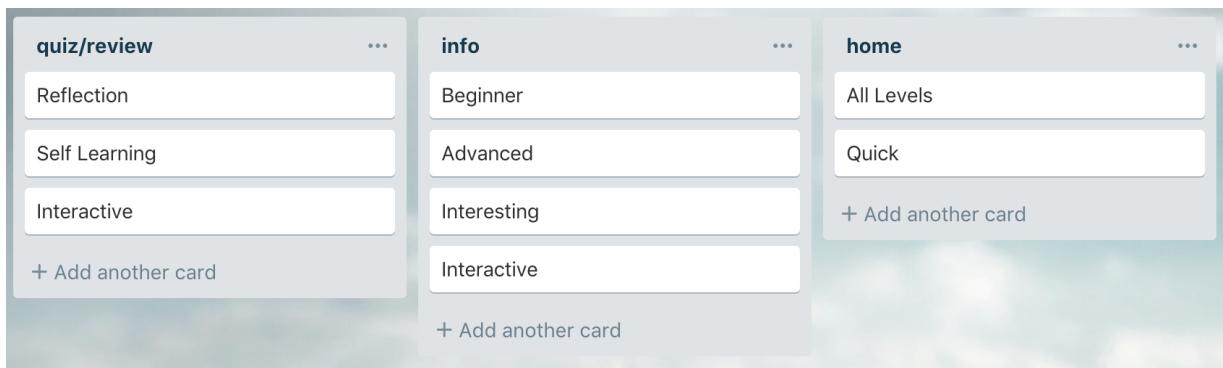
Person 2

Figure 1.2: Person 2's Card Sorting Result

How did you group the tags?

Beginner and advanced are linked and interesting is cool

All Levels and Quick are navigation type

Reflection/SL/Interactive seem like quizzing

How did you name the groups?

- Quiz/Review
 - Reflection/SL is like looking back at what you learnt
 - Looking back
- Info
 - Looking at Beginner and Advanced and interactive is like the middle of where you go
 - Middle man of the navigation
- Home
 - They seem like navigation and be able to go through the site

Summary

When it came to grouping the content together both Person 1 and Person 2 grouped elements together with an understanding of the level of difficulty different tags have. Since both users mentioned this first it can be assumed this is the primary concern or forefront of user thought. Person 1 also created a card group based on interactivity, Person 2 also mentioned that there are cards that are related to interactivity. Therefore it can be assumed that users are also grouping based on how much static an element is and how interactive it is.

From these content can be broken up into three main sections:

Main Homepage: This page is the main area where the user will learn the basics and be interested to learn more. This site will be majority static content.

Reference Sheet: This page will be just a bunch of commands and the usage/description of the commands. This site will also be a static based site.

Quizzes: The quizzes will be used for the user to recap the knowledge they have learnt through the site. This site will be interactive and only supported on browsers which support a wide range of interactivity.

These three pages help to break up the content through the two categories identified in the card sorting. Main Homepage and Reference Sheet allow for two different difficulty levels (beginner and advanced respectively), while delivering primarily non-interactive. The Quizzes page covers all difficulty level with the user specifying what difficulty level they want to be tested on. The Quizzes page will also provide a user interactive approach where all content displayed on the screen is based on interactions made by users.

1.3.2 Navigation Systems

A lot of the shown “correct” styles of navigation systems followed a similar style and placement. A lot of “incorrect” styles were outside the norm of having common elements. These elements are:

- A main banner which include a general logo and quick navigation links underneath
- Most of the examples also used an inner page navigation panel on the left for filtering content on the current page

Reflecting on the themes and the presentation styles used across websites that are considered good design, a similar layout will be used for this website. However slight modifications will be made to suit a scrolling storyline layout. To increase screen size and make the website appear more story like, the main logo will be reduced to be inline with the primary navigation menu. A side navigation menu will be created but it will be semi-hidden for a majority of the website and only showing itself when the mouse interacts with the shown tip.

1.3.3 Site Map

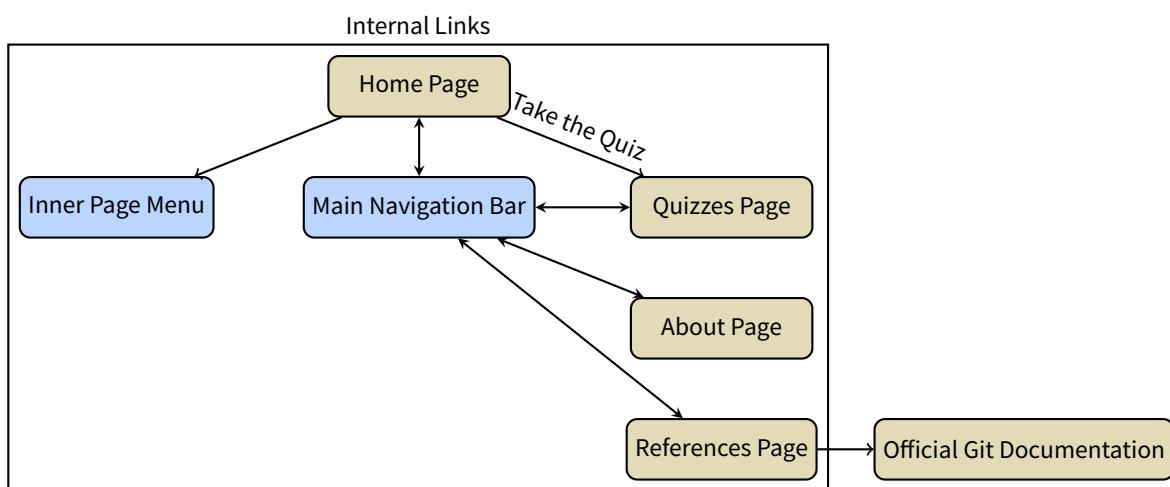


Figure 1.3: Site Map Navigation

Site Map Navigation

The site map design is shown in Figure 1.3, here the user will enter the site via the “Home Page” which will be the main story page. Then to navigate they can chose to navigate through the home page using the “Inner Page Menu” or via scrolling. The other main navigation feature will be the top bar which can be used to navigate to the other pages within the site (“Quizzes Page”, “About

Page”, “References Page”). From these pages, the same navigation element will exist allowing the user to navigate back or to other pages as they see required.

There will be small link at the bottom of the home page what will direct the user to the quizzes page, this symbolises that they have all the knowledge they require and it is time to see if they really learnt as much or need to go back through and understand it much more clearly.

1.3.4 Visual Organisation

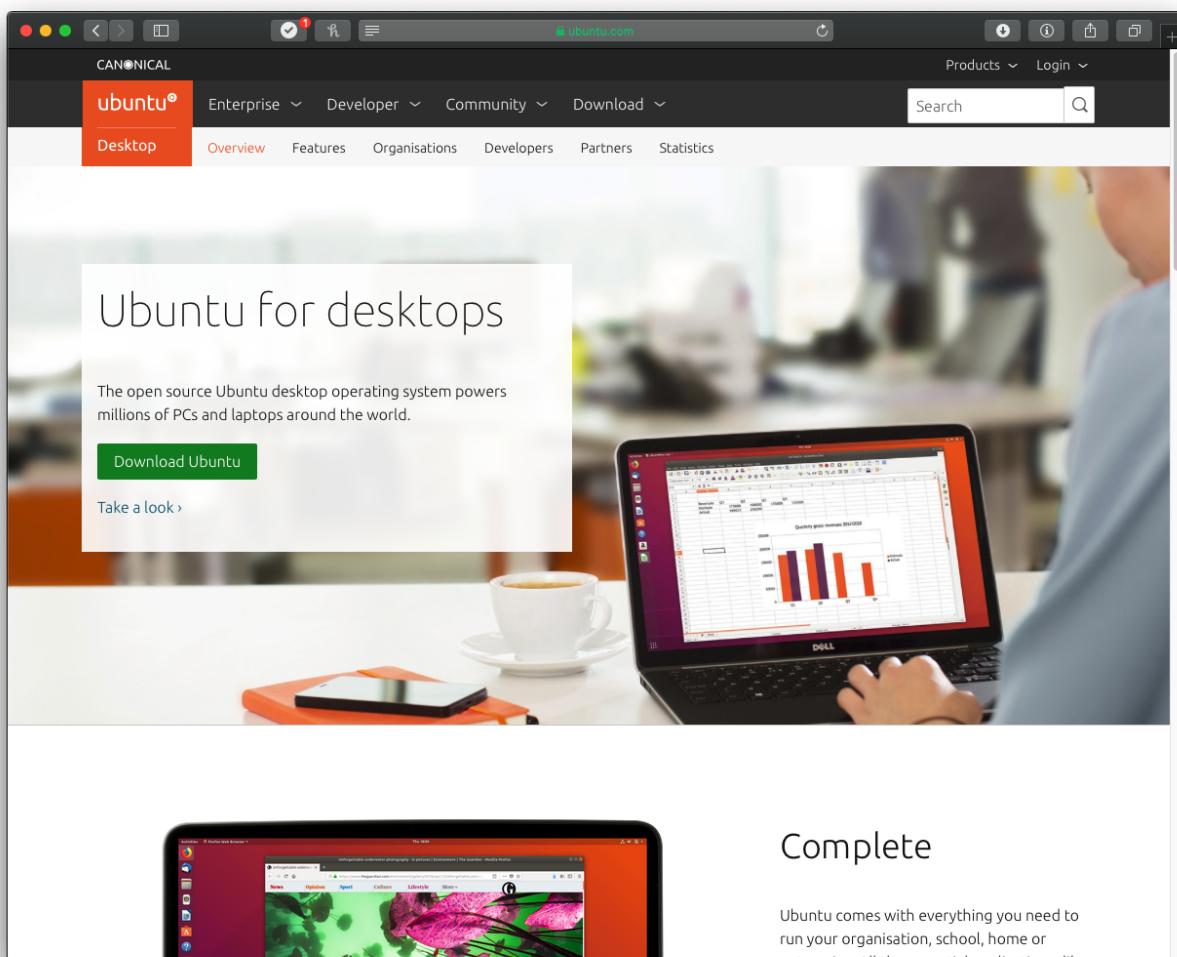


Figure 1.4: Screenshot of Ubuntu Desktop webpage

The example site picked for the visual organisational layout is the Ubuntu Desktop webpage (Figure 1.4). This site incorporates a lot of good design choices and creates a very pleasant user experience through its choice in positioning and colors.

Spacing

The page utilises a lot of spacing around elements to signify the beginning and ending of different sections and content. And pictures are used to help create this space without making the space seem stretched out or the significance of “white space”.

Colours and Fonts

Ubuntu has used a very basic colour palette here, simply just black and white with orange as a primary colour. The use and choice of colour has resulted in the images having a really attention drawn in factor and the text combined with the font choice, is easy and delightful to read. A user is draw to the picture foremost and then curiosity about what they are looking at draws them into the text to find out more. The styling of the text creates a calm and informal attitude which invites readers to only view the information they think is relevant.

Alignment and Layout

The webpage appears to use a three column approach where either content is split across three columns, or the image consumes two columns and text is floated left or right of the image. However due to the use of spacing, this column structure is not strict and instead boosts the appearance of a relax and informal presentation.

Weight

Ubuntu has taken a none-traditional approach to weight in web design by not so much assigning weighting to how bold or coloured the text is. Instead an approach of providing spacing and increased font size is favoured, however font weighting is still used. This primarily puts focus around the user seeing the larger text and the proceeding white space around it as a reference for the weight of a piece of text. This unique approach has provided Ubuntu with the relaxed and informal vibe that appears to be the design goal behind the entire site.

1.3.5 Interactivity and Functionality

Title Page

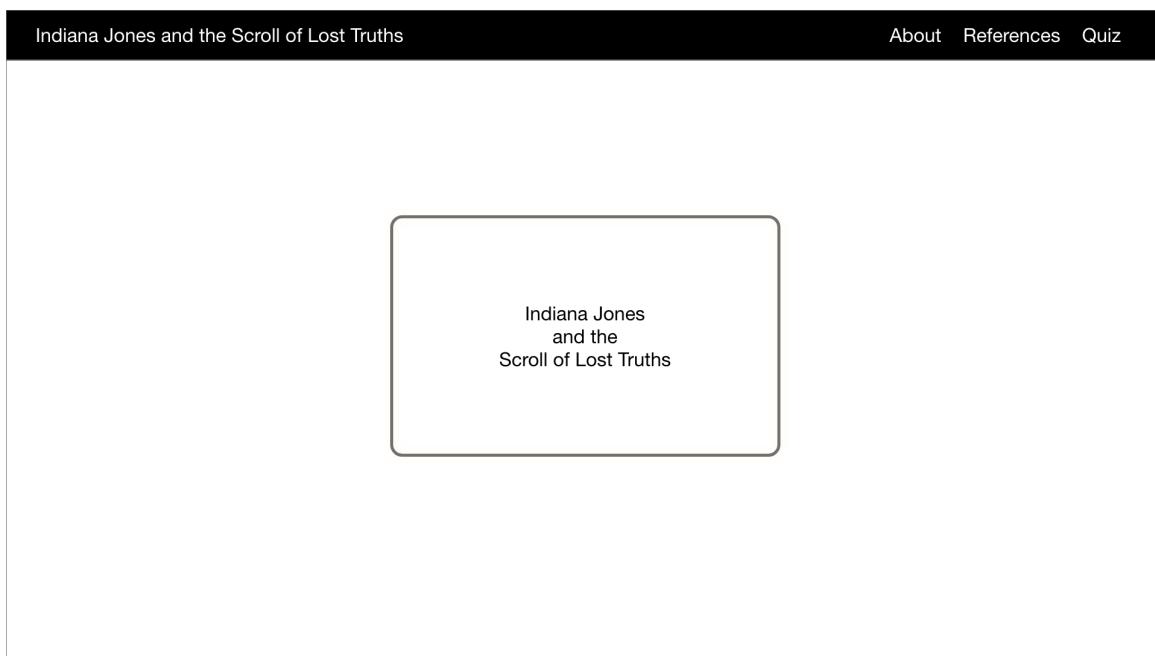


Figure 1.5: Wireframe mockup of main title page

As shown in Figure 1.5, the title page functions primarily as a welcome screen. The background will be an opening and inviting image, as well as set the scene for the wonders that will be covered in future visits. The overall aim of this screen therefore is to get people amazed and further interested in the content being presented. The title page will serve as the first screen and scrolling down will provide the content screens as covered in Section 1.3.5.2.

Main Content

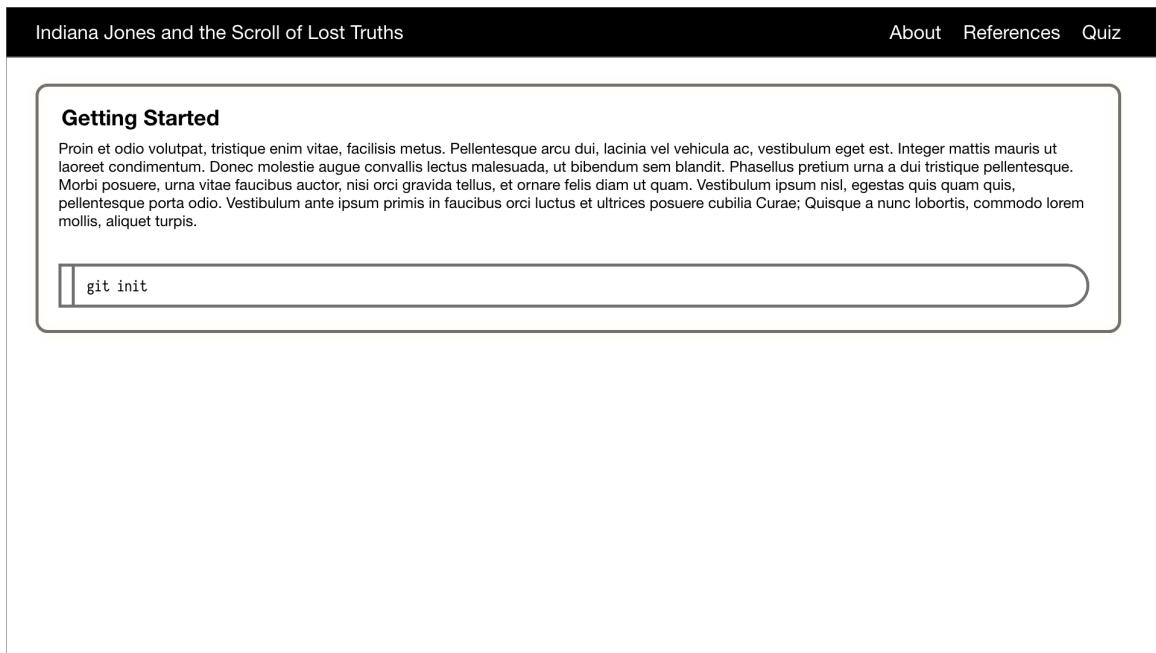


Figure 1.6: Wireframe mockup of single group of content

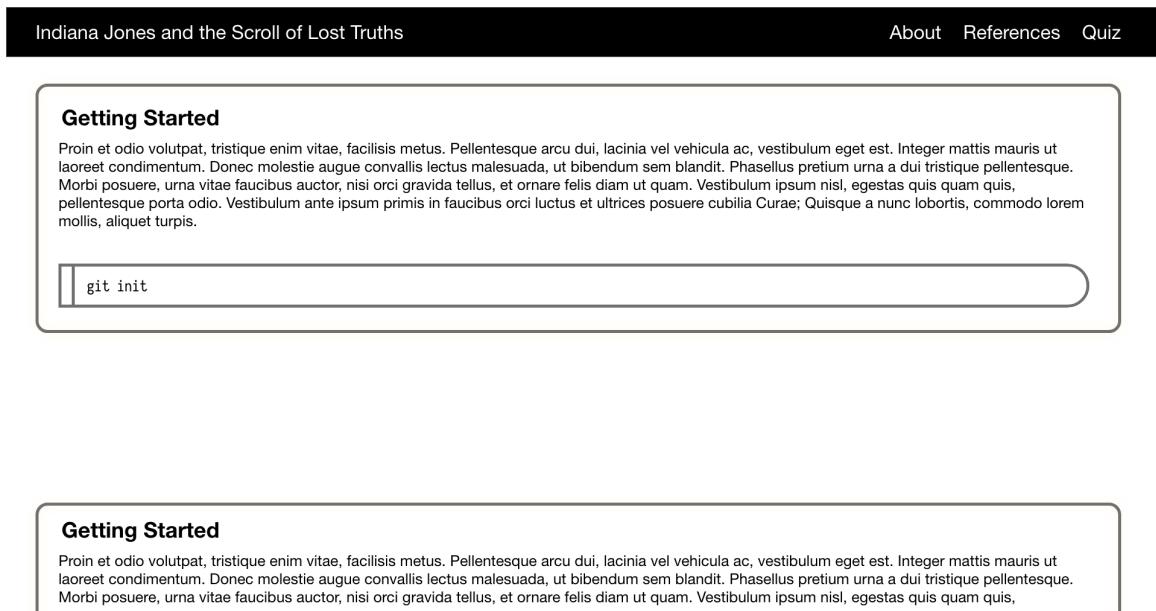


Figure 1.7: Wireframe mockup of a page of content with two groups

The main content will be delivered using “card”s, these cards will contain a header and some content as well as a background and rounded corners. Figure 1.6 shows the wireframe of a content screen with some reference command at the bottom of the card. A content page may also contain two cards (one anchored at the top, and one at the bottom), as shown in Figure 1.7.

About

The about page will be used as a way for people to find out information about the website and the author. Figure 1.8 details the wireframe layout of the about page. The grey box on the right side

About

Proin et odio volutpat, tristique enim vitae, facilisis metus. Pellentesque arcu dui, lacinia vel vehicula ac, vestibulum eget est. Integer mattis mauris ut laoreet condimentum. Donec molestie augue convallis lectus malesuada, ut bibendum sem blandit. Phasellus pretium urna a dui tristique pellentesque. Morbi posuere, urna vitae faucibus auctor, nisi orci gravida tellus, et ornare felis diam ut quam. Vestibulum ipsum nisl, egestas quis quam quis, pellentesque porta odio. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Quisque a nunc lobortis, commodo lorem mollis, aliquet turpis.

Duis non ipsum elit. Mauris lacinia massa eget odio accumsan finibus. Aenean finibus sollicitudin enim sit amet pellentesque. In hendrerit ornare ante, et auctor augue pretium et. Mauris malesuada elementum velit nec finibus. Vivamus vitae justo vel diam varius auctor. Duis euismod mauris arcu, in volutpat leo ornare eget. Mauris sapien est, iaculis hendrerit turpis nec, tempus sodales elit. Maecenas cursus libero tortor, ultrices cursus ipsum facilisis in. Duis ultrices quam in odio volutpat blandit.

Figure 1.8: Wireframe mockup of the about page

will be used for a professional portrait photo of the author and the text on the side detailing both the author and the website.

References

References

Command	Usage	Description
Add	git add	Proin et odio volutpat, tristique enim vitae, facilisis metus. Pellentesque arcu dui, lacinia vel vehicula ac, vestibulum eget est. Integer mattis mauris ut
Add	git add	Proin et odio volutpat, tristique enim vitae, facilisis metus. Pellentesque arcu dui, lacinia vel vehicula ac, vestibulum eget est. Integer mattis mauris ut
Add	git add	Proin et odio volutpat, tristique enim vitae, facilisis metus. Pellentesque arcu dui, lacinia vel vehicula ac, vestibulum eget est. Integer mattis mauris ut
Add	git add	Proin et odio volutpat, tristique enim vitae, facilisis metus. Pellentesque arcu dui, lacinia vel vehicula ac, vestibulum eget est. Integer mattis mauris ut
Add	git add	Proin et odio volutpat, tristique enim vitae, facilisis metus. Pellentesque arcu dui, lacinia vel vehicula ac, vestibulum eget est. Integer mattis mauris ut
Add	git add	Proin et odio volutpat, tristique enim vitae, facilisis metus. Pellentesque arcu dui, lacinia vel vehicula ac, vestibulum eget est. Integer mattis mauris ut
Add	git add	Proin et odio volutpat, tristique enim vitae, facilisis metus. Pellentesque arcu dui, lacinia vel vehicula ac, vestibulum eget est. Integer mattis mauris ut
Add	git add	Proin et odio volutpat, tristique enim vitae, facilisis metus. Pellentesque arcu dui, lacinia vel vehicula ac, vestibulum eget est. Integer mattis mauris ut

Figure 1.9: Wireframe mockup of the references page

Figure 1.9 defines the wireframe for the references page. This page is the main page which users will go to for any quick information. Therefore most of the information regarding this page is placed into tables with a brief description in the rightmost column.

Question 1

This is a really basic question which will be used to provide the user with some feedback based on how well they think they know git. This will also provide a lot of used based feedback so this page will mostly be based around providing interactivity and cool feedback features. Look to be honest I just need a little bit of text to fill up this box a bit more.

- Option 1
- Option 2
- Option 3
- Option 4

Question 2

This is a really basic question which will be used to provide the user with some feedback based on how well they think they know git. This will also provide a lot of used based feedback so this page will mostly be based around providing interactivity and cool feedback features. Look to be honest I just need a little bit of text to fill up this box a bit more.

```
> git init
Repository successfully created
> git add hello.txt
File added successfully

git commit -m "hello"
```

Figure 1.10: Wireframe mockup of the quiz page

Quiz

The quiz page will primarily be used for users to test themselves and their Git knowledge, this page will be focused heavily on user interaction and provide a lot of dynamic content. Figure 1.10 shows the wireframe with two interactive controls.

The first interactive control provides the user with the option to pick one option from a set of options. In Figure 1.10, “Option 2” is selected as the users answer. Upon completion of the quiz, feedback will be provided locally to the control specifying if that particular answer is correct or incorrect.

The second interactive control allows the user to simulate using the Git commands in an emulated environment. Therefore they are able to enter different git commands and receive input based on these commands. Due to the amount of features provided with Git, not all commands will be implemented and only the set of commands covered in the main tutorial will be implemented. Upon completion of the quiz, if the result does not match the requested result from the question the user will be prompted to attempt this question again.

1.3.6 Paper Prototyping

The paper prototype was broken up into the following tests:

Learn the Basics

- **Do:** “Learn the basics”
- **Watch:** If they scroll through the homepage or jump to references
 - **Person 1:** Hovered over the code snippet. Hovered over the heading. “Will I be looking at whitespace”
 - **Person 2:** Went to the about page first
- **Ask:**
 - “Was it intuitive to scroll the page?”
 - * **Person 1:** Yeah very intuitive, but there is no menu have to scan the entire page
 - * **Person 2:** Yes it was quite intuitive, I think that normally when someone encounters



Figure 1.11: User completing the paper prototype test

a website they would scroll down for more information. Especially when the title says getting started

- “Do you feel like the content is will spaced out?”
 - * **Person 1:** Yeah but vertical spacing is verging on a little too much
 - * **Person 2:** If each section is separated then yes, otherwise separate pages might be effective

Complete the Quiz

- **Do:** “Complete the Quiz”
- **Watch:** How capable each of the controls in the quiz are
 - **Person 1:** Got really confused about the terminal thing
- **Ask:**
 - “Did you feel like it was obvious there was a quiz?”
 - * **Person 1:** Yeah it was obvious because of the quiz button. Weird it was between references and about
 - * **Person 2:** Yes because there was a heading up the top saying quiz
 - “Was the Quiz easy to flow through?”
 - * **Person 1:** I don’t know how many questions there are... Yes
 - * **Person 2:** Yes
 - “Do you think you would benefit from the quiz?”
 - * **Person 1:** Yes cause I know what I don’t know, find out weak spots
 - * **Person 2:** Yes because a quiz is useful to check whether the content learnt was absorbed

Get information on Advanced commands

- **Do:** “Get information on Advanced commands”
- **Watch:** If they scroll through the home page screen first or go straight to the references page

- **Person 1:** Went to the homepage first
- **Person 2:** Went to the homepage first

- **Ask:**

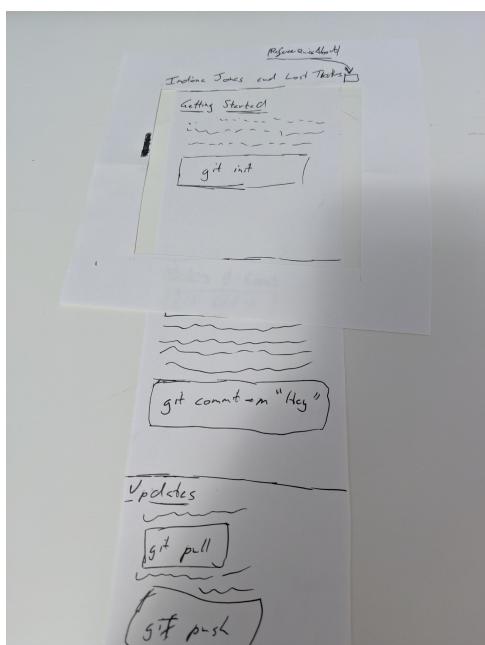
- “Was it clear that there is a references overview page?”
 - * **Person 1:** Yeah but I thought it was citations, not git command references
 - * **Person 2:** Yes there was a title at the top saying references. Title it “git command reference”

View information about the creator

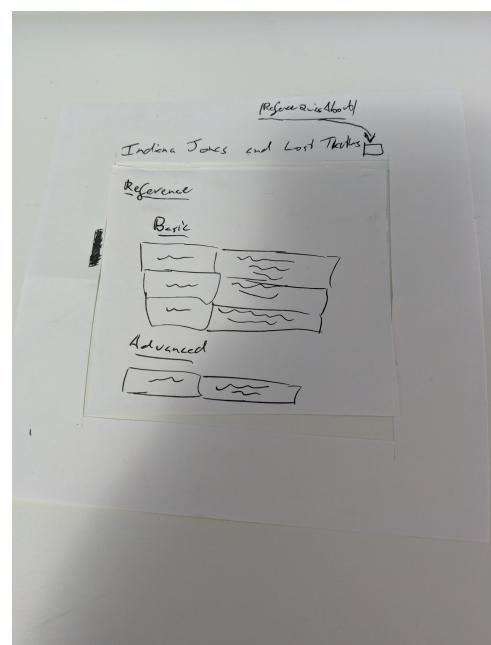
- **Do:** “View information about the site creator”
- **Watch:** How easy the navigation bar is to use
- **Ask:**
 - “Did you know exactly where you wanted to go?”
 - * **Person 1:** yeah but thought about was about the page not about the person
 - * **Person 2:** yes this was a very intuitive button

How do you update your git?

- **Do:** “How do you update your git repo?”
- **Watch:** If they navigate to the references or the home page
 - **Person 1:** Navigated to the home page
 - **Person 2:** Navigated to the references page
- **Ask:**
 - “Did you know where you needed to go?”
 - * **Person 1:** Yeah I had a vague idea because I started on that page. I wouldn't if I didn't scroll the page
 - * **Person 2:** Yes, because the references will show me all the commands I can use



(a) Paper Prototype screen of the main homepage



(b) Paper Prototype screen of the references page

Figure 1.12: Screenshots of paper prototype

Chapter 2

Development and Implementation

2.1 Aesthetics

2.1.1 Style Guide

Colour Scheme

When picking a colour scheme it is important to take into consideration the effects the colours will have on people, also known as the colour psychology. Brown represents strength and reliability, meanwhile orange represents enthusiasm and attention. All of these traits are traits that are either associated with Git or can be used to maintain people's interest. Therefore the primary colour of the website is part the way between brown and orange to attempt to get a blend of these traits. Finally the primary colour also represents a gold style colour to better represent the value of using Git, since gold is associated with money and wealth. [1]

A secondary colour was chosen to represent calming in order to make sure that the user never got too anxious over the content being presented to them. However after user testing and evaluation it was obvious that the users did not reach a point that the colour was required. [1]

The background colour chosen is based on a darker shade of the primary colour, this is to help make the background a lesser focus of the content and make the content the frontmost focus of the user. This colour is meant to complement both the content background and the primary colour used in the content. The colour difference between the background and primary should be a noticeable difference but not something immediately obvious and distracting to an average consumer.

The main goal is the use of colour between; the immediate content (headings and title blocks), the content (the main information and reason the user is visiting the page), and the background. Therefore content and colours used for the content is the blending piece between the background colour and primary colour. Another consideration for the content colours is the use of dark text or light text and the effects on readers. In order to not strain the users's eyes when reading and to enforce proper reading and not skimming, a light background with dark text approach was taken [2]. Therefore a white background with black text scheme was chosen for the content.

An area of content may have partially highlighted areas which are of interest to readers if they are quickly scrolling or skimming through the content. These areas are of interest but should not distract from normal reading consumption. A slight grey tinge background with a medium sized margin around the highlighted content will help to ensure the content is well recognisable to quick reads but not distracting to normal readers. This grey combined with the primary colour on titles allows users to see the code block and then immediately identify the content.

The final HTML Hex codes are as follows:

Primary: #A18613

Secondary: #1975FF

Background: #6D532D

Content Text: black

Content Background: white

Content Colouring Code

The use of “black” and “white” as the content colours allows for Operating System (OS) overrides to adjust the text, so if the user has any preferences that modify the default values of websites than these preferences will be applied to the content. The drawback of using this type of referencing means that there are varied results across browsers and systems.

Font Families

The font chosen is an Open Source font by Adobe, Source Sans Pro. It is a sans serif based typeface and the first Adobe Open Source font family. The font is intended to be used on user interfaces. This font is easy to read and understand and allows for users to both sit down and read and quickly skim through text without strain. [3]

A typewriter based font is used as a secondary font for identifying blocks of code within paragraphs. This font was used because of its recognition to code based fonts and terminal fonts. Therefore giving the user a sense of recognition and relationship between the content and the terminal.

Font Weights and Sizes

Font weights are used to associate the strength of a piece of text in this project. Therefore all headings and title blocks are bolded to indicate their strength and importance. With that, small little messages and indicators (which should be read but not as strong in their statement) are not bolded and instead italicised. All normal consumption of content should be of normal weighting and not italicised, this is to help put a better emphasis on the content that is different.

Font sizing is also used to create emphasis on content, but it is also used as a slight benefit to content which is meant to appear in a smaller space and not draw too much from the user. Any slight tooltips instructing the user on how to use a new piece of content should be reduced to 80% of the original font size, this helps to ensure the tooltip while still readable and helpful. It is not consuming up any extra space that could otherwise be utilised. An exception to this rule is a tooltip that is dismissible and only shows on a predefined user action, this exception exists because now that space is only being used temporarily as a guidance if the user requires.

Links

Common links should be highlighted from normal content with the use of the primary color and a basic underlining. The underlining is used to draw resemblance to other stylings of links across the Internet.

Some links however have slight variations, these links will have a hover effect where the underline will progressively get stronger across a given time. This is meant to simulate the link “activating”, as if the link between the text and the destination webpage is getting stronger until it is fully activated. Figure 2.1 shows a screenshot of a content block with links included.

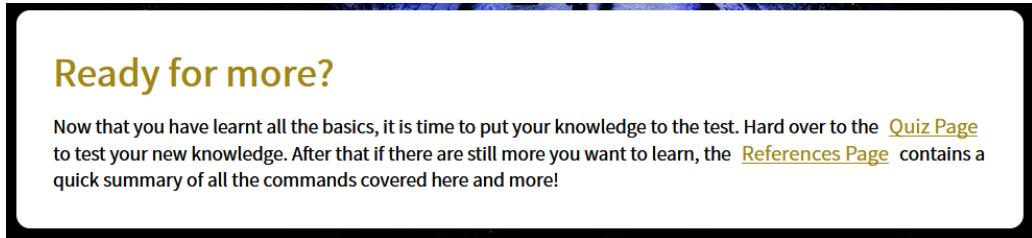


Figure 2.1: Screenshot of the link used in a content block

Attention

Sometimes a possible feature is not always easily identifiable from a website and requires some way of identifying the user that there are more actions that can be done to better improve their viewing experience. This form of grabbing attention is completed through a bouncing the item very slightly. The bouncing should be smooth and not distracting from normal reading but upon scanning the entire page it should alert the user. Each individual bouncing element should also be interactive in some way, for example a docked menu can bounce and upon mousing over the menu will appear.

Code Blocks

Large chunks of code will be represented using the grey colour tones (as noted in Section 2.1.1.1). This toned and padded content will allow for code to be easily identified when skimmed through. The goal of code blocks is to be easily identified with the title of each content blocks. Figure 2.2 shows an screenshot of the code block in use on the main page.

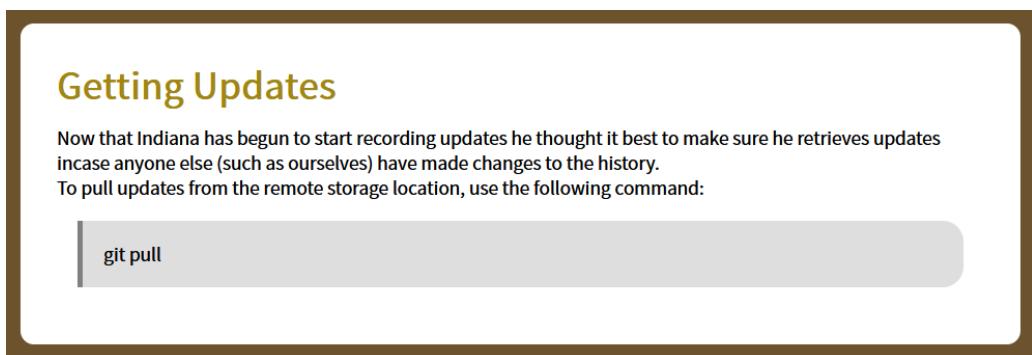


Figure 2.2: Screenshot of the code block used in a content block

Background

The website should use by default a dark background color as defined in Section 2.1.1.1. The aim of this color choice is to ensure it both complements the primary color as well as placing focus on the content foremost.

An alternative background is allowed with a background image. If a background image is used than the image should be a basic image with minimal activity and can be washed out if required. This is so that the image follows the same goals as the plain background color, however in addition the background image should never be repeated or feature any transitions/features independent of the content. These additional features could draw attention away from the content and leave the user distracted, however simple and non-distracting animations could be used but not in excess as to distract the user away. Figure 2.3 demonstrates the style of image to be used as well as how the content is still represented as the forefront and the background image is purely used for aesthetics.

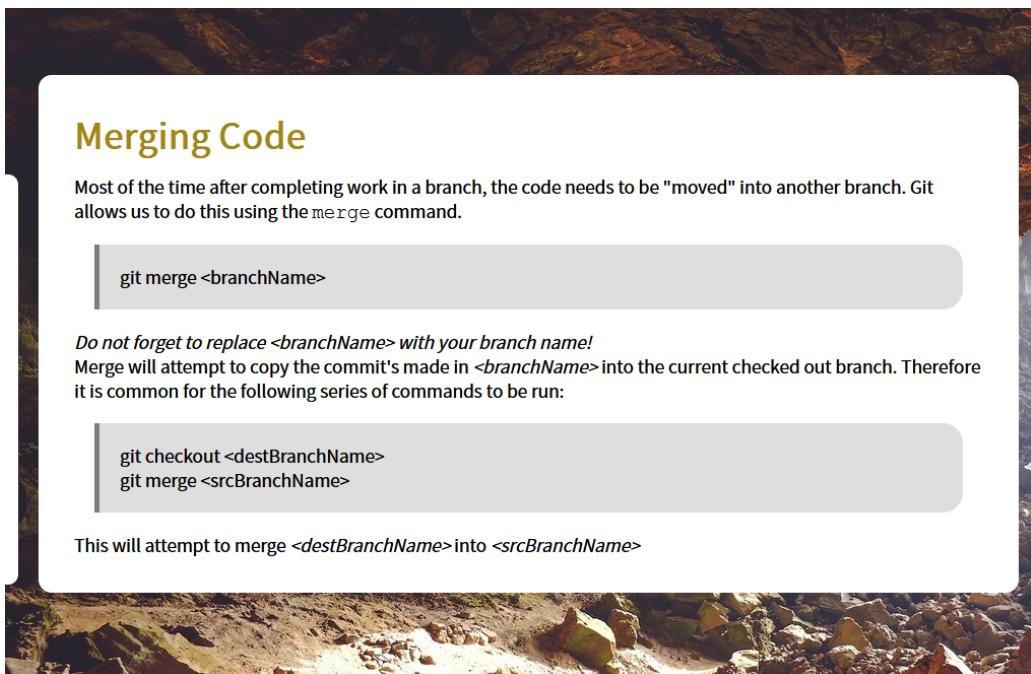


Figure 2.3: Screenshot of the use of a background image behind content

Smooth Hovering

A lot of the content being delivered is often perceived as difficult or challenging to learn by users, with a massive learning curve. So the aim of this site is to not go too fast and to not overwhelm people with quick movements. Therefore all actions should be animated or have a transition applied. These animations should occur for roughly 300 milliseconds, with an ease timing curve. These settings are aimed to help provide the smoothest transition possible while still appearing to be snappy. The ease timing curve helps to make the starting and end appear smooth while the middle filling bit quicker, therefore the user sees the larger defining changes more while still having an overall quick effect. Overall achieving the desired user transitions will help to provide a great User Experience (UX).

2.1.2 Aesthetics User Testing

Landing Page

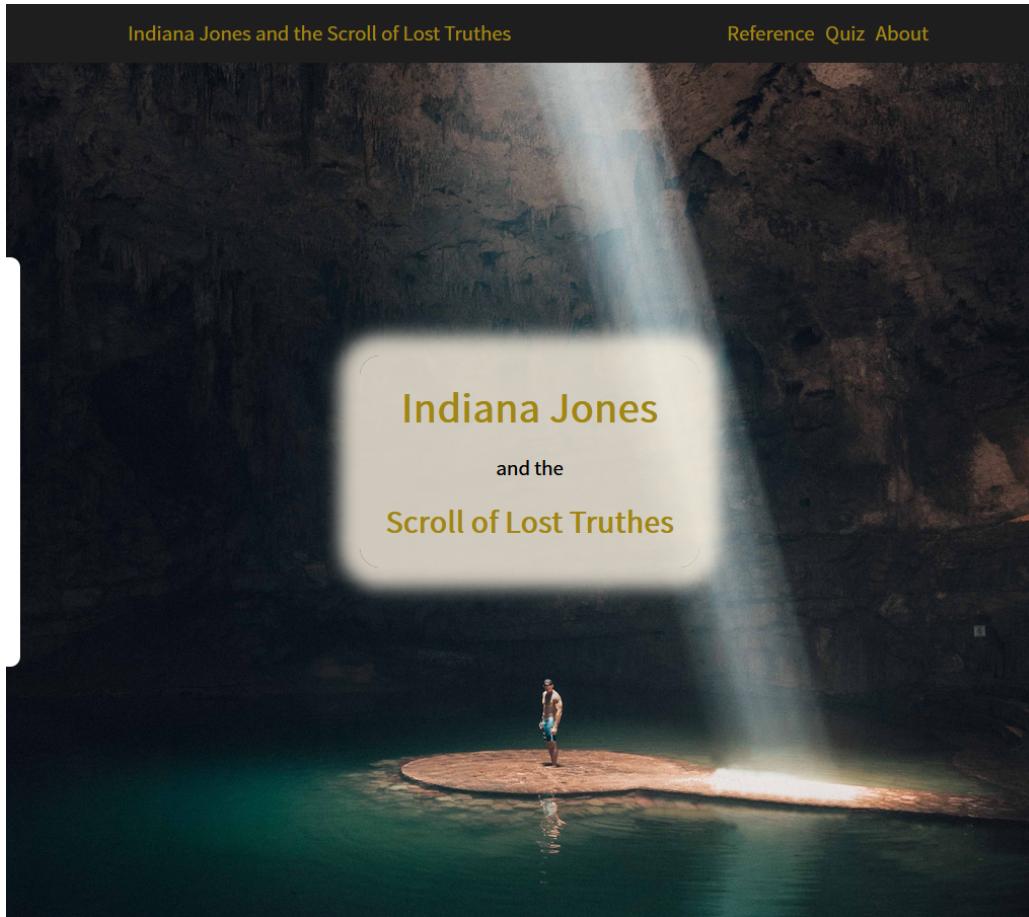


Figure 2.4: Aesthetic example of the main landing page with content available on scroll

An important aspect of web-design is being able to capture and engage your audience from the very beginning. People browsing the internet are rarely forgiving for design and so it is important that people are engaged immediately. The aim of this test was to receive feedback from users about their thoughts on the site and if they are interested to know more.

Figure 2.4 shows the initial mockups used to test people's responses. Almost everyone pointed out that due to the use of the colour and font sizing on the title, there were caught immediately. The second drawing factor is the lack of information partnered with the interesting title. Everyone wanted to know more and learn more about what was on the page. However all of the keen interest was suddenly directed to confusion when the question was raised about what to do next, the lack of direction and indication of actions on the site left people losing interest.

Detailed Content Example

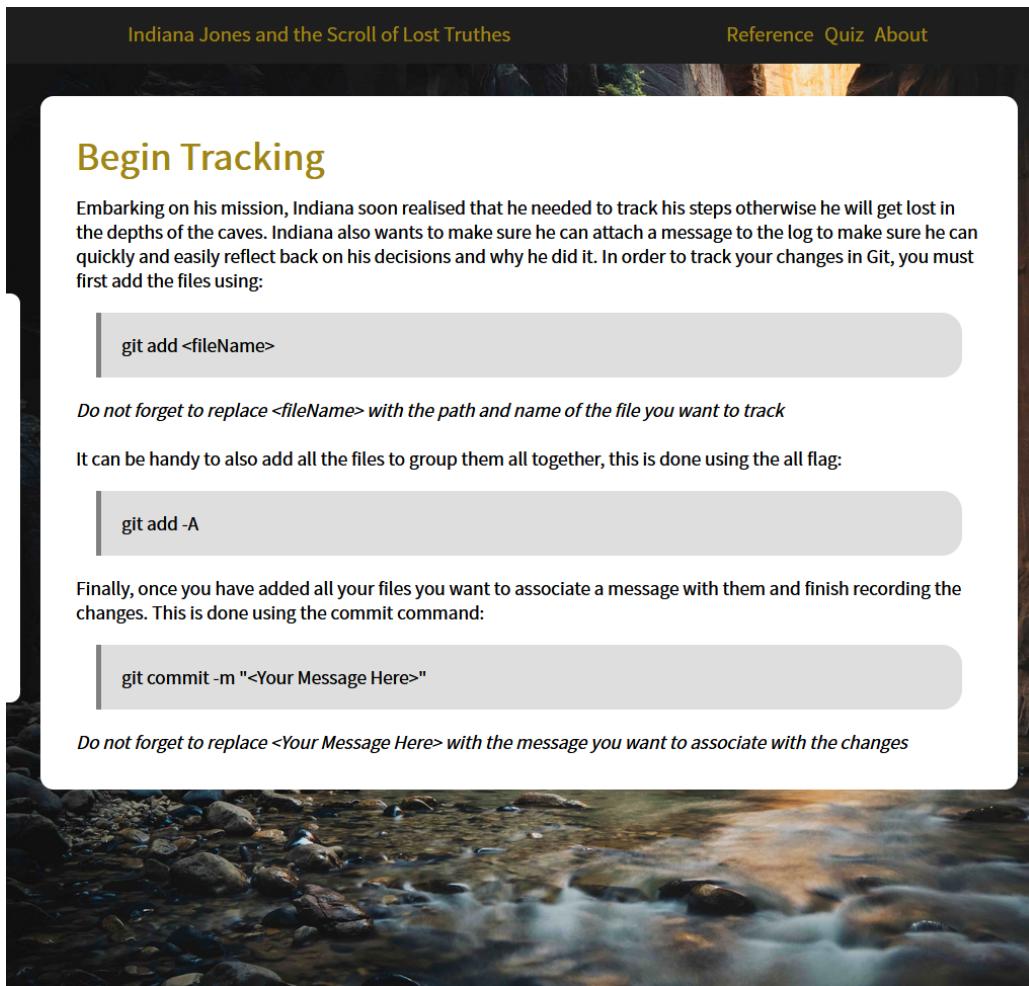
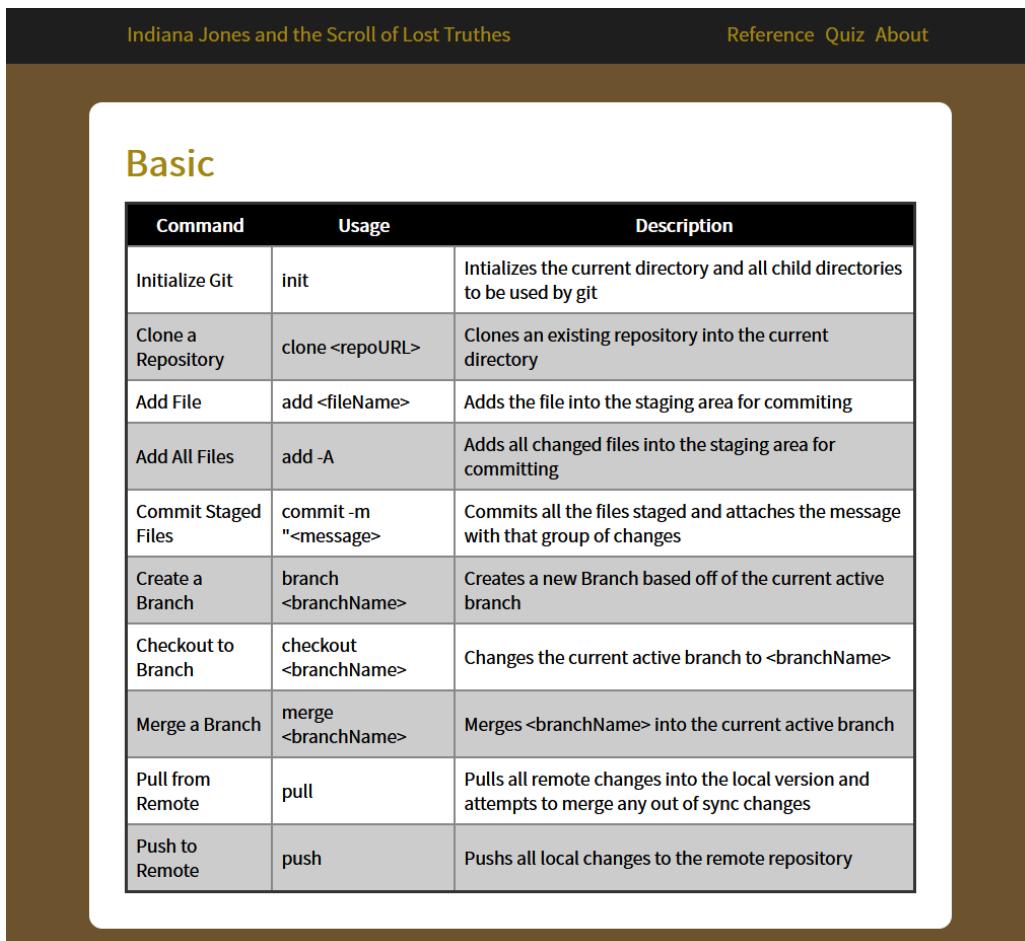


Figure 2.5: Aesthetic example of a page with a lot of detailed content

Another important test is the deliver of content and people's feedback on the choice of spacing and delivery of content. Figure 2.5 is a screenshot of the mockup produced to users. All users liked the use of the white background on-top of the background image, with the black foreground text. Everyone found it easy to concentrate on the content and did not find it distracting. It was noted that the font sizing and spacing helped to break up the content into smaller sections which were easier to consume. Not everyone was aware of the use of the grey box and what they represented, however for people with some extensive computer knowledge they were able to see the metaphor between existing computer tutorials.

References Page with Table Layout



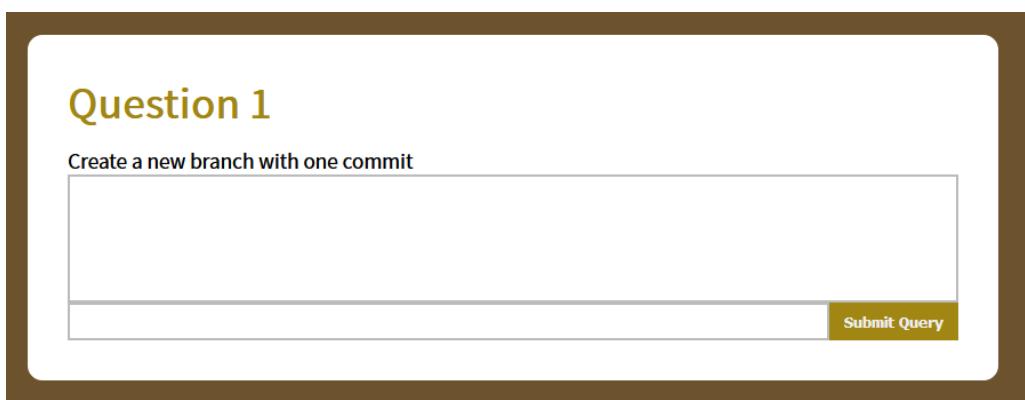
The screenshot shows a dark-themed web page with a navigation bar at the top. The navigation bar includes links for 'Indiana Jones and the Scroll of Lost Truthes', 'Reference', 'Quiz', and 'About'. Below the navigation bar, the page title 'Basic' is displayed in a large, bold, yellow font. A table follows, containing ten rows of Git commands, their usage, and descriptions. The table has three columns: 'Command', 'Usage', and 'Description'. The rows alternate in color between white and light gray.

Command	Usage	Description
Initialize Git	init	Initializes the current directory and all child directories to be used by git
Clone a Repository	clone <repoURL>	Clones an existing repository into the current directory
Add File	add <fileName>	Adds the file into the staging area for committing
Add All Files	add -A	Adds all changed files into the staging area for committing
Commit Staged Files	commit -m "<message>"	Commits all the files staged and attaches the message with that group of changes
Create a Branch	branch <branchName>	Creates a new Branch based off of the current active branch
Checkout to Branch	checkout <branchName>	Changes the current active branch to <branchName>
Merge a Branch	merge <branchName>	Merges <branchName> into the current active branch
Pull from Remote	pull	Pulls all remote changes into the local version and attempts to merge any out of sync changes
Push to Remote	push	Pushes all local changes to the remote repository

Figure 2.6: Aesthetic presentation of the references page, showing some basic commands

Figure 2.6 was used to check the colour scheme and colour variability for a table being represented on the page. The aim of this test was to get user feedback around the styling of the table and if it fits within the style of the rest of the website. A lot of people agreed that the style of the table was simple and intuitive, however most people noted that the table as a whole does not fit the general style of the website. The website is more based around smooth and clean edges, while the table has hard and sharp corners.

Quiz Git Sandbox



The screenshot shows a dark-themed web page with a form for a quiz. The form is titled 'Question 1' in a large, bold, yellow font. Below the title is a text input field with the placeholder 'Create a new branch with one commit'. At the bottom right of the input field is a yellow button labeled 'Submit Query'.

Figure 2.7: Aesthetic layout of the Git sandbox

The final aesthetics test was centred around getting feedback on the Git Sandbox control which is used in the Quiz page. This control is to allow people to test their basic Git knowledge in an environment which can do no harm to their system. Everyone that is unfamiliar with programming languages' tutorials did not understand the control and how to use it. The feedback provided was there was no clear place to begin and leave with the device. Some simple tooltips and differentiation between the top half and the bottom half.

2.2 Website Implementation

2.2.1 Accessibility, Graceful Degradation & Progressive Enhancement

Accessibility

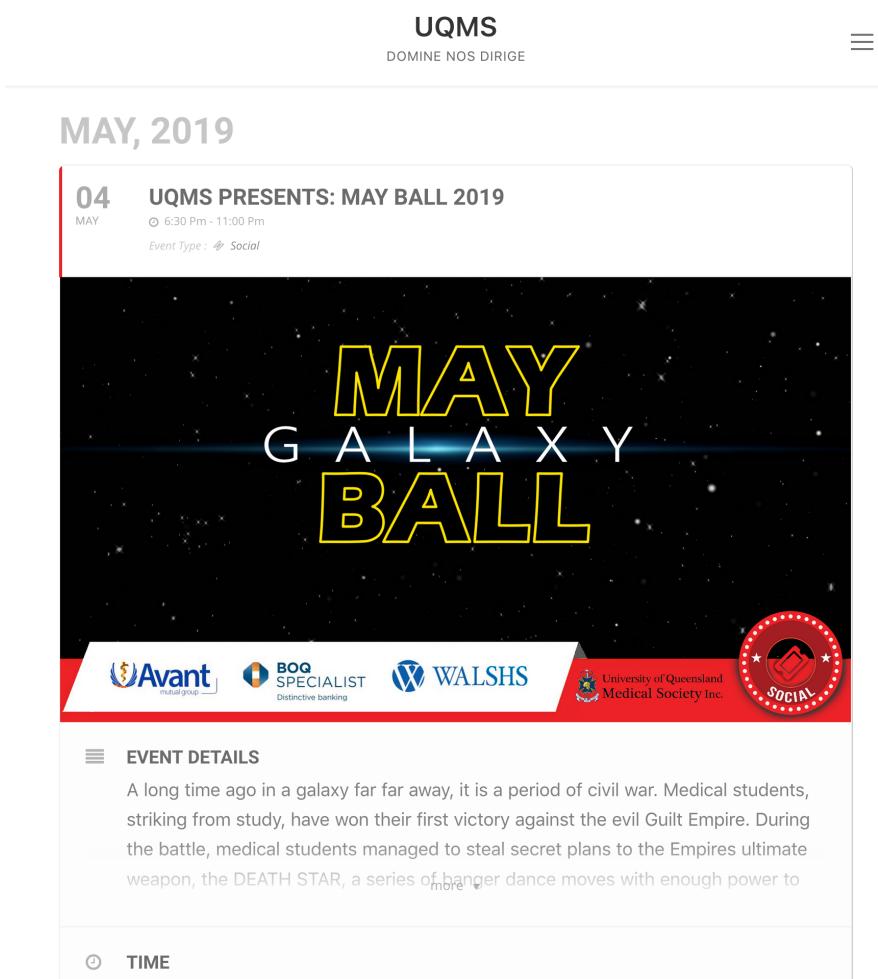


Figure 2.8: Screenshot of the event page for the 2019 May Ball hosted by UQMS

All website should be accessible to their users and have support for people with impairments or a disadvantage. The Web Content Accessibility Guidelines (WCAG) outlines four key areas all websites should be assessed on and how these areas impact people and their use of the site. Figure 2.8 shows a screenshot of the event page for the UQMS Ball in 2019, the accessibility of this site is as follows:

Perceivable: While all content is available upfront to the user, not all of the non-text content of the website has a text alternative. A lot of the images have not provided an alt attribute. However all of the content is presented visually in a simple one dimensional structure format,

the choice in colours between the foreground and the background has resulted in a difficulty to view and read the content.

Operable: The website is not operable purely from a keyboard, being able to view and read all of the content on the website requires the use of a mouse to expand the details. The navigation works as expected, allowing users to clearly and quickly identify where they are and being able to navigate to different pages easily through the menu.

Understandable: The content is clearly sectioned and defined making it easy to read and understand what is being delivered. It follows a structure similar to other events pages and is clearly family upon opening.

Robust: Upon inspecting the source of the website it is clear that the robustness of the website is lacking behind common web standards. An example is the clutter of div tags. With the lack of use of normal semantic HTML tags and nesting content inside of p tags.

Graceful Degradation

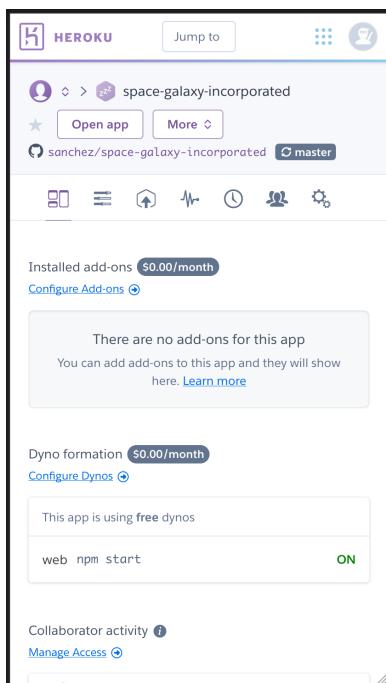


Figure 2.9: Screenshot of the Heroku dashboard in a mobile view

An example of graceful degradation is the Heroku administrator dashboard. Figure 2.9 shows the site in a mobile view, graceful degradation is applied here because the site is still usable, however some of the float controls have been wrapped around and not displayed as mobile friendly as possible. The “Open App” button could be collapsed into the “More” button and relabelled to represent a hamburger icon. The website overall is useful as a mobile application however, therefore the site gracefully degrades from desktop to mobile.

Progressive Enhancement

Bootstrap is a perfect example of progressive enhancement, because the entire framework is around mobile-first design. Mobile-first design forces the designer to design the website with mobile in mind first and then once the site is designed mobile it can be scaled up to desktop with extra features being added and removed based on the screen size. Figure 2.10 shows a comparison of the website between the mobile and desktop.

As seen in Figure 2.10a the checkout list appears in the list however in Figure 2.10a the list appears

Billing address

First name

Last name

Username
 @

Email (Optional)

Checkout form

Below is an example form built entirely with Bootstrap's form controls. Each required form group has a validation state that can be triggered by attempting to submit the form without completing it.

Product name	Brief description	\$
Third item	Brief description	5
Promo code	EXAMPLECODE	-\$5
Total (USD)		\$20

Promo code Redeem

Billing address

First name	Last name
<input type="text"/>	<input type="text"/>

Username @

Email (Optional)

Address
1234 Main St

Address 2 (Optional)
Apartment or suite

Country State Zip

Your cart 3

Product name	Brief description	\$
Second product	Brief description	8
Third item	Brief description	5
Promo code	EXAMPLECODE	-\$5
Total (USD)		\$20

Promo code Redeem

(a) Mobile version of Bootstrap's checkout
(b) Desktop version of Bootstrap's checkout

Figure 2.10: Screenshots of Bootstrap's example checkout page

on the right side of the page. This design choice means the user is presented with the most important content first in mobile view but following common checkout design patterns in desktop view. This is achieved using media queries with respect to the window size, allowing for the window to be flexible and the mobile page is presented if the desktop screen size is too small.

Another notable difference is in the layout of the form for the billing address. In the desktop there are multiple columns of fields, but on the mobile version everything is one dimensional (all the fields flow down the page). This is achieved using both flexboxes to define the way content should flow in the page, and media queries to define the size of the columns and content inside the columns.

Reflection

It is clear that a direction of either degradation or enhancement is needed to be chosen. Since the website is primarily focussed at users on a computer (since Git is desktop only tool), the main focus will be on desktop devices and the website will gracefully degrade to support mobile devices. The accessibility of the website can be reinforced by picking more contrasting colours to help with identification of sections, and the use of more semantic HTML can help improve the robustness.

2.2.2 Security & Privacy

Security

Security plays a massive role in modern web consumption, especially with ecommerce sites such as Wish.com. Wish.com is a site for buying and selling items online at really cheap prices. Figure 2.11 shows a screenshot of the landing page of Wish.com, some initial security threats are alerted when evaluating this website:

- A lot of the items are so cheap it can sort of feel like a quick and dirty scam
- There is little to no descriptions about the items for sale
- The images of the items do not look representative of the real items
- The site attempted to run Flash scripts

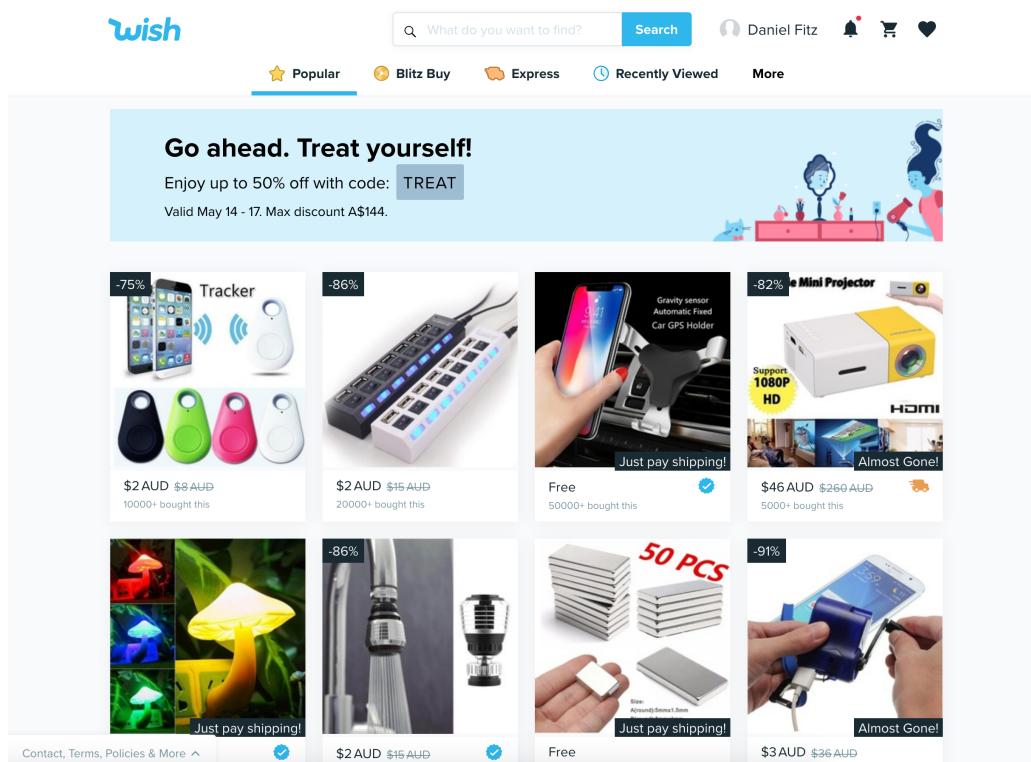


Figure 2.11: Screenshot of the homepage of a Wish.com site

Flash has long been considered a threat to web security due to the access it has to the underlying OS

While these are some strong security threats, Wish.com also has some good security initiatives in place to protect itself and the users:

- The website is clean and unclustered
- There is a review system and a seller review system
- Purchases can be made using PayPal
- The site forces the use of HTTP Secure (HTTPS)

The certificate is however verified and assigned to GoDaddy, which a relationship is not mentioned on the site anywhere

Privacy

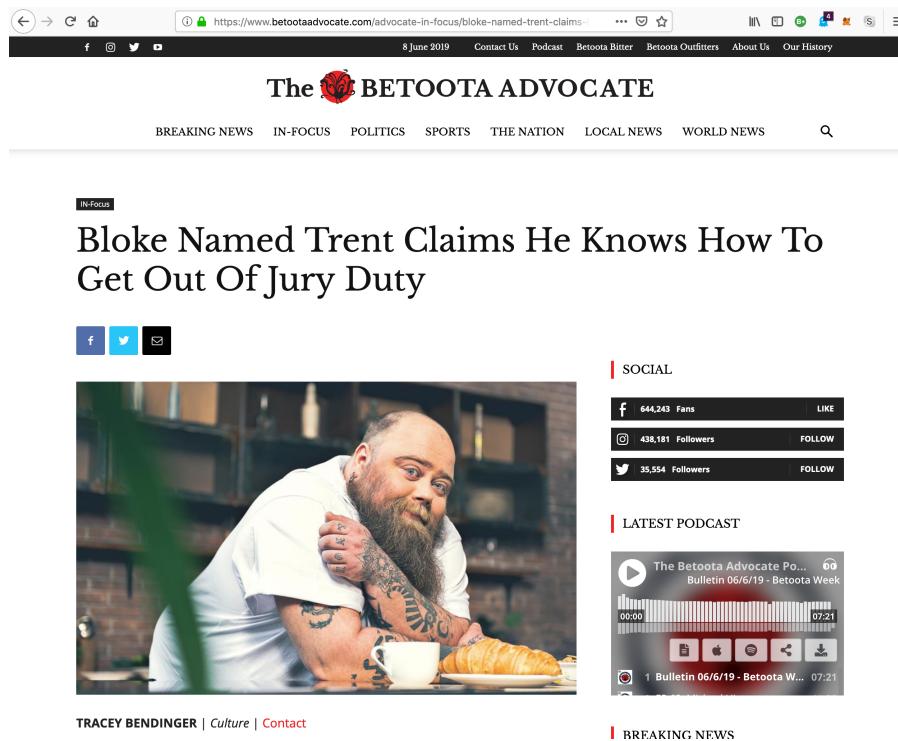


Figure 2.12: Screenshot of a news article on The Betoota Advocate

User privacy is important to not only be aware of but to also respect too. The Betoota Advocate is a popular website providing news articles to users, news article providers benefit greatly from trackers and advertisements. However Betoota is different because Ghostery has alerted that there are no advertisements and only three trackers used in the article being observed (Figure 2.12). On top of the minimal trackers and advertisements, Betoota also has minimal cookies in use (10 cookies in total) most of which are related to third-party tools or services the site uses.

2.2.3 Hi-Fi User Testing

For the Hi-Fi User Testing task there were five main instructions requested from the user to complete during the session. These tasks were designed to get an extensive knowledge if any gaps exist within the website, Figure 2.13 shows a student completing the Hi-Fi Test.

1. Learn the basics of Git
Observe the speed at which the user consumes the knowledge on the homepage
2. Access the Quizzes page
Observe if they look for a link on the homepage or in the navigation bar
3. Find an advanced command
Observe if they scroll through the page and look for an advanced looking command or jump to the references page
4. Complete the first question involving the terminal sandbox
Observe how the user interacts with the sandbox, is there clear direction to their actions
5. Create a branch in the terminal sandbox
Observe if the user switches back to the main tutorial to look for commands

Upon initial observations it became clear that users were unable to realise the site could be scrolled and the homepage contained content past the first screen. This set back placed a lot of users in a place of confusion and frustration already. Therefore when they realised they could scroll they

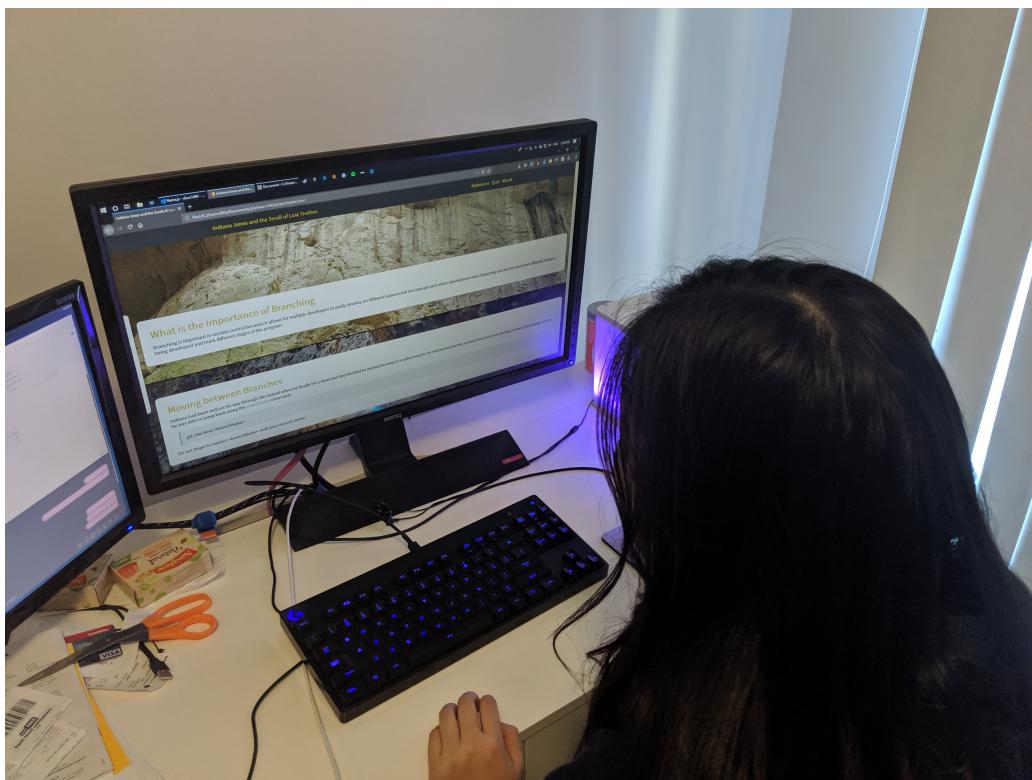


Figure 2.13: Photo of student conducting Hi-Fi User Testing

really quickly skimmed through all the content without properly observing the information and reading.

Access the quizzes page was done primarily through the use of the navigation bar, with only one user looking at the bottom of the page for a quiz link after reading the content.

The advanced command however, most users thought an advanced command was a command covered on the page and had no idea there were more commands hidden in the references page.

Both tasks involving the Git sandbox resulted in the users not being able to understand how to use the sandbox and not knowing what commands to use. Some of the users also noted they had no idea the text in the grey boxes were commands that could be run in the sandbox.

Reflection

Upon receiving this feedback it was clear some adjustments were required to get the product up a standard that is usable for users. Some minor changes are needed to be made to fix the issues people had with the Hi-Fi test:

- Add an arrow or some indication on the first screen to inform users that they can scroll down. Also make this action interactive so that if the user clicks on it they will be moved down to the next section.
- Make the side menu more noticeable via the use of some animation, most users were not aware it could be used or even existed.
- Add a final paragraph that links to the other pages as an indicator for the next steps the user can take.
- Add some tooltips to both the command boxes and the Git sandbox to help the user understand what the content is for and how to use it.

Chapter 3

Conclusion

To conclude, the website created provides a platform to learn and test their skills at Git. It follows all the goals set out in the early design phase (Section 1.2.1.2), and is enjoyable with a good user experience. The site does seem to present content which can be difficult for people to understand, however people with some programming background (as a requirement of the target audience) seem to really flow smoothly through the content and have a reasonably solid understanding afterwards. The addition of the quiz at the end of the journey really helps to tie in the content learnt and cement the knowledge.

3.1 Course Reflection

Given a chance to start the course content again I would first of all focus more on the design side of the course and really get a solid design plan and have it tested more before beginning development. Seen as I already have a solid background in the practical content it would be more beneficial to provide more design insights. I also think I would focus more on the individual components of the website and less on the overall content, starting by looking at a really basic component toolkit which is then extended to the entire website.

I would also have liked to investigate topics that might be easier for people in the course to understand. I am passionate about Git, however when it came time to user testing on a lot of the content, a lot of the people were not interested to invest the amount of time required to properly learn the content and led to results which were less than favourable. However given people with more programming knowledge and a proper willingness to learn Git, they enjoyed the site and thought it was perfect for them. I would have liked to pick a topic which is much more suitable to both audiences.

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