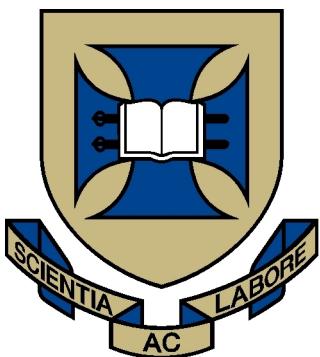


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DECO1400 – Introduction to Web Design

Design Report

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Glossary

API Application Programming Interface. 1

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. 1, 3, 4, 12

JavaScript Browser scripting language used to provide interactive features. 1

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

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

Pain Points:

- She gives up incredibly easily

David

Age: 23

Gender: Male

Goals:

- Wants to move into a more software development role in his company

Pain Points:

- Easily distracted and ends up losing track of current task

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

Pain Points:

- Has mentality of "Why learn this if my old thing can do a similar job"

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

Pain Points:

- He doesn't want to learn, he is just being pressured by the rest of his team

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 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	
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

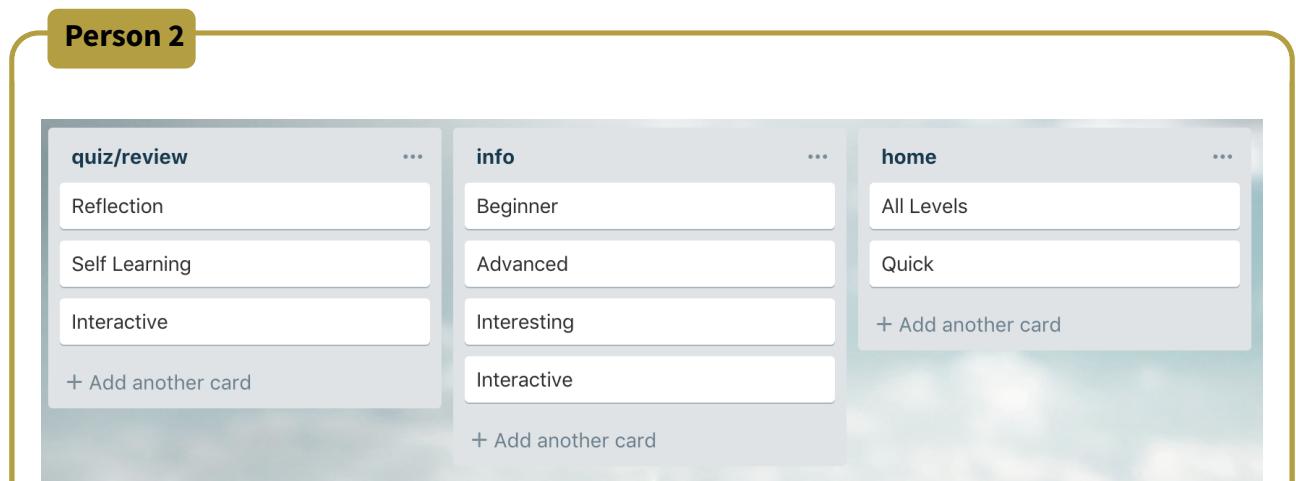


Figure 1.2: Person 2's Card Sorting Result

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

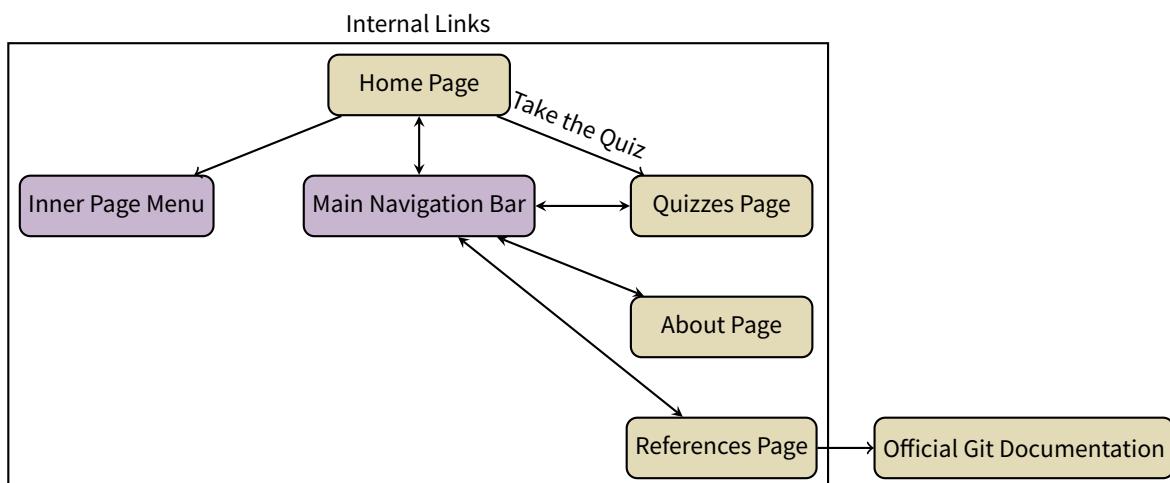


Figure 1.3: Site Map Navigation

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 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

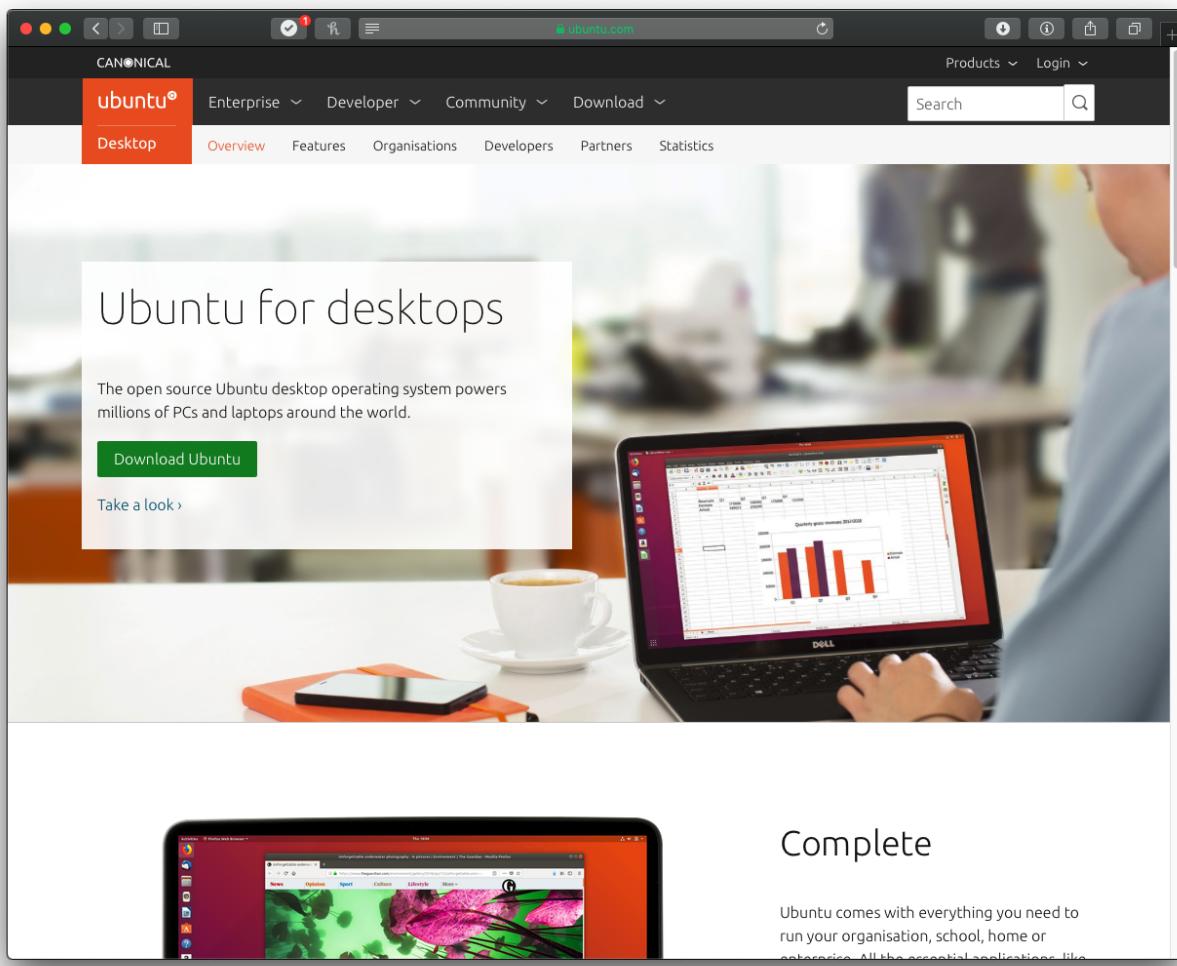


Figure 1.4: Screenshot of Ubuntu Desktop webpage

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

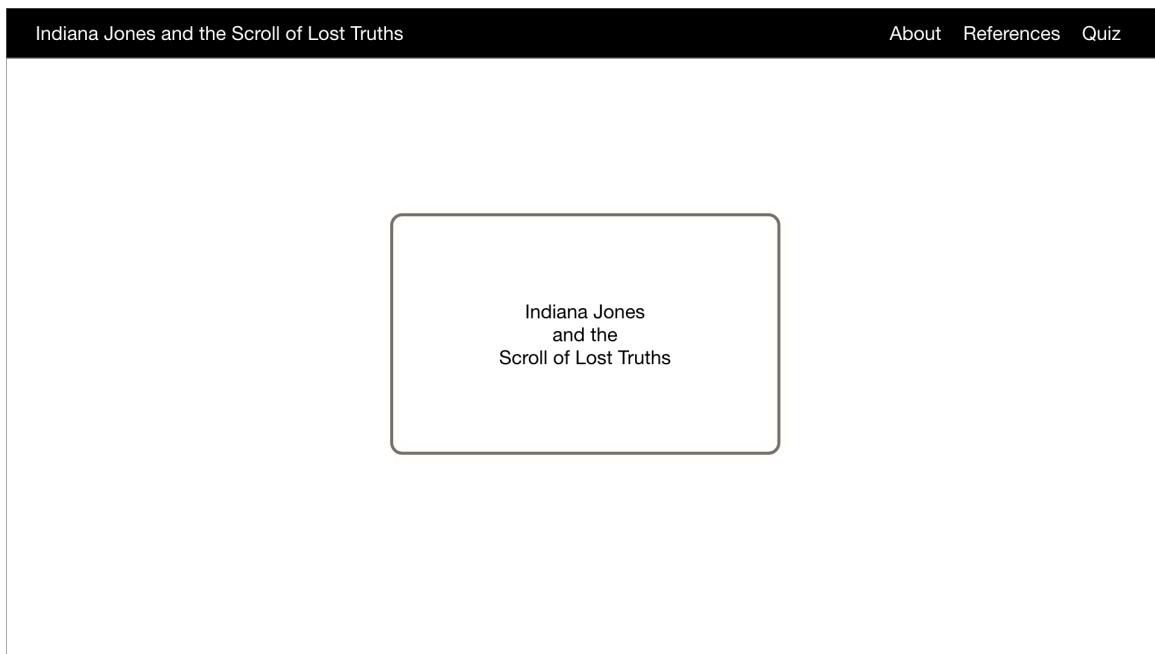


Figure 1.5: Wireframe mockup of main title page

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

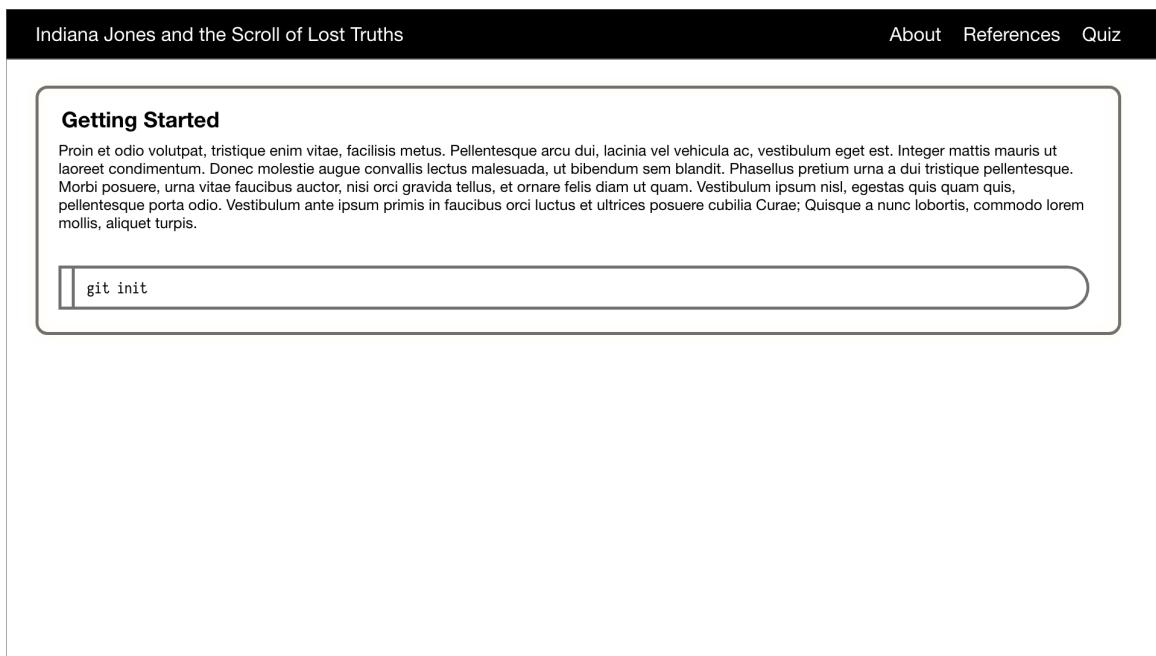


Figure 1.6: Wireframe mockup of single group of content

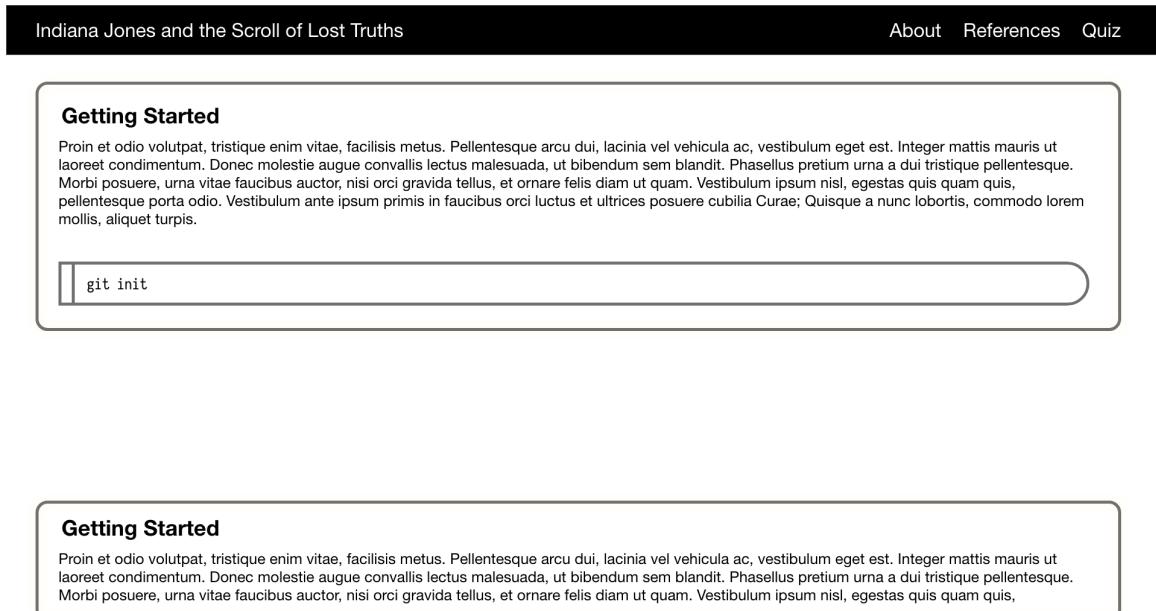


Figure 1.7: Wireframe mockup of a page of content with two groups

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.

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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

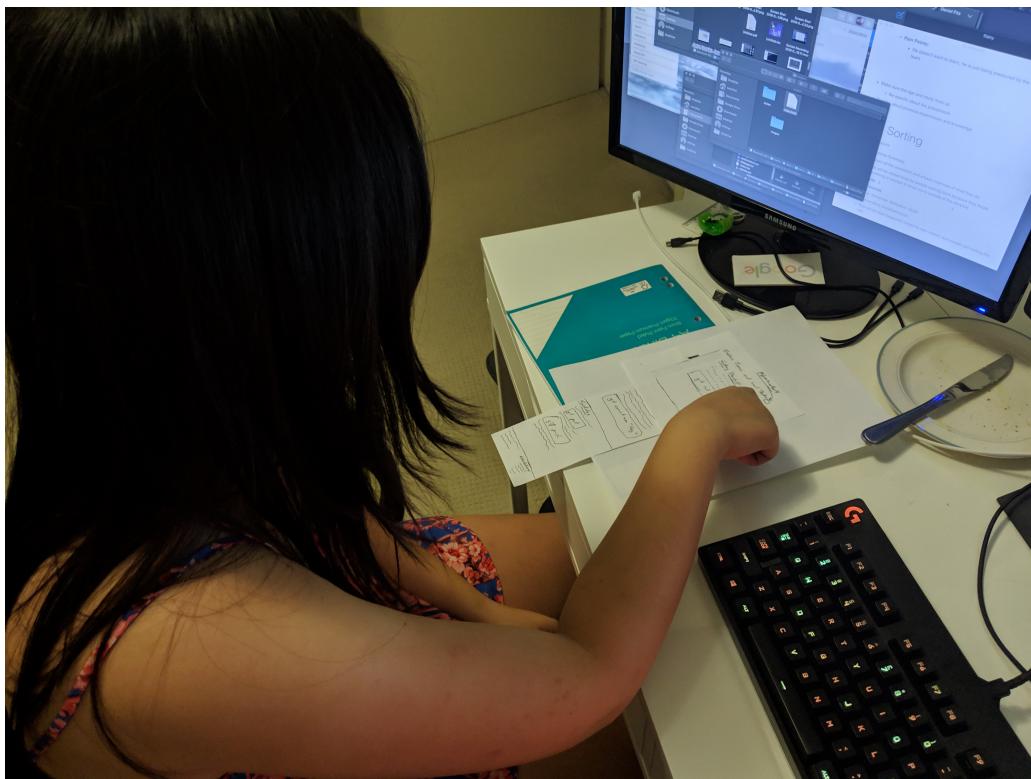


Figure 1.11: User completing the paper prototype test

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:**

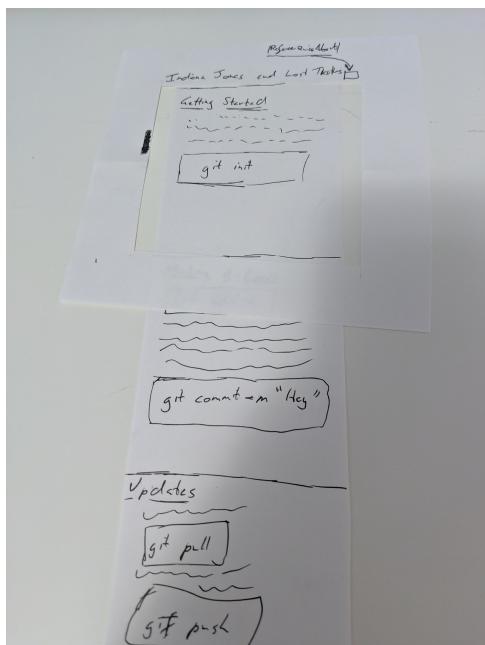
- “Was it clear that there is a references overview page?”
 - * **Person 1:** Yeah but I thought it was citations, not git command references
 - * **Person 2:** Yes there was a title at the top saying references. Title it “git command reference”

View information about the creator

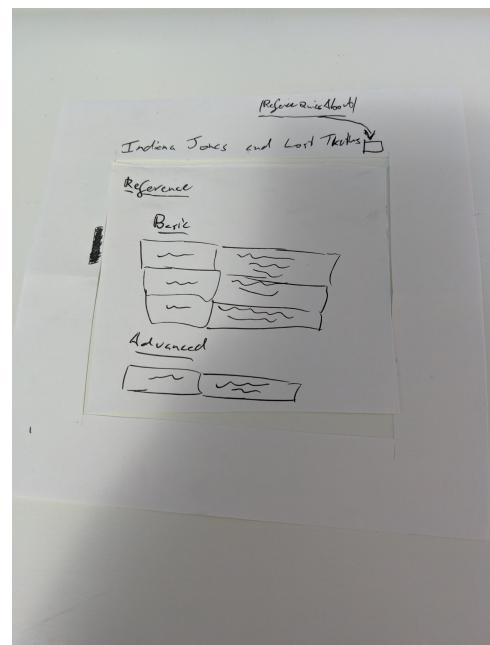
- **Do:** “View information about the site creator”
- **Watch:** How easy the navigation bar is to use
- **Ask:**
 - “Did you know exactly where you wanted to go?”
 - * **Person 1:** yeah but thought about was about the page not about the person
 - * **Person 2:** yes this was a very intuitive button

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

Color Scheme

[1]

Font Families

Font Weights and Sizes

Links

Bouncing

Code Blocks

Background

Smooth Hovering

2.1.2 Aesthetics User Testing

2.2 Website Implementation

2.2.1 Accessibility, Graceful Degradation & Progressive Enhancement

2.2.2 Security & Privacy

2.2.3 Hi-Fi User Testing

Chapter 3

Conclusion

3.1 Course Reflection

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- [1] Kendra Cherry, “Color psychology: Does it affect how you feel?” <https://www.verywellmind.com/color-psychology-2795824>, 5 2019. Accessed: 4 June 2019.