DSP Design Report CI7810

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Augmented Reality for Interactive Children's Books

AR+

Design Report

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Role outline

As a Designer, I was responsible for the visual design, usability, and user experience of our project, which consists of a mobile app and a book. My focus was on creating consistent and predictable interface layouts and on the aesthetics of the book and all related materials by strategically implementing typography, images, and colours. As the only team member with graphic design and print background, I took full responsibility for the book production. I was also responsible for a hi-fidelity prototype, setting up a blog and creation of promo materials (graphics, photography, video recording, editing). I worked closely with the Game Designer to understand essentials of game development as I had no prior experience of the gaming field (creating or playing). We collaborated for continuous iterative testing of the target design (the book) and the AR overlay (interface).

MY DELIVERABLES ARE:

Wireframes

User journey

Mock ups

Prototype

Book Design (pre and post production)

Final video

Final presentation

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Research

COMPETITOR ANALYSIS

We've decided to use the leading AR platform – Vuforia to build our game. I reviewed existing applications made with this tool on the official website and in iTunes Store. I found many games and toy and educational applications. No Road Safety Rules app for children was found. In the AR children's book sector I've found a charming augmented reality book Goodnight Lad on Kickstarter. This book has great visual experience and is aesthetically pleasing.

BOOK RESEARCH

To get inspiration from the best children's book designs I looked at the 100 Best Children's Books of All Time', the Best Children's Picture Books 2015, the Best Children's Books of 2016, the Waterstones Children's Book Prize. When it comes to buying a book "Kids typically don't think about the story in a book, the rules and challenge of a game, the plot of a cartoon, or anything like that. Kids are interested in the visual. That's all they really care about." (Joey Dias) That's why the main challenge to produce eye-catching illustrations and choose the right font.

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Book Design

The book is used as scene backdrop. As augmented reality is the centre of this book, the images are there to trigger the scene interaction.

The image tracking used in VR applications works by finding portions of high contrast (edge detection) on an image and makes those points of interest. To cater for this, I had to find vector illustrations with high contrast elements and collage them into the story we produced. I needed to find illustrations with the similar style for the 6 locations used in the book, the book cover and the application icon. Images were acquired from Adobe Stock.

Also, I needed to find a vector image for the main character which would be as close as possible to the 3D model created by the game designer.

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1 Cover

2 Instructions

3 "At home"

Activity: Pick up items

Background: Home interior, woods + rain outside

Text: Barney the Badger is going to meet his friends in the park. Help Barney get ready to go by grabbing his rainy gear.
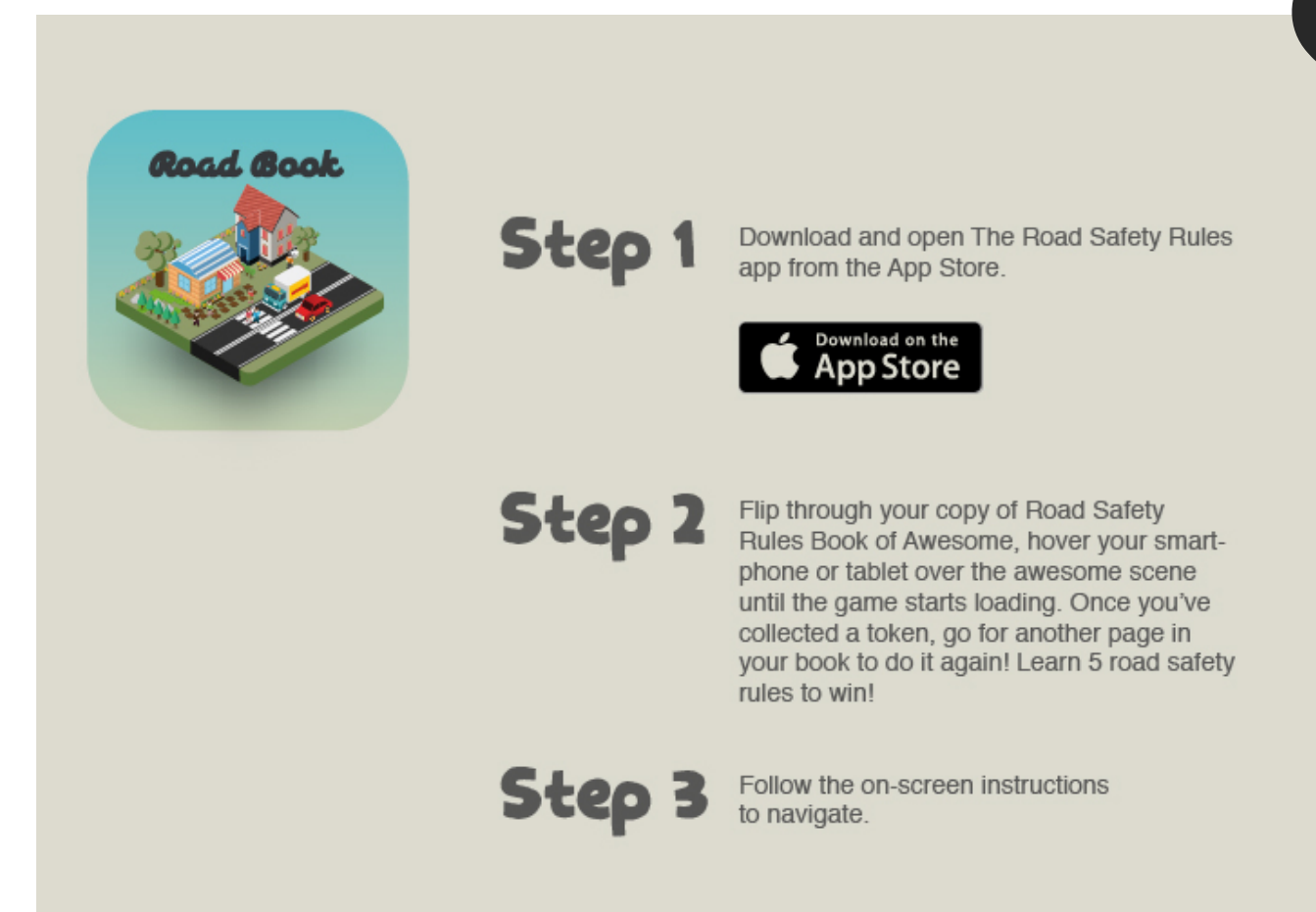
4 "Dirt Truck"

Activity: Basic crossing

Background: Woodland

Text: On his way, Barney comes up to a road. STOP! LOOK around! Is there anything coming? LISTEN! For cars. If it's all quiet help Barney across.

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Step 1 Download and open The Road Safety Rules app from the App Store.

Download on the App Store

Step 2 Flip through your copy of Road Safety Rules Book of Awesome, hover your smart-phone or tablet over the awesome scene until the game starts loading. Once you've collected a token, go for another page in your book to do it again! Learn 5 road safety rules to win!

Step 3 Follow the on-screen instructions to navigate.

Barney the Badger is going to meet his friends in the park. Help Barney get ready to go by grabbing his rainy gear.

On his way, Barney comes up to a road. STOP! LOOK around! Is there anything coming? LISTEN! For cars. If it's all quiet help Barney across.

5 "Road"

Activity: Zebra crossing

Background: The town's ahead, but there's another road! A stripey zebra crossing is the best place to cross. When the cars slow down, it's safe to go.

6 "Shops"

Activity: Pelican crossing

Background: Shops in town

Text: Barney wants to pop to the shop on the other side of the street. At this crossing, Barney needs to press the button. When the signal is green, look both ways and go!

7 "Towards the Park"

Activity: Multiple road challenges

Background: Park gates ahead

Text: He's got all he needs and the Park's ahead. But Barney knows not to rush. 3 roads to go, let's take it slow.
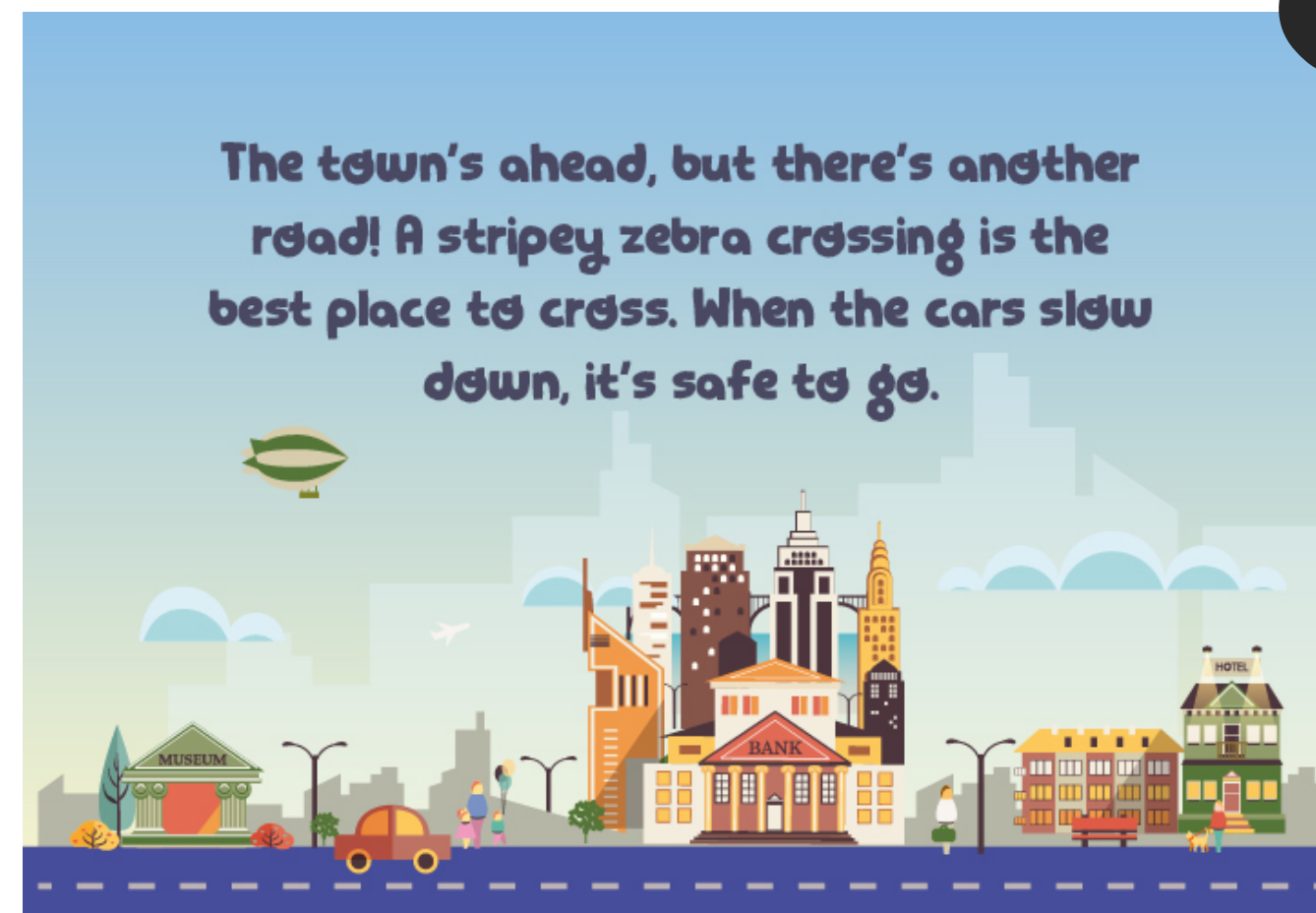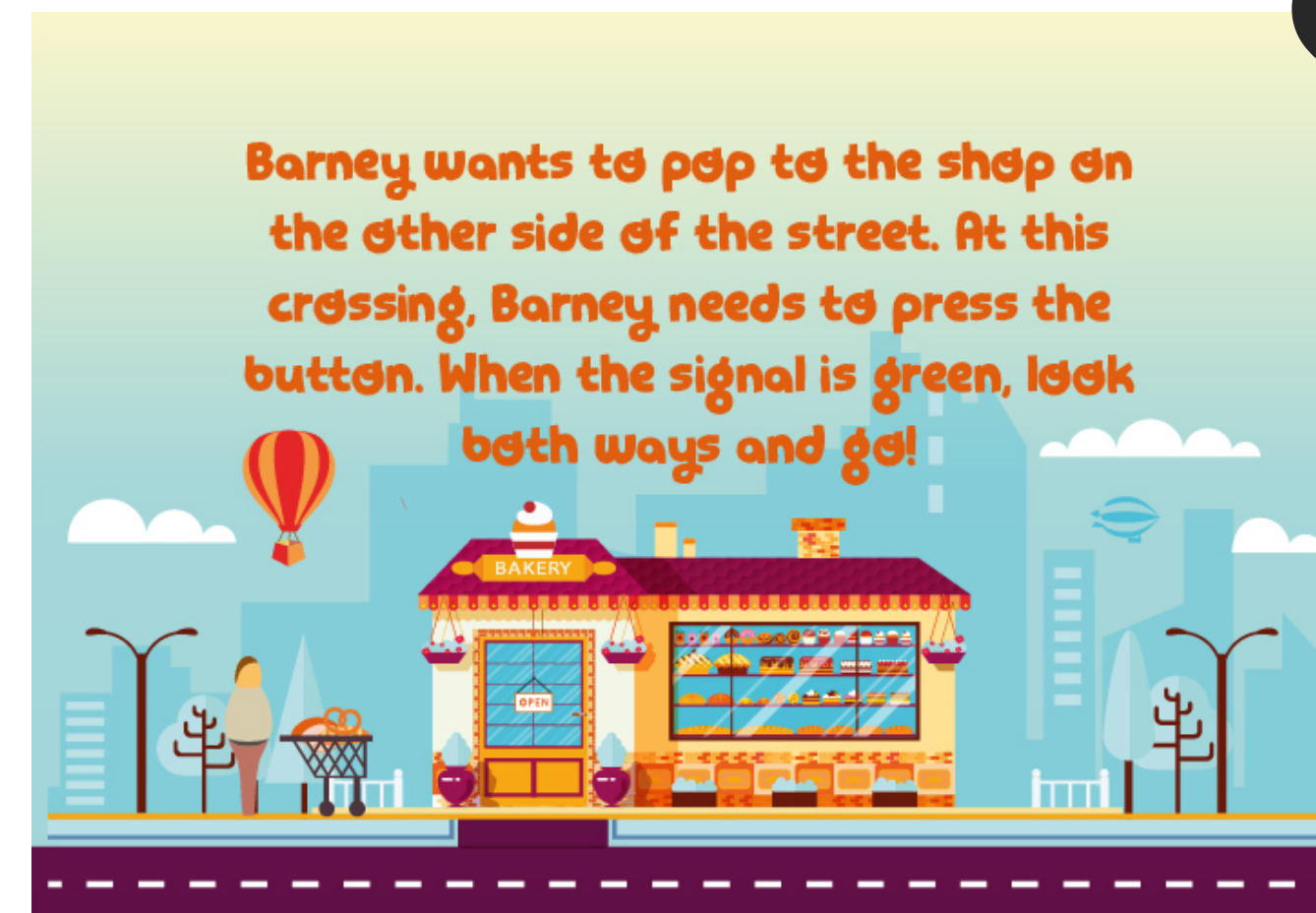
8 "At the Park"

Final Animation

Background:

Text: Finally here, Barney's brought snacks! Now he and his friends can really relax. Remember all you've learned today, being safe along the day!

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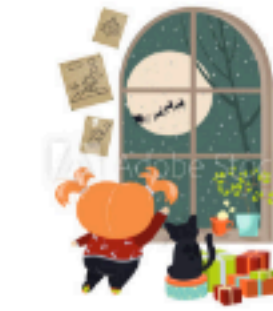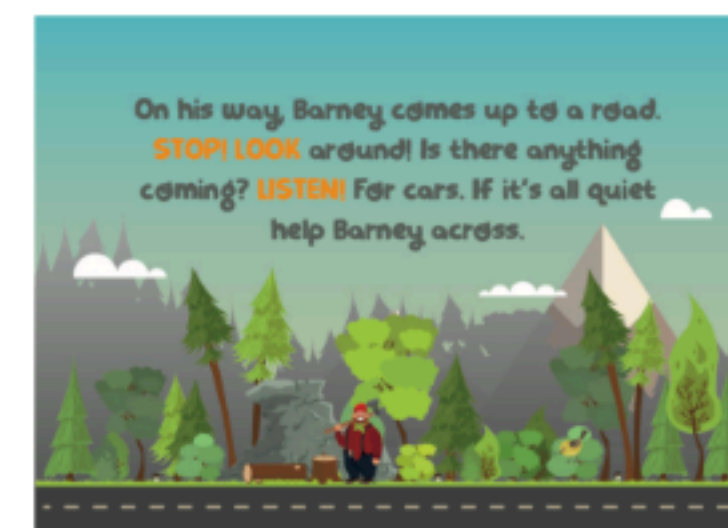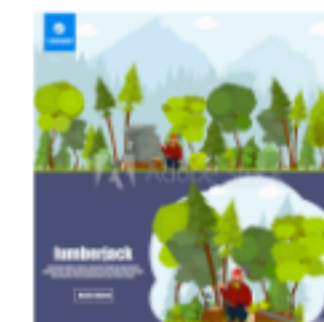
The town's ahead, but there's another road! A stripey zebra crossing is the best place to cross. When the cars slow down, it's safe to go.

Barney wants to pop to the shop on the other side of the street. At this crossing, Barney needs to press the button. When the signal is green, look both ways and go!

He's got all he needs and the Park's ahead. But Barney knows not to rush. 3 roads to go, let's take it slow.

Finally here, Barney's brought snacks! Now he and his friends can really relax. Remember all you've learned today, being safe along the day!

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Images

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Images

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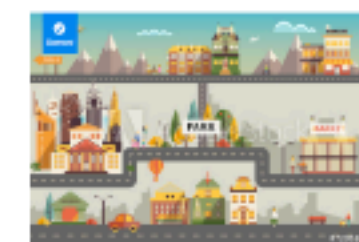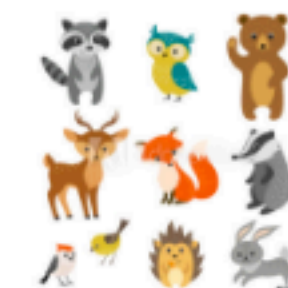
Book Design

ORIENTATION

Upright position and landscape format for the book are the result of technical limitations and visual experience concerns. To simply describe this product form - I'd call it a desk calendar format.

In order to project a scene on the screen, the device camera should face the book directly. This means a user can't use the AR features of the book sitting comfortably behind a table. He or she would need to stand tall over the book and the device. We've changed the angle to achieve a more pleasant interaction.

The reason we chose landscape format for the book is that the user is more likely to hold a mobile phone in a landscape mode. The book and the game scene will be on the screen simultaneously. To give the game more room on the screen, proportions of the book were changed.
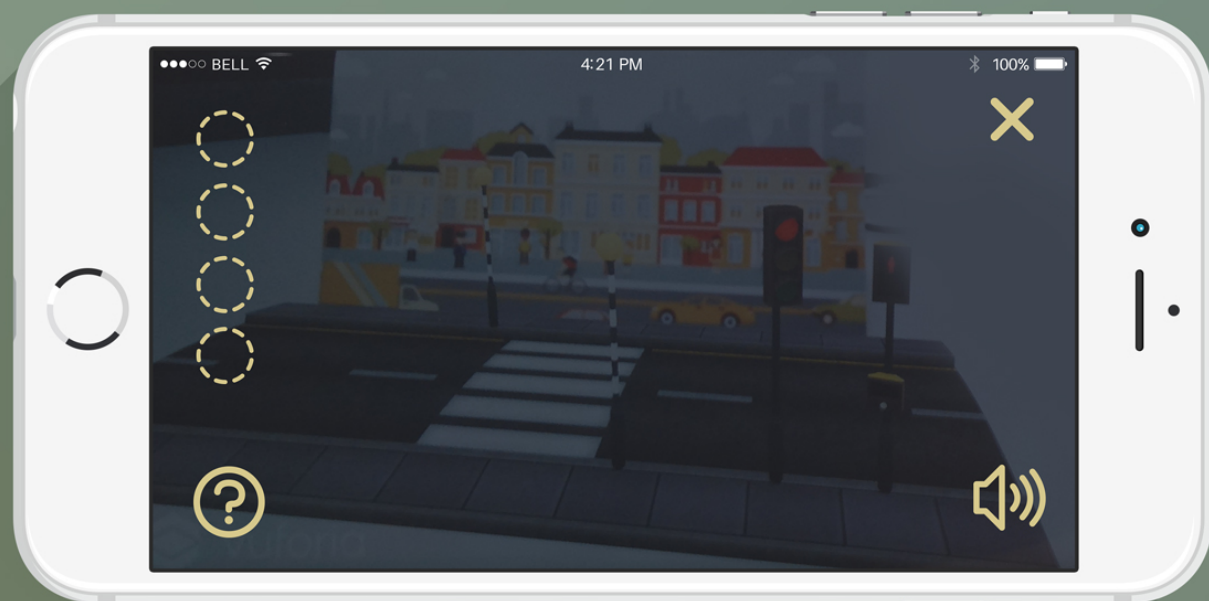
PRODUCTION

To produce this calendar-like book's stand I user the 400 gsm textured paper. To make it stand I had to crease it 3 times in different directions. For the internal pages, I printed out 8 one side full-colour A4 pages on a 200 gsm paper. To put the book together I used wire binding. To complete the book I used a transparent cover.

Book Design

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First Mock ups

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User Experience

"Too often, systems are designed with a focus on business goals, fancy features, and the technological capabilities of hardware or software tools. All of these approaches to system design omit the most important part of the process – the end user." [1] Working on this project we were following a user-centered design (UCD) approach. I covered several UCD methods during this project, they are listed below.

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Wireframing

Wireframes are guides to where the major navigation and content elements of an application are going to appear on the page. [2]
Some core design principles for wireframing: show two-dimensional illustration of an interface that specifically focuses on space allocation and prioritisation of content, functionalities available, and intended behaviours. No styling, colour, or graphics.

We've used wireframes to achieve the following:
To clarify consistent ways for displaying particular types of information on the user interface
To determine intended functionality in the interface
To prioritise content through the determination of how much space to allocate to a given item and where that item is located

To the right is the wireframe of the first screen seen by the user. It's not interactive - it serves as an introduction. The wireframe shows a loader with status. Assuming user holds the smartphone in a portrait position this screen suggests the user to rotate the screen, as the game orientation is horizontal. Also, this screen has the progress bar to indicate the position of the user in this game.

Please rotate screen

Loading 30%
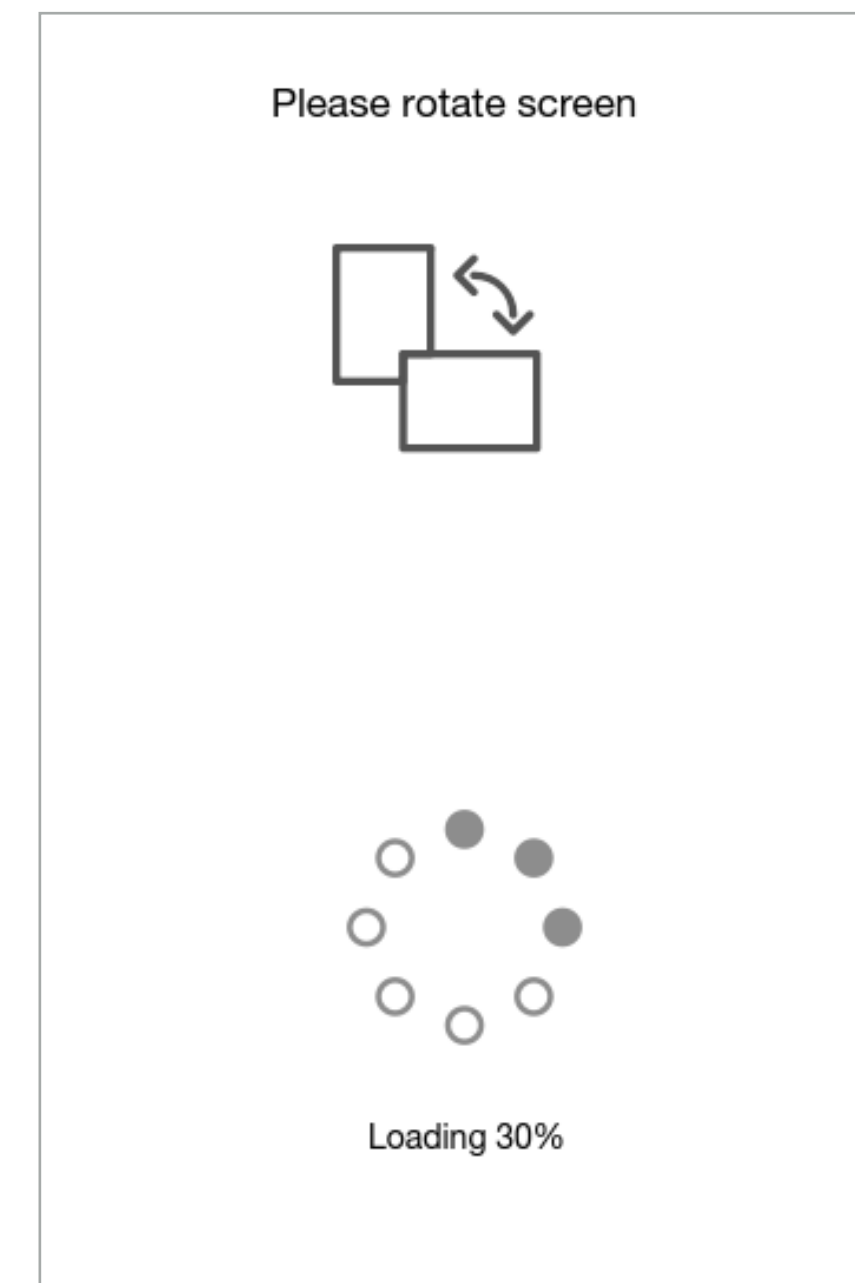
The second screen explains the navigation throughout the game. We used common mobile interaction patterns: swipe, up, down, left, right, tap. User will see this screen in the very beginning to understand how to use the application, and also if they click on the Help button in the game.

Navigation
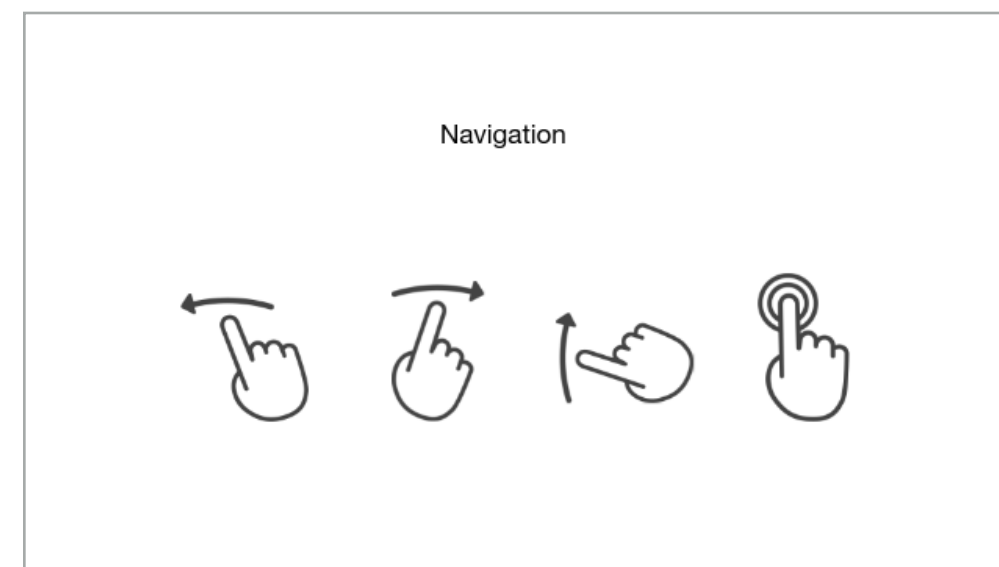
This is the main interface of the game. It has controls: close button, help button and volume toggle. Also it shows user score and the overall game progress bar.

This is the game start screen, where the user is introduced to the game graphics where user sees familiar graphics from the book cover, including the main character, and most importantly can click to start the game.

START

Warning

Suggested behaviour
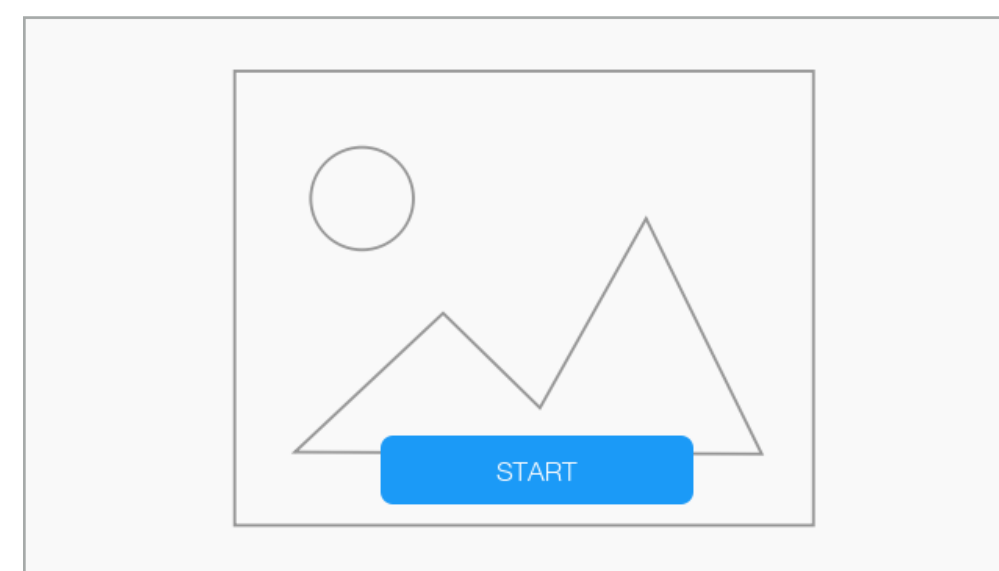
This is the standard look of the user dialog/feedback window. They all would use the same hierarchy and structure for consistency and clarity: a relevant icon at the top, then message title and suggested behaviour underneath. Most important part is the close button (x), as the user should feel in control.

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UI Design Principles

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1

Consistency

I kept layout, colour scheme and typography consistent, so that user has better understanding of how things work. This should increase user efficiency.

2

Informational feedback

The interface informs the user if his or her actions are correct or incorrect or not supported by the game. Also the users are always informed about changes of the game state or any errors, for example during the loading process, or if the camera loses target. This is done in an unambiguous language familiar to users using a popup window.

3

Clarity

To be effective using the interface, people must be able to recognize what it is, care about why they need to use it and understand how it helps them interact with the game. The first page of the book clearly explains how to use this book and get access to the application. The second screen in the application explains how to interact with it.

4

Structure

I've designed the interface to allow the user to focus on what's most important - the game. The size and color of UI elements were designed not to distract the user and element placement does not obstruct the game view.

5

Visibility Principle

All the needed options (how to navigate) and task descriptions (those are on the book pages) as kept visible without distracting the user with extraneous or redundant information.

6

One primary action per screen

Every screen supports a single action. This makes it easier to learn and easier to use.

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Tatiana Pavlova

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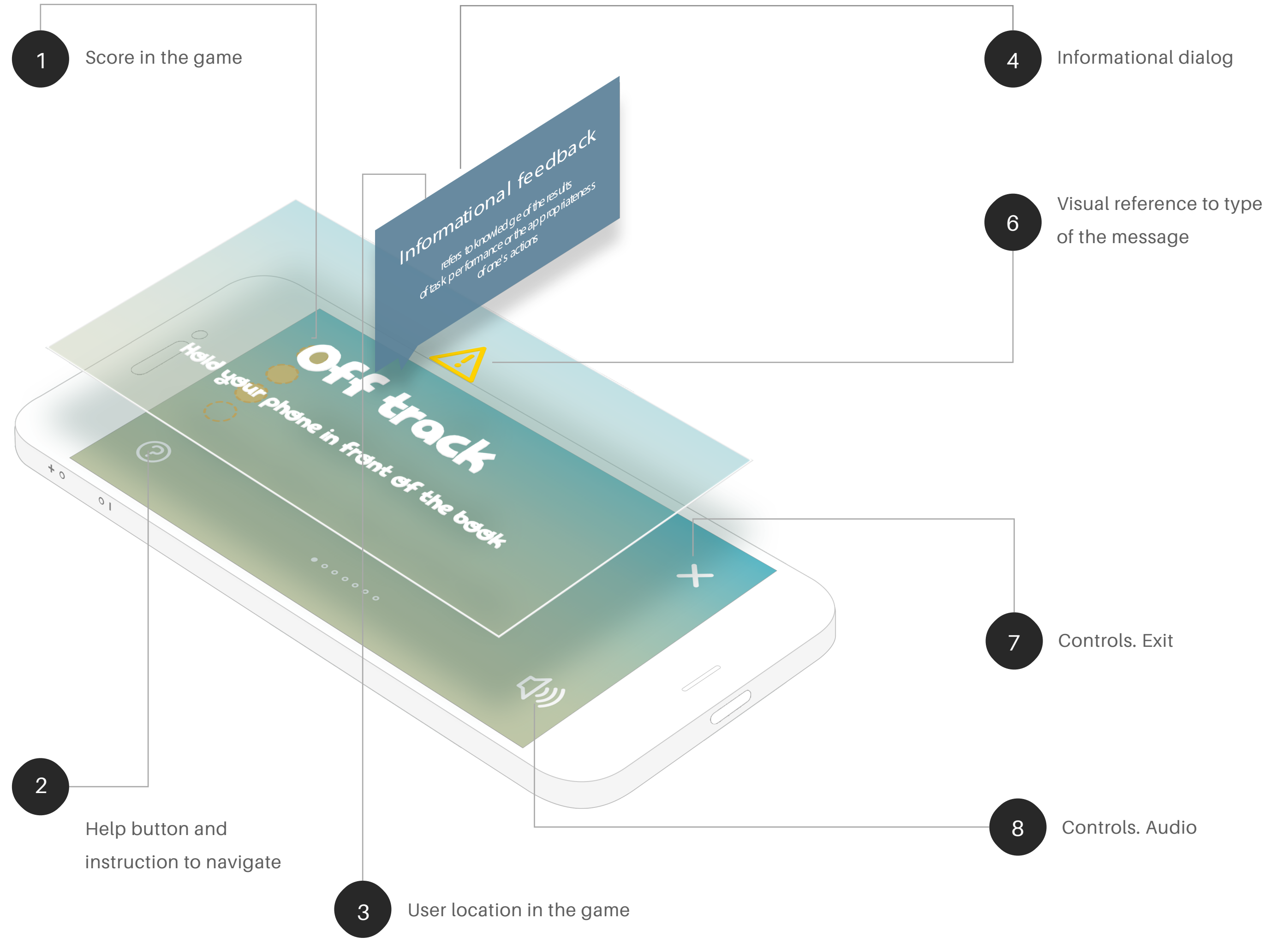# UI Design Principles

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7 The zero state

The first time experience with an interface is crucial. In order to best help users first screens are not interactive, as they are direction and guidance.

8 Simplicity

The game consists of users (children) performing simple tasks which are explained in the book (please refer to the Book section). Users are given 5 simple navigational actions to be able to complete the tasks. The navigation is communicated clearly through commonly used icons. The interface doesn't contain any unnecessary elements for the user. Every element has a purpose as described in the table below. This helps people understand the interface easier, more quickly and without too much cognitive load.

Screen app

Loader
Please rotate your screen

Cover screen
Let's go to the PARK with Barnie
Start ›

Exit
Do you want to finish the game?
Yes   No

Navigation
How to navigate
Go left   Go right   Forward   Action
Hover your phone over the scene until the game start loading

Scene 4

Scene 1

Scene 5

Well done
Well done!
Turn a page

Off track
Off track
Hold your phone in front of the book

Scene 2

oops
Ooops!
Please do it again

Congratulations
Congratulations!
You've collected all tokens and learned first rules. Start again?

Warning
You've not collected a token for each page, go back to page 3

Scene 3

1   Score in the game

4   Informational dialog

6   Visual reference to type of the message

Informational feedback
refers to knowledge of the results of task performance or the appropriateness of one's actions

Off track
Hold your phone in front of the book

7   Controls. Exit

2   Help button and instruction to navigate

8   Controls. Audio

3   User location in the game

User Journey

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Prototyping

When creating the prototype the User Journey was an extremely useful exploration tool. It was created basing on the Game design specification. Here are series of steps which demonstrate a scenario in which a user interacts with the book and the app. Yellow colour in the below scheme indicates an interaction with the book and grey is a mobile app interface interaction.
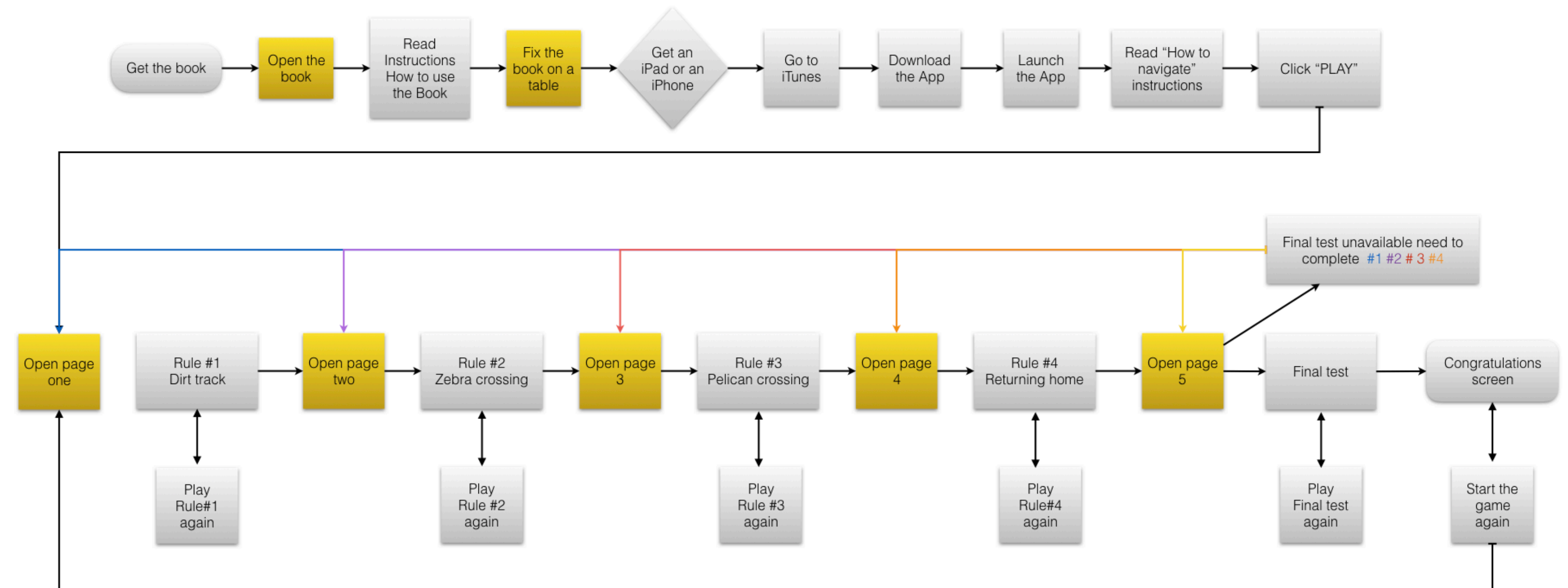
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Tools and Technologies Used

I've created my first mock up of the application interface in Adobe Photoshop at first but then I had to migrate everything to Invision to make it interactive. Also it has great options to share and comment on the prototype.

The physical book was created in Adobe Illustrator, as I had to work with vector and prepare the book for printing and post-production.

I've created wireframes in Proto.io – a prototyping tool with a preset UI kit.
Final video was shot on Canon 6D camera in full HD format. I used iMovie for editing. Final presentation was created in Keynote using the Rhino template from Envato market.

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Conclusion

Work on this project not only showed me new areas of design, but also taught me how to work with a multi-disciplinary team. On this project I've learned about the augmented reality platform and about using it in the advertising and design industries. Also I've learned about game development.

Teamwork was the main challenge for me and it helped me learn new approaches and techniques to get things done on time.

The projects like this one, which are aimed at helping children learn crucial life skills and which utilize the latest technologies are very inspiring.

The most important parts of the project which helped me grow professionally were the work on a presentation and the creation of this report. These activities help create a deeper understanding of the project and of the details of the work accomplished. Also the team presentation helps to develop presentation and product marketing skills.

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Tatiana Pavlova

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Referencing

[1] http://www.usabilityfirst.com/about-usability/introduction-to-user-centered-design/

[2] usability.gov.uk

Caddick, R., & Cable, Steve. (2011). Communicating the User Experience: A Practical Guide for Creating Useful UX Documentation. Hoboken: Wiley.

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http://bokardo.com/principles-of-user-interface-design/

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