

Antti Wilenius

**INTERACTIVE FICTION APPLICATION WITH HTML5**

# INTERACTIVE FICTION APPLICATION WITH HTML5

Antti Wilenius  
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## ABSTRACT

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Author: Antti Wilenius

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The idea for this Bachelor's thesis sparked from the notion that digital games and other audiovisual forms of entertainment have superseded the reading of books. This made me think about the ways how we could make written stories more appealing and interesting, especially for younger generations.

The aim of this Bachelor's thesis was to design and develop a prototype of an application that would combine novels and games in an inspiring and exciting way to raise the popularity of the written story and to introduce a new member to the family of interactive fiction applications.

The work began by looking at the past and present forms of interactive fiction. Analyzing their core features and combining their strengths and weaknesses with the ideas and visions that I had in my mind lead to the concept of the IFA. The concept was refined to a functional and technical design, on which the first prototype was based on.

The results of the prototype were promising, although many areas of improvement were discovered during the development process.

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Keywords: interactive fiction, ebook, games, visual novel, gamebook

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# 1 INTRODUCTION

The aim of this thesis was to create a prototype of an interactive fiction engine for a family of new applications combining digital books and gamified solutions. The working title for the project was Interactive Fiction Application or IFA, which is used throughout this thesis to refer to the concept and the prototype. The finished prototype would act as a first demo of the intended project and as a starting point for the development of a commercial product and service targeted for global markets.

The work started by getting familiar with the history and modern applications of interactive fiction, exploring other products or services sharing similarities with the concept of the service described in this thesis. After this it was possible to define the concept and vision of the IFA project and make detailed designs of the core characteristics and features required by the service. The design allowed the development of the first IFA prototype which is described as a broad step-by-step walkthrough at the final section of this thesis.

This thesis is divided into five distinct sections; Defining the IFA, Designing the IFA, Technology, Walkthrough of the IFA Prototype and Analyzing the IFA prototype. The first section contains introductory information about the past and present applications of various interactive fiction solutions, and sets the contextual frame of the desired result I was aiming to produce. The second section describes the concept and design principles of the IFA prototype. The third section describes the technological solutions chosen for the development of the prototype based on the observations and requirements outlined in the previous section. The fourth section of this thesis is a walkthrough of the final prototype from both a user experience and a technical point of views. The last section of the thesis focuses on analyzing the prototype from a conceptual and a technical point of view.

## **2 DEFINING THE IFA**

The IFA concept began with a simple idea of an interactive story. The core vision was to convert a written work of fiction into a digital format to be experienced on PCs and mobile devices, but with added audiovisual and game-like elements. The aim was to create an application that would act as a digital entertainment product, but at the same time would re-introduce and familiarize written stories to modern young audiences accustomed to consume highly visual and even passive forms of entertainment.

At its heart, the IFA concept is a work of interactive fiction. Interactive Fiction is defined as a software where players use text-based commands to control characters or to interact with simulated environments. The term Interactive Fiction is commonly used to refer to text adventure games, but it is a broad concept and can also refer to adventure games in general, interactive storytelling or visual novels popular in Japan (1).

To understand the idea and core vision behind the IFA concept, one must first look at the different kinds of interactive fiction applications available. All the examples described here have one or more features in common with the IFA concept.

### **2.1 Choose Your Own Adventure books**

Choose Your Own Adventure is a series of physical children's books written from a second-person point of view. The reader takes on a role relevant to the story, and after reading a set amount of pages he or she is presented with two to three options to choose from, which lead to a new piece of storyline and set of options, until the choices lead the reader to one of the many endings. Choose Your Own Adventure was one of the most popular children's book series during the 1980's and 1990's (2).

### **2.2 Text adventures**

Text adventure games are video games that convey the game's story through a text, and are controlled by written commands typed by the player. Early text adventures used simple verb-noun

parsers to interpret instructions such as “open door” to interact with the game objects. Later text adventures and modern interactive fiction have parsers capable of interpreting complex sentences such as “take the key which is on the desk, then open the door” (3). FIGURE 1 shows an example of a text adventure game.



FIGURE 1. Text adventure game (4).

## 2.3 eBooks

An eBook is an electronic version of a traditional book. It is read by using an eBook reader, which can either be a software application on your PC or mobile device, or a physical device with a built-in software for displaying an eBook. eBooks are typically purchased on a website (such as Amazon.com) and are downloaded on the target device. Featuring most of the options as those of a paper book, eBooks can also contain built-in dictionaries and options for changing font sizes and styles (5). FIGURE 2 shows an example of an eBook on a tablet device.





FIGURE 2. An eBook on a tablet computer (6).

## 2.4 Visual Novels

Visual novels are a form of interactive fiction that resemble mixed-media novels, featuring mostly static anime-style graphics and a text-based storyline, as seen in the example of a visual novel in FIGURE 3. Visual novels contain a minimal gameplay, and typically the majority of interaction is limited to keeping the text and audiovisual elements moving. The branching of the storyline is usually implemented by providing the user with multiple-choice decision points that drive the story to a certain direction (7).

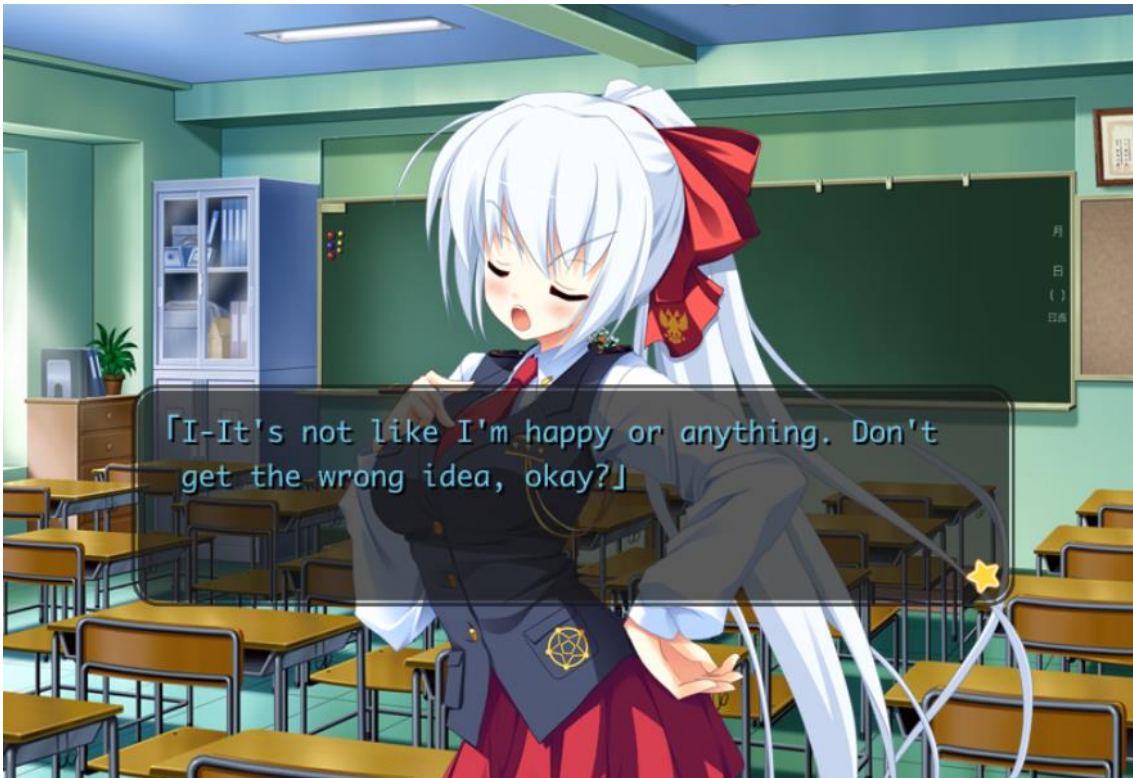


FIGURE 3. Visual novel (8).

## 2.5 Gamebooks

A gamebook is a work of fiction that allows the player to make choices during the story which creates branching storylines. Gamebooks can be as simple as novels with branching storylines, or they can implement role-playing features and even a strict set of game rules. Gamebooks usually present the story in a series of text sections ranging from a few paragraphs to several pages, and at the end of each section the reader is given a choice of narrative branches that they may follow (9).

FIGURE 4 shows a screenshot of the “Judge Dredd: Countdown Sector 106” gamebook in action. The text section is decorated with a descriptive image of the written storyline events.



FIGURE 4. Screenshot of the “Judge Dredd: Countdown Sector 106” gamebook by Tin Man Games.

## 2.6 Definition of the IFA

The IFA concept has its roots in the Choose Your Own Adventure book series, but it resembles both visual novels and gamebooks the most. It has a relatively visual outlook compared to eBooks and text adventure games, but the depth and complexity of the game mechanics are more than seen in a typical visual novel. Probably the most accurate definition of the IFA concept would be a “game-like story” or a “gamified story”.

### **3 DESIGNING THE IFA**

The starting point for designing the IFA application was the vision of offering different types of gamified written stories that would incorporate the best elements of modern interactive fiction to produce a potentially new and unique genre of digital entertainment. The desired end-result would be a hybrid of a digital novel and a game, featuring branching, text-based storylines infused with audiovisual elements and game-like interaction scenes.

IFA stories consist of text-based storytelling and narrative with branching storylines. Decisions made by the user and the outcome of the game scenes affect the story and its progress. However, whatever the choice or outcome, an IFA story can never end in a game over state, forcing the user to start the story over again. All story affecting interaction scenes are designed to enhance and modify the user experience and to drive it to a more personalized outcome.

From a technological point of view the application can be broadly characterized and viewed as a digitalized book featuring static and animated graphics, audio clips and interactive scenes which utilize a game-like application logic on the background. The content of the application can be furthermore divided into three different categories based on their properties and behavior: static, animated and interactive. Most of the storyline texts and graphical objects can be regarded as a static content, although some of them may be dynamic in nature. An animated content refers to in-story cinematic events or sequences, excluding normal transition effects between scenes and their content. All scenes requiring a user input - mainly scenes that prompt for a user choice or action - are defined as interactive.

#### **3.1 Character creation & modification**

Unlike in a classic novel, an IFA story allows the user to create or adjust a character and his or her characteristics. The amount and depth of a character customization depends on the specific world and its features. The purpose of the in-story characters is to provide the users with a more personalized and gamified user experience, while still maintaining the feeling of experiencing the story from a second person point of view.

In-story characters and their traits, skills or properties are used primarily during interactive scenes that require some sort of user action. A scene might contain a list of available actions to choose from for the story to continue, and the character's skills might affect the outcome of those actions. Character traits or properties may also reveal additional available options on certain scenes. If made possible by the story, the user's character may also evolve or level up during the story depending on the choices made or events taken place.

This feature requires the application to have a database for the users to access and modify the characters and their properties inside a specific world. The system must support multiple characters per user.

### **3.2 Story Worlds**

All IFA stories are based on the concept of "Story Worlds". Story Worlds are distinct universes and settings where the events of a certain story takes place from a thematic point of view. There can be multiple different stories inside a specific Story World, and they all share certain features or characteristics that are primarily used in utilizing cross-story content features.

This feature requires the application and its content to be designed so, that the application engine and content engine need to be separated. The application engine will be responsible for only advancing the story and accessing the core system functions, while the content engine will take care of managing the events and content related to the Story World.

### **3.3 Cross-story content**

Another key feature of the IFA concept is the use of a cross-story content; resources such as skills, items or other useful objects that stay with the user from one story to another to be used when needed, or otherwise appropriate inside the context of the story. For example, a user may find an item while reading a story and making a certain decision. This item may be used later during the story, or maybe even in a different story inside the same Story World.

Each Story World needs to have its own database for cross-story content resources and functions for managing them. The content engine is responsible for accessing, modifying and performing the tasks related to a cross-story content in a story.

### **3.4 Story elements**

The storyline of an IFA story is presented in a text format from a second person view, unlike in a regular book where the story is typically presented from a third person view. In a traditional novel, the text covers the whole page, but in an IFA story the text is presented in small chunks of one or more sentences during each scene. This is to avoid the user's screen from filling with a huge amount of small sized text and to maintain a certain pace for the story. The properties of the text, such as a font size, type or color, may change from one scene to another depending on the context of the story. Some scenes contain a dynamic text which can differ depending on the choices the user has made previously, or based on his or her character's skills and traits.

All storyline content must be stored as pre-defined and identifiable blocks of text in a format where they can be easily and quickly accessed when loading the scene content. Specific paragraphs or certain words of a text content block need to be identified as dynamic in nature, so that the game engine can display the correct content at the right place.

### **3.5 Audiovisual elements**

The role of the audiovisual elements in an IFA story is to support the written story and to enhance the user experience of the product. They also play an important role during the game-like scenes and interaction points. The use of these elements should be careful and delicate to avoid the risk of distracting the user from reading the text content.

Most of the visual content of a story is constructed out of thematic background elements such as background images, textures or decorative details. Scenes may also contain individual graphical objects which are used to support the text content.

The audio content consists mainly of subtle background music tracks, ambient sounds and sound effects. Like with the visual elements, the audio elements also exist to support the written story and to provide an improved user experience where necessary and appropriate.

The application must have a system that stores and accesses the audiovisual elements when required by a specific scene or event. All audiovisual elements should be small in file size to minimize loading and processing times, which is especially important from a mobile user perspective.

### **3.6 Gameplay elements**

The gamified scenes and elements of IFA stories are typically multiple-choice selection scenes that have a set of predefined options to choose from. Each choice has a certain effect on the story and its characters or events, and when an option is chosen, the system calculates whether the performed action is successful or not, and how it affects the storyline events. The skills and traits of the user's character affect not only to the success rate of the options, but they may also disable or reveal some additional options.

Each story has its own unique content for game scenes and the underlying game mechanics. All gameplay related content is loosely tied to the Story World and managed by the content engine, but still separated from the rest of the content and application logic. This requires the application to have separate scripts and functions for the game logic of each distinct story. However, some elements such as the layout or core behavior of the interactive scenes may be common with each other and handled by the engine.

### **3.7 Scene based structure**

An IFA story is built on scenes. Each scene may contain a varying amount of text, images, animations, interaction sequences or any combination of the above mentioned. A typical scene is built around 3 to 5 paragraphs of text, one or two background or other images, and a multiple-choice selection event at the middle or end of the scene.

The application requires a logic that is capable of handling large chunks of content data in the correct order and style defined by the content. The content data in itself must be structured, stored and implemented in a way that the engine can handle the data fast and efficiently.

### **3.8 General application flow**

The user starts the IFA application. In the case of this prototype, the user starts his or her Internet browser and navigates to the web address where the application is located.

The main lobby of the application is shown. The main lobby lists all the available Story Worlds, as well as the option to either sign up for a user account or sign in with a previously created user account. Creating a new user account or logging in with an existing user account takes the user to his or her user details which show information about the stories the user has completed and the ones that are unfinished. Selecting a Story World takes the user to the main view of the World where all stories available are listed. The main lobby functionality has not been implemented in this prototype. Instead, the user is taken directly to the title screen of the prototype story where the only available option is to start the story.

Selecting a story opens the story title screen which provides the user with a short description of the plot and content of the story, as well as some basic information regarding the story, an estimated duration and a genre. All possible types of cross-story content resources and other extra content are also shown on the title screen. The user may choose to begin the story or to return to the previous screen.

The story begins with a prologue, which explains the current situation and setting. The purpose of the prologue is to set the user in the right mood and mindset. After the prologue, the actual story begins, usually accompanied with a character creation or a modification scene.

The character creation takes place at the very beginning of the story. Whenever possible, the character creation process is interrelated to the storyline events at the beginning of the story, aiming to maximize the immersion of the user. The character creation is carried out by making choices related to the questions the system is asking, usually in the form of a narrative with a character or other entity in the story. The questions are structured so that the feeling of being a



part of the story is maintained for the user. For example, instead of prompted to choose a weapon proficiency directly by clicking a button on the screen, the user might be asked about his favorite weapon or preferred combat style.

After the character creation process the story starts to unfold. The user will experience scenes filled with storyline text, images and audio, accompanied by occasional interactive sequences such as multiple-choice questions. If there are more complicated interactive scenes, their mechanics are introduced and explained in the story. During a story the user may also face character modification scenes or the possibility to gain some cross-story content resources.

The final scene of a story is the epilogue. The epilogue sums up and closes the story, showing the key events and their consequences for the user. It also shows the user all the special skills, cross-story resources and other abstract or useable items collected during the story. If there are sequels or side stories available, they are listed in the prologue view with the option of returning to the main lobby of the application

## **4 TECHNOLOGY**

From a technological point of view, the IFA application is a relatively simple and small piece of software. There is no need for massive technological challenges or solutions that would require a lot of innovative software engineering. However, the possibilities and available technologies for developing this kind of application are numerous.

The technological aims of the IFA prototype were to test the selected technologies on a limited set of platforms to see whether the concept would look and feel as intended. The prototype would also pinpoint the biggest problem areas and technological challenges that would lay ahead when considering the development of a commercial version of the product.

### **4.1 Platform**

The primary platform selected for the first IFA prototype was PC browser environments. This choice was made because the first and foremost aim of the prototype was to test the general feasibility and user experience of the concept. Developing for PC environments is fast and straightforward, and by utilizing light responsive web design principles, the end product can also be surface tested on mobile and other small screen resolution devices.

### **4.2 Technology**

Platform independence, versatility and ease of production were the key factors when weighing the different options for the technological construction of the prototype. Platform independence was the most crucial of these, as the core vision and philosophy of the IFA application was to enable the use of the product on a multitude of different devices such as PCs, mobile devices and even SMART-TVs. The ease of production was chosen as an important factor, especially for the prototype, as quick and short development iterations were considered to be an important aspect of the early phase development process. It was decided early on that the technologies to be used were HTML5 and jQuery.

### **4.2.1 HTML5**

HTML5 is the fifth revision of the HTML markup language standard, which features new and improved properties for developing complex web applications. HTML5 adds many new features targeted especially for displaying and handling a multimedia and graphical content without the need for proprietary plugins and APIs. (10)

### **4.2.2 jQuery**

jQuery is a lightweight, CSS3 compliant and cross-browser compatible Javascript library, which makes tasks such as HTML document manipulation, event handling, animations and Ajax operations, much simpler (11). jQuery has an extensive selection of built-in animation and transition effects, which were considered important from the audiovisual and user experience perspective of the application. As HTML5 was chosen for the core technology for the application prototype to be developed, it was natural to strengthen it with the jQuery library.

## **4.3 Application engine**

The most important tasks of the engine are to control the loading and displaying of scenes and their content, tracking the story and user progress, and providing the user with basic controls of the story. The story content and story related game logic are separated from the core engine. FIGURE 5 shows the overview of the application workflow.

When a story is launched, the engine checks the current scene id number and tag linked to the user account and its story progress data. The corresponding content is then loaded by the engine, processed if required, and displayed to the user. The engine then waits for the user input. After the user has performed the necessary tasks for advancing to the next scene, the main function of the engine is called with necessary parameters passed along the request. The engine processes the passed data, saves the state of the story and proceeds to load the next scene based on the scene id and tag.

The story progress and the user's character information is saved on the client using the local storage API. With the HTML5 local storage, web applications can save large amounts of data

locally on the browser. It is more secure than using cookies and does not require information to be passed on the server (12). All story progress and user character data is saved on the local storage to prevent the loss of critical story related data in case of a browser error, page refresh or unexpected shutdown. The data is saved every time the story requests for a new scene from the application engine.

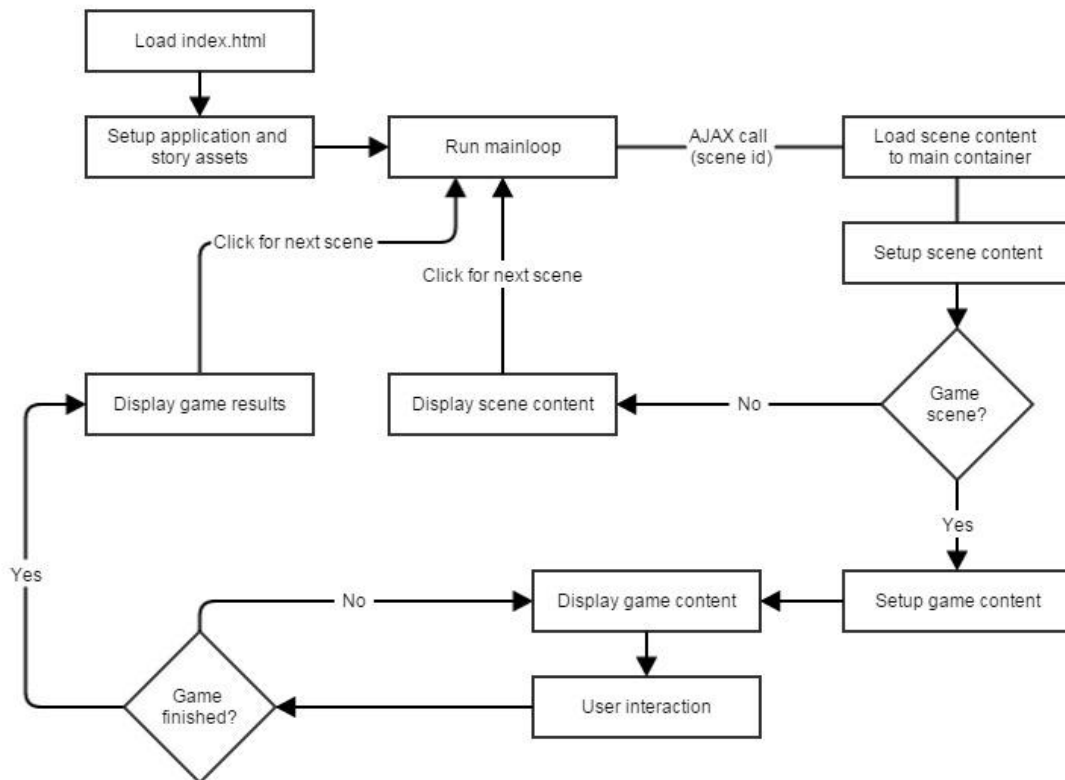


FIGURE 5. Application workflow.

#### 4.4 Screen layout

The layout consisting of the actual story content and the user interface areas is referred to as a Screen. The screen is a basic HTML layout consisting of HTML elements, such as <div> and <section> tags, which are styled and positioned with CSS styles. A Screen layout depends on the actual story, its theme and the artistic vision of the developer.

The screen elements are dynamically modified and filled with an appropriate content or data by using a simple jQuery AJAX call. The screen layout and style is controlled by an external CSS file tailored individually for each story and its theme.

FIGURE 6 shows how each scene is structured in the basic HTML layout. The main HTML file (index.html) contains a content container div and external files, such as core stylesheet and script files, including the engine script. Each scene file contains additional div elements on which the actual content is placed. The scene scripts control the behavior, content and displaying of scene specific HTML elements and their content.

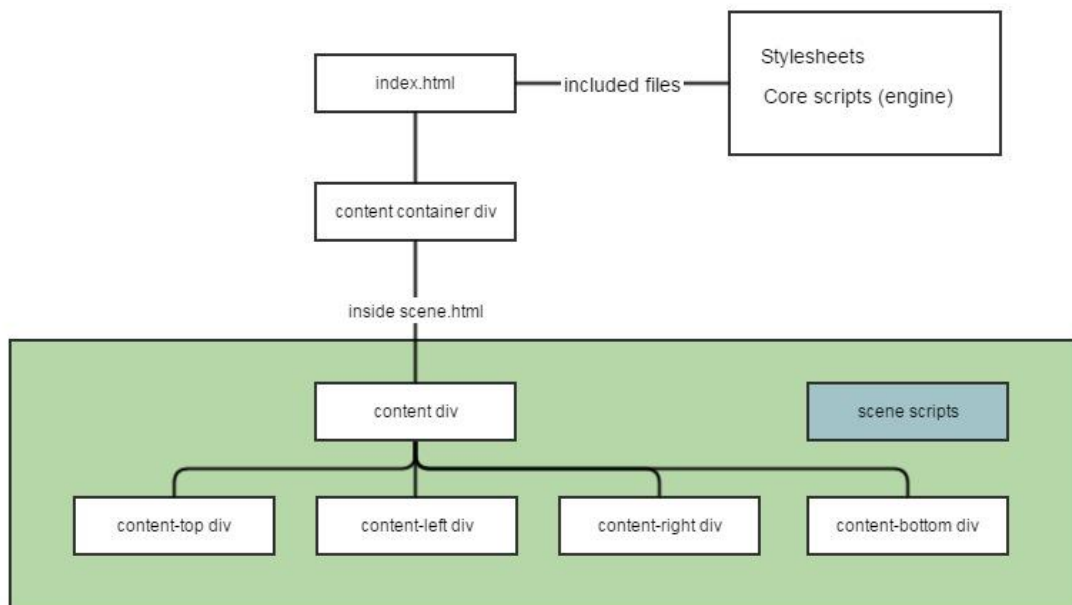


FIGURE 6. Screen structure.

#### 4.5 Content format and structure

The contents of a specific scene are stored in separate HTML files containing both HTML markup and Javascript or jQuery code for executing different actions regarding the screen content or gamified elements. Each scene is saved as its own unique scene HTML file. As the engine loads the scene content on the content container with an AJAX function, the scene content is displayed on the screen and the included Javascript code is executed. FIGURE 7 shows an example of the content format and structure of a typical scene file.

```

<div id="content">
  <div id="content-top"></div>
  <div id="content-left">
    <h2>A Header</h2>
    <p class="someClass">
      Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque nec convallis erat.
      Pellentesque condimentum, est vitae egestas iaculis, urna nulla vehicula arcu, vitae
      porta arcu ipsum id enim. <span class="important">Vestibulum</span> ut libero quis arcu
      tempor vulputate sit amet sit amet nisl. Quisque ac ex vulputate, consequat ex sit amet,
      posuere lacus. Class aptent taciti sociosqu ad litora torquent per conubia nostra,
      per inceptos himenaeos.
    </p>
  </div>
  <div id="content-right">
    <div id="dynamicContent"></div>
  </div>
  <div id="content-bottom"></div>
</div>
<script>
  // SETUP SCENE CONTENT
  $('#content-top').css('background', 'url("path/spritesheetName.png") no-repeat 0px 0px');
  $('#content-bottom').css('background', 'url("path/spritesheetName.png") no-repeat -960px 0px');

  // ADD GAME RELATED CONTENT DYNAMICALLY INTO THE SCENE
  $('#dynamicContent').html("<h3>Player Name: " + playerName + "</h3>");

  // CALL EXTERNAL FUNCTIONS
  fadeAllContentIn();
  performSomeTask();
</script>

```

FIGURE 7. Content format and structure of a scene file.

#### 4.6 Storyline and text content

The narrative, dialogues and other text content is stored inside the scene HTML files. Each block of text is stored inside a paragraph element accompanied with an id for a dynamic control of the content. A text block can also contain words or passages of text marked with a `<span>` element for the purposes of highlighting the text or for it functioning as an interactive element.

#### 4.7 Audiovisual content

All audiovisual assets are stored in a dedicated folder on the server, where they are referred to in the scene files. Graphics are stored in sprite sheets for the purposes of reducing file sizes and the amount of HTTP requests whenever possible.

All audio resources are divided into small clips based on their theme or context of use. Ambient sounds and background music is achieved by looping the audio clips to create the illusion of a continuous audio flow.

#### **4.8 Scene control scripts**

Each scene contains specific Javascript or jQuery scripts for controlling the behaviour and flow of the content elements. These scripts are performed when the application engine loads the content HTML file. The scripts can also contain scene specific event listeners or function calls for displaying a dynamic content.

#### **4.9 Animations and Transitions**

The IFA prototype features two kinds of animations and transitions: predefined parameter controlled basic effects and scene specific custom animations and transitions. The predefined transitions are called by the engine and are used for fading in or out the scenes and their content, as well as the generic user interface elements. These transitions and animations share the same core characteristics for providing a unified user experience across stories of the same world. The custom animations and transitions are content bound visual effects, which are used to emphasize the narrative events. Most of these animation effects are handwritten for each scene, as their characteristics vary according to the type, purpose and theme of the scene in question.

From a software development point of view, the most ideal solution would be to use completely predefined animation functions, which are controlled and played by a set of parameters loaded with the scene content itself. This is a technical feature to be designed and implemented to the application at a later date, but does not fit in the scope or aims of this prototype.

#### **4.10 Interactive scenes**

The scripts for interactive scenes such as multiple-choice selections or other gameplay related events are stored, accessed and operated outside the core engine. An interactive scene contains a function call to the game logic script which loads and processes the game content. This content is then displayed on the screen.

The choices made by the user have an impact on the narrative in the form of branching storylines and a type or an amount of options available in future interactive scenes. The technical implementation depends heavily on the content and structure of the story, as well as the importance and emphasis of branching storylines from the point of view of the story. Three different types of branching and dynamic content were identified for this prototype: a branching storyline, a branching content and dynamic in-game resources.

A branching storyline occurs when a choice made by the user has a dramatic effect on the story events. In this case the story is shifted completely on a new path with an almost completely different content as the path so far. Technologically, this kind of a storyline shift is implemented so that when the user makes a storyline altering choice, the application engine receives a notification of this in the form of a variable, which changes the file path or scene ID to match it to the new story branch. All following scenes are loaded from this new branch.

Branching content refers to situations where, based on the user's choice, a certain content element is displayed. This might occur, e.g. during a dialogue with a non-user character from the story, where the user's choice of words determines which of the two possible answers are displayed. The content engine registers the user's choice, passes it along as a parameter to the function responsible for loading the answer and displays the result on the screen.

A dynamic in-game resource refers to all of the user character's attributes, skills and items or cross-story resources that may have an effect on the storyline events. Dynamic in-game resources could be considered as activators in the form of variables that enable the types of branching elements described above. For example, during a scene where the user's character is surrounded by hostile enemies, he or she may choose to use a weapon and the last of the little ammo left in it. Whatever the outcome of the scene at hand, the weapon may not be displayed as an option in some future interactive scene because the user character has ran out of ammo. Both the weapon and ammo are just story and character related variables, which are tracked by the scripts for the interactive scenes, and the content is displayed based on these variables.



## **5 WALKTHROUGH OF THE IFA PROTOTYPE**

The prototype of the IFA application is titled "The Racing Driver". It tells the story of a young promising racing driver given a chance to prove his abilities in an invite-only young talent racing event, where team principals and sponsors are looking for the next future champion.

The reason for choosing motorsports as the setting for the first prototype was because of the highly challenging task of creating a text-based racing roleplaying game. If the prototype proves to be successful with a genre like this, it will almost certain work well with other genres, too. Secondly, racing and motorsports are familiar and close to the developer's heart, which makes it easier to approach the development of the story.

### **5.1 Prologue**

The prototype story begins with a scene where the main character is in an airplane about to land on an airport close to a location where an international motorsports organization is hosting an invitation-only young talent racing event. The purpose of the prologue depicted in FIGURE 8 is to introduce the setting and theme of the story, and to present the player with the current situation. In the prototype, the prologue is just a simple set of scenes with static text and images.

## Chance awaits...

As you watch the city lights below, you cannot help but to think how far you have come from the days carefree go-kart racing.

It wasn't that long ago when you started your career and entered your first race. The years went by quickly, and soon you noticed how you defeated opponent after another. There was something special in you. And now you have the chance to show what you're made of!



FIGURE 8. Screenshot of the prologue.

## 5.2 Story tutorial and character creation

The next part of the story is about the main character arriving on the venue of the racing event to meet with his designated racing engineer. This sequence works both as a conceptual tutorial for the story and its game mechanics, as well as a character creation or modification scene disguised as a narrative between a driver and an engineer.

The character creation and modification scene is presented as a series of questions performed by the racing engineer. Each answer affects the user's driver character's properties, which in turn affect the content and success rate of all future actions on and outside the track. However, during the user's racing career, these properties and characteristics may change based on the user's choices. FIGURE 9 shows an example of a question performed by the racing engineer, which will affect the user's character and his or her traits and skills.

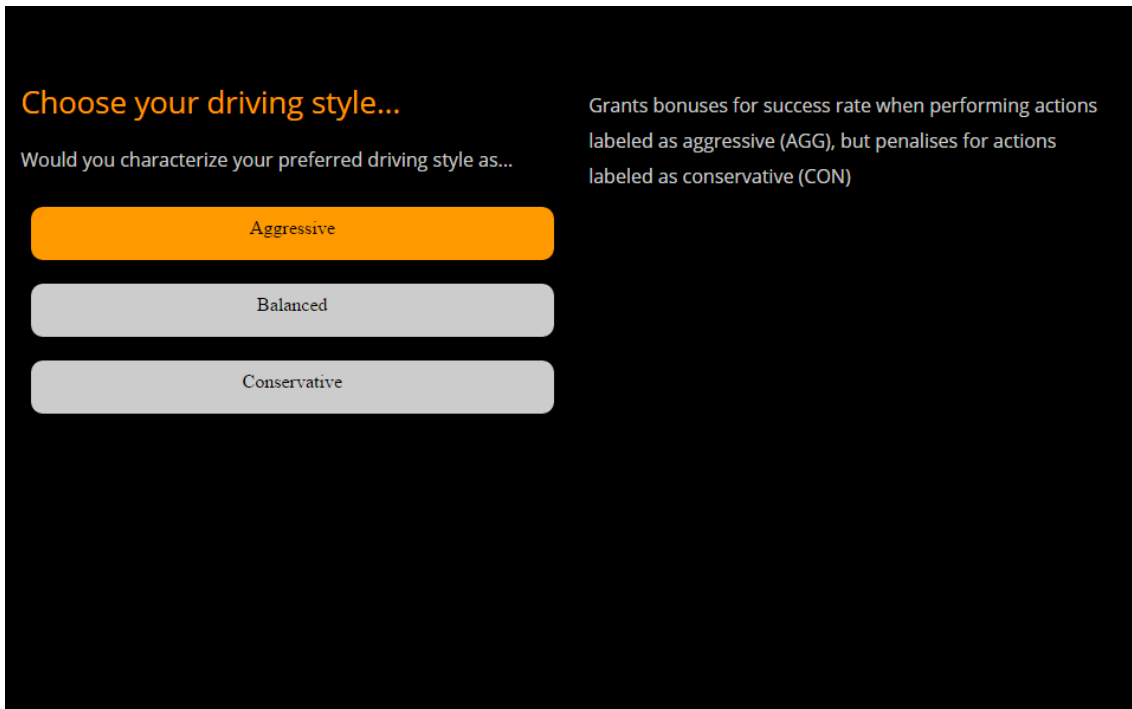


FIGURE 9. Character creation process.

### 5.3 The Free Practice

During free practice, the user's mission is to select a programme he or she wants to run out on the track. The user may choose between a race simulation, a qualifying simulation, learning the track or setting up the car. Each choice provides positive and negative effects on certain areas, which affect the user's qualifying time and the race performance of the car. FIGURE 10 shows the list of programmes to choose from, including a short description of the effects the programme in question has.

Running a programme always affects the areas of racing involved, but the amplitude of these effects depend on the success of on-track choices. During each programme run the user is presented with a multiple-choice gameplay event regarding random events on the track. The user needs to choose the option which feels the most comfortable or best choice to him or her at the given moment. Each action has a success rate which is dependent on the user character's skills and traits selected during the character creation phase. Some of the choices the user does on the track affect his or her character properties, which in turn might affect the storyline events and opportunities outside the track. FIGURE 11 shows a typical on-track racing event that prompts for a user action choice.

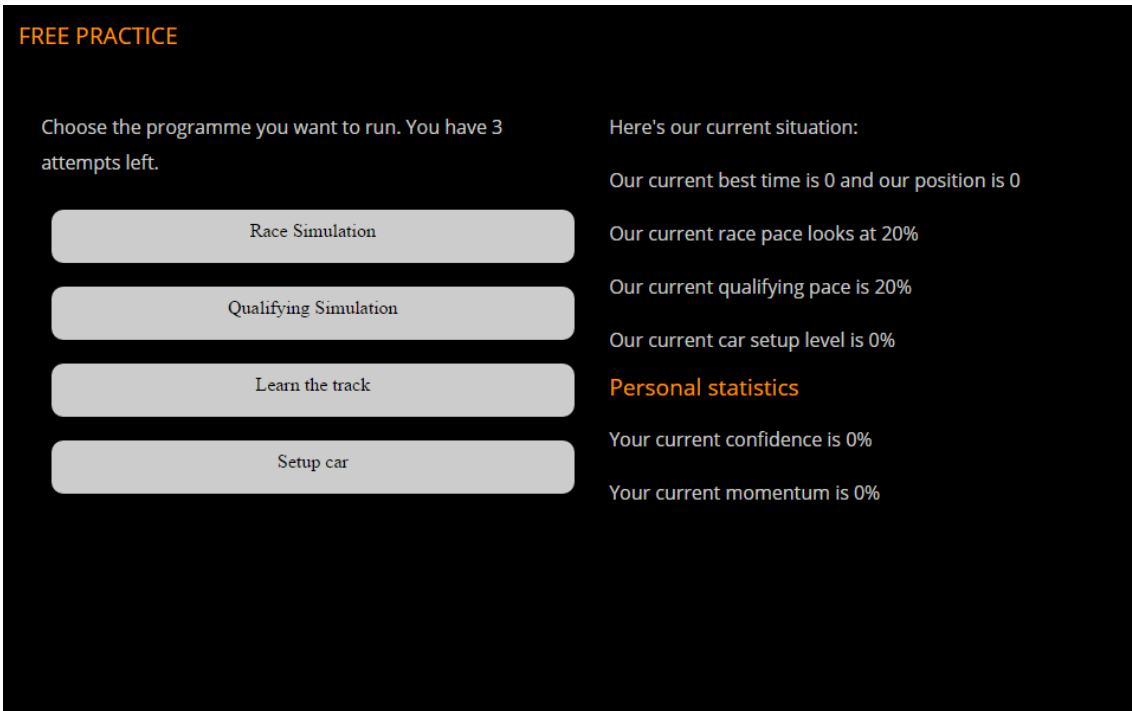


FIGURE 10. Choosing a programme in free practice.

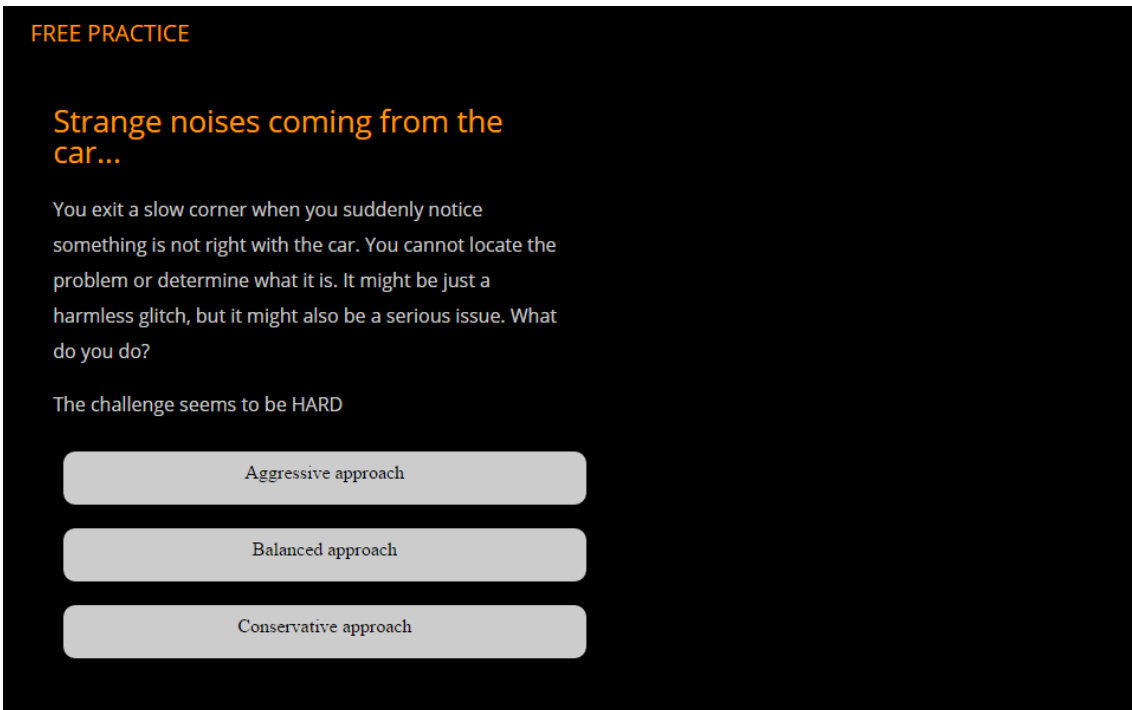


FIGURE 11. Making an on-track choice during free practice.

## 5.4 The Qualifying

The user's goal during a qualifying session is to achieve as fast lap time as possible because it will determine the starting position for the race. The higher the starting position, the better. During qualifying, the user has three attempts to achieve the best possible lap time. After his or her third attempt the user may choose to perform one extra timed lap with a cost of a reduced race performance or other negative bonuses.

During a timed lap attempt, the user is first presented with a potential positive or negative random event or effect that may affect his or her performance. The user may choose whether to carry on or abort the timed lap, wasting one attempt for a good lap time. After this, the user needs to choose what area he or she will be focusing on during the out lap before trying to set a time.

During each timed lap, the user is presented with three racing events containing multiple-choice options to choose from. Whatever the nature of the event, the user is always given three basic choices to choose from: he or she may choose to take a risk and chase for a better time, play it neutral or approach the event conservatively, losing a bit of time but playing it safe. The choices and their success rate determines the final lap time. FIGURE 12 shows a racing event during a qualifying run.

## QUALIFYING

### Slower car ahead

You're on a quick lap when you suddenly notice a slower car ahead of you. Your laptime will be ruined if you don't pass him. What do you do?

The challenge seems to be NO CHALLENGE

Your split time is 3.967s behind current polesitter

Pass him with a little risk! (AGG)

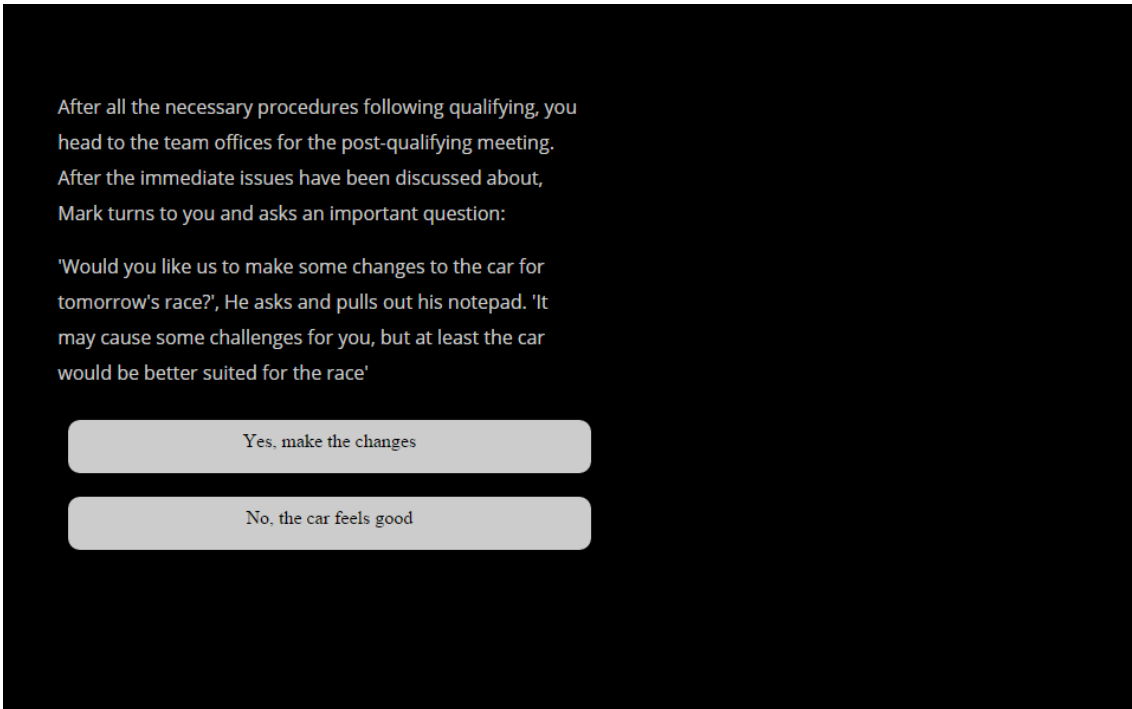
Make the pass, but play it safe (BAL)

Pass him carefully (CON)

FIGURE 12. Qualifying.

## 5.5 Post-qualifying

After the qualifying has been finished, the user's character is called to a debriefing with his or her racing engineer, where the results of the qualifying are shown and discussed of. The engineer presents the user with some questions about whether to make changes to the car for tomorrow's race. Making changes affects the properties of the car and the driver. The available changes and their effects can be seen in FIGURE 13.



*FIGURE 13. Post-qualifying debriefing with engineer.*

## **5.6 The Race**

The race combines features from both the free practice and qualifying scenes. The race has a set of random based racing events with multiple-choice options to choose an action from. The user character's skills and traits, the properties of the car and the choices made by the user during the free practice and qualifying, all affect the content and success rate of the available actions. FIGURE 14 shows an example of a typical racing event.

Lap 30/30

## Late braking

You are on a good qualifying lap and feeling comfortable with the car when you notice a great opportunity to brake a bit later to a corner for maximizing your laptime. What do you do?

The challenge is HARD

Brake as late as possible, take a risk! (AGG)

Brake later than usual, but keep it under control (BAL)

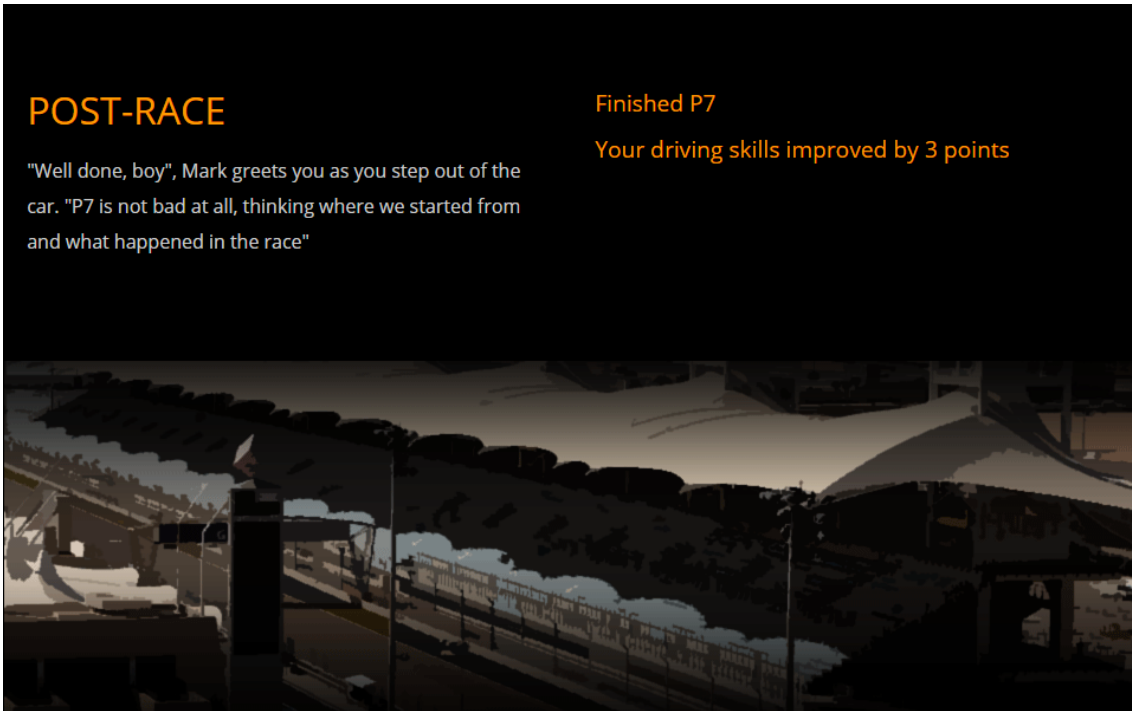
Brake normally (CON)

FIGURE 14. Race.

## 5.7 Post-race

After the race has been finished, the user's character is called to another debriefing session with his or her racing engineer. During this meeting, the results of the racing weekend are shown, as well as the changes and bonuses applied for the user's driver character. These variables and traits carry on to the next racing weekend (story) with the user. FIGURE 15 shows the post-race debriefing session with weekend results and character modifiers.





*FIGURE 15. Post-race debriefing session with engineer.*

## **5.8 Epilogue**

The epilogue of the prototype is a single static content scene, which shows the results of the racing event. If the results were good, the user character is approached by a team principal interested in signing the young talent to his or her team. However, if the results were bad or not just good enough, the epilogue shows the user's character packing his gear alone and getting ready to return home without a racing seat. FIGURE 16 shows one possible ending for the story.

## EPILOGUE

The young drivers racing event is over. The track has fallen silent and all equipment has been carried away. Only the faint smell of gasoline, brake pads and burnt rubber lingers around the circuit.

You came and demonstrated your racing skills in front of the crowds, team principals and sponsors. You did enough to prove that you are worthy of a racing seat. New challenges await you next season as you step into the world of international motorsports.

You are ready.



*FIGURE 16. Epilogue.*

## 6 ANALYZING THE IFA PROTOTYPE

The primary aim of this thesis and the prototype was to test the core idea of the IFA concept and analyze whether it would have potential as a commercial product. The secondary aim was to prototype a simple technical solution with HTML5 and jQuery, and to analyze the possibilities and requirements for a further development.

On a conceptual level, the prototype works as a rough demo for a Gamebook-like product with a few unique features and divergent design philosophies. Opposed to the idea of an “interactive story” described in the chapter defining the IFA concept, at least the prototype works better as a game than as a story. However, there are few fundamental aspects that determine how we perceive the end-product.

First of all, where to draw the line between an interactive story and a story driven game? Does one such line even exist? This is more of a philosophical question that does not fit the scope of this thesis, but it proves just how hard it is to accurately define products with artistic drivers. The second aspect deals with the genre chosen for the prototype: motorsports related products tend to have less narrative content because of their style and the appeal of the target audience.

From a technical point of view, the application is far away from being ready for a commercial distribution. Key development areas include the architecture of the application engine, the format and methods of use of the content data, and the mobile optimization. The application architecture should be designed so that a content management engine and a game engine would be separated from the core application engine. This is because the core functionality of the application remains consistent regardless of the content, but the actual content is dependent on the boundaries and rules set out by the Story World and its features. All interactive scenes and possible mini-games are also small self-contained applications that derive their content and rules from the Story World. By dividing the application into these three areas, the management and content production might become easier and faster. Alternatively, all of the three engines could be merged into one single engine, which only interprets the content data of the stories and executes them as defined in the parameters passed along with the content data.

The content data should be in a format that supports a multiplatform functionality, such as JSON or XML. Minimizing loading times and reusing the audiovisual content should be key goals and requirements for the content data. The application and all content should be mobile optimized, as the application would most likely be used with either a tablet computer or a mobile phone. Technically, this would be accomplished by developing the application to be a native or a hybrid application, or a pure HTML5 application featuring extensive responsive web design features.

To sum it up, the finished prototype does not feel as much of a novel as it was originally intended to, but a dramatic content and narrative elements could be added to it to create a more book-like feeling and user experience. This bias towards either a game or a novel is heavily affected by the content and the artistic visions of the developer.

Technologically, the best solution would be to develop the final product as a hybrid mobile application with Phonegap or other similar product. HTML5 together with jQuery provides the features and APIs required to develop a high quality mobile application that fulfills the requirements and needs of both the IFA concept and the target audience.

## 7 CONCLUSION

When I started this thesis, I had only a vague vision and a purpose in my mind: to create an application for telling interactive gamified stories to inspire especially the younger generations of our days to see the fun and excitement in written stories. This vision and purpose is still strong in my mind, but it has matured and taken a more solid, concrete form.

I have learned a lot about programming with HTML5 and jQuery, and especially about developing a complex audiovisual and interactive application with these technologies. I have also made many mistakes during the development process, and there are thousands things I would do differently now if given the chance to start all over. Nevertheless, I feel that I have succeeded in achieving something that I can be proud of.

All in all, the development of this prototype from an idea to a working prototype provided me with a lot of ideas, experience and answers regarding the possible future development of the application. It has increased my faith in the concept and left me inspired to push it forward. I feel that I have learned a lot, and that I have become better in more than just programming or designing an application.

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