Der Blonde Eckbert - A Serious Game Interpretation of the Eponymous Romantic Fairy Tale

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Abstract. Literature-based sciences deal with plenty of great stories. As a combination of traditional knowledge transfer methods in the humanities and newer technologies associated with the digital humanities, serious games can be a great way to motivate a younger audience to deal with such heritage assets. In this paper we present our contribution to this: A serious game interpretation of Ludwig Tiecks *Der blonde Eckbert* (English: Fair-Headed Eckbert.). After a summary of the story and its literary relevance we introduce our concept of the game based around audiovisual storytelling with a runner game and provide an overview about included didactic elements. We discuss our strategy on how to keep players intrinsic motivation high to achieve a longer playtime and thereby better knowledge consolidation. Finally, we present several generalized code components which arose during development. These components - such as an audiovisual cutscene and an endless runner template - provide the opportunity to develop similar serious games without requiring coding skills.

Keywords: Serious games · Digital humanities · Digital literary

1 Introduction

A common task of the humanities is the preparation of cultural heritage and heritage assets in such way that their intellectual value is preserved for future generations. The so called *digital humanities* emerged by the digital transformation in the humanist research professions, providing new approaches for archiving, researching, publication and teaching. In this process digital storytelling emerged as mediation format in the literary studies, often enhanced by audio and visual elements[1]. These provide especially text-based professions with the possibility to create modern interpretations of historically relevant literature which convey their stories on different cognitive layers. Moreover, to satisfy a

[1] We'll use therefor the phrase *audiovisual novel* in the following.

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younger audience, audiovisual novels can be enhanced to serious games by adding gamified interactive elements.

In this area we implemented a serious game called *Der blonde Eckbert*[2] based on the same titled romantic tale written by Ludwig Tieck [1][3]. Our implementation tells the underlying historic text enhanced as audiovisual novel. Its gaming part is realized as runner game that is connected to important story parts. For didactic purposes, the application conveys literary interpretations of the fairy tale on different levels. Furthermore, after finishing the story once an achievement system retains players long-term motivation.

Fortunately, implementing *Der blonde Eckbert* resulted in several reusable components that can be used for similar projects in future; e.g. an audiovisual novel component, a runner game template and a modular achievement system. All components were built in the Godot engine[4] and have been published open source[5] under MIT Licence.

In this paper, we present the main ideas of our interpretation of *Der blonde Eckbert*. Initially, we present research that inspired our serious game concept, give a short overview of the story and discuss its relevance from literary perspective. Subsequently we present our serious game approach by giving an introduction in our storytelling, gameplay and the didactic elements. Based on this we discuss concepts that were added providing knowledge consolidation. Finally, we describe reusable technical components and provide a further outlook.

2 Related Work

Our serious game concept was inspired by the assumptions which we present in the following section.

According to Jones [2], (serious) games research was excluded in the humanities for several decades. Besides his assumption, it is "*because they* [games] *possess a stigma as mass entertainments*", he presents possible topics that are of interest for humanistic research and how the humanities might gain of (serious) games. As he states: "*Because games [...] combine computing with modes of cultural expression associated with the humanities – storytelling, design, aesthetics, social communication – they would seem to be of obvious interest to the digital humanities.*" Hergenrader [3] also presents connections between games and the humanities, and additionally proposes the use of (serious) games as persuasive and educational tools. Thinking further about his statement "*A digitally literate person is one who can thoughtfully use text, image, sound and interactive elements [...] to create a purposeful experience for a specific audience.*", then (serious) games are the next logical step in imparting knowledge in the humanities.

[2] English: Fair-Headed Eckbert.

[3] The game can be accessed at https://uni-tuebingen.de/en/213265, last access 30.06.2021.

[4] https://godotengine.org/, last access 30.06.2021.

[5] The repository is accessible under https://gitlab.com/kkoerner/dh-templates.

Mortara et al. [4] also share this assessment and provide an overview on serious games made for teaching cultural heritage. The authors present serious games developed in the digital humanities, their educational objectives, and provide an analysis of relations between game genres, application contexts[6], technological solutions and finally learning effectiveness. They conclude two main factors as key for serious game effectiveness: "an appealing and meaningful environment and a suited and intuitive interaction paradigm."

Manero et al. [5] present their narration-based game concept for *La Dama Boba*[7], a game aiming to motivate students toward classic theater. In their publication the authors present their concept, a quantitative study, and conclude their discussion stating "*the performance of the game is directly related to whether the game genre is included or not among the player's gaming preferences.*"

3 Background Story

Ludwig Tieck's *Der blonde Eckbert*, first published in 1797, is a groundbreaking work for early German Romanticism. It is labeled as a "Kunstmärchen", an artificial fairy tale, that combines elements of a novella and a traditional fairy tale. As such, it centers on the knight Eckbert and his wife Bertha. The protagonists are stalked by a miraculous old woman, which finally drives Eckbert insane. Rabenstein discusses in [6], how Tieck mixes up the literary genres to separate fairy tale and realistic elements, only to combine them again. As a result, the further the recipients read, the more it becomes uncertain, what is real and what is fiction. This uncertainty led to a variety of interpretations - some in a fantastic-layered others in a more realistic-psychological reading. However, no approach is free of contradictions.

This goes to show, that *Der blonde Eckbert* is not interested in a singular, correct interpretation, but a variety of different, equally important readings existing simultaneously. As Rabenstein mentions, Tieck creates this multitudinousness using the poetics of the miraculous, which allows him to switch between elements that create and dismantle fiction. That way *Der blonde Eckbert* addresses uncertainty, subjectivity, confusion and the unease, that the story triggers within the recipients, as well as the deconstruction of the belief in a singular, correct interpretation. According to Rabenstein the entanglement in both content and design in Tieck's arabesque hence result in a literary-creative chaos. Thus, due to the narrative unreliability, Eckberts madness virtually crosses over to the recipient.

4 Our Serious Game Approach

4.1 Storytelling

For the game we subdivided the origin text of *Der blonde Eckbert* into five main chapters as illustrated in Fig. 1. Each chapter ends with the current protagonist

[6] Where is the application used; e.g. as part of an exhibition, within an curriculum.
[7] Eng.: The Foolish Lady.

fleeing, what we use as crossover to a runner game level. Furthermore, the story can be divided into a part where Bertha explains her story, a part where Eckberts story is told and a finale in which everything previously believable is questioned.

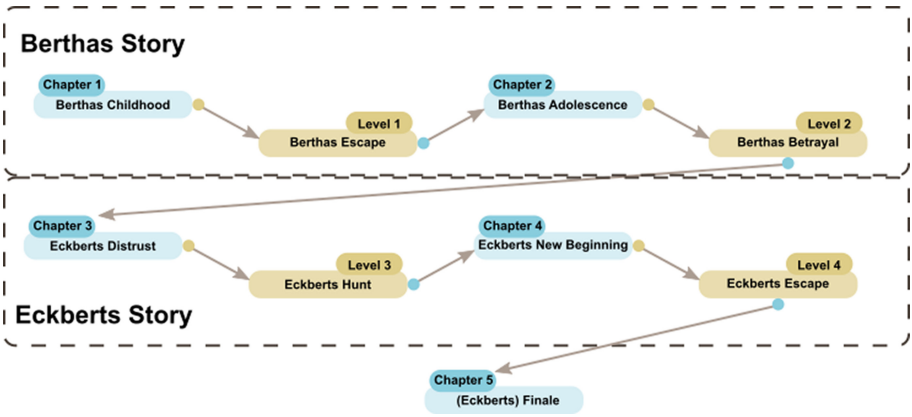

Fig. 1. Storyline of *Der Blonde Eckbert*

Each chapter is narrated in an individual audiovisual novel (see an example in left side of Fig. 2) we call *cutscene*. A cutscene presents a minor modified version of the origin text placed on an aquarelle painting, which visualizes the current story. Moreover, background music accompanies the current mood; e.g. a melancholic sound for sad parts and a more hectic melody during an escape. One of our main goals of the cutscenes has been to slow down its speed so the player has time to experience all textual, audio and visual aspects connected to the story. Therefore, the text becomes visible character by character. A fading system for texts and paintings, as well as a sound that emulates rustling paper, emphasize turning book pages.

4.2 The Runner Game

The runner game is inspired by the Google Chrome T-Rex-Runner [7][8]. The main story includes four individually scripted levels whose scenery depends on the previous chapter. Moreover, an endless-runner gets available to the players after finishing the last chapter. To keep the game elements in style with the novel parts, all elements are also (animated) aquarelle paintings.

Gameplay. The main theme for the runner game is the protagonists fleeing corresponding to the ending of each chapter. An exemplary scenery is shown on

[8] You can access the game by using the Google Chrome Browser, entering "chrome://dino" in the browsers adress bar.

Fig. 2. Left: Cutscene, Right: Runner game

the right side of Fig. 2. Bertha and Eckbert are running through the landscape, followed by their fears, and have to avoid approaching obstacles by jumping and crouching. Avoiding an obstacle successfully results in collecting one gem[9], colliding in loosing three gems. Levels provide scripted obstacle spawn-times. This ensures that players can replay levels, thereby train their input behavior and become better over time. However, to avoid player frustration during the story-based gameplay, there is no game over in levels. Instead, for long-term motivation, we chose to show a small statistics page at the end of each level, that illustrates how well the player performed.

Scenery. The fleeing character runs in front of a parallax background presenting the player spatial depth. Depending on the story, the backgrounds layers may fade. This way players get the feeling of changing locations; e.g. level one is starting in a forest, passing through hills and ending in the mountains.

Obstacles appear on the right side of the screen and move toward the player. For simplicity we focused on four main obstacles: Stones, branches, buzzards and crows. The former two must be passed jumping, the latter ones need to be passed crouching.

For didactic purposes the scenery contains the so called *anxiety cloud* (see right side of Fig. 2). It follows the player frequently nearer or further away. Inside the cloud so called *anxities* are spawned and rise from the ground above the player and move to the right side of the screen. Their use is described in the upcoming section.

4.3 Didactic Elements

The main goal of the game is to get the players into the story of *Der blonde Eckbert* and provide layers of interpretation. Obviously the cutscenes are the base element of the knowledge transfer since they present the story to the players. To connect cutscenes and levels each level provides a short introduction. This summarizes the main reasons which led to the escape wish of the protagonist in the previous cutscene.

[9] These gems are an important story element.

The *anxiety cloud* is used for illustrating important narrative elements such as the characters main fears and indicators for narrative unreliability that showed up in the story. Its movement - sometimes the cloud is nearer and sometimes it is further away from the character - visualizes that these elements are always there but not all the time omnipresent. These *anxieties* always rise above the characters and move ahead of them - symbolizing they'll be upcoming again in the future.

During the progressing story another main theme - Eckberts rising madness - slowly becomes discernible. We hide this motif from players at the beginning using the customized cutscene and level selection menu shown in Fig. 3. The first six buttons are illustrated as an icon showing a main component of the connected cutscene or level. The last three ones are hidden at first. Once the player finishes the third level, the menu is extended by a maelstrom representing Eckberts mental state. After the player finishes the final cutscene, the maelstrom is also extended by an illustration showing Eckbert walking right into it. Moreover, during the *cutscenes* some illustrations subliminally indicate Eckberts mental state: The miraculous old woman's face is blurred at all times and appropriate text sections feature overlapping background images which give the feeling that something is uncertain. This shall present players with the main question of the story: Was it real or was it all just Eckberts madness?

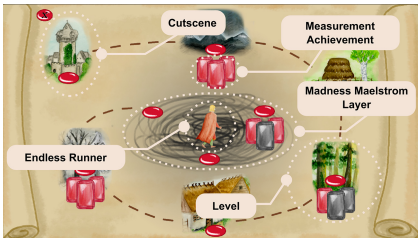

Fig. 3. Level selection

4.4 Long-Term Motivation

Playing through the main story takes around 30 min. Since we want to keep players interested in playing a longer time for knowledge consolidation we implemented two additional game components: An achievement system containing 24 individual achievements and an endless runner extension[10].

The endless runner uses the same gameplay and scenery as the runner game presented in Sect. 4.2. However there is a major modification: The first time the randomly chosen character collides with an obstacle it counts as game over. Also instead of scripted obstacle spawning, it features a randomized one containing

[10] External testers required approx. 2 h to unlock all achievements.

increasing difficulty with passing time by faster obstacles and more obstacle spawns. Consolidation of knowledge is achieved in that all anxieties of the levels are added randomly to the anxiety cloud each run. This way, the story elements found to be important are brought back to the players mind.

IDs	Challenge
1 - 4	Level completion
5 - 7	Gem collection
8 - 10	Obstacle avoiding
11 - 13	Playtime
14 - 16	Endless runner enduring
17 + 18	Completionist-based
19 + 20	Story-based
21 - 24	Miscellaneous

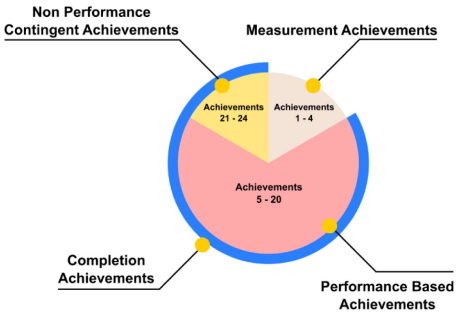

Fig. 4. Left: Challenges, Right: Challenge classification using Blairs system [8]

We implemented 24 achievements to challenge players. They were classified using the classification system of Lucas Blair [8] as illustrated on the right side of Fig. 4. For each level we added a *Measurement Achievement* (achievements 1–4): Since levels can't be lost, the achievement challenges players to collide with as few obstacles as possible during their run. As feedback on their performance players receive an image containing one, two, or three (best performance) gems (see Fig. 3).

The other twenty achievements (5–24) can be assigned to the *Completion Achievements* category. Their challenge descriptions are listed at the left side of Fig. 4. Going even more in detail using Blairs system, challenges 5–20 are *Performance Based Achievements* which challenge players to perform well in the game. Their challenges range from experiencing the story, collecting gems towards surviving an amount of time in the endless runner. Finally, challenges 21–24 can be classified as *Non-Performance Contingent Achievements*. Their challenges are mainly funny yet not difficult at all. They range from clicking on a link, forced obstacle-collision up to a cross-reference to a well-known video game. All *Completion Achievements* provide a positive feedback phrasing as well as a comic-like illustration to increase player self-efficacy; e.g. receiving the achievement *Olympian* for enduring 120 s in the endless runner without collision.

Based on the difficulty recommendations Blair postulated also in [8], we subdivided our *Completion Achievements* into three degrees of difficulty as illustrated in Fig. 5. Achievements located in the *Entry-Level Tasks* layer are easily unlocked during the initial playthrough. Their goal is to satisfy even inexperienced players by unlocking achievements and generate intrinsic motivation to unlock other achievements. Achievements located in the *Keep Going Tasks* layer need more effort to be unlocked: Players require the approx. timely effort of a

second playthrough to unlock these. However, players might also use the endless runner to fulfill the required tasks. Achievements located in the *Challenging Tasks* layer require the most effort. They're designed a way that players require approx. two playthroughs and several rounds of the endless runner to receive their reward. To ensure that players understand their task to unlock achievements in the *Increasing Challenge Tasks* area, they are designed in such way that they build on one another. E.g. there are three achievements for collecting gems: *Merchant* for collecting 200 gems, *Lord* for collecting 350 gems and *King* for collecting 500 gems. All *Non-Performance Contingent Achievements* placed in the *Non Challenging Tasks* layer can be achieved anytime to let players explore the game additionally to the story.

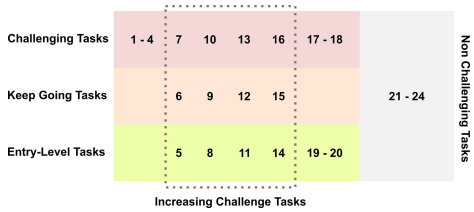

Fig. 5. Achievement challenge layers

5 Reusability and Adaptability

We implemented *Der blonde Eckbert* using the Godot-Engine (See Footnote 4) in version 3.2 and gdscript as programming language. Based on the approach presented in Sect. 4, we developed the core components of the game as Godot *scenes*. Since the discussion of the whole architecture would go beyond the scope of this paper, in the following we only present the main benefit - from an artist's or developer's perspective - of our implementation.

All implemented code has been published under MIT Licence on (See Footnote 5). Somebody planning a new game may reuse the following components, configuring all required information in the Godot inspector without requiring coding skills.

Storytelling is the main technique for knowledge transfer within our project. Out *Cutscene* implementation is designed in a way required texts, their screen positions, background images and audio files can be configured. Furthermore, it includes a typewriter effect, image fading and sound fading to achieve smooth story transition. Thus, artists can - with little technical effort - create audiovisual novels.

For scenery purposes we implemented Godot scenes for a *moving background*, a *fading background*, and a *parallax background*. These serve as reusable backgrounds for 2D games such as platformers. The first one is used as an infinite looping image. Artists may configure its speed, direction and reset point

to achieve a seamless infinite background. The *fading background* provides two *moving background* layers of which only one is active at the same time. Moreover, artists can configure a set of background images, including their display duration, speed, direction, and positioning data. This way, over time multiple moving backgrounds will be shown and faded into another. Lastly, the *parallax background* provides multiple individually configurable *fading background* instances in one scene. Artists can thereby design multiple background layers, configure these in a way that the 'nearest' is the fastest, whereas the 'farthest' is the slowest, resulting in a parallax effect.

Our implementation of the endless runner is also reusable. For example, it contains implementations for the playable character, scripted and randomized obstacle spawn, an intro component, and asynchronous own-threaded scene loading. This allows developers to easily create scripted and randomized 2D runner games such as the *Google Chrome T-Rex Runner*. However, to provide more adaptability we created the entire code that way components interact mainly via Godot signaling to ensure interchangeability and used extendable state machines wherever possible.

The implemented achievement system provides twelve achievements that runner games can use immediately, including configurable challenges for playtime, dodging, object-collection and time-survival. However, since other projects might require individual achievements, we designed the architecture in a modular way: New achievements can be implemented in their own Godot scenes and then be hooked into the main achievement scene. This allows projects to use the achievement system, although coding is required to implement new achievements.

6 Future Outlook

We used the initial edition of *Der blonde Eckbert* for our texts, that's been written in German language. Therefore, the game is also in German language for now. Currently we are preparing the translation made by Thomas Carlyle (see [9]) as an English text base. Once this process is finished we're going to implement an internationalization component for the game providing an English version as well.

The acceptance and teaching success has not been thoroughly tested yet. During the project we discussed it with several researchers working in text-based sciences, used individual game testers and received quick-response feedback on what was good and bad. However, to get more reliable results we plan on creating an exemplary curriculum based around the game and for that a quantitative evaluation. Its main goals will be to identify user acceptance and how well the didactic elements perform in practice.

7 Conclusion

Our project *Der blonde Eckbert* is a great example for showing how the digital humanities can use serious games for creating modern interpretations of

historically relevant literature. Players experience the eponymous literary heritage asset written by Ludwig Tieck in multiple cognitive layers instead of only reading a 19th century text. The included didactic elements convey the base aspects of the story which are used by the multiple existing layers of interpretation. Also the presented long-term motivation approach increases the players intrinsic motivation to deal with the story and thereby results in knowledge consolidation. Furthermore, using a dedicated curriculum build around our game, we assume this intrinsic motivation can be transferred on the discourse with additional existing literature and interpretations.

We contribute several reusable components licensed under MIT license to the community targeting especially researchers and artists that are not familiar with programming. These can be used as a base for creating new serious games and audiovisual novels and thereby extend the amount of available educational games in the (digital) humanities.

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