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CSCI 370 Final Report

ByteSize Storytellers

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Table 1: Revision history

Revision	Date	Comments
New	May 12, 2025	Completed Sections I. Introduction II. Functional Requirements III. Non-Functional Requirements IV. Risks V. Definition of Done VI. Team Profile References Appendix A: Key Terms
Rev – 2	May 19, 2025	Completed Sections I. System Architecture
Rev – 3	May 26, 2025	Completed Sections I. Software Test and Quality II. Ethical Considerations
Rev - 4	June 2, 2025	Updated Sections I. Ethical Considerations Completed Sections I. Results II. Future Work III. Lessons Learned IV. Acknowledgements
Rev -5	June 9, 2025	Updated Sections I. Introduction II. System Architecture Completed Sections I. Key terms II. Acknowledgments

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I. Introduction

ByteSize Stories is a tool by Professor Kathleen Kelly. It helps students grasp tough concepts through story-based learning. Currently, ByteSize Stories, made in GameMaker Studio, runs off HTML and must be on the Mines VPN to access. ByteSize Stories works well in many ways, but it needs more features. We remade it for a better web experience. ByteSize Stories uses AI to create stories that teach computer science topics. Users can log in and access a library of all generated stories. Each story also has a quiz system. The project is now a web app instead of GameMaker Studio. This change makes it accessible beyond the Colorado School of Mines network.

Our project explores a number of solutions to these issues.

II. Functional Requirements

- Users should be able to browse through public stories of different school subjects
- Users should be able to login with their username and password, and be able to create an account if they do not already have one
- Users should be able to use AI to generate new stories for other subjects and store them in their library
- Users should have incentives such as badges and achievements earned through the interaction of the website
- Users should be able to view their profile

III. Non-Functional Requirements

- AI generating stories should take no more than ten seconds (subject to change)
- System should support the login of the same user on multiple platforms
- The web app should be functional online across multiple types of devices (computers, phones, etc.)

IV. Risks

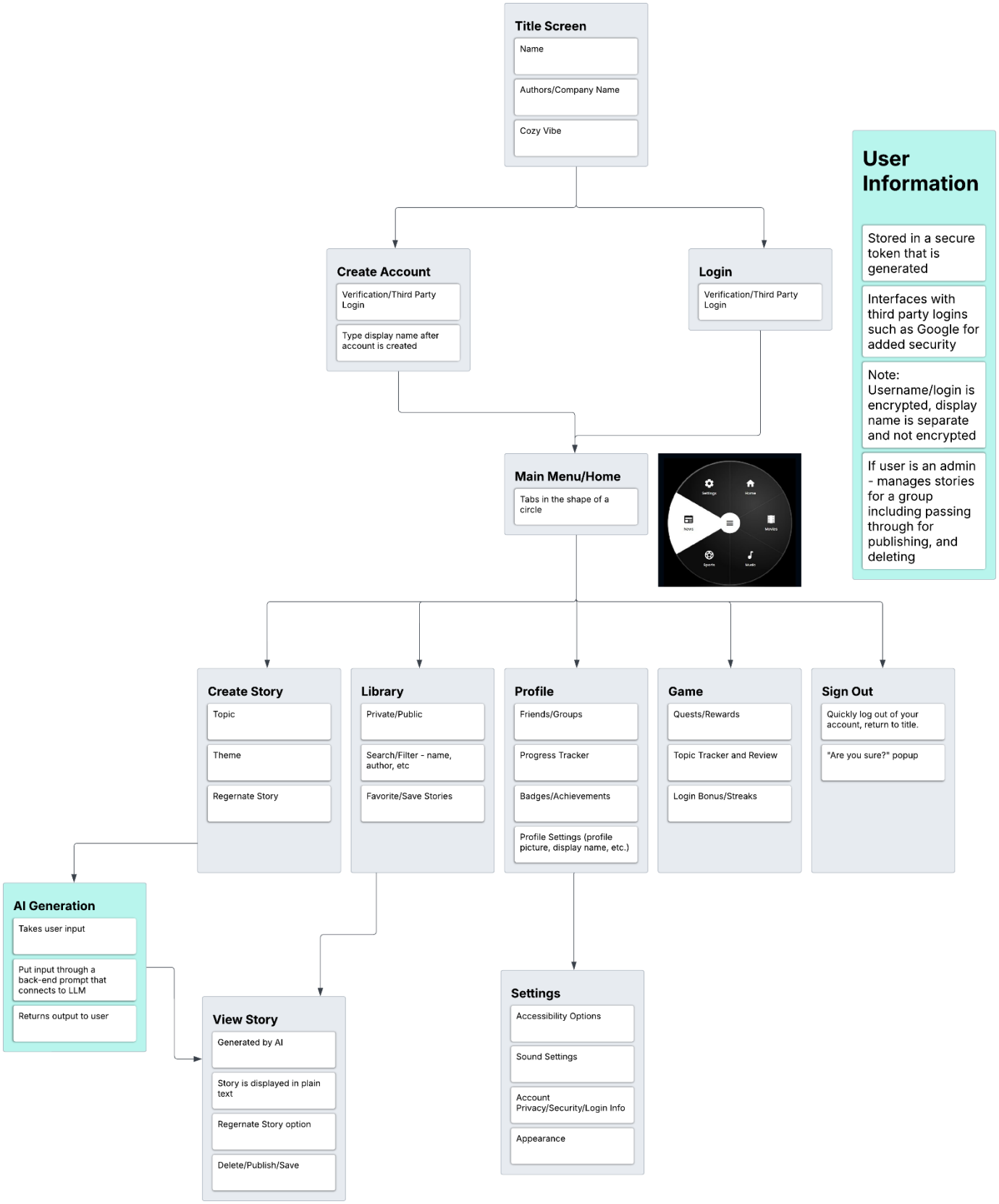
- Security risk (likely) - a publicly accessible website automatically introduces the possibility of malicious users

- Can generate any story (very likely) - since the user can generate any topic, they can do one that has nothing to do with learning. This can flood the public library on the website with useless and possibly harmful stories that would paint the product in a negative light. A filter of sorts may need to be implemented, and the creation of libraries should have an option of staying private for the user
- User forgetting their login (likely)
- Time constraints with UI
- AI incorporation – data privacy concern since the website may focus on outsourcing the storytelling to AI

V. Definition of Done

For the product to be considered done, at the bare minimum, the product must be a publicly accessible website where one can go learn through the art of creative story telling. While the topics can vary, the user must be able to learn at least one topic, whether that'd be a story already created or one generated through the use of AI. The tests the client will run are pulling up the website and successfully reading through at least one story. This product is delivered through the release of the website domain to the client.

VI. System Architecture



The Title Screen is the app's entry point. Here, users see a warm, inviting design. The Create Story section lets users enter a topic and description. Then, an AI creates the story. This module takes user input via a backend prompt connected to a language model. It then returns a generated story for the user to review. The View Story page shows the story in plain text. You can also regenerate, delete, publish, or save it.

The library serves as a hub for saved stories, where users can view public or private entries. The Profile section helps users manage friends and groups. It also tracks progress and achievements. Profile customization includes editing profile pictures and display names.

The Game tab adds fun to the experience. It offers quests and rewards. Users can also track topics and login streaks. This helps boost engagement. Finally, Settings allow users to change accessibility, sound, privacy, and visual appearance preferences.

VII. Software Test and Quality

Generate Story

Purpose:
Verify the application can successfully generate a complete and coherent story on user request.

Description:
The test simulates user input and AI generates of a full-length story

Tools required:

User Input

Threshold:

Story is outputted without error

Edge case:

- Empty or invalid input
- Extremely long

Results:
All standard and edge case inputs generated stories. If the API key is missing or invalid, it will display an error message and let the user try again. If the input is too long, then it will produce a different error with the same result.

Save Story

Purpose:

Verify the application can successfully save stories to a library and let the user reference them later

Description:

This test simulates a user saving stories that are generated.

Tools required:

- Generated stories
- A storage method such as JSON[1] files

Threshold:

Stories are successfully saved without error

Edge case:

- Identical stories are saved
- Identical titles are saved
- Long titles
- A significant number of stories are saved

Results:

Displays stories from local storage, separated like "{story info 1},{story info 2}" for example. These display regardless of title length (expands to show full title no matter the size), or if two of the story infos are identical. As the background zooms to fill, if there are a lot of stories and/or the stories have long titles, the background will zoom in. Otherwise, the library can display a large amount of text and scrolls as expected.

VIII. Project Ethical Considerations

For this project, the primary "stakeholder" would be the client. She is the one who wants the creation of this project to be done and is paying for the AI story generation each time it is tested and will most likely have to pay more the moment the web application becomes public like she desires.

Through ethical tests, it can be concluded that the project is mainly ethical, but with some concerns. The one major part of the web application that is put under ethical tests would be story generation through AI. AI is not always going to be entirely accurate. While AI will cross-check information, there are some topics where AI may not be able to establish its validity. There have been many cases in the past of AI being wrong [1], so the chance of their information being incorrect is not zero. Additionally, there have been many reports over the past several years of AI companies such as OpenAI (which this project utilizes) training from copywritten material, but we are unable to verify whether those claims are true or false. However, the main benefit of using AI is that it allows for a much greater diverse creation of stories to convey computer science topics. Maintaining transparency through the use of a warning that the content in the stories may not always be entirely accurate and recommend to users to read multiple stories of the same topic will help mitigate the risk.

Additionally, not everyone trusts the use of AI. There has been and most likely always will be a debate on whether AI can or cannot be something that has the capability to be trusted according to the more prevalent definitions of trust [2]. As such, everyone is entitled to their own opinions, so it is up to the user as to whether or not to engage in our web application features knowing such things.

Another potential ethical concern is the use of AI generated imagery. To obtain a rough idea of what a final app may look like with our time, skill, and budget, an AI background image was generated. For a larger scale project, this would be an ethical violation as it has all of the same issues as the AI story generation, as well preventing an artist from an opportunity for work.

IX. Project Completion Status

This project is at the point where it has met most of the initial client requirements. The prototype had been successfully recreated into a web application, accessible through both a computer and phone without the need for a specific VPN, like the prototype. In the create tab of the web app, stories generate and then save to a library, but depending on the length, the wait time can be more than the average user's time before they lose patience. The site is smooth and easy to

navigate, and research has been done to discover how it may be deployed for public use through the use of Cloudflare or other similar services.

While this site could become public, it is not ready for public use as it lacks proper security features. Additionally, it does not have the desired account feature that allows users to log in and save their progress. The visuals have a comfortable vibe, but it is very basic with only a cozy background on each page.

While the project did not get as far as planned, it was still successful and would be able to be passed onto another team for further development in the future. A working framework has been built and hopes of it becoming a working public site is not too far away.

X. Future Work

In the future, another team will most likely take on this project. To prepare for this, there is a need to learn the computing languages CSS, HTML, and JavaScript. One would also need to become familiar with how Vue is utilized as it is a functional tool to create web applications and keep the web creation organized. An understanding of web services such as Cloudflare to allow for deployment would also be required to make the app public.

For work that hasn't been implemented yet in this project, as depicted in the chart in section VI, a login feature and game elements have yet to be implemented. The user should have the ability to have a personalized account that they can create and use so as to save the stories they have been reading, as well as save a personal private library full of stories that they have generated. Personalized features such as customizations may be a feature that could be added as to the next team's discretion. The game elements are what would keep the user engaged and wanting to come back, so having them would be another next step. Examples of possible game elements include achievements from reading or doing a form of tutorial to get used to the web application, titles earned, daily quests, reviews in the form of games, etc.

The most important next step would be security for both the site and the use of AI. Another method aside from using the client's personal API key may be an option, but this is what is currently implemented. Making sure the AI is not abused by the users and will generate stories that are meant for learning and are on topic. Personalizing the AI story generation by allowing users to customize or choose the way the story flows (aka choose your own adventure) may also be features that could be applied in the future.

XI. Lessons Learned

The creation of a web app was something new for many of us on the team. After looking through many options we ended up using Vue. An approachable, performant, and versatile framework for building web user interfaces. The use of Vue required the use of CSS, JavaScript, and HTML. Vue made it easy to set up the web app, but there was a big learning curve. You had to manage three programming languages at once.

At the start of the sprints, we enjoyed a lot of freedom to add and implement ideas. The team laid out many ideas to include but soon realized that not all our plans could be implemented. We focused on client needs and chose quality over quantity. This helped us create a great final product.

XII. Acknowledgments

We would like to thank our client, Kathleen Kelly, for allowing us to work on this project. The initial prototype was very cute, and it was impressive that she is doing this to both pursue her PHD as well as finding more ways to engage students with their learning through different means. We look forward to what she will do in the future and are happy to have been a part of her journey.

We would also like to thank our advisor, Kristen Peglow, for supporting us and our journey through this project, offering advice and guidance along the way.

XIII. Team Profile

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Computer Science

Hometown: Lakewood, Colorado

Work Experience: Head Lifeguard, Soccer Referee

Interests: Reading, Creative Writing, Gaming, Soccer, Swimming

Logan Moore

Computer Science

Hometown: Lakewood, Colorado

Work Experience: IT Intern, IT Consultant, Front End Grocery Store Worker/Cashier

Interests: Gaming, Music, Travel

Andres Ramirez

Computer Science

Work Experience: Elderly caretaker, Foodbank worker

Hometown: Aurora, Colorado

Interests: Gaming, Running, Soccer

References

[1] A. Drapkin, "AI Gone Wrong: A List of AI Errors, Mistakes and Failures 2023," *Tech.co*, Nov. 14, 2023. https://tech.co/news/list-ai-failures-mistakes-errors

[2] M. Ryan, "In AI We Trust: Ethics, Artificial Intelligence, and Reliability," *Science and Engineering Ethics*, vol. 26, no. 5, Jun. 2020, doi: https://doi.org/10.1007/s11948-020-00228-y.

[3] "JSON File Extension - What is a .json file and how do I open it?," *Fileinfo.com*, 2018. https://fileinfo.com/extension/json

Appendix A – Key Terms

Include descriptions of technical terms, abbreviations and acronyms

Term	Definition

JSON (JavaScript Object Notation)	*A file type that stores simple data structures and objects. It is a standard data interchange format and is primarily used for transmitting data between a web application and a server. [3]*
Vue	*A framework for developing web applications making use of JavaScript, CSS, and HTML (programming languages).*
API (Application Programming Interface)	*The method of how applications interface with other applications, in this case how the web app interfaces with ChatGPT.*