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Refining the Reading Experience with Visual Storytelling

Shahira Shabnam S[1], Saranya N[2], Mr. Saravanan Elumalai[3], Mrs. A. Maheswari[4], Ms. Stephy Romana Joseph C I[5]
[1, 2]*B. Tech Student Department of Data Science,* [3, 4, 5]*Professor Department of Computer Science, Dr. MGR Educational & Research Institute Chennai, India*

Abstract: ***Our project, the way of re-defining the reading experience with visual storytelling focuses on deploying new methods and improving the way of people reading by understanding and engaging with the actual content presented by combining the content of visual elements (images, video, illustration/Drawing). The existing text based reading can sometimes make it harder for readers to fully understand the complete full-fledged ideas to maintain the same consistency with reading. The way to storytelling by visuals overcome the problems by presenting the actual content with more beginner friendly and easier to understand way of format. Our project also explores the question of combining text with the visualization elements which can improve the narration drastically along with the improved reading experience. Our proposed solution also aims to make the concept of reading more open and accessible for all type of users using the application. We make it accessible by breaking down the complex content into part by part of visual representation. Our project is easy to partake since the visual communication can change the traditional and existing reading templates to a more new, exploring reading experience.***
Keywords: Visualization, images & illustration/Drawing, visual storytelling, video, storytelling visual elements

I. INTRODUCTION

The habit of reading is the most basic and traditional ways of people tend to know many things, gain knowledge and improve their existing knowledge and to understand many information and news. But the existing text based reading methods can be a bit dragging when required in important situations, especially when the content is complex and hard to understand. To solve the problem we introduce a way of using visual elements (image, video, and illustration/Drawing) to blend in the traditional reading experience. The above approach enables to understand the terms easily and make reading more expressive.

So, our project, the way of re-defining the reading experience with visual storytelling focuses on deploying new methods and improving the way of people reading by understanding and engaging with the actual content presented by combining the content of visual elements (images, video, illustration/Drawing). The existing text based reading can sometimes make it harder for readers to fully understand the complete full-fledged ideas to maintain the same consistency with reading. The way to storytelling by visuals overcome the problems by presenting the actual content with more beginner friendly and easier to understand way of format. Our project also explores the question of combining text with the visualization elements which can improve the narration drastically along with the improved reading experience.

Our proposed solution also aims to make the concept of reading more open and accessible for all type of users using the application. We make it accessible by breaking down the complex content into part by part of visual representation. Our project is easy to partake since the visual communication can change the traditional and existing reading templates to a more new, exploring reading experience. To present this, we developed a web-based application, as it helps to present the content in a more visually improved format. For frontend, React and Node.js is used for UI and handling server side operations. For deployment, IBM cloud services are used, which allows us for more scalable and reliable source of hosting application.

II. LITERATURE REVIEW

So far, we've reviewed research papers and focused on the fact that we wanted to fix the issues that we lack and the existing papers and models lack. The GANS-based framework is merely a prototype for generating [1], where as we built a full scale web app and the app is enabled with the feature to let users read any text with parallel display of visuals, enabling an engaging experience.

The existing paper for interactive video stories for reading is mostly based of author specific video content, and it lacks the reusable feature [2]. We improve in this area of interest by breaking down complex contents into part by part in sequential order to help the readers to have a better experience.

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The low-literacy readers have hard time trying to understand complex information by just reading [3]. We introduce an feature where the texts and visuals adapt to the screen size, and the visuals breaks down the complex set of information into simple, part-by-part information.

The existing multi-model writing analysis lacks the combination of how image-text mix should look [4], and the existing VR/AR text environments require high tech hardware, and uses the system resources drastically more as time grows [5]. We improve in this area of interest by adding a feature where the text is placed side-by-side with images, illustrations, and short duration of videos for better helping of understanding.

The existing visual representation of complex concepts represent a topic of charts and diagrams for complexity but lacks the idea of web-based application [7]. We section the text and images in a visual blocks of arranged text with image, videos, illustrations, etc.

The above research papers focus mainly on the multi-model and the method of representation of texts, which we overcome the areas where the existing papers were lacking in our project.

III. PROPOSED METHODOLOGY

The proposed methodology demonstrates a sequential process of design and developing the web based application and it focuses on the area of system design, development, deployment and testing.

A. Requirement Data Analysis:

The first stage focuses on the area of identifying the needs of the users who thinks that a better and more visually expressive engaging reading experience is needed for them. The existing text based reading makes the concept of reading hard to go through just to gain a small piece of information. The system is designed to mix the text with the visual elements consisting of images, illustrations and graphic contents. The goals achieved will be of clear content presenting, responsive design and beginner friendly navigation.

B. Proposed System Design:

By analysing the requirements section, the overall structure of the proposed system is versioned. The main architecture is divided into dual basic parts, Frontend and backend. The frontend is held responsible for the User view screen and the UI elements and the connection to the server side handling. The backend holds the processing and the storage of information. An organized layout is developed to support the storytelling aspect and make the reading process more appealing and interactive.

C. Architecture Part 1: Front-End architecture

The user side of the process – frontend of the application is developed consisting of React.js mainly, which helps in coding an immersive and reusable user interface components. The story pages, elements, navigation parts and the panels of interaction is designed. The dedicated layout is created to confirm that the visuals and the text parts are displayed accordingly and the readers can easily follow the context and understand the content. The UI is optimized so it is responsive in mobiles and tablets too.

D. Architecture Part 2: Backend architecture:

The server side—the backend systems, is developed with using Node.js which helps on data processing and the storage for content and the state of communication between the different parts of application. The user requests and retrieving process are handled by backend, which sends the context to the frontend for user side display. The API's play an integral part in connecting the user and server side, which allows the data to move and transfer the system functions.

E. Cloud Service Deployment:

Once the user and server side development processes are complete, the application is fully deployed on the IBM cloud platform, and it ensures the application is enabled to access from anywhere in the internet. It states the fact that it can handle small to moderate amount of traffic and still function without any crash logs.

F. Evaluation Stages:

The testing process consists of performing various tests to confirm that the system functions properly. The tests such as functional testing, usability testing, performance testing were conducted and the results were convincing. The functional test is conducted for basic working of the application, usability test evaluates the interaction and visual section of the application, feedback is collected from users to improve any feature or add any new feature.

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IV. SYSTEM DESIGN

The design of this system demonstrates a sequential process of design and developing the web based application and it focuses on the area of system design, development, deployment and testing. The first stage focuses on the area of identifying the needs of the users who thinks that a better and more visually expressive engaging reading experience is needed for them. The existing text based reading makes the concept of reading hard to go through just to gain a small piece of information. The system is designed to mix the text with the visual elements consisting of images, illustrations and graphic contents. The goals achieved will be of clear content presenting, responsive design and beginner friendly navigation.

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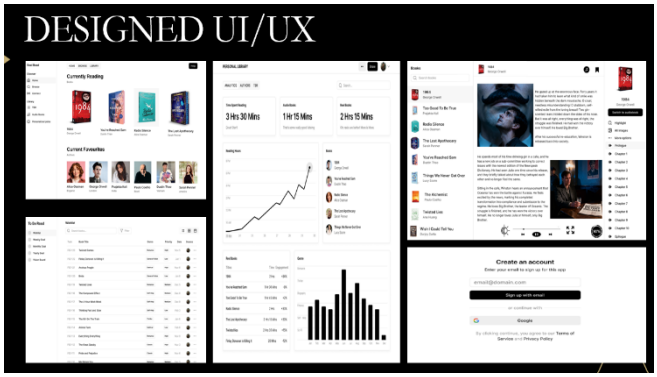


Fig 3. Enhanced UI with more customizable options

The server side—the backend systems, is developed with using Node.js which helps on data processing and the storage for content and the state of communication between the different parts of application. The user requests and retrieving process are handled by backend, which sends the context to the frontend for user side display. The API's play an integral part in connecting the user and server side, which allows the data to move and transfer the system functions.

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V. MODULE DESCRIPTION

The project "Refining the Reading Experience with Visual Storytelling" is divided into several modules to ensure systematic development and proper functioning of the application. Each module is responsible for a specific task within the system. The pipeline is optimized to handle the workload accordingly.

A. Data Analysis:

The first stage focuses on the area of identifying the needs of the users who thinks that a better and more visually expressive engaging reading experience is needed for them. The existing text based reading makes the concept of reading hard to go through just to gain a small piece of information. The system is designed to mix the text with the visual elements consisting of images, illustrations and graphic contents. The goals achieved will be of clear content presenting, responsive design and beginner friendly navigation.

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The testing process consists of performing various tests to confirm that the system functions properly. The tests such as functional testing, usability testing, performance testing were conducted and the results were convincing. The functional test is conducted for basic working of the application, usability test evaluates the interaction and visual section of the application, feedback is collected from users to improve any feature or add any new feature.

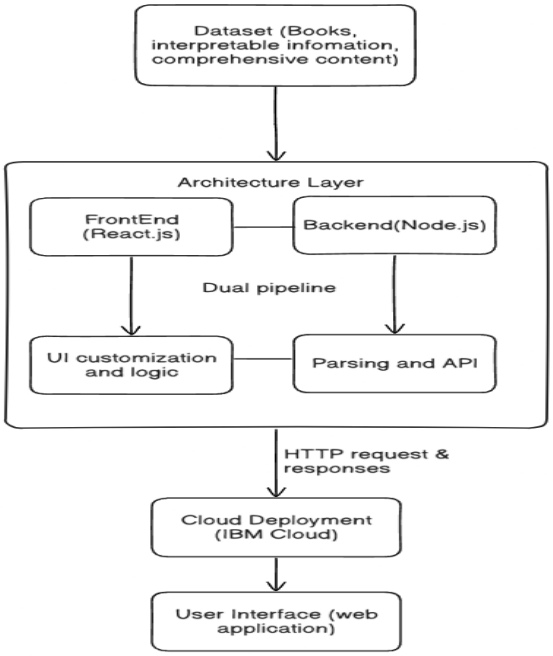


Fig 1. Architecture Diagram

VI. IMPLEMENTATION & RESULTS

This project "Refining the Reading Experience with Visual Storytelling" is successfully deployed and implemented as an application of web-based, which combines the text contents with visuals to improve the concept of reading. The system provides a more engaging and interactive platform for readers and people who are new to reading.

The dual part of architectures, both frontend and backend are optimized for the performance area of interest. The user side of the process – frontend of the application is developed consisting of React.js mainly, which helps in coding an immersive and reusable user interface components. The story pages, elements, navigation parts and the panels of interaction is designed. The dedicated layout is created to confirm that the visuals and the text parts are displayed accordingly and the readers can easily follow the context and understand the content. The UI is optimized so it is responsive in mobiles and tablets too.

The backend systems, is developed with using Node.js which helps on data processing and the storage for content and the state of communication between the different parts of application. The user requests and retrieving process are handled by backend, which sends the context to the frontend for user side display. The API's play an integral part in connecting the user and server side, which allows the data to move and transfer the system functions.

As the web-based application is completed locally, for people to actually access, the application is deployed in IBM cloud services, which makes it easier and to ensure the application is enabled to access from anywhere in the internet. It states the fact that it can handle small to moderate amount of traffic and still function without any crash logs and server not found error logs.

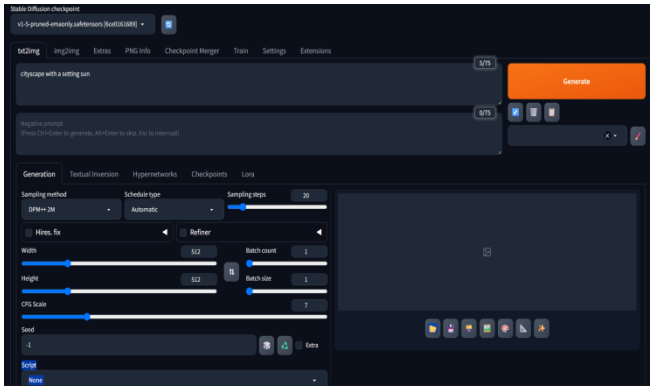


Fig 2. Image Generating Screen

VII. CONCLUSION & FUTURE ENHANCEMENTS

Our proposed project successfully mentions the limitations of the traditional and existing text based reading which is often rated as a hard situations for readers to maintain consistency with the given comprehension. With us developing a web based application that combines the visual elements and illustrations with our dual architecture pipeline, our research provides useful insights to improve and fix existing problems to handle efficiently. We ensure that the applications handle the complex comprehensions by breaking them down into accessible and next-to-next sequential visual representations.

Moving forward, we consider adding these features in the application, coming future:

A) Automated content generation:

We begin these feature with integrating AI frameworks to generate parallel visuals for any user-provided text. Improving the manual section of visual blocks.

B) Enhanced Interactivity:

Expanding the reusable features of the application to import user-defined video stories.

C) Resource Optimization:

Combining AR/VR text related environments to optimized to use fewer system resources, suitable for high tech without specific hardware.

D) Dynamic Data Handling:

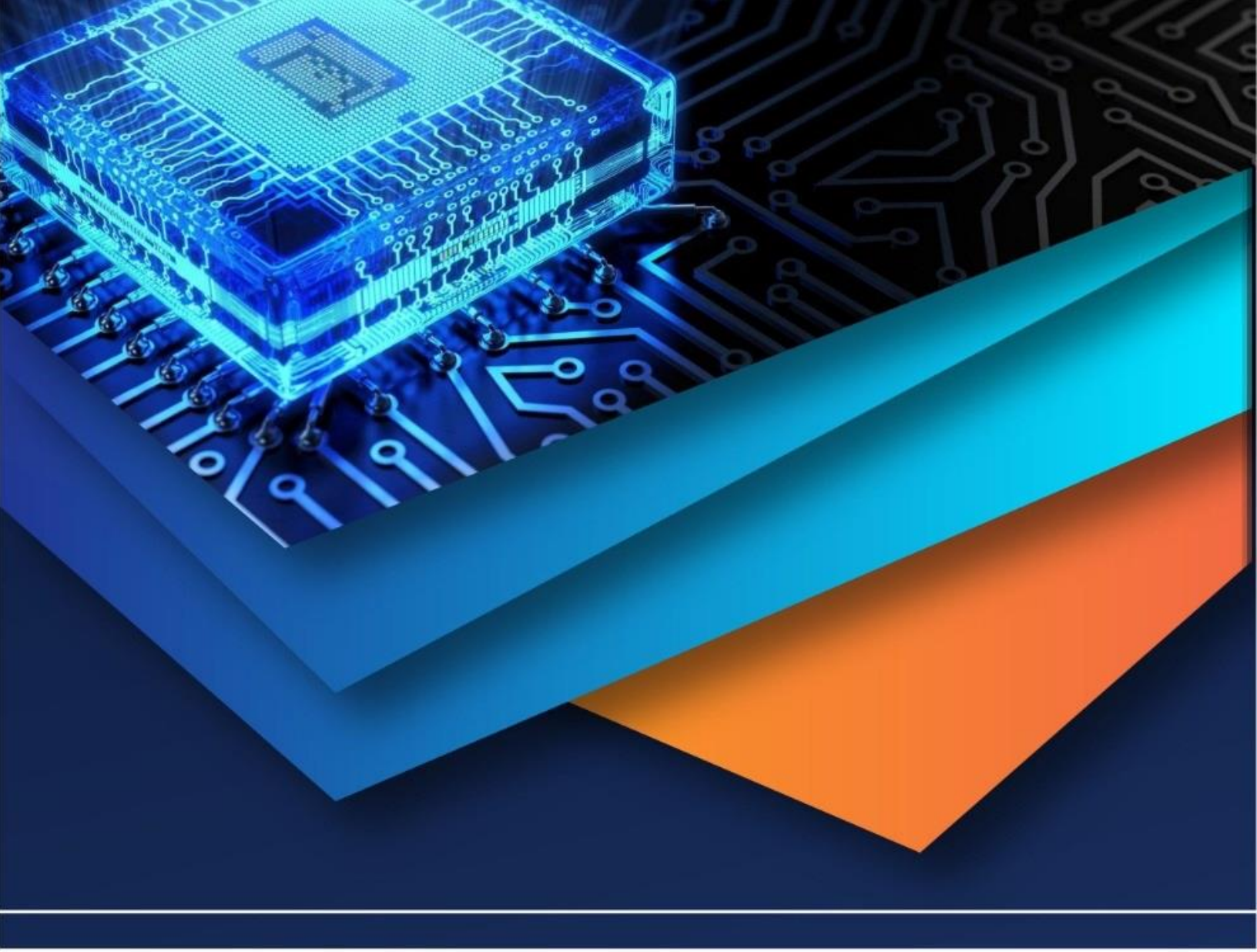
Scaling backend services to high traffic volumes handling and more complex data processing as per the user base grows over the coming years.

VIII. ACKNOWLEDGMENT

I would like to express my sincere gratitude to my project guide and the faculty members of the Department of Computer Science and Engineering for their valuable guidance, encouragement, and support throughout the completion of my project titled “Refining the Reading Experience with Visual Storytelling.” Their suggestions and continuous motivation helped me successfully complete this work. I would also like to thank my institution for providing the necessary resources and facilities to carry out this project. My sincere thanks to my friends and classmates for their helpful discussions and support. Finally, I am grateful to my parents and family members for their constant encouragement and moral support.

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