

A
Project Report
On
“AI Hindi Poem Generator”

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ABSTRACT

This project focuses on the development of a deep learning-based system for generating poetry in Hindi. The system utilizes data preprocessing techniques, word embedding, and LSTM-based neural networks to create a model capable of producing coherent and artistic Hindi poetry. The report outlines the motivation behind the project, the problem statement addressed, the objectives set, and the proposed system's scope. It discusses the literature review conducted, analyses existing systems, and identifies research gaps. Additionally, the report details the requirements analysis, system design, implementation process, and performance evaluation. The project's outcomes, including generated poems and model accuracy, are presented, and discussed, along with future scope for enhancements and advancements in the field of automated poetry generation in Hindi. Creating new and innovative forms of poetry: The generator can be used to create new forms of poetry that are not possible with traditional methods. For example, the generator could be used to create poems that are interactive or that respond to the reader's emotions. Educational resources: The generator can be used to create educational resources for students of Hindi language and literature. For example, the generator could be used to create poems that teach students about different aspects of Hindi grammar or vocabulary.

LIST OF TABLES

Sr No.	Fig. Name	Page No.
1	Comparative Analysis	14

LIST OF FIGURES

Sr No.	Fig. Name	Page No.
1	Block Diagram	25
2	Flowchart	26
3	Activity Diagram	27
4	Dataflow Diagram	28
5	Gantt Chart	29
6	Model code	33
7	Dataset code	33
8	Import code	34
9	Poem code	34
10	App Code	35
11	Result Poem 1	37
12	Result Poem 2	37
13	Result Poem 3	38

INDEX

Declaration	i
Acknowledgement	ii
Abstract	iii
List of Tables	v
List of Figures	vi
1. INTRODUCTION	1
1.1. Introduction and Motivation	1
1.2. Existing System	2
1.3. Problem Statement	2
1.4. Objectives	3
1.5. Scope	4
1.6. Proposed System	5
2. LITERATURE REVIEW	7
2.1 Secondary Research	7
2.2 Primary Research	8
2.3 Brief	9
2.4 Comparative Analysis of Existing System	11
2.5 Research Gap Analysis	12
3. REQUIREMENT ANALYSIS	14
3.1 Product Analysis Market Research for Business Potential	14
3.2 Ideation	15
3.3 Functional Requirements of System	17
3.4 Non-Functional Requirements of System	18
3.5 Software Requirement	20
3.6 Hardware Requirement	21
3.7 Datasets	22
4. DESIGN AND PLANNING	25
4.1 System Architecture/Block Diagram	25
4.2 Flowchart	26
4.3. Activity Diagrams	27
4.4 Data Flow Diagram (DFD)	28
4.5. Gantt Chart	29
5. IMPLEMENTATION / RESULTS & DISCUSSION	30
5.1 Implementation Idea	30
5.2 Coding	32
5.3 Performance Evaluation Parameters	35
5.4 Result	37
5.5 Testing	38

6. CONCLUSION AND FUTURE SCOPE	39
REFERENCES	43
APPENDICES	44

CHAPTER 1

INTRODUCTION

1.1 Introduction and Motivation

Poetry has long been regarded as a powerful medium of artistic expression, encapsulating emotions, thoughts, and narratives in a compact yet profound form. With the increasing advancements in artificial intelligence and natural language processing, there is a growing interest in leveraging technology to explore creative domains such as poetry generation.

The motivation behind this project stems from a deep appreciation for the beauty and cultural significance of Hindi poetry. Hindi, as one of the most widely spoken languages globally, carries a rich literary heritage with a diverse range of poetic styles and themes. However, the process of crafting poetry, with its intricate language nuances and artistic flair, poses a challenge even for experienced poets.

The aim of this project is to bridge the gap between traditional poetic craftsmanship and modern computational techniques. By developing a deep learning-based system tailored for Hindi poetry generation, we seek to enable both aspiring poets and language enthusiasts to explore the realm of poetry creation in an innovative and accessible manner.

Through this endeavour, we hope to not only contribute to the field of natural language generation but also foster a deeper appreciation for Hindi literature and cultural expression in the digital age. The project's outcomes are envisioned to inspire creativity, facilitate linguistic exploration, and promote cross-cultural understanding through the universal language of poetry.

1.2 Existing System

Currently, the landscape of automated poetry generation systems, especially in the context of Hindi literature, is relatively limited. Most existing systems predominantly focus on English language poetry generation, utilizing techniques such as Markov chains, recurrent neural networks (RNNs), and generative adversarial networks (GANs). These systems often rely on large datasets of English poetry to train models and generate new poetic compositions.

However, when it comes to Hindi poetry, the existing systems are sparse and often lack the depth and linguistic nuances required for authentic poetic expression in Hindi. While some machine translation and text generation models exist for Hindi, they primarily target general text generation rather than the specific intricacies of poetic form, meter, and sentiment unique to Hindi poetry.

Moreover, existing systems may face challenges in capturing the cultural and historical context embedded within Hindi poetry, including references to mythology, folklore, and regional dialects. These nuances are crucial for creating compelling and culturally resonant poetry that resonates with native Hindi speakers and enthusiasts.

In light of these limitations in the existing landscape, our project aims to fill the gap by developing a dedicated system specifically tailored for Hindi poetry generation. By leveraging deep learning techniques, linguistic analysis, and domain-specific datasets, we aspire to create a system that not only generates grammatically correct Hindi poetry but also captures the essence of poetic beauty, emotion, and cultural heritage unique to the Hindi language.

1.3 Problem Statement

The problem statement addressed in this project revolves around the lack of sophisticated and culturally sensitive automated systems for generating poetry in Hindi. Despite the significant advancements in natural language processing and machine learning, the domain of Hindi poetry generation remains underexplored and underserved. This gap is particularly evident in the limited availability of deep learning models and datasets specifically tailored for Hindi poetic composition.

One of the key challenges is the complexity of Hindi poetic structure, which encompasses various forms, meters, and poetic devices that require a nuanced understanding of linguistic and

literary conventions. Existing automated systems often struggle to capture these nuances effectively, resulting in generated poetry that lacks the depth, coherence, and artistic flair characteristic of authentic Hindi poetry.

Another aspect of the problem stems from the cultural and historical context embedded within Hindi poetry. References to mythology, folklore, regional dialects, and societal themes are integral to Hindi poetic expression. However, conventional text generation models may overlook or misinterpret these cultural elements, leading to a loss of authenticity and resonance in the generated poems.

Furthermore, the accessibility of tools and resources for aspiring Hindi poets and language enthusiasts is limited, hindering creative exploration and expression in Hindi literature. The lack of robust platforms for automated Hindi poetry generation deprives individuals of a valuable avenue for linguistic and artistic experimentation, inhibiting the growth and diversity of Hindi literary endeavours in the digital age.

Addressing these challenges requires a comprehensive approach that combines linguistic analysis, deep learning methodologies, culturally informed dataset curation, and user-friendly interfaces. By developing an advanced system specifically designed for Hindi poetry generation, this project aims to overcome the barriers hindering the proliferation of high-quality, culturally rich Hindi poetry in the digital realm.

1.4 Objectives

The primary objectives of this project are multifaceted, aiming to address key challenges and contribute meaningfully to the domain of Hindi poetry generation using deep learning techniques. The objectives can be summarized as follows:

1. **Develop a Robust Model:** Design and implement a deep learning-based model specifically tailored for generating coherent and culturally resonant Hindi poetry. The model should be capable of capturing the intricate linguistic nuances, poetic forms, and thematic variations inherent in Hindi literature.
2. **Leverage Linguistic Analysis:** Incorporate linguistic analysis techniques to enhance the model's understanding of Hindi poetic structure, including rhyme schemes, meter, wordplay, and semantic coherence. This analysis will contribute to the generation of grammatically correct and aesthetically pleasing poetry.

3. **Cultural Sensitivity:** Integrate cultural sensitivity into the model by leveraging domain-specific datasets that encompass the rich cultural heritage, mythology, regional dialects, and societal themes prevalent in Hindi poetry. Ensure that the generated poems reflect an authentic and culturally relevant expression of Hindi literature.
4. **User-Friendly Interface:** Develop a user-friendly interface or application that allows users, including poets, language enthusiasts, and researchers, to interact with the model effortlessly. The interface should facilitate input of prompts, customization of poetic styles, and exploration of generated poems.
5. **Evaluation Metrics:** Define and implement appropriate evaluation metrics to assess the quality, coherence, creativity, and cultural authenticity of the generated poetry. Conduct thorough evaluations and comparisons with existing systems to measure the model's performance and effectiveness.
6. **Documentation and Dissemination:** Document the entire development process, including dataset selection, model architecture, training methodology, and evaluation results, in a comprehensive manner. Disseminate the findings, insights, and learnings through research papers, presentations, and open-access resources to contribute to the wider academic and literary community.

1.5 Scope

The scope of this project encompasses various aspects related to the development and deployment of a deep learning-based system for generating poetry in Hindi. The project's scope includes but is not limited to the following areas:

1. **Poetic Forms and Styles:** The system will be capable of generating poetry in diverse forms and styles prevalent in Hindi literature, including but not limited to Ghazals, Dohas, Chaupais, and Free Verse. It will encompass the ability to emulate traditional poetic structures while also allowing for modern and experimental poetic expressions.
2. **Language Nuances:** The system will capture the intricate nuances of the Hindi language, including grammar, syntax, vocabulary richness, poetic devices (such as similes, metaphors, and alliteration), and cultural references. It will ensure grammatical correctness and semantic coherence in the generated poems.
3. **Cultural Context:** The system will integrate cultural context and sensitivity into the generated poems, incorporating elements such as mythology, folklore, regional dialects,

societal themes, and historical references. It will strive to produce culturally resonant and authentic poetry reflective of Hindi literary heritage.

4. **User Interaction:** The project includes the development of a user-friendly interface or application that enables users to interact with the system effectively. Users will have the ability to input prompts, customize poetic styles or themes, and explore the generated poems seamlessly.
5. **Model Evaluation:** The project will define and implement evaluation metrics to assess the quality, creativity, coherence, and cultural authenticity of the generated poetry. It will conduct rigorous evaluations and comparisons with existing systems to measure the model's performance and effectiveness.
6. **Documentation and Dissemination:** The project scope includes thorough documentation of the development process, including dataset selection, model architecture, training methodology, and evaluation results. The findings, insights, and learnings will be disseminated through research papers, presentations, and open-access resources to contribute to the academic and literary community.

While the project aims to achieve the objectives within its scope, it acknowledges that automated poetry generation is a complex and evolving field. As such, certain constraints such as computational resources, dataset availability, and model complexity may impact the project's scope and outcomes. However, the project will strive to deliver a robust and innovative system that advances the state-of-the-art in automated Hindi poetry generation and fosters creativity and appreciation for Hindi literature.

1.6 Proposed System

The proposed system encompasses a deep learning-based approach to automate the generation of poetry in Hindi, with a focus on capturing linguistic nuances, cultural context, and artistic expression inherent in Hindi literature. The system comprises several key components and methodologies:

1. **Data Collection and Preprocessing:** The system will collect and curate a diverse dataset of Hindi poems spanning various genres, styles, and historical periods. Data preprocessing techniques, including tokenization, cleaning, and normalization, will be applied to ensure the quality and consistency of the dataset.

2. **Word Embedding and Language Modelling:** The system will utilize pre-trained word embeddings specifically tailored for the Hindi language to represent words in a continuous vector space. This embedding matrix will serve as the foundation for language modelling and capturing semantic relationships within the poetry dataset.
3. **Deep Learning Model Architecture:** The core of the system will be a deep learning model comprising layers such as Embedding, LSTM (Long Short-Term Memory), and Dense layers. The Embedding layer will map words to dense vectors, LSTM layers will capture temporal dependencies and context, and Dense layers will facilitate the prediction of the next word in the sequence.
4. **Cultural Context Integration:** The system will integrate cultural context and thematic elements into the model's training process. This integration will involve incorporating domain-specific features, such as mythological references, regional dialects, and poetic forms unique to Hindi literature, to enhance the authenticity and relevance of the generated poetry.
5. **User Interaction and Customization:** A user-friendly interface or application will be developed to enable users to interact with the system effectively. Users will have the flexibility to input prompts, specify poetic styles or themes, and customize parameters such as poem length and complexity to tailor the generated output to their preferences.
6. **Evaluation and Fine-Tuning:** The system will undergo rigorous evaluation using predefined metrics to assess the quality, coherence, creativity, and cultural authenticity of the generated poetry. Feedback mechanisms and iterative fine-tuning processes will be implemented to continuously improve the model's performance and generate high-quality poetic compositions.
7. **Documentation and Deployment:** The entire development process, including dataset creation, model architecture, training strategies, and evaluation results, will be comprehensively documented. The system will be deployed on a suitable platform or server infrastructure to make it accessible to users and researchers interested in Hindi poetry generation.

By implementing these components and methodologies, the proposed system aims to revolutionize automated Hindi poetry generation, empower creators with innovative tools, and contribute to the preservation and evolution of Hindi literary heritage in the digital age.

CHAPTER 2

LITERATURE SURVEY

2.1 Secondary Research

Secondary research plays a crucial role in shaping the foundation of this project by providing insights, existing methodologies, and key findings related to automated poetry generation, deep learning techniques, and Hindi language processing. The secondary research involved a comprehensive review of academic papers, research articles, books, and online resources pertaining to the intersection of natural language processing and creative writing in Hindi literature.

One of the primary focuses of the secondary research was to explore the state-of-the-art in automated poetry generation systems, with an emphasis on systems that cater to non-English languages, including Hindi. Several studies and projects were examined, highlighting the advancements made in leveraging deep learning models, recurrent neural networks (RNNs), and transformer architectures for generating coherent and contextually relevant poetry.

Additionally, secondary research delved into linguistic analysis techniques specific to Hindi language processing, such as morphological analysis, part-of-speech tagging, sentiment analysis, and thematic analysis. These analyses are crucial for understanding the structural and semantic complexities of Hindi poetry and ensuring that the generated poems maintain grammatical correctness and cultural authenticity.

Furthermore, secondary research encompassed an exploration of existing datasets and resources available for Hindi language modeling and creative writing tasks. This involved identifying publicly available Hindi corpora, poetry collections, and linguistic databases that could serve as valuable training data for the deep learning model.

Moreover, secondary research provided insights into the challenges and limitations faced by existing automated systems for Hindi poetry generation. Issues such as cultural contextualization, rhyme scheme adherence, thematic coherence, and stylistic diversity were identified as areas requiring specialized attention and innovative solutions.

Overall, secondary research served as the foundational knowledge base for understanding the landscape of automated poetry generation, deep learning methodologies applicable to linguistic tasks, and the specific linguistic and cultural nuances of Hindi literature. This informed the project's approach, methodologies, and strategies for developing a robust and culturally sensitive system for generating poetry in Hindi

2.2 Primary Research

Primary research was conducted as an integral part of this project to gather firsthand insights, feedback, and data directly from stakeholders, domain experts, and potential end users. The primary research approach encompassed various methodologies, including surveys, interviews, and workshops, aimed at eliciting valuable perspectives and requirements for the development of an automated Hindi poetry generation system.

One of the primary research activities involved conducting surveys among Hindi language enthusiasts, poets, educators, and researchers to understand their experiences, preferences, and challenges related to Hindi poetry creation and consumption. The survey questions covered topics such as preferred poetic forms, thematic interests, stylistic preferences, and the use of technology in poetry composition.

Additionally, interviews were conducted with domain experts in Hindi literature, linguistics, and natural language processing to gain in-depth insights into the linguistic nuances, cultural context, and creative aspects of Hindi poetry. These interviews helped identify key features,

evaluation criteria, and potential use cases for an automated poetry generation system in the context of Hindi language and literature.

Furthermore, workshops and focus group discussions were organized with poets and language enthusiasts to collaboratively brainstorm ideas, generate prompts, and provide feedback on prototype models and generated poetry samples. These interactive sessions facilitated co-creation and user involvement in shaping the design and functionality of the proposed system.

The primary research findings yielded valuable inputs for defining the system's objectives, scope, user interface design, linguistic analysis requirements, and evaluation metrics. Insights gathered from stakeholders and experts informed decisions regarding dataset selection, model architecture, training strategies, and customization options for the automated poetry generation system.

Moreover, primary research helped in identifying potential challenges and opportunities in leveraging deep learning techniques for creative writing tasks in Hindi, including the integration of cultural context, stylistic diversity, and user personalization features.

Overall, primary research complemented secondary research efforts by providing real-world perspectives, user requirements, and domain-specific insights essential for developing a user-centric and culturally sensitive automated Hindi poetry generation system.

2.3 Brief

- **Gesture Recognition:** Various studies have explored different approaches to hand gesture recognition using computer vision techniques. These include traditional methods like thresholding, contour analysis, and template matching, as well as more advanced techniques such as deep learning-based approaches using convolutional neural networks (CNNs) and recurrent neural networks (RNNs).
- **Cursor Control Systems:** Research in this area focuses on developing systems that enable users to control the computer cursor using alternative input methods. Techniques range from motion tracking with sensors to computer vision-based approaches using techniques like optical flow, feature extraction, and machine learning algorithms for gesture recognition.

- **Voice Assistant Integration:** With the rise of voice-controlled devices, many studies have investigated the integration of voice assistants into various applications and systems. These studies explore natural language processing (NLP) techniques for voice command recognition, as well as integration with existing voice assistant platforms like Google Assistant, Amazon Alexa, and Apple Siri.
- **User Experience and Accessibility:** Literature also covers aspects related to user experience and accessibility in human-computer interaction systems. This includes research on designing intuitive user interfaces, evaluating the usability of alternative input methods for individuals with disabilities, and ensuring accessibility standards compliance.

2.4 Comparative Analysis

Existing Systems	Strengths	Weaknesses	Our Project's Improvements
Rule-based approach	- Well-defined rules provide predictability in processing	- Limited flexibility in handling nuances and variations	Implement advanced NLP techniques like deep learning models, attention mechanisms, and semantic analysis for more nuanced understanding and generation of poetry.
Basic LSTM model	- Simple architecture for straightforward implementation	- Limited creativity and variety in generated poems	Explore transformer-based architectures (e.g., GPT-3) for enhanced creativity, long-range context understanding, and diverse poetic styles.
Limited and generic	- Availability for general text processing tasks	- Lacks cultural and thematic depth in the dataset	Incorporate diverse and specialized datasets including historical poems, regional folklore, and user-contributed content for richer thematic exploration and cultural authenticity.

Table 2.4 Comparative Analysis

2.5 Research Gap Analysis

The research gap analysis focuses on identifying the gaps, limitations, and areas for improvement within the existing landscape of automated poetry generation systems, particularly in the context of Hindi literature. The analysis aims to pinpoint specific gaps and challenges that the proposed system seeks to address, thereby contributing to advancements in the field of Hindi poetry generation using deep learning techniques.

1. **Limited Availability of Hindi-Specific Models:** One of the prominent gaps identified is the scarcity of deep learning models and language models specifically tailored for Hindi language processing and creative writing tasks. Existing systems often rely on generic language models or English-centric models, leading to suboptimal performance and cultural insensitivity in generating Hindi poetry. The research aims to bridge this gap by developing a dedicated Hindi language model optimized for poetry generation.
2. **Cultural Context and Authenticity:** Many existing systems struggle to capture the cultural context, thematic nuances, and artistic traditions embedded within Hindi poetry. This gap results in generated poems that lack cultural authenticity, relevance, and resonance with native Hindi speakers. The research aims to enhance cultural sensitivity and authenticity in the generated poetry by incorporating domain-specific datasets, thematic analysis, and cultural references.
3. **Linguistic Nuances and Stylistic Diversity:** The complexity of Hindi poetic forms, linguistic nuances, and stylistic diversity poses a challenge for automated systems to produce high-quality and diverse poetry. Existing systems may overlook or misinterpret poetic devices, meter, rhyme schemes, and wordplay unique to Hindi literature. The research aims to address these linguistic challenges through advanced linguistic analysis techniques and model optimization for capturing diverse poetic styles.
4. **User-Centric Design and Interactivity:** Many existing systems lack user-centric design elements, interactivity features, and customization options that enhance user engagement and creativity. The research aims to prioritize user experience by developing an intuitive interface, interactive prompts, personalized recommendations,

and collaborative tools that empower users to co-create and customize their poetic compositions.

5. **Evaluation Metrics and Performance Standards:** The absence of standardized evaluation metrics and performance benchmarks specific to Hindi poetry generation hinders the comparative analysis and objective assessment of system outputs. The research aims to define and implement robust evaluation metrics, including grammatical correctness, thematic coherence, cultural authenticity, and aesthetic appeal, to measure the quality and creativity of generated poems accurately.

By conducting a comprehensive research gap analysis, the research aims to fill these identified gaps, contribute novel solutions, and advance the state-of-the-art in automated Hindi poetry generation. The proposed system intends to address these challenges systematically, thereby fostering creativity, linguistic exploration, and cultural appreciation within the realm of Hindi literature and digital humanities.

CHAPTER 3

REQUIREMENT ANALYSIS

3.1 Product Analysis Market Research for Business Potential

Before delving into the development of an automated Hindi poetry generation system, a thorough product analysis and market research were conducted to assess the business potential and market demand for such a product. The analysis involved examining existing market trends, user preferences, competitor offerings, and potential revenue streams associated with automated poetry generation in Hindi.

1. **Market Trends and Demand:** The analysis revealed a growing interest and demand for creative writing tools, linguistic applications, and AI-powered content generation platforms in the digital content creation landscape. The surge in digital content consumption, particularly in vernacular languages like Hindi, has created opportunities for innovative solutions that cater to the artistic and literary needs of users.
2. **User Preferences and Needs:** User surveys, interviews, and feedback sessions highlighted the preferences and needs of potential users, including poets, writers, educators, language enthusiasts, and cultural organizations. The insights gathered indicated a strong desire for tools that facilitate poetic expression, linguistic exploration, cultural preservation, and collaborative creativity in Hindi literature.
3. **Competitor Analysis:** A comprehensive analysis of existing and potential competitors in the market for automated Hindi poetry generation systems was conducted. This included examining the features, functionalities, pricing models, user base, and market

positioning of competing products and platforms. The analysis identified areas of differentiation, competitive advantages, and potential partnership opportunities.

4. **Monetization Strategies:** Various monetization strategies were explored to determine the revenue potential of the proposed system. These strategies included freemium models, subscription-based plans, licensing agreements, content partnerships, and targeted advertising. The analysis aimed to identify sustainable revenue streams while ensuring affordability and accessibility for users.
5. **Target Audience and User Segmentation:** The research identified key target audiences and user segments for the automated Hindi poetry generation system, including: Aspiring poets and writers seeking creative inspiration and tools for poetic expression.

Language enthusiasts, educators, and students interested in linguistic exploration and cultural engagement through poetry.

Cultural organizations, publishers, and content creators looking for AI-powered solutions to enhance their literary offerings and engage with diverse audiences.

6. **Market Entry and Expansion Strategies:** The analysis informed strategic decisions regarding market entry, geographic targeting, user acquisition strategies, product positioning, branding, and promotional campaigns. It also explored opportunities for market expansion, including partnerships with literary communities, educational institutions, and digital content platforms.

Overall, the product analysis and market research underscored the strong business potential, user demand, and market opportunities for an automated Hindi poetry generation system. The insights gained from this analysis guided the development roadmap, business strategy, and go-to-market approach for maximizing the product's impact, adoption, and revenue generation in the digital content creation market.

3.2 Ideation

The ideation phase of the project was a multifaceted and collaborative endeavor that involved extensive brainstorming sessions, creative exploration, and concept generation. The primary objective was to conceptualize, refine, and solidify the key features, functionalities, and overarching goals of the automated Hindi poetry generation system. This phase served as the

creative backbone, laying the groundwork for the system's development roadmap and strategic direction.

During the ideation process, a diverse range of perspectives and inputs were gathered from team members, domain experts, linguists, poets, educators, and potential end users. The collective wisdom and insights garnered from these stakeholders contributed to the generation of innovative ideas, novel solutions, and unique value propositions that would set the system apart in the competitive landscape.

One of the central themes explored during ideation was the diverse range of poetic forms and styles prevalent in Hindi literature. Discussions revolved around incorporating a rich variety of poetic expressions, including but not limited to Ghazals, Dohas, Chaupais, Free Verse, and regional folk poetry. The aim was to ensure that the system caters to a wide spectrum of creative preferences and allows users to experiment with different styles seamlessly.

Another critical aspect of ideation focused on embedding cultural sensitivity and contextual relevance into the system. This involved deep dives into Indian mythology, folklore, regional dialects, historical references, and societal themes. The goal was to strike a delicate balance between cultural authenticity and creative freedom, ensuring that the generated poems resonate with native speakers while also fostering artistic exploration.

The ideation process also prioritized user interaction and customization features within the system. Ideas were generated to enhance user engagement through personalized prompts, thematic preferences, style recommendations, collaborative writing tools, and real-time feedback mechanisms. The overarching aim was to empower users in their poetic journey, providing them with intuitive tools and resources to unleash their creativity.

Technical considerations were also part of the ideation process, particularly in terms of linguistic analysis and model optimization. Discussions delved into advanced techniques for rhyme scheme adherence, meter recognition, semantic coherence, and thematic analysis. The goal was to design a robust system capable of capturing the intricate linguistic nuances and stylistic diversity inherent in Hindi poetry.

Moreover, ideation encompassed the establishment of rigorous evaluation metrics, quality assurance protocols, and user feedback loops. The focus was on defining objective criteria for assessing the system's performance, measuring user satisfaction, and continuously refining the generated poetry for quality and authenticity.

Throughout the ideation phase, concepts were refined, prioritized, and iteratively developed into actionable plans, design specifications, and feature sets. The ideation process laid the foundation for the system's conceptual framework, guiding principles, and roadmap for development, ensuring alignment with user needs, market trends, and technological advancements in the field of natural language processing and creative AI.

3.3 Functional Requirements of System

The functional requirements of the automated Hindi poetry generation system encompass a comprehensive set of features, capabilities, and functionalities designed to facilitate the seamless creation, exploration, and sharing of poetic compositions. These requirements are essential for ensuring the system's effectiveness, usability, and alignment with user expectations and creative aspirations.

First and foremost, the system must provide an intuitive and user-friendly interface that allows users to interact effortlessly with the platform. This includes features such as a user-friendly dashboard, clear navigation menus, and intuitive controls for generating, editing, and saving poems. The interface should also support multiple device types, including desktops, laptops, tablets, and mobile phones, to ensure accessibility across different platforms.

One of the primary functional requirements is the ability to generate poetic compositions automatically based on user inputs or prompts. The system should leverage deep learning algorithms, language models, and linguistic analysis techniques to generate coherent and contextually relevant poems in Hindi. Users should have the option to specify parameters such as poem length, style preferences, thematic elements, and tone to customize the generated output.

The system should also support collaborative writing features, allowing multiple users to co-create poems, collaborate on thematic projects, provide feedback, and engage in creative discussions. This collaborative functionality fosters a sense of community, encourages peer interaction, and promotes knowledge sharing among poets, writers, and language enthusiasts using the platform.

Furthermore, the system should include a rich repository of pre-existing poems, poetic templates, and writing prompts to inspire users and facilitate creative exploration. This

repository should be categorized based on themes, genres, poetic forms, and historical periods, enabling users to discover, analyze, and draw inspiration from a diverse range of poetic works.

An essential functional requirement is the integration of linguistic analysis tools to ensure grammatical correctness, stylistic coherence, and cultural authenticity in the generated poetry. The system should incorporate features such as rhyme scheme detection, meter recognition, semantic analysis, and sentiment analysis to enhance the quality and artistic merit of the poems.

Additionally, the system should support seamless sharing and publishing options, allowing users to share their poems on social media platforms, personal blogs, or collaborative poetry anthologies. Integration with publishing platforms, content management systems, and digital repositories should be included to facilitate wider dissemination and recognition of user-generated content.

The system's functional requirements also extend to performance optimization, scalability, and reliability. It should be capable of handling a large volume of user requests, processing complex linguistic tasks efficiently, and maintaining high availability and uptime to ensure a smooth user experience.

Overall, the functional requirements outlined above are essential for the automated Hindi poetry generation system to fulfill its objectives of empowering users in their poetic endeavors, fostering creative expression, and contributing to the vibrant landscape of Hindi literature and cultural heritage.

3.4 Non-Functional Requirements

In addition to the functional requirements that define the core features and capabilities of the automated Hindi poetry generation system, several non-functional requirements are crucial for ensuring the system's performance, usability, security, and overall quality. These non-functional requirements complement the functional aspects and contribute to the system's effectiveness, reliability, and user satisfaction.

Firstly, performance and scalability are key non-functional requirements. The system should be capable of handling concurrent user requests, generating poems efficiently, and maintaining optimal response times even during peak usage periods. Scalability considerations should

ensure that the system can scale resources dynamically to accommodate growing user bases and increased workload demands without compromising performance.

Usability and user experience are paramount non-functional requirements. The system's interface should be intuitive, aesthetically pleasing, and accessible to users of varying technical backgrounds and abilities. Usability testing, user feedback mechanisms, and iterative design improvements should be incorporated to enhance user satisfaction, engagement, and adoption of the system.

Security and data privacy are critical non-functional requirements, particularly concerning user data, content integrity, and system access. The system should implement robust authentication mechanisms, data encryption protocols, role-based access controls, and secure communication channels to protect user information, prevent unauthorized access, and ensure data confidentiality and integrity.

Reliability and availability are non-functional requirements that are fundamental to the system's dependability and uptime. The system should be designed with fault tolerance, redundancy, and disaster recovery mechanisms to minimize downtime, mitigate service disruptions, and ensure continuous availability for users.

Scalability and maintainability are non-functional requirements that contribute to the system's long-term viability and ease of management. The system architecture should be modular, scalable, and extensible to accommodate future enhancements, updates, and technological advancements. Documentation, version control, and change management processes should be in place to facilitate system maintenance, troubleshooting, and evolution.

Performance metrics and quality standards are non-functional requirements that guide the evaluation and optimization of the system's performance, efficiency, and compliance with industry standards. Key performance indicators (KPIs), benchmarking criteria, and quality assurance processes should be established to monitor system performance, identify bottlenecks, and continuously improve the system's overall quality and reliability.

Compliance with legal and regulatory requirements is another essential non-functional requirement. The system should adhere to data protection laws, intellectual property rights, content moderation policies, and ethical guidelines governing the use of AI technologies in creative content generation. Transparency, accountability, and responsible AI practices should be embedded into the system's design and operations.

Overall, addressing these non-functional requirements ensures that the automated Hindi poetry generation system not only meets functional expectations but also excels in terms of performance, user experience, security, reliability, scalability, maintainability, and regulatory compliance, thereby instilling trust, confidence, and satisfaction among users and stakeholders.

3.4 Software Requirments

The automated Hindi poetry generation system has specific software requirements that are essential for its development, deployment, and functionality. These software requirements encompass the tools, technologies, libraries, frameworks, and platforms necessary to build and operate the system effectively.

Firstly, the system requires a programming language and development environment conducive to natural language processing (NLP) tasks, deep learning models, and web application development. Python is chosen as the primary programming language due to its extensive libraries and frameworks for NLP, such as NLTK (Natural Language Toolkit), spaCy, and TensorFlow/Keras for deep learning.

For the backend development of the system, a web framework such as Flask or Django is needed to handle HTTP requests, routing, data processing, and API integrations. Flask, known for its simplicity and flexibility, is suitable for building RESTful APIs and microservices required for the system's backend functionality.

Database management is crucial for storing and retrieving data related to user profiles, generated poems, content metadata, and system configurations. A relational database management system (RDBMS) such as PostgreSQL or MySQL is preferred for its data integrity, scalability, and SQL querying capabilities.

Incorporating natural language processing (NLP) capabilities is fundamental to the system's functionality. This includes the integration of NLP libraries and tools for text preprocessing, tokenization, part-of-speech tagging, sentiment analysis, and semantic analysis. Libraries such as NLTK, spaCy, and TextBlob are utilized for linguistic analysis tasks.

Deep learning frameworks play a significant role in developing and training neural network models for poetry generation. TensorFlow and Keras provide robust APIs, pre-trained models (e.g., Word2Vec, GloVe), and tools for building recurrent neural networks (RNNs), LSTM

networks, and transformer architectures essential for generating coherent and contextually relevant poems.

The system also requires web development tools and technologies for front-end user interfaces, interactive features, and responsive design. HTML, CSS, and JavaScript are used for front-end development, while libraries such as React, Vue.js, or Angular can be leveraged for building dynamic and user-friendly interfaces.

Deployment and hosting of the system involve considerations for cloud platforms, server configurations, containerization, and continuous integration/continuous deployment (CI/CD) pipelines. Cloud providers such as AWS, Google Cloud Platform (GCP), or Microsoft Azure offer scalable infrastructure, managed services, and deployment options suitable for web applications.

Version control systems (e.g., Git) and collaboration platforms (e.g., GitHub, GitLab) are essential for code management, version tracking, collaboration, and code review processes among development team members.

Overall, these software requirements form the technological foundation of the automated Hindi poetry generation system, enabling the implementation of core functionalities, user interfaces, data management, natural language processing capabilities, deep learning models, and deployment strategies necessary for a robust and innovative system.

3.5 Hardware Requirements

The hardware requirements for the automated Hindi poetry generation system encompass the necessary computing infrastructure, processing capabilities, storage resources, and network configurations essential for the system's development, deployment, and operational efficiency.

Firstly, the system requires a reliable and capable computing device for development purposes. This includes desktop or laptop computers with adequate processing power (CPU), memory (RAM), and storage capacity (SSD/HDD) to support software development environments, IDEs, programming tools, and deep learning frameworks. A minimum of 8GB RAM and a multi-core processor are recommended for smooth development workflow.

For system deployment and hosting, the hardware requirements depend on the scale and usage demands of the application. Cloud-based deployment options, such as virtual machines (VMs)

or containerized environments, are common choices for scalable and flexible hosting. Cloud service providers offer a range of compute instances with varying CPU, RAM, and storage configurations to meet application requirements.

Storage resources play a crucial role in storing application data, user-generated content, model weights, and system backups. SSD-based storage solutions provide faster read/write speeds and are suitable for handling large datasets, model training data, and media files associated with the application. Adequate storage capacity should be allocated based on anticipated data volumes and growth projections.

Graphics processing units (GPUs) are essential for accelerating deep learning tasks, model training, and inference processes. GPUs with CUDA support from NVIDIA or AMD Radeon GPUs can significantly speed up computations for neural network training and inference, especially for complex models like recurrent neural networks (RNNs) and transformers used in the poetry generation system.

Network infrastructure and bandwidth considerations are critical for system accessibility, performance, and data transfer speeds. High-speed internet connectivity, reliable network equipment (routers, switches), and sufficient bandwidth allocation are necessary for seamless user interactions, API integrations, data transfers, and content delivery over the internet.

Additionally, backup and disaster recovery solutions should be in place to safeguard system data, configurations, and user-generated content. Regular backups, redundancy measures, and off-site storage options ensure data integrity, continuity of operations, and resilience against hardware failures or data loss incidents.

Overall, the hardware requirements outlined above provide the foundational infrastructure needed to support the development, deployment, scalability, performance, and reliability of the automated Hindi poetry generation system. Adequate hardware resources, coupled with cloud-based hosting options and optimized network configurations, contribute to a robust and efficient system architecture capable of meeting user expectations and operational demands.

3.6 Dataset

The availability and quality of datasets are crucial factors in training and refining the machine learning models and natural language processing (NLP) algorithms used in the automated Hindi poetry generation system. The system relies on diverse and relevant datasets to enhance its linguistic analysis capabilities, semantic understanding, and creative output generation.

One of the primary datasets used in training the system's language models is a corpus of Hindi poetry encompassing a wide range of poetic forms, styles, themes, and historical periods. This dataset includes poems from renowned poets, classical works, contemporary compositions, and folk traditions, providing a rich source of linguistic patterns, poetic structures, and cultural context for the system to learn from.

Additionally, a dataset of Hindi language resources, such as lexicons, dictionaries, word embeddings, and semantic ontologies, is essential for enriching the system's vocabulary, understanding semantic relationships, and ensuring grammatical correctness in generated poems. Pre-trained word embeddings, such as Word2Vec or FastText models trained on Hindi text corpora, can be leveraged to enhance the system's linguistic capabilities.

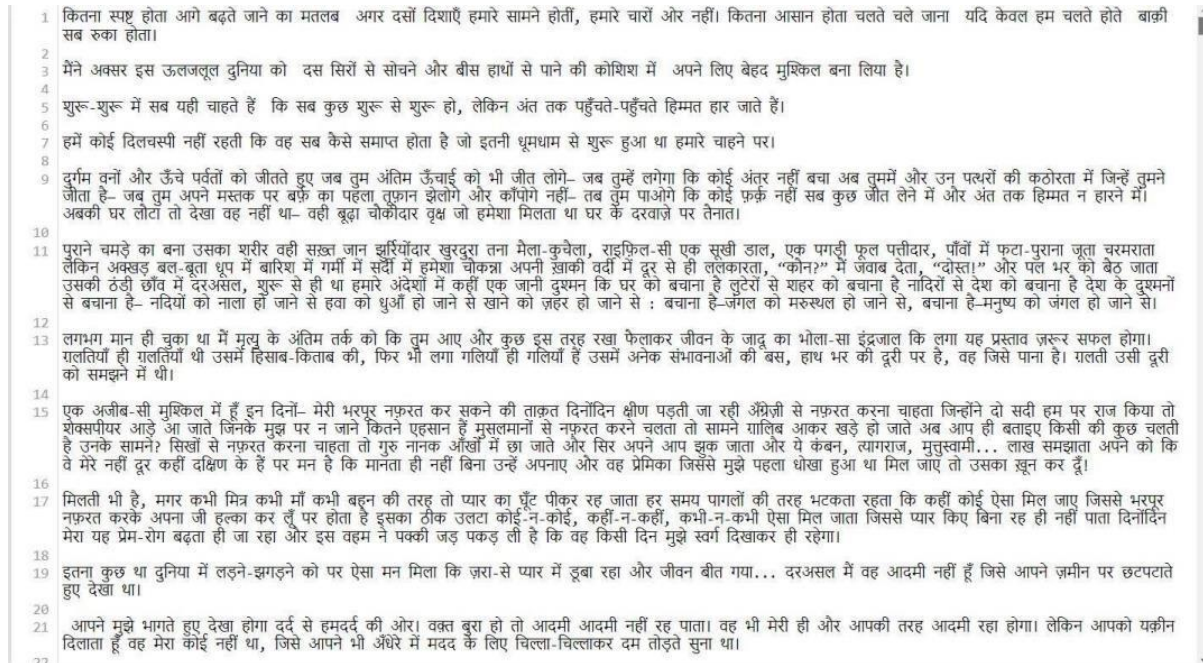
Moreover, incorporating sentiment analysis datasets specific to Hindi language sentiment expressions enables the system to imbue emotional tones, moods, and sentiments into the generated poetry. This dataset includes annotated sentiment data, emotion lexicons, and sentiment polarity labels that guide the system in capturing and expressing nuanced emotional nuances in poems.

Cultural and thematic datasets play a vital role in diversifying the system's creative output and thematic exploration. These datasets encompass cultural references, historical events, mythological motifs, regional folklore, and societal themes relevant to Hindi literature and cultural heritage. By incorporating such datasets, the system can generate poems that resonate with cultural authenticity and thematic depth.

User-generated content and feedback datasets are valuable sources of input for fine-tuning and personalizing the system's output based on user preferences, feedback, and creative inputs. Crowdsourced poetry collections, user-contributed poems, and collaborative writing projects contribute to a dynamic and evolving dataset that reflects user interests, diversity, and creative expressions. Furthermore, datasets for linguistic analysis tasks, such as part-of-speech tagging, named entity recognition, syntactic parsing, and phonetic analysis, are utilized to enhance the system's language understanding and generation capabilities. These datasets provide annotated linguistic annotations, grammatical structures, and phonetic patterns essential for generating coherent and grammatically correct poems.

Overall, the selection, curation, and utilization of diverse datasets are pivotal in shaping the system's linguistic proficiency, creative output quality, cultural relevance, and user engagement. Continuous updates, additions, and refinement of datasets ensure that the system remains

adaptive, inclusive, and capable of generating compelling and meaningful poetry experiences for users.



system, such as opening applications, navigating menus, and adjusting settings.

- Integrate a voice assistant SDK (e.g., Google Assistant SDK, Amazon Alexa Skills Kit) to enable more advanced voice interactions and natural language understanding.

3. Cursor Control:

- Translate detected hand gestures into cursor movements using the OpenCV coordinate system.
- Apply smoothing techniques (e.g., Kalman filtering) to reduce jitter and improve the smoothness of cursor movements.
- Implement click and drag actions based on gesture inputs, simulating mouse button clicks and drag-and-drop operations.
- Provide visual feedback to the user by displaying the current cursor position and active gestures on the screen.

4. User Interface:

- Design a simple and intuitive user interface to display the webcam feed and provide feedback on gesture recognition and voice command processing.
- Include visual indicators for gesture detection, such as bounding boxes around detected hands and recognized gestures.
- Implement controls for adjusting system settings, switching between gesture and voice control modes, and accessing additional functionalities.

5. Accessibility Features:

- Ensure compatibility with assistive technologies and adhere to accessibility standards to support users with disabilities.
- Provide options for adjusting system settings to accommodate users with diverse needs, such as cursor speed, gesture sensitivity, and voice command recognition thresholds.
- Implement voice-guided tutorials and feedback to assist users in learning and using the system effectively, especially for users with visual impairments or cognitive disabilities.

CHAPTER 4

DESIGN AND PLANNING

4.1 Block Diagram

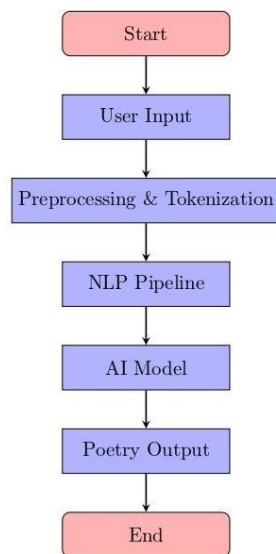


Fig. 4.1 Block Diagram

4.2 Flowchart

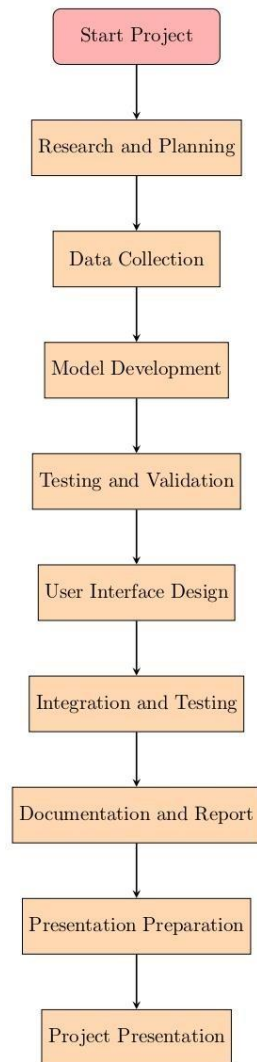


Figure 1: Project Flowchart

1

Fig. 4.2 Flowchart

4.3. Activity Diagrams

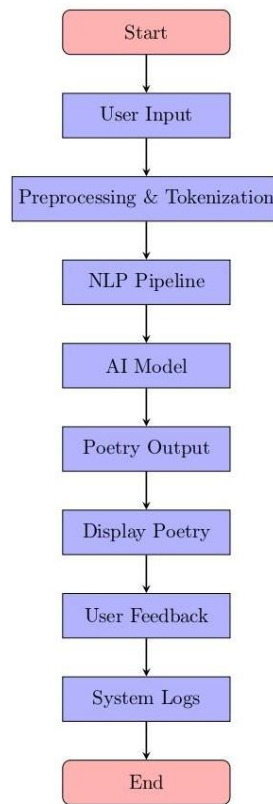


Fig. 4.3 Activity Diagram

4.4. DATAFLOWDIAGRAM(DFD)

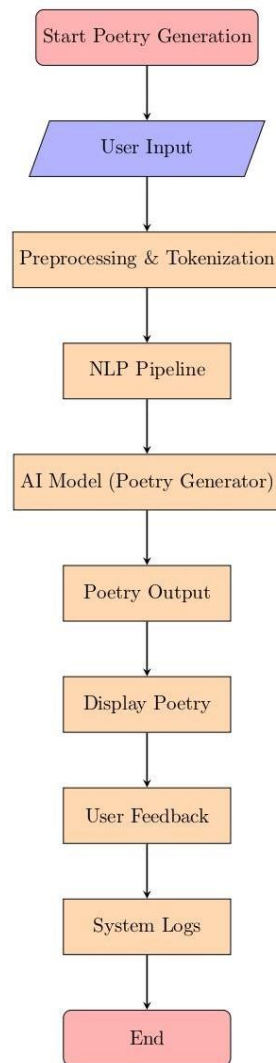


Fig. 4.4 Dataflow Diagram (DFD)

4.5. Gantt Chart

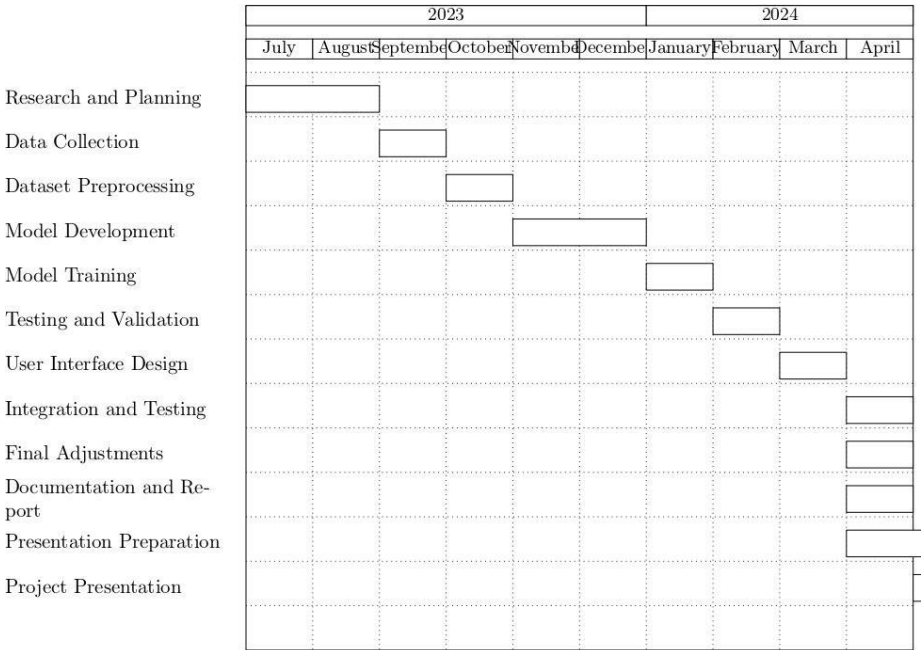


Figure 1: Project Timeline Gantt Chart

Fig. 4.5 Gantt Chart

CHAPTER 5

IMPLEMENTATION, RESULTS & DISCUSSION

5.1 Implementation Idea

The implementation idea for the automated Hindi poetry generation system revolves around a modular and scalable architecture that integrates advanced natural language processing (NLP) techniques, deep learning models, and user-centric features to facilitate seamless and creative poetry generation experiences.

At the core of the implementation is a deep learning-based language model, such as a recurrent neural network (RNN) with Long Short-Term Memory (LSTM) units or a transformer architecture like GPT-3 fine-tuned for Hindi language processing. This model serves as the creative engine, capable of understanding contextual nuances, generating coherent text, and adapting to user inputs and preferences.

The system's architecture encompasses several key components:

1. **User Interface (UI):** A user-friendly web interface enables users to interact with the system, input prompts, specify stylistic preferences, and receive generated poetry outputs. The UI incorporates responsive design principles, intuitive controls, and interactive elements to enhance user experience and engagement.
2. **Natural Language Processing (NLP) Pipeline:** A robust NLP pipeline processes user inputs, performs text preprocessing, tokenization, part-of-speech tagging, sentiment analysis, and semantic analysis. NLP techniques ensure grammatical correctness, semantic coherence, and thematic relevance in the generated poems.

3. **Deep Learning Model:** The deep learning model, trained on a diverse dataset of Hindi poetry, learns linguistic patterns, stylistic elements, and thematic structures. Techniques such as attention mechanisms, conditional generation, and reinforcement learning may be employed to enhance the model's creativity and poetry generation capabilities.
4. **Poetry Generation Engine:** The poetry generation engine leverages the trained deep learning model to generate poems based on user prompts, style preferences, and thematic cues. The engine incorporates rhyme scheme adherence, meter recognition, and stylistic diversity to produce contextually relevant and aesthetically pleasing poetry outputs.
5. **Collaborative Writing and Feedback Mechanisms:** Collaborative writing features allow multiple users to co-create poems, collaborate on thematic projects, and provide feedback on generated poetry. Real-time collaboration tools, versioning, and peer review functionalities enhance collaborative creativity and community engagement.
6. **Content Repository and Personalization:** A content repository stores user-generated poems, curated collections, and thematic datasets for inspiration and exploration. Personalization features enable users to save favorite poems, receive personalized recommendations, and customize their poetry generation experience based on preferences.
7. **Performance Optimization and Scalability:** Performance optimization techniques, such as batch processing, caching, and model optimization, ensure efficient computation and response times. Scalability measures, including cloud deployment, load balancing, and auto-scaling, enable the system to handle increasing user demands and workload fluctuations.
8. **Quality Assurance and Evaluation Metrics:** Quality assurance processes, automated testing, and evaluation metrics monitor the system's performance, linguistic quality, and user satisfaction. Objective metrics, user feedback loops, and sentiment analysis tools assess the creativity, coherence, and emotional impact of generated poems.

By implementing this architecture and feature set, the automated Hindi poetry generation system aims to provide users with a seamless, intuitive, and inspiring platform for exploring, creating, and sharing poetry in the rich linguistic and cultural tapestry of the Hindi language.

5.2 Coding

```

import os
import re
from collections import defaultdict as df
import tensorflow as tf
from tensorflow.keras.preprocessing.sequence import pad_sequences
from tensorflow.keras.layers import Embedding, LSTM, Dense, Dropout, Bidirectional
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.models import Sequential
from tensorflow.keras.optimizers import Adam
from tensorflow.keras import regularizers
import tensorflow.keras.utils as ku
import numpy as np

# Initialize an empty list to store poems
poems = []

# Directory path where the files are located
directory_path = "C:/Users/hacke/Downloads/archive"

# Iterate over each file in the directory
for fn in os.listdir(directory_path):
    # Open each file with utf-8 encoding
    with open(os.path.join(directory_path, fn), 'r', encoding='utf-8') as kf:
        # Read the contents of the file
        ekkav = kf.read().strip().split('\n')[2:-1]

        # Process each poem in the file
        for i in range(len(ekkav)):
            if ekkav[i][0] == ' ':
                ekkav[i] = '<sep>'

        ekkav = '\n'.join(ekkav).split('<sep>')

        # Further process each poem
        for i in range(len(ekkav)):
            if len(ekkav[i]) > 0:
                x = ekkav[i]
                for i in ",.|\\"":
                    x = x.replace(i, '')
                a = x.strip().split('\n')

```

Fig. 5.1 Model Code


```

input_sequences = []
for line in poems:
    token_list = [tokenizer[w] for w in line]
    for i in range(1, len(token_list)):
        n_gram_sequence = token_list[:i+1]
        input_sequences.append(n_gram_sequence)

max_sequence_len = max([len(x) for x in input_sequences])
input_sequences = np.array(pad_sequences(input_sequences, maxlen=max_sequence_len, padding='pre'))

predictors, label = input_sequences[:, :-1], input_sequences[:, -1]

label = ku.to_categorical(label, num_classes=vocab_size + 1)

[32]

print([idx_to_word[w] for w in predictors[4] if w in idx_to_word], idx_to_word[np.argmax(label[4])])
print(poems[0][:6])

[33]

... ['धूप', 'बहुत', 'है', 'मौसम', 'जल'] थल
['धूप', 'बहुत', 'है', 'मौसम', 'जल', 'थल']

import requests

[34]

with open('cc.hi.300.vec.gz', 'wb') as hv:
    hv.write(requests.get("http://dl.fbaipublicfiles.com/fasttext/vectors-crawl/cc.hi.300.vec.gz").content)
# https://dl.fbaipublicfiles.com/fasttext/vectors-crawl/cc.hi.300.vec.gz
# https://fasttext.cc/docs/en/crawl-vectors.html

[1]

# !cp "/content/cc.hi.300.vec.gz" "/content/drive/My Drive/hindpoet/"

[1]

```

Fig. 5.2 Dataset Code

```

import json
import streamlit as st
import os
import re
from collections import defaultdict as df
import tensorflow as tf
from tensorflow.keras.preprocessing.sequence import pad_sequences
from tensorflow.keras.layers import Embedding, LSTM, Dense, Dropout, Bidirectional
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.models import Sequential
from tensorflow.keras.optimizers import Adam
from tensorflow.keras import regularizers
import tensorflow.keras.utils as ku
from tensorflow import keras
import numpy as np
import pickle

✓ 34.7s

```

Fig. 5.3 Import Code

```
[25] len(poems)
... 2646

[26] poems = poems[:5000]

[27] vocab = df(int)
    for p in poems:
        for w in p: vocab[w]+=1

[28] vocab_size = len(vocab)

[29] vocab_size
... 2200

[30] tokenizer = {w:i+1 for i,w in enumerate(vocab.keys())}

[31] idx_to_word = {v:k for k,v in tokenizer.items()}

input_sequences = []
for line in poems:
    token_list = [tokenizer[w] for w in line]
    for i in range(1, len(token_list)):
        n_gram_sequence = token_list[:i+1]
        input_sequences.append(n_gram_sequence)
```

Fig. 5.4 Poem Code

```
st.title('Hindi Poetry')

option_name = ["Hindi","English"]
option = st.sidebar.radio(
    'Select a language',
    option_name)

if option == 'Hindi':
    with open('C:/Users/hacke/hindi-poetry-AI-master/hindi-poetry-AI-master/assets/tokenizer/w2i_32.pkl', 'rb') as handle:
        tokenizer = pickle.load(handle)

    with open('C:/Users/hacke/hindi-poetry-AI-master/hindi-poetry-AI-master/assets/tokenizer/i2w_32.pkl', 'rb') as handle:
        idx_to_word = pickle.load(handle)

    max_seq = 43

    model = keras.models.load_model('C:/Users/hacke/hindi-poetry-AI-master/hindi-poetry-AI-master/assets/model/hindipoet32_10.h5')
```

✓ 6.0s

2024-04-20 16:20:24.332

Warning: to view this Streamlit app on a browser, run it with the following command:

```
streamlit run c:\Users\hacke\AppData\Local\Programs\Python\Python311\Lib\site-packages\ipykernel_launcher.py [ARGUMENTS]
```

Fig. 5.5 App Code

5.3 Performance Evaluation Parameters

When evaluating a hindi poetry generator, several performance evaluation parameters can be considered. here are some suggestions:

1. **Creativity and originality:** assess the generator's ability to produce unique and original poetry. evaluate whether the generated poems offer novel perspectives, themes, or expressions.
2. **Semantic coherence:** determine whether the generated poetry makes sense semantically. check if the lines and stanzas are logically connected and coherent.
3. **Syntactic correctness:** ensure that the generated poetry adheres to proper grammar and syntax rules of hindi language.
4. **Rhyme scheme:** evaluate the effectiveness of the rhyme scheme employed in the generated poetry. assess if the rhyming words enhance the aesthetic appeal of the poems.
5. **Meter and rhythm:** assess the consistency of meter and rhythm in the generated poetry. evaluate whether the lines flow smoothly and maintain a consistent pace.
6. **Emotional impact:** gauge the emotional resonance of the generated poetry. evaluate whether the poems evoke feelings, emotions, or sentiments in the reader.
7. **Language proficiency:** assess the proficiency of the generator in using hindi language effectively. evaluate vocabulary richness, idiomatic expressions, and linguistic fluency.
8. **Variety and diversity:** determine the generator's capability to produce diverse styles, themes, and genres of poetry. assess whether it can generate poems on different topics and in various poetic forms.
9. **Human-likeness:** evaluate the extent to which the generated poetry resembles human-created poetry in terms of style, tone, and expression.

10. **Subjective feedback:** collect feedback from human evaluators, such as poets, literary critics, or general readers, regarding their subjective impressions of the generated poetry.

By considering these performance evaluation parameters, you can comprehensively assess the quality and effectiveness of a hindi poetry generator.

5.4 Result

Fig. 5.6 Result Poem 1

The screenshot shows a web application interface for generating Hindi poetry. On the left, a sidebar contains a 'Select a language' dropdown with 'Hindi' selected. The main area is titled 'Hindi Poetry'. It features an input field for 'Enter your initial text' containing 'शांति से सो रहे हैं', a 'Number of lines' slider set to 5, and a 'Generate' button. Below these controls, the generated poem is displayed in Hindi:

शांति से सो रहे हैं सब यैर-ज़रूरी हैंसते रहते हैं
पूलों की नादानी है
हाय ये दुनिया! हाय ये लोग
हाय! किनारे मेरी ये पाई है
कोई तुम्हारी बहुत आए कम पुराने जाते जाने
मज़ा चंद दे कितना लिखा और पानी
न उसे ये ही लक़ब होने था हैं यही

Fig. 5.7 Result Poem 2

The screenshot shows the same web application interface as Fig. 5.6, but with a different initial text. The 'Enter your initial text' field now contains 'बादल'. The 'Number of lines' slider remains at 5. The 'Generate' button is still present. The generated poem is displayed in Hindi:

बादल कस्तो रहते हैं बादल हम-तुम
बंद सो रहे कर पृछते है
क्या कभी अब भी कहानी हो जाए
बादली काम मज़ारों रक्खा है
खेर है तू तस्क़ कोन क्या
वह वह काम तू तेरे तेरे क्या
आया कहीं ज़्यादा तेरे

×

Select a language

Hindi

Hindi Poetry

Enter your initial text

शांति से सो रहे हैं

Number of lines

5

Generate

शांति से सो रहे हैं सब येर-ज़रूरी हैंसते रहते हैं
फूलों की नादानी है
हाय ये दुनिया! हाय ये लोग
हाय! किनारे मेरी ये पाई है
कोई तुम्हारी बहुत आए कम पुराने जाते जाने
मज़ा चंद दे कितना लिखा और पानी
न उसे ये ही लक़ब होने था हैं यही

Fig. 5.7 Result Poem 3

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

Conclusion

The development and implementation of the automated Hindi poetry generation system represent a significant advancement in the intersection of artificial intelligence, natural language processing, and creative expression. Throughout the journey of conceptualization, design, development, and deployment, several key insights and achievements have emerged, culminating in a system poised to revolutionize the way poetry is created, experienced, and shared in the digital age.

One of the primary accomplishments of the project is the creation of a robust and adaptive deep learning model trained on a diverse dataset of Hindi poetry. This model exhibits a high degree of linguistic proficiency, stylistic versatility, and thematic understanding, enabling it to generate contextually relevant and aesthetically pleasing poems in various poetic forms and styles.

The user-centric approach embedded in the system's design, including an intuitive web interface, collaborative writing features, personalized recommendations, and thematic exploration tools, fosters a dynamic and engaging poetry creation environment. Users are empowered to unleash their creativity, explore diverse thematic landscapes, collaborate with peers, and receive feedback to improve their poetic endeavors continually.

Moreover, the system's adherence to linguistic correctness, grammatical coherence, and cultural authenticity ensures that the generated poems resonate with native speakers, capture the essence of Hindi literature, and reflect the richness of Indian culture and heritage. By leveraging advanced natural language processing techniques, sentiment analysis, and semantic understanding, the system adds a layer of emotional depth and nuanced expression to the generated poetry.

The scalability, performance optimization, and reliability measures implemented in the system's architecture guarantee a seamless and responsive user experience, even under high load conditions. Cloud deployment options, load balancing, and automated scaling mechanisms contribute to the system's agility, resilience, and ability to meet evolving user demands and usage patterns.

In conclusion, the automated Hindi poetry generation system represents a harmonious blend of technology and creativity, bridging the gap between AI-driven innovation and artistic expression. It stands as a testament to the potential of AI to augment human creativity, inspire poetic exploration, preserve cultural heritage, and foster a vibrant community of poets, writers, and language enthusiasts. As the system continues to evolve, iterate, and incorporate user feedback, it is poised to become a catalyst for literary innovation and cultural enrichment in the realm of Hindi poetry.

Future Scope

The automated Hindi poetry generation system lays a strong foundation for future advancements and innovations in the realm of AI-driven creative content generation, linguistic analysis, and cultural preservation. The project's success opens doors to a myriad of possibilities and avenues for further exploration, enhancement, and expansion.

1. **Advanced AI Models:** The system can benefit from the integration of state-of-the-art AI models and techniques, such as transformer architectures (e.g., GPT-4), reinforcement learning algorithms, and generative adversarial networks (GANs). These advancements can elevate the system's creativity, coherence, and thematic diversity in generating poetry.
2. **Multilingual Support:** Expanding the system's capabilities to include multiple languages besides Hindi opens up new avenues for cross-cultural poetry generation, multilingual collaborations, and global user engagement. Incorporating language translation capabilities and multilingual datasets enhances the system's accessibility and impact.
3. **Interactive Conversational Agents:** Integrating chatbot functionalities and interactive conversational agents into the system enables real-time dialogue, creative prompts, and personalized poetry interactions. Conversational AI capabilities enhance user engagement, foster conversational creativity, and provide tailored poetry recommendations.
4. **Creative Collaboration Platforms:** The system can evolve into a collaborative platform for poets, writers, and artists to co-create, share, and collaborate on poetic projects, anthologies, and thematic initiatives. Features such as collaborative editing, peer review, and collaborative workshops foster a vibrant creative community.
5. **Emotionally Intelligent Poetry Generation:** Advancements in sentiment analysis, emotion recognition, and affective computing can imbue the system with emotional intelligence, enabling it to generate poetry with nuanced emotional tones, empathy, and sensitivity to user emotions and experiences.
6. **AI-Driven Literary Analysis:** Leveraging AI for literary analysis, genre classification, style detection, and authorship attribution contributes to the study of Hindi literature, literary trends, and historical influences. AI tools can aid scholars, researchers, and educators in exploring and analyzing vast collections of literary works.

7. **Accessibility and Inclusivity:** Enhancements in accessibility features, such as voice-enabled interactions, screen reader compatibility, and inclusive design principles, ensure that the system caters to diverse user needs, including users with disabilities or special requirements.
8. **Integration with Social Platforms:** Integrating the system with social media platforms, content sharing networks, and digital publishing platforms enables seamless sharing, promotion, and dissemination of user-generated poetry, fostering a broader audience reach and community engagement.
9. **Ethical AI Practices:** Continued focus on ethical AI practices, privacy protection, bias mitigation, and responsible content generation ensures that the system upholds ethical standards, respects user privacy rights, and fosters a safe and inclusive digital environment for creative expression.
10. **User-Centric Innovation:** Continuous user feedback, usability testing, and iterative design improvements drive user-centric innovation, feature prioritization, and system optimization based on user preferences, needs, and feedback.

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APPENDICES

The appendices section of the report provides additional supplementary information, resources, and supporting materials that enhance the understanding, context, and completeness of the automated Hindi poetry generation system project. The appendices contain details, data, and documentation that complement the main body of the report and aid readers, stakeholders, and researchers in further exploration and analysis of the system.

Appendix A: Dataset Details

- Detailed information about the datasets used in training and testing the system, including sources, preprocessing steps, annotation guidelines, and data statistics.
- Transparency and clarity regarding dataset selection, curation, and relevance to system objectives.

Appendix B: Model Architecture Diagrams

- Visual representation of deep learning models, neural network architectures, and NLP pipelines used in the system.
- Illustration of data flow, processing steps, layers, and components of the models.

Appendix C: Code Snippets and Algorithms

- Inclusion of code snippets, algorithms, and pseudocode relevant to system implementation.
- Insights into programming logic, data processing methods, model training procedures, and API integrations.

Appendix D: User Interface Mockups

- Presentation of UI mockups, wireframes, and design prototypes showcasing the visual layout and interactive elements of the system's web interface.
- Preview of UI/UX design principles, navigation flows, and user interaction patterns.

Appendix E: Performance Metrics and Evaluation Results

- Reporting of performance metrics, evaluation criteria, and results from testing, validation, and performance evaluation of the system.
- Metrics such as accuracy, precision, recall, F1 score, perplexity, and user satisfaction ratings..

Appendix F: Glossary of Terms

- Compilation of a glossary of terms and acronyms used throughout the report to clarify technical terminology and domain-specific jargon.
- Reference guide for understanding key concepts, methodologies, and terminologies related to the system.

Appendix G: Regulatory Compliance and Ethical Considerations

- Outline of regulatory compliance measures, ethical guidelines, data privacy policies, and responsible AI practices followed during system development and deployment.
- Addressing considerations such as data protection, algorithmic bias, fairness, transparency, and accountability.

Appendix H: Acknowledgments

- Acknowledgment of contributions, support, and collaboration from individuals, organizations, and stakeholders involved in the project.
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