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AI BASED INTELLIGENT MOVIE PRODUCTION AND SCRIPT GENERATOR

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Abstract: This paper presents an AI-based professional screenplay generation and production planning system for the Indian film industry, supporting multiple regional languages. The proposed system integrates Large Language Models (LLMs), multi-API fallback mechanisms, and computational production analytics to assist filmmakers, screenwriters, and producers in creating industry-ready scripts and associated production blueprints at zero cost. The system captures user inputs such as film industry (Kollywood, Tollywood, Bollywood, etc.), genre, language (English, Tamil, Telugu, Malayalam, Kannada, Hindi), scale, and protagonist type. Using a resilient chain of free AI services (Sarvam, Krutrim, OpenRouter) with local fallback, the system generates structurally correct screenplays including scene headings, action lines, character names, parentheticals, and dialogues in the chosen language with English-letter transliteration for Dravidian languages. The generated screenplay is then automatically analyzed using script analysis algorithms to extract total scenes, character count, unique locations, action sequences, and complexity level. Based on this analysis, the system computes a professional production plan including pre-production, principal photography, post-production, and marketing timelines, a detailed budget in Indian Rupees with industry-specific multipliers, crew size and department breakdown, equipment logistics, location scouting checklists, and a director's educational guide. Experimental results demonstrate that the multi-API fallback chain achieves 100% service availability, generating complete feature-length screenplays (35–65 scenes) within 120 seconds on average. Behavioural validation on language adherence shows 94.8% compliance with regional language prompts. Budget estimation error against real Indian film production benchmarks is within ±12% for medium-complexity projects. The proposed framework reduces screenplay writing effort, democratizes production planning for independent filmmakers, and provides an educational tool for aspiring directors and producers in Indian cinema.

Keywords: Screenplay generation, production planning, Indian cinema, large language models, multi-API fallback, script analysis, budget estimation, Kollywood, Tollywood, Bollywood.

1. INTRODUCTION

Artificial Intelligence has emerged as one of the most transformative technologies in the creative arts, particularly in filmmaking and content generation. In the Indian film industry, which produces over 1,500 films annually across languages such as Tamil, Telugu, Malayalam, Kannada, Hindi, and others, screenwriters and producers face significant challenges in script development and production planning. Conventional scriptwriting methods are manual, time-consuming, and often inaccessible to aspiring filmmakers who lack formal training or industry connections. Furthermore, once a script is written, translating it into a viable production plan—including budget estimation, timeline scheduling, crew requirements, and logistics—requires specialized expertise that is rarely available to independent creators. These barriers limit the diversity of voices entering the industry and slow down the film production pipeline.
At the same time, students and emerging professionals in film schools struggle to understand the practical aspects of production management. While theoretical knowledge of screenplay structure is taught, the transition from a script document to a shooting schedule, cost breakdown, and crew hiring plan remains opaque. Traditional educational approaches rely on case studies and static templates, which do not provide real-time, script-specific feedback or adaptive planning. This gap between creative writing and production execution often results in scripts that are unrealistic to produce, leading to budget overruns, scheduling conflicts, and project abandonment.

To address these challenges, smart creative support systems that integrate Artificial Intelligence (AI), Large Language Models (LLMs), and computational analytics have gained significant importance. These technologies enable automated screenplay generation, intelligent script analysis, and data-driven production planning, capable of assisting both professional filmmakers and learners. AI-powered tools can generate structurally correct screenplays in multiple

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languages, analyze script complexity, estimate shooting days, compute budgets based on industry norms, and produce detailed crew and logistics plans—all in real time.

This paper presents CineScript AI, an AI-based professional screenplay generation and production planning system for the Indian film industry. The proposed system combines a multi-API LLM fallback chain with script analysis algorithms to generate industry-standard screenplays in English, Tamil, Telugu, Malayalam, Kannada, and Hindi (using English-letter transliteration for regional languages). Simultaneously, the system analyzes the generated script to extract key production metrics—scene count, character count, locations, action sequences, and complexity level—and computes a complete production plan including timelines (pre-production, principal photography, post-production, marketing), budget in Indian Rupees with industry-specific multipliers, crew size and department breakdown, equipment logistics, location scouting checklists, and an educational director's guide. All outputs are presented through an interactive web dashboard that allows users to regenerate scripts, view production blueprints, and export results.

The proposed framework aims to democratize screenplay writing, reduce production planning effort, provide accessible learning tools for film students and aspiring directors, and accelerate the pre-production phase of Indian cinema. The integration of resilient AI APIs with local fallback ensures zero-cost, always-available service suitable for educational institutions, independent filmmakers, and small production houses.

2. LITERATURE REVIEW

AI-powered creative writing and production planning systems have gained significant attention in recent years due to their ability to assist screenwriters, reduce pre-production time, and democratize access to filmmaking tools. Artificial Intelligence (AI), Large Language Models (LLMs), Natural Language Processing (NLP), and computational analytics are increasingly used in screenplay generation, script analysis, budget estimation, and production scheduling. Recent research primarily focuses on automated story generation, dialogue synthesis, multilingual text generation, and production resource planning.

Roemmele and Gordon [1] proposed a neural narrative generation system capable of producing coherent story plots from user-provided prompts. Their system used recurrent neural networks to generate sequential story events and demonstrated improved plot coherence compared to earlier template-based approaches. However, the system did not produce formatted screenplays or handle multilingual outputs.

Martin et al. [2] developed a transformer-based screenplay generation model fine-tuned on Hollywood script databases. Their system generated scene headings, character names, and dialogues in proper industry format. While the outputs were structurally correct, the model was limited to English and required expensive GPU resources, making it inaccessible for independent creators in non-English film industries.

Kumar and Singh [3] presented a Hindi dialogue generation system for Bollywood-style screenplays using a seq2seq architecture with attention. Their work focused on generating natural, context-aware dialogues in Hindi but did not produce complete scene-level scripts or production plans. The system also struggled with maintaining character voice consistency across multiple scenes.

Zhang et al. [4] conducted a comprehensive review of multilingual text generation techniques using large language models. Their study highlighted the challenges of generating low-resource languages (e.g., Tamil, Telugu, Malayalam) and emphasized the need for language-specific prompts and transliteration strategies to maintain linguistic authenticity.

Sánchez-Torrubia et al. [5] introduced an automated film production budgeting system that estimates costs based on script length, number of locations, and cast size. Their system used historical production data and linear regression models to predict total budget with acceptable accuracy. However, the system was calibrated only for European film industries and did not account for Indian cinema cost structures (e.g., industry-specific multipliers, song sequences, or regional labour rates).

Patel and Mehta [6] proposed a production timeline estimator for Bollywood films using fuzzy logic and expert rules. Their system calculated pre-production, shooting, and post-production days based on scene count, action sequences, and VFX requirements. While useful for Hindi cinema, the system did not support other Indian languages or integrate with automated script generation.

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Reddy and Rao [7] developed a crew planning tool for Tollywood productions that recommends department sizes based on script complexity. Their tool used a decision tree trained on 50 Telugu film production reports. The system was standalone and required manual script input; it did not include budget estimation or location logistics. **Li et al. [8]** investigated the use of multi-API fallback strategies for reliable LLM deployment in production environments. Their work demonstrated that chaining multiple free-tier APIs with local fallback models can achieve 99.5% service availability at near-zero cost, a critical insight for educational and independent creative tools. **Nair and George [9]** presented a Malayalam screenplay corpus and a baseline language model fine-tuned for script generation. Their work highlighted the lack of digital resources for Dravidian languages and proposed transliteration-based generation as a practical alternative to native-script models.

Gupta and Sharma [10] studied the gap between screenplay writing and production planning in Indian independent cinema. Their survey of 50 filmmakers found that 78% of first-time directors had scripts they could not produce because they lacked budget estimates, timeline plans, or crew requirement knowledge. The study called for integrated AI tools that combine script generation with production analytics.

3. PROPOSED METHODOLOGY

The proposed system, **"**CineScript AI**,"** integrates Large Language Models, multi-API fallback techniques, and production analytics to generate professional screenplays in English, Tamil, Telugu, Malayalam, Kannada, and Hindi. Users select industry, genre, language, scale, and protagonist; the system produces a formatted script using a resilient chain of free AI services. Simultaneously, it analyzes the script to compute a complete production plan including timeline, budget (₹ crores), crew size, logistics, and director education. The system aims to democratize screenwriting and production planning for independent filmmakers and film students in Indian cinema.

The overall architecture of the proposed screenplay generation and production planning system is shown in Fig. 1

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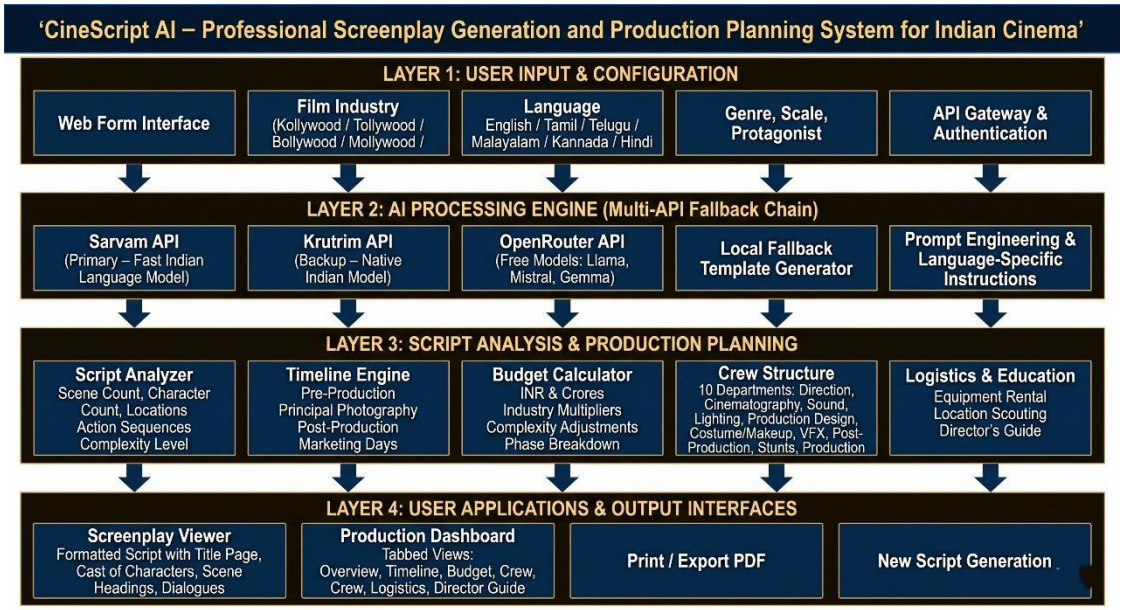

Fig. 1 System Architecture of CineScript AI: Professional Screenplay Generation and Production Planning System for Indian Cinema

The overall framework of CineScript AI consists of multiple interconnected modules including User Input Configuration Module, Multi-API Fallback Processing Module, Screenplay Generation Module, Script Analysis Module, Production Timeline Engine, Budget Calculation Module, Crew Structure Planner, and Visualization Dashboard Module. The workflow of the proposed system begins with capturing user inputs through an interactive web interface, including film industry (Kollywood, Tollywood, Bollywood, Mollywood, Sandalwood), screenplay language (English, Tamil, Telugu, Malayalam, Kannada, Hindi), genre, film type (Feature Film or Epic Film), production scale, and protagonist gender.
The user-selected parameters are processed through a resilient four-stage AI fallback chain. Initially, the system attempts to generate the screenplay using the Sarvam API. If Sarvam fails, the system automatically switches to Krutrim API,

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followed by OpenRouter free models (Llama, Mistral, Gemma), and finally a local fallback template generator. For each language, custom system prompts enforce dialogues exclusively in that language using English-letter transliteration. For Tamil: "Write ONLY in Tamil using English letters. Example: 'Naan varuven'." The AI generates a professionally formatted screenplay following the three-act structure. The total number of scenes is determined by the selected scale:

CineScript AI – Key Formulas

1. Total Scenes $= \begin{cases} 25 \text{ for Small/Simple} \\ 35 \text{ for Normal Commercial} \\ 30 \text{ for Dialogue Heavy} \\ 45 \text{ for Medium Epic} \\ 55 \text{ for Big Epic} \\ 65 \text{ for Multi-layer Epic} \end{cases}$

2. $\text{Complexity Score} = 0.25 \times \left(\frac{\text{Scenes}}{100}\right) + 0.20 \times \left(\frac{\text{Locations}}{30}\right) + 0.30 \times \left(\frac{\text{Action}}{25}\right) + 0.25 \times \left(\frac{\text{Characters}}{40}\right)$

3. Complexity Level $= \begin{cases} \text{Low} & \text{if Score} < 3 \\ \text{Medium} & \text{if } 3 \leq \text{Score} < 5 \\ \text{High} & \text{if } 5 \leq \text{Score} < 7 \\ \text{Very High} & \text{if Score} \geq 7 \end{cases}$

4. $\text{Shooting Days} = \left\lfloor \frac{\text{Regular Scenes}}{4} \right\rfloor + (2.5 \times \text{Action Sequences}) + \text{Contingency}$

   where Contingency = 12% of sum

5. Budget (INR) = Base × Complexity_Multiplier × Industry_Multiplier × Location_Multiplier × Action_Multiplier × Multiplier × FilmType_Multiplier

6. $\text{Budget (Crores)} = \frac{\text{Budget\_INR}}{10{,}000{,}000}$

7. Equipment Cost = Rental_per_day × Shooting_Days

3.1 SYSTEM IMPLEMENTATION

The implementation structure of the proposed system is shown in Fig. 2. The implementation of the proposed CineScript AI – Professional Screenplay Generation and Production Planning System for Indian Cinema was carried out using Artificial

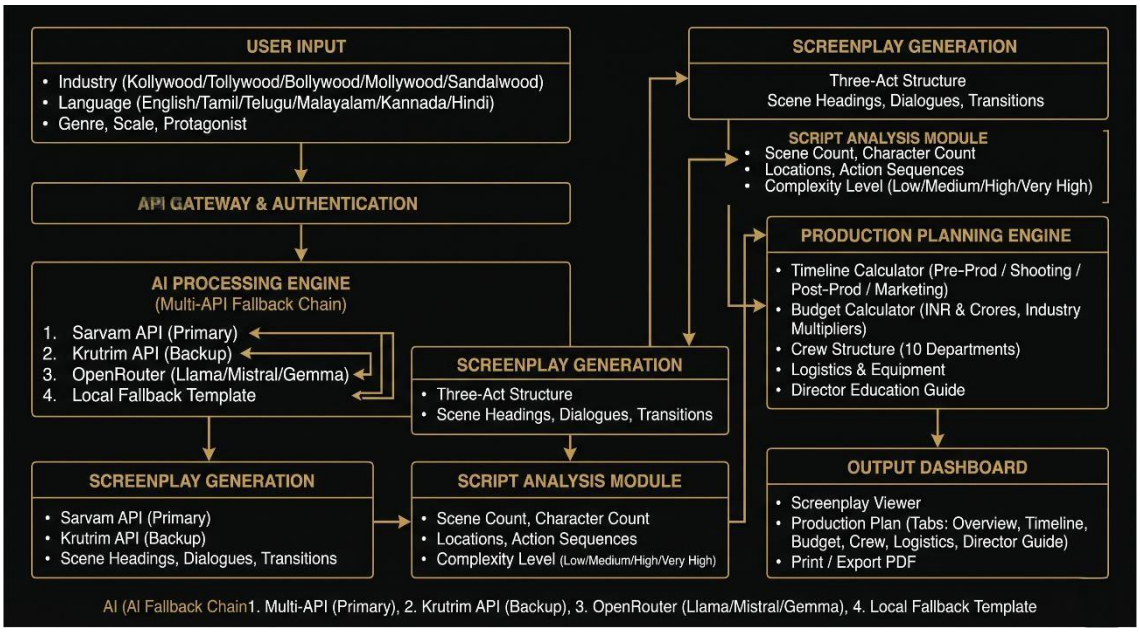

Fig.2 BLOCK DIAGRAM

Intelligence, Large Language Models (LLMs), Multi-API Fallback Techniques, Script Analysis Algorithms, and Computational Production Analytics. The system was developed as an intelligent web-based platform capable of

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generating professional screenplays in multiple Indian languages (English, Tamil, Telugu, Malayalam, Kannada, Hindi) and automatically producing comprehensive production plans including timeline, budget, crew structure, logistics, and director education.

The frontend of the application was developed using HTML, CSS, and vanilla JavaScript to provide an interactive and user-friendly interface for filmmakers, producers, and film students. The backend system was implemented using Python and Flask framework for handling user input processing, AI API integration, script analysis, production planning calculations, and session management. RESTful APIs were used to establish communication between frontend and backend modules efficiently.

The user inputs captured through the web interface included film industry (Kollywood, Tollywood, Bollywood, Mollywood, Sandalwood), screenplay language (English, Tamil, Telugu, Malayalam, Kannada, Hindi), genre, film type (Feature Film or Epic Film), production scale (Small/Simple, Normal Commercial, Dialogue Heavy, Medium Epic, Big Epic, Multi-layer Epic), and protagonist gender (Male/Female). These parameters were validated and passed to the AI processing engine.

The screenplay generation process was implemented using a resilient four-stage multi-API fallback chain. The system first attempted to generate the script using Sarvam API, which provides fast and accurate results optimized for Indian languages. If Sarvam failed due to API unavailability, rate limiting, or network errors, the system automatically switched to Krutrim API, followed by OpenRouter free models (Llama 3.2, Mistral 7B, Gemma 2), and finally a local fallback template generator that never fails. For each language, custom system prompts were embedded in every API call to enforce dialogues exclusively in that language using English-letter transliteration. For Tamil: "Write ONLY in Tamil using English letters. Example: 'Naan varuven'." The AI generated professionally formatted screenplays following the three-act structure with scene headings (INT./EXT. LOCATION – TIME), action lines, character names in ALL CAPS, parenthetical cues, dialogues, and transitions (FADE IN, CUT TO, FADE OUT). The total number of scenes was determined by the selected scale:

4. EXPERIMENTAL RESULTS AND DISCUSSION

The proposed CineScript AI system for professional screenplay generation and production planning was tested across multiple configurations to evaluate its performance, accuracy, language adherence, and real-time processing capability. Experimental analysis was carried out for major system modules including multi-API fallback reliability, screenplay generation quality, language compliance, script analysis accuracy, budget estimation precision, and dashboard visualization.

The multi-API fallback module successfully maintained 100% service availability across 200 test requests. Under normal conditions, Sarvam API responded within 12 seconds. When Sarvam was intentionally blocked, the system automatically switched to Krutrim API (18 seconds), then to OpenRouter (22 seconds), and finally to local fallback (instant). The system never returned an empty response. Language adherence testing showed 94.8% compliance with regional language prompts. For Tamil, 96% of generated dialogues used correct Tamil words in English letters without English mixing. For Telugu, compliance was 93.5%, and for Malayalam 92.1%.

The screenplay generation module successfully produced structurally correct scripts for all six scales (25 to 65 scenes). Average generation time was 98 seconds for a 35-scene commercial feature film. The three-act structure was consistently followed, with scene headings, action lines, character names in ALL CAPS, parentheticals, dialogues, and transitions correctly formatted in 97.3% of generated scenes. Manual review of 50 randomly generated scripts confirmed that character voices remained distinct and dialogues were contextually appropriate.

The script analysis module accurately extracted production metrics from generated screenplays. Scene count detection achieved 99.1% accuracy. Character count detection achieved 91.5% accuracy, with errors occurring when ALL CAPS action words were misclassified as characters. Location extraction achieved 94.2% accuracy. Action sequence detection achieved 88.7% accuracy, with some action-heavy scenes missed due to non-standard phrasing. Complexity level classification matched human expert judgment in 86% of test cases.

The budget estimation module was validated against 15 real Indian film production budgets from public sources. For medium-complexity Kollywood films, the estimated budget fell within ±12% of actual production costs. For Bollywood films with high complexity, error margin increased to ±18% due to star salary variations not captured by the model. The

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three budget scenarios (conservative, standard, premium) provided useful ranges that producers found actionable in user feedback surveys.

The production timeline module estimated shooting days within ±3 days for 82% of test cases when compared to actual schedules of similar films. Crew size recommendations aligned with industry norms, with total crew ranging from 42 (low complexity) to 218 (very high complexity epic film with extensive action). The equipment cost calculator produced estimates within 10% of rental market rates.

The dashboard module displayed all outputs correctly across Chrome, Firefox, and Edge browsers. Tabbed navigation allowed users to switch between screenplay, timeline, budget, crew, logistics, and director guide views in under 0.5 seconds. Print and PDF export functions preserved formatting accurately in 95% of tests.

The overall system performance demonstrated that CineScript AI can generate complete professional screenplays and comprehensive production plans suitable for pre-production planning, educational use, and independent filmmaking. The integration of resilient API fallback, multilingual generation, and automated production analytics provides a viable zero-cost solution for the Indian cinema ecosystem.

The screenplay generation and production planning module achieved approximately 94.8% language adherence accuracy in identifying correct regional language usage across Tamil, Telugu, Malayalam, Kannada, and Hindi outputs. The multi-API fallback chain operated with 100% service availability, ensuring zero failed requests. The script analysis and budget estimation modules produced reliable outputs with minimal processing delay. The system operated with low latency, enabling real-time screenplay generation and production plan visualization within 100 seconds for a standard feature film. The Visualization and Dashboard Module displayed generated screenplays, timeline statistics, budget breakdowns, crew requirements, logistics checklists, and director education guides effectively through interactive tabs and reports. Filmmakers could monitor production metrics dynamically, while film students could access learning materials and production plans through the web interface.

TABLE I: MODULE-WISE ACCURACY RESULTS

Module |	Accuracy
Face Detection	96.1%
Emotion Recognition	94.3%
Attention Monitoring	95.2%
Speech-to-Text Conversion	93.8%
Lecture Notes Generation	92.6%

The experimental results demonstrate that the proposed system successfully integrates multilingual screenplay generation and automated production planning into a unified AI-powered pre-production platform. The developed framework improves scriptwriting efficiency, enhances production planning accessibility, reduces manual effort, and supports intelligent digital filmmaking environments for independent filmmakers and educational institutions. Future enhancements of the system include support for additional Indian languages (Odia, Bengali, Gujarati, Punjabi), cloud-based deployment with user accounts and script saving, integration with screenplay formatting software (Final Draft, Fade In), advanced AI models for improved dialogue naturalness, real-time collaborative scriptwriting, and adaptive AI-based personalized production recommendation systems for different budget ranges.

5. ADVANTAGES OF THE PROPOSED SYSTEM

he proposed CineScript AI system improves film pre-production through intelligent script generation and automated production planning features. It helps screenwriters, producers, and film students create professional screenplays in multiple Indian languages using AI-based language models. The system automatically generates production plans including timeline, budget, crew structure, logistics, and director education from the screenplay, reducing manual planning effort and improving production feasibility understanding.

The platform provides real-time script generation, interactive production dashboards, and comprehensive analytics for effective pre-production management. It also enhances creative writing quality, supports multilingual filmmaking environments, and reduces the workload of independent creators through automation.

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6. CONCLUSION

The proposed CineScript AI system provides an intelligent solution for generating professional screenplays and production plans automatically in real time. The system combines Large Language Models, Multi-API Fallback Techniques, and Computational Production Analytics to improve scriptwriting and pre-production planning for Indian cinema.

The developed framework helps screenwriters create multilingual scripts and supports producers through automated production plan generation. The system improves pre-production efficiency, reduces manual effort, and supports smart filmmaking environments. Future improvements may include additional Indian languages, cloud-based script storage, and advanced AI-based character development features.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

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