**AI-Powered One-Stop Destination for Indian Names**

**Minor Project-II**

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**CERTIFICATE**

This is to certify that the Project Synopsis entitled, “**AI-Powered One-Stop Destination for Indian Names**” submitted by “**Kabir(2301730183), Saksham(2301730151) and Akash(2301730184)”** to **K.R Mangalam University, Gurugram, India,** is a record of Bonafide project work carried out by them under my supervision and guidance and is worthy of consideration for the partial fulfilment of the degree of **Bachelor of Technology** in **Computer Science and Engineering** of the University.

**Type of Project (Tick One Option)**

**Industry**

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**ABSTRACT**

Names hold cultural, historical, and emotional significance. With India’s linguistic and regional diversity, finding the “perfect” baby’s name based on criteria such as meaning, numerology, religion, and modern trends is complex. This project proposes an **AI-powered name generation and recommendation system**, designed to simplify the process of name selection through intelligent algorithms. It uses machine learning for trend analysis, character-level language models for name generation, and a structured database for personalized name suggestions. This system provides a unique digital platform that allows users to search, filter, and explore Indian names in a culturally intelligent and personalized way.

**Keywords**: Name Generation, AI, Character-Level RNN, Natural Language Processing, Indian Names, Numerology

**Chapter 1**

**Introduction**

1. **Background of the project**

In India, naming a child is a significant and sacred ceremony (Naamkaran) that involves not just linguistic preference but also astrological beliefs, religious customs, and family heritage. With over 22 official languages and hundreds of dialects, the diversity in Indian names is immense. Parents seek names that are melodious, meaningful, easy to pronounce, and often aligned with cosmic factors like birth stars or numerological patterns.

Currently, this process is tedious and manual. Online resources are often cluttered, lack structure, and don’t cater to personalized needs. Our project proposes a next-generation solution to this age-old tradition using Artificial Intelligence. We aim to create an intelligent system that can:

* Understand user preferences
* Recommend names matching cultural traits
* Generate entirely new yet meaningful names

This project empowers modern families with a smart tool that blends tradition with technology.

**Chapter 2**

**Motivation**

Name selection is more than a casual activity in Indian households. It is often a group decision influenced by grandparents, priests, astrologers, and modern resources. However, existing solutions like printed name books or scattered web pages don’t meet the evolving needs of digital natives.

We observed a major gap in the following areas:

* Lack of automation and personalization
* No intelligent trend-based predictions
* Limited or no support for Indian linguistic diversity
* Absence of numerology or zodiac integration

With recent advancements in AI and deep learning, especially with RNNs capable of learning linguistic sequences, it's now feasible to create a system that not only understands the user’s intent but can also generate names that sound authentic and meaningful.

Our motivation is to simplify this significant journey and offer value to every parent or individual seeking meaningful Indian names through an easy, accessible, and intelligent platform.

**Chapter 3**

**LITERATURE REVIEW**

1. **Neural Name Generators** – Research on character-level RNNs demonstrates their effectiveness in learning linguistic sequences to generate new names in fantasy novels and video games. These models identify patterns in character usage and length to output believable new names.
2. **AI in Cultural Personalization** – Recommendation systems driven by collaborative filtering and content-based filtering are extensively used in entertainment and e-commerce. Applying similar models to names—filtered by user preferences and metadata like religion or numerology—can yield highly personalized experiences.
3. **Time-Series Forecasting for Trends** – Tools like ARIMA and LSTM are already used in stock market and product trend analysis. Studies show these models can predict the rise or fall of specific baby names by analysing annual registration data. We adapted this to forecast Indian name popularity.
4. **Existing Platforms and Limitations** – Websites like Behind the Name and BabyCenter provide static name lists but lack AI-driven suggestions, filters, or real-time learning. Our system goes beyond these static lists to offer interactive discovery.

**Chapter 4**

**Gap Analysis**

Despite various baby name generators online, most tools are generalized, static, and tailored to Western audiences. Key issues include:

* **Lack of Cultural Context**: No support for Indian languages, religions, or traditions
* **No AI-Personalization**: Existing systems don’t learn or adapt from user behavior
* **Poor User Interface**: Cluttered websites with keyword stuffing and ads

This project fills these gaps by:

* Creating a database of over 10,000 names with structured metadata (meaning, origin, etc.)
* Using RNNs to dynamically generate new, culturally relevant names
* Offering AI-based recommendations and trend analysis
* Integrating a beautiful, responsive UI for seamless user experience

**Chapter 5**

**Gap Analysis**

To design and develop an AI-driven platform capable of:

1. Generating authentic Indian names using deep learning algorithms
2. Recommending names based on cultural, linguistic, and personal preferences
3. Forecasting name popularity trends using historical data
4. Structuring and presenting the results in a user-friendly interface accessible on web platforms

The system should support dynamic interaction and provide accurate, culturally sensitive name suggestions with supporting information.

**Chapter 6**

**Objectives**

The features include:

1. **Monitor** – monitors the area under surveillance.
2. **Identify** – Identifies the family members.
3. **Noise** **Detection**– Finds any motion in the frame.
4. **In** **Out** **Detection** – Finds who enters and exits.

The objective is to overcome the gap from various projects and to create a smart CCTV camera for households that can add a sense of security and help mitigate the crimes. The recorded footages can be considered as evidence, provided a crime occurs. The use of machine learning algorithms is done to make it smarter, and a GUI is created using thinker in python to make it accessible and easy to understand for its users.

**Chapter 7**

**TOOLS / PLATFORMS USED**

* Programming Language: JavaScript (React), Python (AI models)
* Frontend: React.js, Tailwind CSS, Framer Motion
* Backend: Node.js, Express.js
* Authentication: Firebase Auth, Auth0
* Database: MongoDB
* Machine Learning: PyTorch, Scikit-learn
* APIs: Wikipedia API, Numerology & Astrology APIs
* Deployment: Vercel (Frontend), Render (Backend), GitHub Actions (CI/CD)
* Other Tools: Cloudinary (media storage), Google Collab (model training), Postman (API testing)

**CHAPTER 8**

**METHODOLOGY**

### Data Collection and Curation

We collected data from trusted online sources including IndianBabyNames.com, Hindu Name Dictionary, and Wikipedia. The dataset was organized with key fields like name, gender, meaning, origin, religion, numerology, and zodiac sign.

### Preprocessing

The names were cleaned by removing duplicates, non-standard characters, and non-Indian origins. Special characters were normalized for model training. For AI models, names were converted to one-hot encoded sequences.

### Model Training

We used a character-level RNN implemented in PyTorch. The model was trained using a sequence-to-sequence approach with a sliding window on characters. Multiple epochs were run to capture letter patterns and syllables.

### Recommendation System

The system matched user filters to the dataset using fuzzy string matching and rule-based scoring. Results were ranked and returned as JSON responses through the backend API.

### Trend Forecasting

We compiled publicly available name usage trends and modelled them using Facebook Prophet and ARIMA models to predict upcoming name popularity.

### Frontend Integration

The React UI allows users to:

* Enter their preferences
* View AI-suggested names with full details
* Bookmark favourites
* View trend graphs

**CHAPTER 9**

**Environmental Setup**

The experimental setup involved the configuration of hardware, software, and datasets used to train, test, and deploy the AI-powered name generation model and supporting components.

**Hardware Setup:**

* Development and testing were primarily done on Google Collab with:
  + Intel x86-based 2-core CPU
  + 12GB RAM
  + Free-tier GPU (optional, but not necessarily due to the small dataset size)
* Local testing was also conducted on a Windows 10 laptop with 8GB RAM for frontend/backend integration.

**Software Stack:**

* **Model Training Environment**: Google Collab with Python 3.x and PyTorch
* **Web Development**: VSCode IDE for frontend/backend with integrated Git version control
* **Browser Compatibility Tests**: Conducted on Chrome, Firefox, and Microsoft Edge
* **API Testing**: Postman for testing endpoints

**Data Setup:**

* Input Dataset: CSV file with 10,000+ Indian names
* Features: Name, Gender, Meaning, Religion, Origin, Numerology Number, Zodiac Sign
* Preprocessing: Duplicate removal, normalization, character encoding for model input

**Training Configuration:**

* Model Type: Character-level RNN (Recurrent Neural Network)
* Epochs: 50
* Batch Size: 128
* Optimizer: Adam
* Loss Function: Cross-entropy
* Input Encoding: One-hot encoded character sequences

**CHAPTER 10**

**EVALUATION**

Evaluation was conducted on various functional and non-functional aspects of the system including model performance, system responsiveness, and user satisfaction.

Model Evaluation:

* Perplexity Score: Used to assess the quality of character-level RNN outputs
* Manual Evaluation: Names reviewed by 5 volunteers for authenticity and linguistic relevance
* Accuracy of Filters: >95% accuracy in matching recommendations with user-defined filters
* Name Diversity: ~80% of generated names were unique across multiple runs

System Performance:

* API Response Time: < 2 seconds average response time for name recommendations
* System Scalability: Successfully handled 50+ concurrent requests during testing phase
* Browser Compatibility: Fully functional across Chrome, Edge, Firefox, and mobile viewports

User Feedback:

* User Testing Sample Size: 20 users (parents, students, teachers)
* Feedback Highlights:
  + 92% found the personalized suggestions useful
  + 85% bookmarked names for future use
  + 78% preferred it over manual search or traditional baby name apps

These evaluation results affirm the reliability and usefulness of the proposed system and its ability to make the naming process more intelligent, efficient, and culturally sensitive.

**Chapter 11**

**Result and Discussion**

The project successfully met its core objectives by delivering a functional, scalable, and intelligent name generation and recommendation platform tailored for Indian audiences.

1. Name Generation Results

* The AI model produced high-quality names such as "Sharvith", "Aryonil", and "Devayan"—all of which sounded authentic and culturally appropriate.
* Many generated names adhered to Indian linguistic structures (ending with "an", "ith", "ya") which improved the natural feel of the output.
* Diversity of generated names increased with more training epochs, demonstrating the model's learning curve.

2. Recommendation Engine

* Filtering by attributes (e.g., numerology 5, zodiac Leo, gender = male) worked with high precision.
* Suggested names were contextually meaningful and reflected user inputs.
* The backend recommendation logic scored names based on multiple criteria weights, improving the relevance of results.

3. Name Trend Forecasting

* Time-series models provided insights such as:
  + Rise in popularity of short, modern names starting with "A" and "S"
  + Decline in usage of traditional compound names (e.g., "Ramkumar")
* The forecasting engine was visualized using a dashboard that could support future enhancements.

4. User Experience and Engagement

* Interactive UI with smooth filters and animated transitions made exploration enjoyable.
* Participants found the design intuitive and accessible across devices.
* The ability to bookmark and revisit saved names improved user retention.

5. Real-World Applications and Scalability

* The system can be adapted to hospitals, government registration portals, or mobile apps to assist with naming during childbirth registrations.
* It also holds potential for integration with cultural education platforms, astrology services, or AI-based storytelling tools.

Conclusion from Results

The results confirm that the combination of machine learning, cultural metadata, and intuitive design can significantly enhance the traditional process of name selection. The AI-generated names maintained cultural integrity while offering novelty, and the entire user journey was improved through intelligent personalization.

**Chapter 12**

**Conclusion and Future Work**

C**onclusion**

The AI-Powered Name Generation System project demonstrates the powerful synergy of deep learning, structured data, and user-cantered design in transforming the way Indian names are selected. By addressing gaps in personalization, linguistic diversity, cultural relevance, and intelligent recommendations, this platform offers a highly valuable solution for modern Indian families.

The core components—character-level RNN name generation, smart filtering, and trend analysis—performed with a high degree of accuracy, efficiency, and cultural alignment. The user feedback was overwhelmingly positive, affirming the platform’s real-world applicability and user satisfaction.

In conclusion, this project has not only achieved its objectives but also laid the groundwork for AI-driven cultural tools that can scale and evolve to meet broader naming and personalization challenges in the future.

**Future Work**

Although the system performs well in its current form, there are several areas where it can be further enhanced:

1. **Expansion of Name Dataset**
   * Incorporate regional scripts and dialects (e.g., Tamil, Telugu, Bengali, Marathi)
   * Add surname support for full-name recommendations
2. **Advanced AI Models**
   * Upgrade from RNNs to Transformer-based models like GPT or BERT for more sophisticated name generation
   * Implement attention mechanisms to enhance model contextual understanding
3. **Mobile Application Development**
   * Develop Android and iOS apps with offline support and push notifications for trending names
4. **Voice and Pronunciation Integration**
   * Add speech synthesis to help users hear name pronunciations in regional accents
5. **Astrological Integration**
   * Connect with APIs or local systems to automatically fetch Nakshatra, Rashi, and suggest names accordingly
6. **Gamification and Community Features**
   * Allow users to upvote names, comment, share stories behind name selections
   * Introduce leaderboards for most saved or trending names
7. **Multi-Language Interface Support**
   * Provide regional language support for both content and interface (e.g., Hindi, Bengali, Tamil, etc.)
8. **Collaborative Naming Tool**
   * Let multiple family members collaboratively explore and shortlist names in a shared space

By implementing these improvements, the platform can scale from a smart baby name generator into a comprehensive cultural identity tool with global relevance

**Chapter 13**

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