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Startsahay: An Ai Based Startup Scheme Recommender and Pitch Deck Generator

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Abstract - The rapid growth of artificial intelligence (AI) has created new opportunities for supporting entrepreneurs in identifying suitable government schemes and preparing effective startup proposals. However, entrepreneurs often face difficulties in finding relevant schemes due to the large number of schemes, complex eligibility criteria, and lack of personalized guidance. At the same time, preparing a professional pitch deck and business plan requires significant time, business knowledge, and proper structuring. This review paper presents an AI-Based Startup Scheme Recommendation and Pitch Deck Generator, an integrated platform designed to address these challenges using artificial intelligence, natural language processing (NLP), recommendation techniques, and generative AI. The proposed system analyzes user-provided information such as startup domain, business stage, location, financial requirements, and eligibility-related details to identify and recommend relevant government and private schemes. In addition, the system uses generative AI to assist users in creating structured pitch decks and business plans based on their startup information. The review examines existing research on AI-based recommendation systems, public-service recommenders, pitch deck analysis, generative AI, and automated business planning, while identifying limitations such as lack of personalization, explainability, real-time scheme integration, and domain-specific pitch generation. The study highlight how combining recommendation systems and generative AI is beneficial.

***Keywords*:** Artificial Intelligence, Government Startup Schemes, Scheme Recommendation, Eligibility Matching, Recommendation System, Machine Learning, NLP, Startup Support, Personalized Recommendation, MongoDB, MERN Stack.

1.INTRODUCTION:

The growth of startups and entrepreneurship has increased the demand for financial assistance, government support, business guidance, and professional documentation. Governments and private organizations provide various schemes, subsidies, loans, grants, incubation programs, and other support services for startups. However, entrepreneurs often face difficulty in identifying the schemes that are relevant to their business because information is distributed across multiple platforms and each scheme may have different eligibility criteria, documentation requirements, and application procedures. Similarly, preparing a professional pitch deck and business plan requires knowledge of business planning, market analysis, financial planning, and effective presentation. These challenges create a need for an intelligent system that can provide personalized scheme recommendations and assist in generating startup documents.

1.1 Need of the System:

The proposed system is needed to simplify the process of finding suitable startup schemes and preparing business documents. Traditional scheme-search methods generally require users to manually search through multiple government and private websites and compare eligibility requirements. This can be time-consuming and may result in users missing schemes for which they are eligible.

An AI-based recommendation system can analyze user information such as startup type, business sector, location, business stage, investment requirements, annual income, and other eligibility-related parameters and identify potentially relevant schemes. Furthermore, a pitch deck generator can reduce the effort required to create structured startup presentations by generating content based on the user's business idea.

Therefore, the system aims to provide a single platform for personalized scheme discovery and AI-assisted startup documentation.

1.2 Use of the System:

The system can be useful for:

- Startup founders to discover relevant government and private schemes.
- Entrepreneurs to understand scheme eligibility and requirements.
- Students and early-stage innovators to explore financial and incubation opportunities.

- Small businesses to identify available support programs.
- Business consultants and incubators to assist entrepreneurs in finding suitable schemes.
- Startup applicants to generate structured pitch decks and business plans.

The AI component can reduce manual searching and provide recommendations based on the user's requirements. Generative AI can additionally assist in producing sections such as the problem statement, proposed solution, market opportunity, business model, competitive advantage, financial requirements, and future plans.

1.3. Overview of the Design:

The proposed system consists of the following major components:

- User Interface: Users enter their startup details and requirements through a web interface.
- User Profile Module: Collects information such as business sector, location, startup stage, and funding requirements.
- Scheme Database: Stores government scheme details, eligibility criteria, benefits, funding, and application information.
- AI Recommendation Module: Matches user requirements with scheme eligibility using NLP, rule-based matching, and recommendation techniques.
- Recommendation Module: Displays relevant schemes along with eligibility, benefits, and application details.
- Pitch Deck Module: Uses Generative AI to generate structured pitch-deck content based on startup information.
- Business Plan Module: Assists in generating important business-plan sections such as market analysis, business model, and financial requirements.
- Output Module: Presents recommended schemes and generated documents to the user.

1.4 Functional Design:

The functional design describes the main operations performed by the system.

- User Registration and Login: Users can register, log in, and manage their startup profiles.
- Startup Information Collection: The system collects details such as business sector, startup stage, location, business idea, and funding requirements.
- Requirement Analysis: User information is analyzed to identify relevant startup requirements and eligibility parameters.
- Scheme Recommendation: The system matches user requirements with scheme eligibility criteria and recommends relevant government schemes.
- Scheme Information: Recommended schemes are displayed with eligibility, benefits, funding details, required documents, and application information.
- Pitch Deck Generation: Generative AI can create structured pitch-deck content based on startup information.
- Business Plan Generation: The system can assist in generating important business-plan sections.
- Content Editing: Users can review and modify generated content.
- Document Generation: Pitch decks and business plans can be prepared in a structured format.
- Admin Management: Administrators can add, update, and remove scheme information from the database.

2. LITERATURE REVIEW:

Recent advancements in artificial intelligence have transformed recommender systems, entrepreneurship automation, and generative modeling.

2.1 Government Scheme & Public Service Recommendation Systems:

Providing personalized, accessible public service recommendations requires moving beyond basic demographic filtering toward context-aware and explainable models. Deshmukh. introduced *KALPAVRIKSHA* [1], leveraging Knowledge Graph Enhanced Graph Neural Networks (KEGNN) combined with voice interfaces to provide multilingual access to welfare schemes. Similarly, [3]. utilized Natural Language Processing (NLP) and clustering algorithms for user profiling to match eligibility criteria efficiently.

To improve interpretability, [4]. proposed a Neuro-Symbolic AI framework combining Large Language Models (LLMs) with Knowledge Graphs and SHACL rules, ensuring explainable recommendations for public services. On the behavioral side, [2] demonstrated through empirical simulation ($N = 46$) that AI-driven recommendation engines significantly enhance user engagement and decision likelihood.

Table.1: description for Government and private scheme recommendation

Author/ Publish Year	**Application/ Objective**	**Main Technique**	**Major Contribution**	**Limitation / Gap**
Deshmukh et al. (2026)	Personalized government and private scheme recommendation	Knowledge Graph + GNN + voice interface	Personalized and multilingual scheme access	complex architecture; startup-specific recommendation is not the primary focus
Rajpoot et al. (2025)	Government scheme recommendation	NLP + Clustering	Groups users and matches them with schemes	Limited explanation and integration with startup documentation

A recommendation function can be represented as:

$$R(u, s) = f(\text{Profile } u, \text{Features } s, \text{Eligibility } u, s)$$

2.2 Pitch Deck & Business Plan Generation:

AI applications in entrepreneurship have progressed from simple template generation to intelligent pitch analysis and business planning. [5]. developed *Startup Sphere*, utilizing

hybrid recommendation models (content-based and collaborative filtering) over a full-stack MERN architecture to connect startups with suitable investors. To evaluate existing proposals,[8]. implemented multi-phase LLM analysis using Gemini-1.0 Pro and Zephyr-7B to automate pitch deck screening and extract critical financial metrics for investors.

In educational and strategic contexts, [6]. integrated AI adaptive learning with Blockchain and the Business Model Canvas (BMC) under the ADDIE instructional framework to improve student startup readiness. Addressing sustainability, [7]. introduced a human-AI collaborative framework employing LLMs and the Dilemma Triangle Method (DTM) to align business plan development with UN Sustainable Development Goals (SDGs).

The pitch can be represented as:

$$\text{Pitch} = f(\text{StartupProfile}, \text{IdentifiedScheme})$$

Table.2: description for pitch deck & business plan generation

Author/ Publish Year	**Application / Objective**	**Main Technology**	**Major Contribution**	**Limitation**
Bora et al. (2026)	Startup-investor connection	Content-based + Collaborative Filtering+ MERN	Startup-investor matching	Focuses on investor matching rather than government scheme eligibility
Chauhan et al. (2024)	Pitch deck analysis	Multi-phase LLM using Gemini and Zephyr	Pitch deck screening and financial information extraction	Focuses on evaluating existing decks rather than generating complete decks

2.3 Generative AI & LLM Model Enhancements:

The underlying drivers of these domains rely on advancements in prompt engineering, fine-tuning, and model reliability. [9]. conducted a mixed-methods study on system prompts, emphasizing user-centered taxonomy design to foster transparency and user control. For complex structure generation, [10]. demonstrated the efficacy of *CrysText*, combining LLaMA-3.1-8B and Mistral-7B models fine-tuned with Group Relative Policy Optimization (GRPO) to generate valid domain-specific structures with reduced generation errors.

Table.3: description for generative AI & LLM model enhancement

Author/ Publish Year	**Application / Objective**	**Main Technology**	**Major Contribution**	**Limitation**
Neumann et al. (2026)	User interaction with generative AI	System prompts and user-Centered taxonomy	Supports user control and transparent AI interaction	Does not specifically address startup documentation
Mohanty et al. (2025)	Structured domain-specific generation	LLaMA-3.1, Mistral-7B and GRPO	Demonstrates structured generation using fine-tuned LLMs	Domain is different from entrepreneurship and scheme recommendation

2.4 Comparative Analysis and Proposed Methodology:

The existing literature uses different approaches for government scheme recommendation and AI-based pitch deck generation. Table 1 compares these methodologies with the proposed approach.

Table.4: combine analysis of features

Area/ Author	**Existing Methodology**	**Key Techniques**	**Proposed Methodology**
Scheme Recommendation/ Bora et al. (2026)	Hybrid Recommendation	Content-Based + Collaborative Filtering	Rule-Based Eligibility + Content-Based Matching
Scheme Recommendation/ Deshmukh et al. (2026)	KEGNN	Knowledge Graph + GNN	Attribute-Based Matching + Weighted Scoring
Scheme Recommendation/ Loannis et al. (2025)	Neuro-Symbolic AI	LLM + Knowledge Graph + RDF + SHACL	Rule Engine + LLM Explanation

Scheme Recommen-dation/ Rajpoot et al. (2025)	NLP + Clustering	NLP + Clustering	NLP/LLM + Eligibility Rules
Pitch Deck Generation / Chauhan et al. (2024)	Multi-Phase LLM	Gemini + Zephyr	LLM + Prompt Engineering
Pitch Deck Generation/ Ashtari et al. (2025)	Human-AI Collabo-ration	LLM + DTM	User Input + LLM + User Editing
Pitch Deck Generation/ Basri et al. (2026)	AI + ADDIE	Adaptive Learning + ADDIE	Prompt-Based LLM + Slide Generation
Generative AI & LLM Model/ Neumann et al. (2026)	Human-AI interaction, Prompt Engineering	LLM + Prompt Engineering	User-Centered Design + Mixed-Method Analysis
Generative AI & LLM Model/ Mohanty et al. (2025)	Text-to-Crystal Generation + CIF Generation + Crystal Structure Prediction	LLM + Fine - Turning + Reinforcement learning	Supervised Fine-Tuning + GRPO-based RL

3. PROPOSED APPROACH:

Based on the analysis of existing government scheme recommendation, eligibility matching, generative AI, and pitch-generation methodologies, an integrated AI-based approach is proposed for supporting startups in identifying suitable government schemes and preparing business documents.

1.Startup Profile and Input:
The system collects relevant startup information such as business idea, business type, sector, startup stage, location, funding requirement, and other required details. This information forms the basis for subsequent eligibility analysis and recommendation

2.Startup Feature Extraction and Analysis:
The collected information is processed to identify important startup characteristics and requirements. NLP and AI techniques can be used to extract relevant features from the startup idea and user-provided information.

3. Eligibility Checking and Scheme Matching:
The extracted startup features are compared with the eligibility conditions of available government schemes. Rule-based eligibility checking is combined with AI-based matching to identify schemes that satisfy the startup's requirements.

4. Government Scheme Recommendation:
Based on eligibility and matching results, the system recommends suitable government schemes. The recommendation output provides information such as scheme benefits, funding or support, eligibility conditions, required documents, and application-related information.

5. Startup Idea Validation and Business Model Generation:
After scheme recommendation, the startup idea is analyzed using AI. The system generates a Business Model Canvas and provides suggestions related to the business model, helping the user refine the proposed startup.

6. Pitch Deck and Financial Projection Generation:
Using the startup information, validated business idea, and generated business model, the system generates an investor-ready pitch deck. The proposed approach also includes generation of relevant financial projections and supporting business information.

7. User Customization and Document Generation:
The generated content can be reviewed and customized by the user. The final Business Model Canvas, pitch deck, financial information, and other relevant reports are compiled into downloadable documents.

4. FUTURE RESEARCH DIRECTIONS:

- Conversational eligibility assessment with follow-up questions to collect required profile details.
- Multilingual support for entrepreneurs to interact in their preferred Indian regional language.
- Schema-based representation of knowledge graphs capturing relationships between enterprises, industries, schemes, ministries, locations, and support types.
- Monitoring of schemes to track changes in official websites.
- Analysis of application-readiness to collect missing documents and prepare for submission.
- Generation of scheme-specific documents such as concept notes, executive summaries, project proposals, and business plans.
- Recommendation based on user feedback to improve rankings.

5. DISCUSSION:

The literature shows that AI can improve government scheme recommendation and provide useful support to entrepreneurs. Existing systems mainly focus on scheme recommendation or business planning separately. The proposed approach combines eligibility checking, AI-based scheme recommendation, and pitch deck generation in one platform. A hybrid approach using rules and AI can improve recommendation relevance and reliability. However, accurate scheme data and validation of AI-generated content are important for effective results.

5. CONCLUSION:

The proposed AI-based system provides an integrated platform for government scheme recommendation and startup pitch deck generation. By combining eligibility rules, AI-based matching,

and Generative AI, the system can help startup founders identify suitable schemes and prepare structured pitch decks. Future improvements can include real-time scheme updates, multilingual support, document verification, and integration with official government APIs.

REFERENCES:

1. V. Deshmukh, M. Deshmukh, S. Tathe, P. Wankhade, and M. F. I. Khandwani, "KALPAVRIKSHA: AI-Powered Personalized Government & Private Schemes Recommender System," 2026 International Conference on AI Applications, 2026.
2. A. A. Mahmood, "Evaluating the impact of AI-based recommendation engines on customer behavior and business profitability," Pacific Journal of Business Innovation and Strategy, vol. 3, no. 1, pp. 14–28, 2026, doi: 10.70818/pjbis.v03i01.0141.
3. M. Rajpoot, A. Thakur, and S. Kumar, "Government Schemes AI Recommendation System," 2025 International Conference on Artificial Intelligence, 2025.
4. Konstantinidis, I. Magnisalis, and V. Peristeras, "A framework for a public service recommender system based on neuro-symbolic AI," Applied Sciences, vol. 15, no. 20, Art. no. 11235, 2025, doi: 10.3390/app152011235.
5. G. Bora, M. Ghildiyal, and D. Chopra, "Startup Sphere: An AI-Powered Web Platform for Connecting Startups and Investors Using the MERN Stack," 2026 International Conference on Software Engineering, 2026.
6. Basri, T. Isnaini, S. Achmady, H. Nadhira, and M. Iqbal, "AI and Blockchain Integration in Entrepreneurship-Based Coding Education: Advancing Student Startup Readiness in the Digital Era," Education and Information Technologies, 2026.
7. S. Ashtari, S. Mandegari, A. K. Das, J. K. Allen, and F. Mistree, "Human-AI Collaboration for Social Entrepreneurs: AI-Driven Business Plan Evolution Aligned with SDGs," *2025 International Conference on Artificial Intelligence*, 2025.
8. A. S. Chauhan, A. Sharma, and H. Bhatia, "An Automatic Pitch Deck Analyzer," 2024 IEEE Conference, 2024.
9. A. Neumann, Y. Pi, and J. Singh, "Who Controls the Conversation? User Perspectives on Generative AI (LLM) System Prompts," in Proc. CHI Conf. Human Factors in Computing Systems (CHI '26), Barcelona, Spain, Apr. 2026, doi: 10.1145/3772318.3791726.
10. T. Mohanty et al., "Crys Text: A Generative AI Approach for Text-Conditioned Crystal Structure Generation Using LLM," Chem Rxiv, Nov. 2025. doi: 10.26434/chemrxiv-2024-gjhpq-v2.
11. A. Parvez, S. Meshram, S. Taksande, O. Punewar, and R. Badukale, "SchemeSarthi: Unified Government Scheme Information and Review Portal," International Journal of Scientific Research in Engineering and Management (IJSREM), vol. 10, no. 3, pp. 1–9, Mar. 2026, doi: 10.55041/IJSREM57818.
12. M. Uddin, S. U. Arfeen, F. Alanazi, S. Hussain, T. Mazhar, and M. A. Rahman, "A Critical Analysis of Generative AI: Challenges, Opportunities, and Future Research Directions," Archives of Computational Methods in Engineering, vol. 33, pp. 1763–1793, 2026.
13. R. Singh, S. Khan, A. Joshi, K. Raghuveer, and V. Kumar, "Exploring the Role of Artificial Intelligence on Business Innovation and Entrepreneurship," Journal of Innovation and Entrepreneurship, 2025
14. C. A. Guzmán Solano, C. Aguilar Cruz, and I. Arroyo-Fernández, "Effective Pitch Decks through User-Centered Prompts for Generative AI," Proc. International Conference on Human-Computer Interaction, 2024.
15. C. Jeong, "A Study on the Implementation of Generative AI Services Using an Enterprise Data-Based LLM Application Architecture," Journal of Information Processing Systems, 2024.
16. H. Touvron et al., "LLaMA: Open and Efficient Foundation Language Models," arXiv:2302.13971, 2023.
17. H. Touvron et al., "Llama 2: Open Foundation and Fine-Tuned Chat Models," arXiv:2307.09288, 2023.
18. J. Wei et al., "Chain-of-Thought Prompting Elicits Reasoning in Large Language Models," in Advances in Neural Information Processing Systems (NeurIPS), 2022.
19. P. Lewis et al., "Retrieval-Augmented Generation for Knowledge-Intensive NLP Tasks," in Advances in Neural Information Processing Systems (NeurIPS), vol. 33, 2020.
20. T. Brown et al., "Language Models are Few-Shot Learners," in Advances in Neural Information Processing Systems (NeurIPS), vol. 33, pp. 1877–1901, 2020.
21. J. Devlin, M. W. Chang, K. Lee, and K. Toutanova, "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding," in Proc. NAACL-HLT, Minneapolis, MN, USA, pp. 4171–4186, 2019

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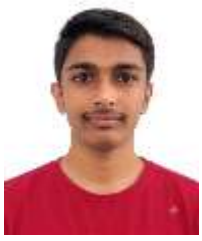
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