International Research Journal on Advanced Engineering and Management
https://goldncloudpublications.com
https://doi.org/10.47392/IRJAEM.2026.0324
e ISSN: 2584-2854
Volume: 04 Issue: 05
May 2026
Page No: 2249 - 2253

AI Powered Patent Intelligence and IPR Assistance System for Legal Compliance and Entrepreneurial Support

Sagar E L[1], Neha T N[2], Arpita[3], Chitra B T[4]
[1,2,3]UG Scholar, Dept. of CSE-CY, RV College Of Engineering., Bangalore, Karnataka, India
[4]Assistant professor, Dept. of IEM, RV College Of Engineering, Bangalore, Karnataka, India
Emails: *sagarel.cy24@rvce.edu.in[1], nehatn.cy24@rvce.edu.in[2], arpita.cy24@rvce.edu.in[3], chitrabt@rvce.edu.in [4]*

Abstract
In today's rapidly evolving innovation environment, students, developers, and growing startups often encounter significant difficulties in protecting and commercializing their ideas due to inadequate awareness of intellectual property frameworks, complicated patent procedures, and restricted access to government support services. This research proposes an Artificial Intelligence-based Patent Intelligence and Intellectual Property Guidance System designed to tackle with this gap by offering a comprehensive and integrated platform for refining raw ideas into legally secured and commercially viable assets. The proposed system utilizes advanced Natural Language Processing and ML techniques to assess user-submitted ideas and evaluate semantic similarity analysis against existing available patent databases, allowing users to identify prior art and obtain relevant patent recommendations. Furthermore, the system integrates a Legal Risk and Compliance Checker that determines patent eligibility based on defined legal provisions, identifying constraints such as non-patentable subject matter, novelty concerns, and potential legal conflicts, thereby improving the chances of successful patent approval. In addition, an intelligent Government Scheme Auto-Matching Engine is incorporated to link innovations with appropriate support programs by analyzing eligibility criteria, funding opportunities, and application procedures, thereby improving entrepreneurial accessibility. The platform also enables automated generation of essential patent documentation, including abstracts and claims, significantly reducing procedural effort and time consumption. The results indicate improved efficiency in idea evaluation, enhanced awareness of legal compliance, and improved accessibility to innovation support frameworks. This study shows that integrating patent intelligence, legal validation, and entrepreneurial support into a unified framework can significantly enhance innovation management practices, facilitate informed decision-making, and promote to the development of a more robust, legally compliant, and innovation-driven ecosystem.

Keywords: *Artificial intelligence; Intellectual property rights; Machine learning; Natural language processing; Patent intelligence; Innovation management; Legal compliance; Startup environment*

1. Introduction
The rapid evolution of artificial intelligence and digital technologies have significantly reshaped the innovation landscape, creating both prospects and limitations for inventors, startups, and developers. Intellectual Property Rights (IPR) serve as a crucial mechanism for protecting creative and technological innovations, enabling creators to derive economic value from their work. However, managing the complex legal and procedural landscape of patent systems remains a formidable challenge, especially for students and early-stage entrepreneurs who lack domain expertise. The intersection of AI and IPR has emerged as a pressing area of concern globally. Existing legal frameworks were initially designed for

International Research Journal on Advanced Engineering and Management
https://goldncloudpublications.com
https://doi.org/10.47392/IRJAEM.2026.0324
e ISSN: 2584-2854
Volume: 04 Issue: 05
May 2026
Page No: 2249 - 2253

human-driven innovation and are increasingly inadequate in addressing AI-assisted inventions and automated content generation. In the Indian context, provisions such as Section 3(k) of the Indian Patents Act impose specific restrictions, while the absence of AI-specific IP legislation creates further ambiguity. At the international level, harmonized global frameworks remain underdeveloped despite growing recognition of these gaps. Questions of authorship, ownership, and legal recognition of AI-generated works further complicate existing copyright and patent systems. In the area of patent processing, AI has shown great promising potential through transformer-based analysis, automated summarization[1], and lifecycle management tools. Despite this, a significant portion of innovators remain unaware of government-backed support mechanisms like Startup India and MSME schemes, and procedural complexity in patent filing continues to discourage innovation. Existing tools address these challenges in isolation, but no unified system integrates patent intelligence, legal compliance, and entrepreneurial support into a single framework — representing a critical unmet need. This paper proposes an AI-powered Patent Intelligence and IPR Assistance System integrating NLP and machine learning for semantic patent analysis, legal compliance checking, government scheme matching, and automated patent document generation, tailored to the Indian innovation ecosystem.

1.1. Problem Statement

Many students, developers, and startups grapples with difficulties in protecting and commercializing their innovations due to insufficient knowledge of patent procedures, regulatory requirements, and available support mechanisms. Additionally, the shortage of integrated tools for patent analysis, legal validation, and scheme identification makes the innovation process complex and inefficient.

1.2.Objectives

The aim of this study is to develop an AI-based system that enables users to evaluate, improve, and secure their ideas through patent analysis and regulatory compliance assistance. It also aims to streamline the patenting process and enhance accessibility to government initiatives for innovation and commercialization.Shown as Figure 2.1. Flowchart[2].

1.3.Methodology

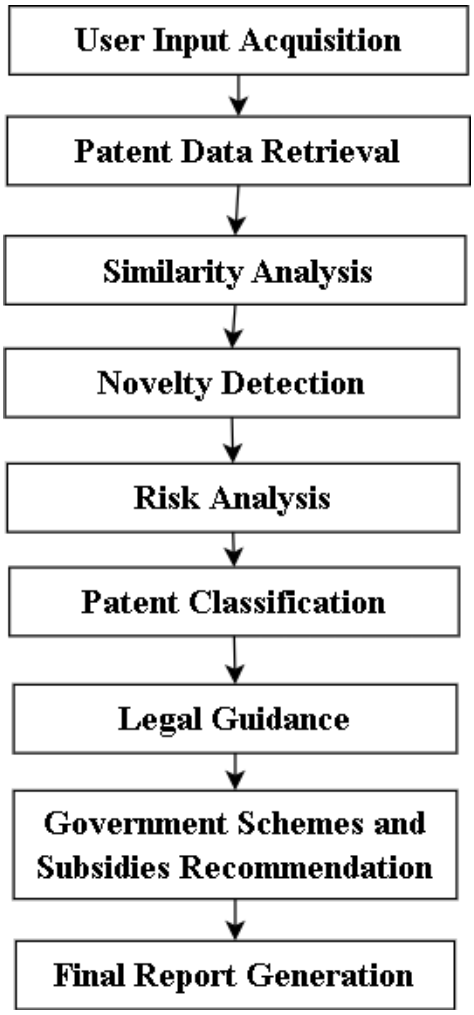

Figure 2.1. Flowchart

1.4.Stage 1: User Input Acquisition

The methodology starts with the User Input phase, where the innovator submits a detailed textual description[3] of the proposed idea using the system interface. This stage is essential for capturing adequate technical and contextual information, which functions as the core input for further subsequent processing steps[4].

1.5.Stage 2: Patent Data Retrieval

In the subsequent stage, the system carries out Patent Data Retrieval by utilizing a locally stored repository of patent documents derived from publicly available sources. Relevant patent documents are filtered and

International Research Journal on Advanced Engineering and Management
https://goldncloudpublications.com
https://doi.org/10.47392/IRJAEM.2026.0324
e ISSN: 2584-2854
Volume: 04 Issue: 05
May 2026
Page No: 2249 - 2253

processed for analysis based on the keywords and contextual information derived from the user input[5].

1.6.Stage 3: Similarity Analysis

The retrieved patent data is subsequently analyzed in the Similarity Analysis stage, where NLP techniques are employed to analyze and compare the user-submitted idea with existing patents. Semantic matching and keyword-based association techniques are applied to identify similarities and discover related inventions[6].

1.7.Stage 4: Novelty Detection

Following similarity analysis, the Novelty Detection phase assesses the uniqueness of the proposed idea. This phase evaluates whether the innovation exhibits adequate originality by evaluating similarities with prior art and identifying distinctive characteristics[7].

1.8.Stage 5: Risk Analysis

The Risk Analyzer stage identifies and evaluates potential risks concerning with the innovation, particularly addressing patent conflicts and legal challenges. This entails identifying areas where the idea may be subject to rejection due to similarity, absence of novelty, or other constraints[8].

1.9.Stage 6: Patent Classification

In this stage, the system classifies innovation into applicable patent domains by leveraging classification techniques[9]. This facilitates organizing the idea within standardized patent categories, enabling better understanding and documentation.

1.10. Stage 7: Legal Guidance

The Legal Guidance stage systematically assesses the innovation against a set of predefined legal rules formulated from patent regulations. It generates structured feedback with respect to patent eligibility, identifying issues such as non-patentable subject matter, and providing recommendations to enhance compliance.

1.11. Stage 8: Government Schemes and Subsidies Recommendation

The system subsequently maps the innovation to applicable Government Schemes and Subsidies. Based on the characteristics of the idea, relevant support programs, including startup initiatives and MSME schemes, are suggested through rule-based matching techniques.

1.12. Stage 9: Final Report Generation

Finally, all outputs generated from previous stages are systematically consolidated into a Final Report. This report presents an insights into novelty, similarity-related risks, regulatory compliance, patent classification, and funding opportunities, thereby offering a comprehensive assessment of innovation and supporting users in decision-making processes and patent preparation applications.

2. Results And Discussion

2.1.Results

The proposed system was assessed by analyzing multiple user-submitted innovation descriptions to evaluate patent viability and legal compliance. The evaluation process focused on generating outputs like idea assessment reports, legal compliance responses, and government scheme recommendations using the integrated system modules[10 – 13]. The outcomes demonstrated that the system accurately recognized similarities to existing patents and delivered useful insights regarding novelty and possible risks. In addition, the Legal Compliance Checker accurately highlighted non-eligible components and proposed enhancements to strengthen patent eligibility. The system further mapped innovations to suitable government support programs, indicating its effectiveness in assisting users with legal validation and entrepreneurial choices

2.2.Discussion

The analysis shows that the proposed system facilitates the transition from idea generation to patent readiness through clear guidance and valuable insights. By combining semantic analysis with legal rule-based evaluation, the system improves the precision of patent eligibility assessments and decreases the likelihood of application denial. In addition, integrating technical analysis with government support recommendations emphasizes its practical significance in advancing innovation and entrepreneurship. In summary, the approach reflects strong potential in facilitating easier access to IP systems and simplifying complicated patent-related operations.Shown as Figure 2.1. Idea Input Interface, Figure 2.2. Similar Patents Results, Figure 2.3. Legal Guidance And Patent Filing Steps, FIGURE 2.4.

International Research Journal on Advanced Engineering and Management
https://goldncloudpublications.com
https://doi.org/10.47392/IRJAEM.2026.0324
e ISSN: 2584-2854
Volume: 04 Issue: 05
May 2026
Page No: 2249 - 2253

Government Scheme Matching, Figure 2.5. Final Analysis Report.

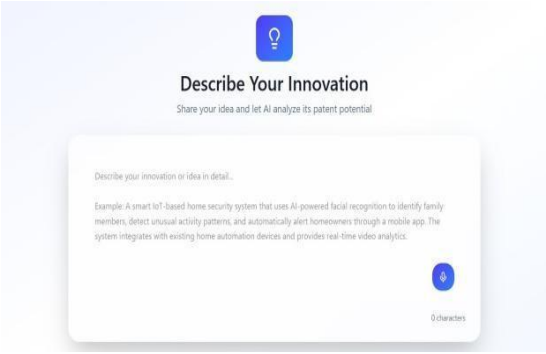

Figure 2.1. Idea Input Interface

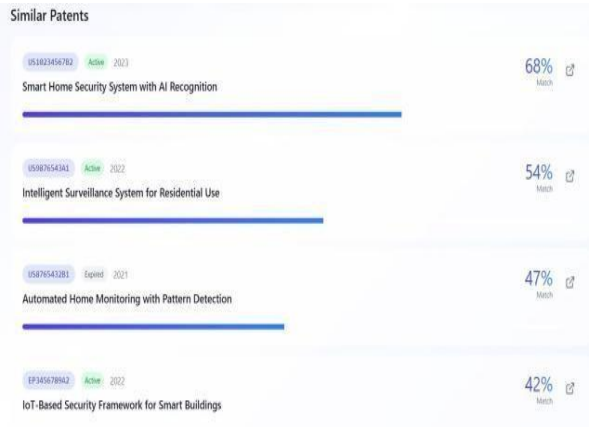

Figure 2.2. Similar Patents Results

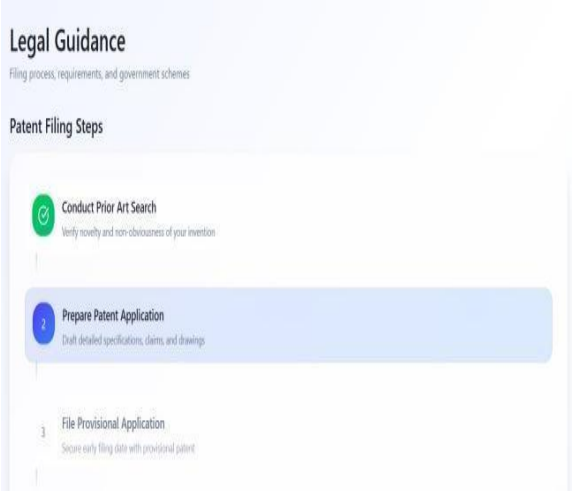

Figure 2.3. Legal Guidance And Patent Filing Steps

Figure 2.4. Government Scheme Matching

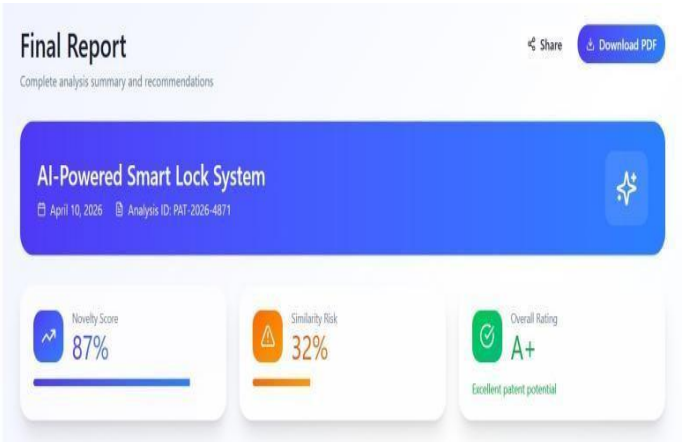

Figure 2.5. Final Analysis Report

Conclusion

This research reveals the complexities in comprehending and managing intellectual property rights, patent eligibility, and support systems can be mitigated through an integrated AI-based solution. The study reveals that the proposed system accurately processes innovation ideas, identifies legal challenges, and provides informative patent-related insights. The Legal Compliance Checker and patent analysis modules improve awareness of patentability and lower the risk of application rejection. Additionally, integrating government scheme recommendations increases access to financial and institutional support for innovators. In summary, the system provides a reliable and efficient platform that supports well-informed decisions while encouraging a systematic and legally sound innovation workflow.

Acknowledgements

The authors intend to convey their heartfelt gratitude to the institution and the faculty members for their

International Research Journal on Advanced Engineering and Management
https://goldncloudpublications.com
https://doi.org/10.47392/IRJAEM.2026.0324
e ISSN: 2584-2854
Volume: 04 Issue: 05
May 2026
Page No: 2249 - 2253

insightful guidance and continuous support throughout the course of this research work and study. The authors acknowledge the contribution of publicly accessible patent databases and resources to the successful execution of the system. The research was cunducted without any external financial support.

REFERENCES

[1]. Zade, M. S., Tamboli, F. A., Salunkhe, A. A.,Kore, M. D., More, A. D., & Ghadge, Y.R. 2023. Intellectual property rights (IPR): An overview. International Journal of pharmaceutical chemistry and analysis.

[2]. ingh, S., & Singh, M. (2024). Artificial intelligence and intellectual property rights: Comparative transnational policy analysis. IEEE Access,10, 2022

[3]. Abdallah, M., & Salah, M. (2024). Artificial intelligence and intelligence and intellectual properties: Legal and ethical considerations. International Intelligent Systems and Applications in Engineering, ISSN: 2147-6799.

[4]. Khan, A., & Vaishnav, p. (2024). Intellectual property law in the era of artificial intelligence. International Journal of Law, Policy and Social Review, 6(2),125-129.

[5]. Nyaboke, Y. (2024). Intellectual Property rights in the era of artificial intelligence. Journal of Modern Law and Policy, 4(2), 57-72.

[6]. Massadeh, F., Alnusair, F., Massadeh, A.A.M., & Ismail, M. (2024). The legal protection of artificial intelligence-generated work: The argument for suigeneris over copyright. Corporate Law & Governance Review, 6(1),49-56.

[7]. Murthy, M. R. S., Devarhubli, G., Bharti, A. K.,

[8]. Das, D., & Mahto, P. K. (Eds.). (2025). Bytes and rights: Global insights on technology, media and cyber policy, law & governance. Centre for Development of intellectual Property and Research.

[9]. Bhavsar, G. (2025). Intellectual property in the age of generative artificial intelligence: Rethinking the legal dimensions of innovation and protection. Trends in Intellectual Property Research,3(1), 34-37.

[10]. Yadav, R. K. (2024). Artificial intelligence and intellectual property rights: Intersection with fundamental human rights such as privacy and freedom of expression. Department of laws, Central University of Punjab.

Saw, C. L., & Lim, D. L. W. (2024). The case for AI authorship in copyright law. Singapore Academy of Law Journal. Chesterman, S. (2024). Good models borrow; great models steal: Intellectual property rights and generative AI. Policy and Society, 44(1),23-37.

[11]. Son, J., Moon, H., Lee, J., Lee, S., Park, C., Jung, W., & Lim, H. (2022). AI for patents: A novel yet effective and efficient framework for patent analysis. IEEE Access, 10, 592025-59218.

[12]. Trappey, A. J. C., Lim, Y. Y. C., & Wu, C.-Y.(2025). Generative AI-based intelligent patent summarization for intellectual property knowledge communication and cooperation. World Patent Information, 83, 102410.

[13]. Akhtar, S. (2025). The role of artificial intelligence in enhancing patent lifecycle management. International Journal of Scientific Research in Computer Science, Engineering and Information Technology, 11(2),2194-2205.