SMART INDIA HACKATHON 2024

TITLE PAGE

- **Problem Statement ID -** ***SIH1701***
- **Problem Statement Title -** ***AI Driven Research Engine for Commercial Courts***
- **Theme -** ***SMART AUTOMATION***
- **PS Category -** ***Software***
- **Team ID -** ***6769***
- **Team Name -** ***Trailers***

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IDEA TITLE

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IDEA / SOLUTION :

Implementation of a **AI Research Assistant for Commercial Courts** specialized by **Chain of AI Agents** using **Gen AI [Large Language Models]**.

- **LLM** is **Fine-tuned** with greater understanding of National, State and Local Laws and Procedures.
- Automates analysis of Legal documents using **RAG**.
- **Chain of AI Agents** collaborates to draft **verified** outputs, documentation & answers user queries.
- Analyses the **relevant past cases** and relevant **legal laws** for better verification & **forecasting** outcomes.
- Ensures reliable, and legally accurate answers through **Chain of Thought** & Verification Agent.
- AI Assistant supports multiple Indian languages.

PROBLEM RESOLUTIONS :

- Our AI Research Assistant drastically reduces **case resolution time** by providing rapid, comprehensive legal analysis, catering to multiple diversities of India.
- Chain of AI Agents delivers **customized reports** with **unbiased** analysis, accurate **forecasting**, enhancing judicial decision-making in commercial disputes.

UNIQUE VALUE PROPOSITIONS (UVP) :

- **Chain of Agents** for precise & accurate legal analysis by reducing the AI hallucination and verified citations.
- **Fewer mistakes** compared to other AI approaches.
- **Bias removal** for incorrect statements and insights.
- **Self-improving system** based on judicial feedback.

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TECHNICAL APPROACH

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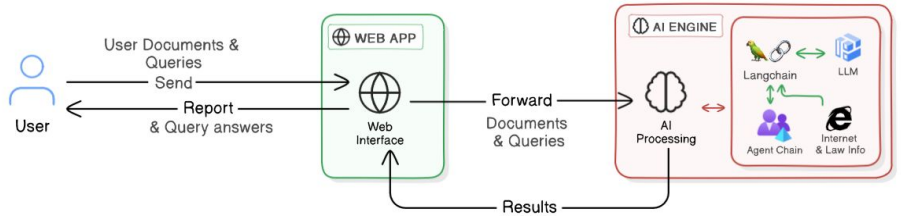
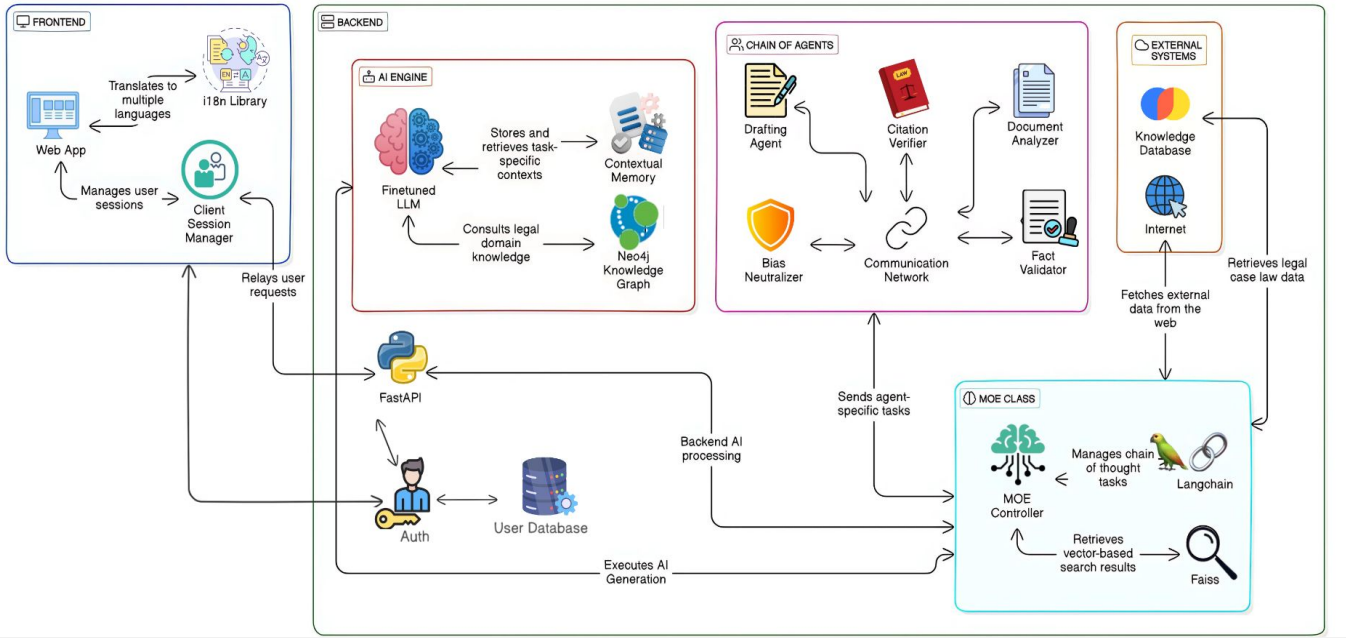
SYSTEM FLOW



SYSTEM ARCHITECTURE



Backend Development :

- **Fast API** (Python) for high-performance API.

Frontend Development :

- **ReactJS** for client-side website rendering.
- **i18n Library** for Multi Language Translation.

AI Development :

- **QLoRA** for fine tuning LLM on Indian Laws.
- **Lang-Chain** to build the AI Architecture.

Databases :

- **FAISS & Chroma DB** to manage AI Memory.
- **OAuth & PostgreSQL** for secure user database.

Product Status : 70% product is built and further build is on progress. Validation testing to be done. Here is the video link & test link for the prototype.

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FEASIBILITY AND VIABILITY

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FEASIBILITY OF IDEA

- The integration of **Gen AI** can improve accuracy and efficiency of legal processes with existing data & frameworks.
- Potential **cost & time savings** with accurate dispute resolution and streamlined judicial processes.
- A **strong demand** for improved legal research tools in commercial courts across India.
- The system requires **minimal operational changes**, leveraging existing judicial processes and workflows.

POTENTIAL RISKS / CHALLENGES OF IDEA

- Integration complexities with diverse legal data sources and ensuring accuracy in AI predictions.
- The complexity of developing AI solutions may lead to unexpected costs, which can strain financial resources.
- Resistance from traditional legal professionals and slow adoption within the judiciary.
- There is a risk of bias in AI algorithms, which can lead to unfair outcomes in legal decisions.

STRATEGIES OF OVERCOMING THESE CHALLENGES

- **Modular architecture** for easier integration and updates to handle diverse data sources.
- Ensure **self-owned infrastructure** to mitigate any unexpected costs.
- Engage Legal professionals with easy to **user interface** and features for smooth and easier adoption of tech.
- Implement reinforcement learning to **continuously refine predictions** and improve system performance based on real-world feedback.

IMPACT AND BENEFITS

POTENTIAL IMPACT ON AUDIENCE

Positive Impact

1. **Improvement** in faster and more accurate legal research leads to quicker dispute resolution.
2. **Economical** i.e reduces long-term costs by streamlining judicial processes and lowering case backlogs.
3. **New Opportunities** are created for further innovation in legal tech and AI applications.
4. **Social Benefits** from enhances transparency and efficiency in the judicial system, promoting fairness and accessibility.

Negative Impact

1. **Adoption Issues** from traditional legal professionals create difficulties in integrating with existing systems.
2. **Operational Costs** of servers increase but are comparatively less than long term costs.

BENEFITS OF SOLUTION

Societal Benefits:

1. **Improved Access** of legal information for legal professionals & public if provided with general access.
2. **Empowerment** of judicial decision-making and reducing case backlog and delays in court system.
3. **Reduction** of delays and inefficiencies in the legal process.

Economic Benefits:

1. Increase in efficiency and **productivity** of legal research and case management and documentation of case.
2. **Costs** are reduced long-term via increase in process efficiencies of case processing, documentation, and research.
3. **Market** drives growth in the legal tech sector and attracts investment.

Environmental Benefits:

1. **Reduction** of paper use and waste, supporting **SDG 12**.
2. **Affordability & Energy efficiency** makes it sustainable to scale, supporting **SDG 7**.

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RESEARCH AND REFERENCES

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RESEARCH REFERENCES

1. *Cobbe, J., & Singh, J. (2021). Artificial intelligence as a service: Legal responsibilities, liabilities, and policy challenges. Computer Law & Security Review, 42, 105573. Link*
2. *Rodrigues, R. (2020). Legal and human rights issues of AI: Gaps, challenges and vulnerabilities. Journal of Responsible Technology, 4, 100005. Link*
3. *Carrillo, M. R. (2020). Artificial intelligence: From ethics to law. Telecommunications policy, 44(6), 101937. Link*
4. *Aissa, H., Tarik, A., Zeroual, I., & Yousef, F. (2021). Using machine learning to predict outcomes of accidents in moroccan courts. Procedia Computer Science, 184, 829-834. Link*
5. *Liu, S., Cao, J., Li, Y., Yang, R., & Wen, Z. (2024). Low-resource court judgment summarization for common law systems. Information Processing & Management, 61(5), 103796. Link*

PROTOTYPE

Tata Sons vs Cyrus Case PDF Document is given with all the case proceedings except the judgement of the case.