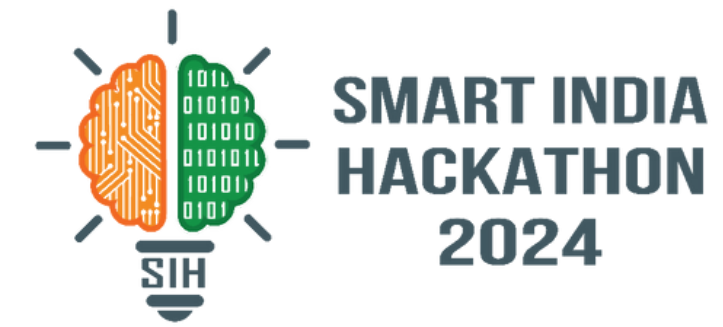# TITLE PAGE

- **Problem Statement ID – 1588**

- **Problem Statement Title- Student Innovation**

- **Theme- Miscellaneous**

- **PS Category- Software**

- **Team ID- 35818**

- **Team Name - SPARK SQUARD**

Proposed Solution Sentinal Rick

Detailed Explaination

Predictive Analytics

Proactively identify and mitigate risks before they escalate by leveraging predictive analytics to analyze historical data and identify patterns.
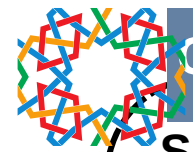
Integrated Risk Assessment

Gain a comprehensive view of potential risks by integrating data from various sources to create a holistic picture of potential threats.

Credit Market Focus

Tailored solutions specifically address the unique operational challenges faced by credit institutions.

Addressing Problem

Costly customization & complex

Sentinal Rick offers a flexible, user-friendly platform that reduces customization costs & complexity, ensuring quick & seamless integration.

Low Operational Risk Focus

Sentinal Rick delivers specialized AI-driven models to comprehensively manage operational risks often overlooked by traditional tools.

Credit & Market Risk Focused

Sentinal Rick provides holistic risk coverage, extending beyond credit and market risks to include critical operational risk management.

Innovation & Uniqueness

Comprehensive Risk Coverage

Covers all critical risk types—credit, market, and operational etc. delivering real-time insights for robust financial protection.

Quick to Deploy

Easily integrates with existing systems, allowing immediate access to AI-powered risk management with minimal setup.

Scalable and Flexible

Adapts seamlessly to growing data and changing business needs, ensuring flexibility without compromising performance.

TECHNICAL APPROACH

Technologies Used

Web Dev & Frameworks

- React.js (Frontend web development)
- Flask (Backend web framework)
- FastAPI (Backend API framework)
- Nginx (Web server and reverse proxy)
- TypeScript (Web application development)

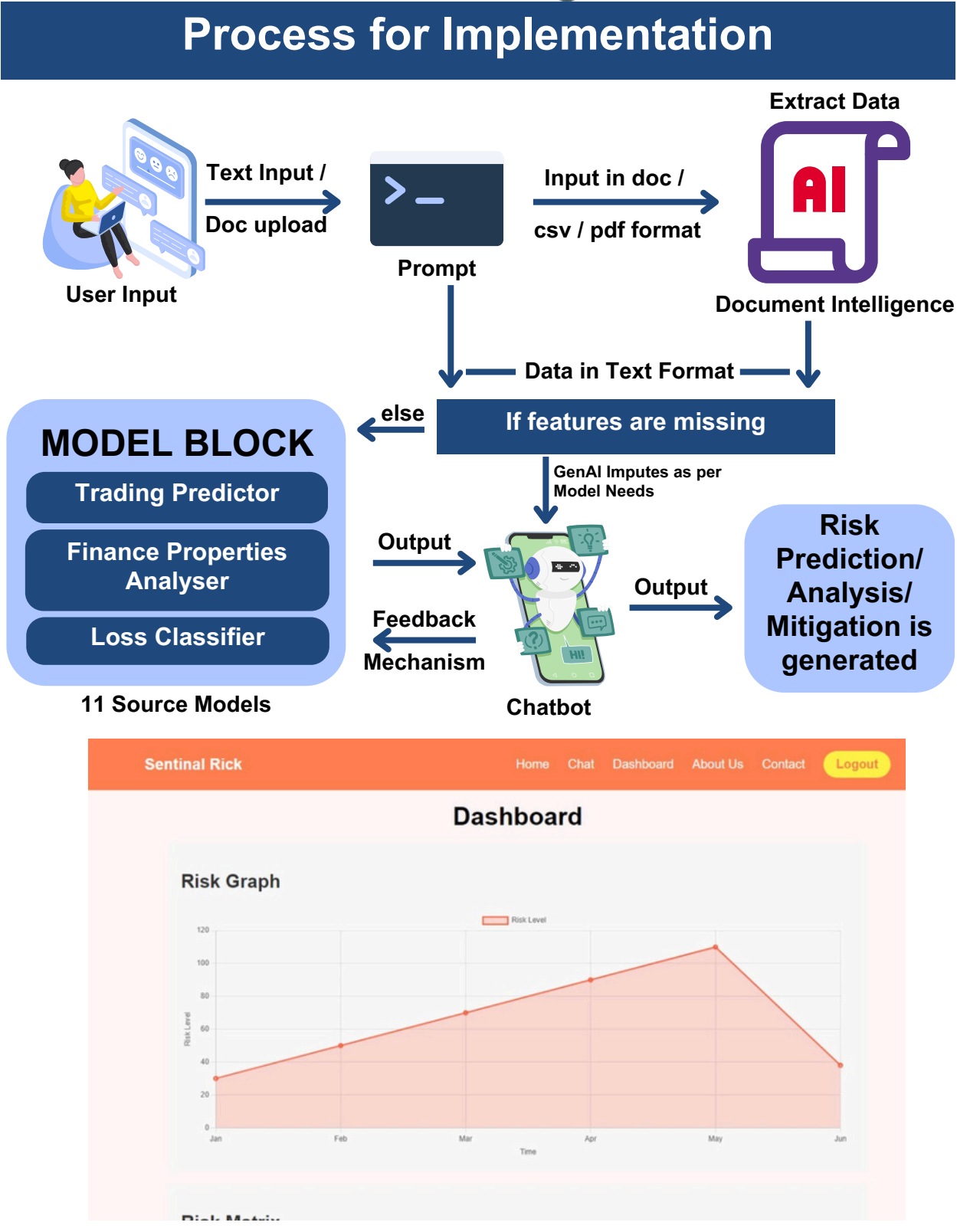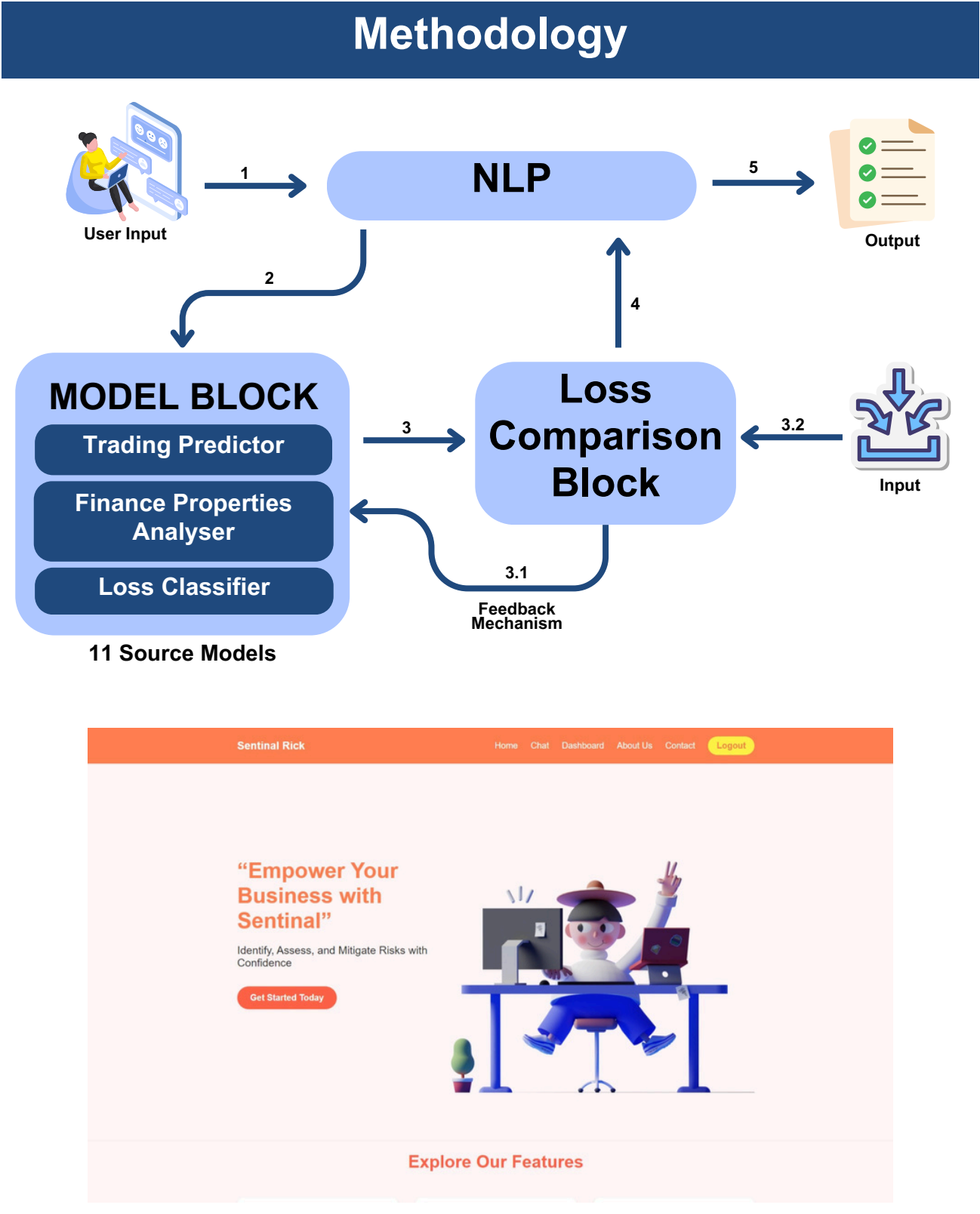### Cloud, Infrastructure & Databases

- AWS (Cloud platform)
- Docker (Containerization platform)
- MongoDB (NoSQL database)
- Redis (In-memory database/cache)
- Vector Database (Milvus)

ML and AI

- LLM (Large Language Models)
- Gen AI (Generative AI)
- PyTorch (Machine learning framework)
- TensorFlow (Machine learning framework)
- CNN + Computer Vision (Image processing and AI)
- LangChain (Framework for LLMs)

Programming Langs & Tools

- Go Lang (Programming language)
- R (Data science and statistical computing)
- Python (Programming language)

Methodology

User Input → 1 → NLP → 5 → Output

NLP → 2 → MODEL BLOCK

MODEL BLOCK
- Trading Predictor
- Finance Properties Analyser
- Loss Classifier

11 Source Models

MODEL BLOCK → 3 → Loss Comparison Block

Loss Comparison Block ← 3.2 ← Input

Loss Comparison Block → 4 → NLP

3.1 Feedback Mechanism

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"Empower Your Business with Sentinal"

Identify, Assess, and Mitigate Risks with Confidence

Get Started Today

Explore Our Features

Process for Implementation

User Input → Text Input / Doc upload → Prompt → Input in doc / csv / pdf format → **Extract Data** → Document Intelligence

Document Intelligence → Data in Text Format → If features are missing

If features are missing → else → MODEL BLOCK

If features are missing → GenAI Imputes as per Model Needs → Chatbot

MODEL BLOCK
- Trading Predictor
- Finance Properties Analyser
- Loss Classifier

11 Source Models

MODEL BLOCK → Output → Chatbot

Chatbot → Feedback Mechanism → MODEL BLOCK

Chatbot → Output → **Risk Prediction/ Analysis/ Mitigation is generated**

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Dashboard

Risk Graph

Risk Level

Jan | Feb | Mar | Apr | May | Jun

FEASIBILITY AND VIABILITY

Feasibility of the Idea

Robust AWS Infrastructure

Utilizes AWS's reliable cloud capabilities for real-time analytics and risk prediction, meeting the fast-paced demands of the financial sector.
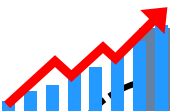
Aligned with Market Trends

Meets increasing demand for AI-driven risk management, aligning with digital transformation in finance.

Scalable & Customizable

Scalable and customizable on AWS, allowing adaptation to various operational needs without major capital outlay.

Challenges and Risks

Complexity in Data Integration

Overcomes multi-source data integration challenges using AWS's integration tools for seamless data synchronization.

Ensuring Model Accuracy

Continuous adaptation of models to new data and market changes, maintaining predictive accuracy.

Security & Regulatory Compliance

Guarantees top-tier security and compliance through AWS's extensive security services and regulatory adherence.

Strategies for Overcoming Challenges

Leveraging AWS for Data Management

Employs AWS for efficient data processing, reducing complexities and enhancing data accuracy.

Adaptive Model Refinement

Regular updates and refinements of AI models based on ongoing data analysis ensure relevance and accuracy.

Implementing AWS Security Protocols

Uses AWS security protocols, including encryption and two-factor authentication, to protect against data breaches and ensure data integrity.

IMPACT AND BENEFITS

Target Audience

Individual Users

Banks
BANK

Firms

Benifits of Sentinal Rick

Social
- Enhanced Financial Security
- Inclusive Financial Services
- Improved Public Trust

Economic
- Reduced Financial Losses
- Increased Efficiency
- Support for Economic Stability

Potential Impact

Individuals
- Enhanced Security
- Personalized Risk Advice
- Increased Trust

Banks
- Reduced Operational Risks
- Improved Compliance
- Enhanced Decision Making

Firms
- Cost Efficiency
- Risk Strategy Optimization
- Market Stability

Environmental
- Paperless Operations
- Energy Efficiency
- Support for Green Finance

Technological
- Advanced AI Integration
- Scalable Infrastructure
- Continuous Innovation

RESEARCH AND REFERENCES

Data Sources

- **RBI (Reserve Bank of India): Financial stability reports, policy updates, regulatory documents.**
- **DBIE (Database of Indian Economy): Macroeconomic data, lending trends, financial indicators.**
- **SEBI (Securities and Exchange Board of India): Market surveillance, investor protection, regulatory frameworks.**
- **CRISIL: Operational risk, SME performance, market risk reports.**
- **Ministry of Finance (India): Economic surveys, fiscal policies, regulatory impact.**
- **Bank Policy Reports: Internal policy documents, risk management strategies, credit assessments.**
- **NIC (National Informatics Centre): Digital governance, transaction risks, cybersecurity.**
- **NABARD: Rural banking, financial inclusion, MSME data.**

Research Papers

- **Chaudhary & Yadav (2021) – Credit and operational risk management in Indian banks.**
- **Patnaik & Shah (2019) – Macroeconomic policy and financial risk in India.**
- **Ghosh (2020) – Non-performing assets (NPAs) in Indian banks.**
- **Agarwal & Kulkarni (2022) – Digital transformation and associated risks in Indian banking.**
- **Bhattacharya & Roy (2021) – Risk management in SME financing in India.**
- **Sharma, A. (2021) – Cybersecurity risks in India's financial sector.**
- **Mishra, S. (2020) – Regulatory compliance in Indian banking post-digitalization.**
- **Verma, P. (2019) – The impact of financial inclusion on risk management in rural India.**