# MSME IDEA HACKATHON 4.0

Reference No. :- **INC24DTN050689**

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| **5. HI/BI Name** | K.L.N.COLLEGE OF ENGINEERING |
| **6. Problem Statements** | Frontier Technology in MSME |
| **7. Idea Sector** | Agriculture, Rivers & Ocean Produce based industries, fertilizers, Agricultural Implements & Agro processing and any related sub-sector |
| **8. Title of proposed idea/innovation** | AI and IoT-Based Crop Recommendation System for Precision Agriculture |
| **9. Briefly explain newness/uniqueness of the innovation** | User-Friendly Web Interface: The project features an intuitive web interface that allows users to easily input data, view real-time sensor readings, and receive crop recommendations, making advanced agricultural technology accessible to non-expert users. Machine Learning Optimization: By employing advanced machine learning algorithms trained on a substantial dataset (2,200 data points), the system enhances the accuracy of crop predictions, adapting to different agricultural contexts and soil conditions. Data-Driven Decision Making: The solution not only provides recommendations but also stores historical data in a CSV format for future analysis, enabling farmers to understand trends and make informed decisions over time. Sustainable Agriculture Focus: By recommending suitable crops based on precise environmental conditions, the system promotes sustainable farming practices, optimizing resource use and potentially increasing yields while reducing environmental impact. |

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| **10. Concept & Objective** | Concept: The proposed project is an AI and IoT-based Crop Recommendation System designed to optimize agricultural practices through the integration of real-time data collection, machine learning algorithms, and user-friendly interfaces. By utilizing a network of sensors, this system monitors essential soil and environmental parameters, enabling it to provide tailored crop recommendations that align with current conditions. This approach aims to enhance decision-making for farmers, ultimately promoting sustainable agriculture and improving crop yield. Objective: Real-Time Monitoring : Utilize IoT sensors to continuously gather data on nitrogen (N), phosphorus (P), potassium (K), rainfall, humidity, temperature, and pH levels. Data-Driven Recommendations : Employ machine learning algorithms to analyze the collected data and deliver accurate crop recommendations based on current conditions. User-Friendly Interface : Develop an intuitive web application for easy data input, real-time viewing, and crop suggestions. Data Storage : Implement a system to store historical data in CSV format for future analysis and insights. Sustainable Agriculture : Promote resource-efficient farming by recommending crops that thrive under optimal conditions. |
| **11. Specify the potential areas of application in industry/market in brief** | Precision Agriculture : Utilizing real-time data to optimize inputs (water, fertilizers, pesticides) can enhance productivity and reduce costs, making farming more efficient. Smallholder Farming : Empowering smallholder farmers with accessible technology for personalized crop recommendations can improve their yields and income, contributing to rural development. Agricultural Cooperatives : Organizations and cooperatives can leverage the system to analyze data collectively, leading to better resource management and shared insights for crop planning. Government Programs : Integrating the technology into government initiatives can enhance agricultural practices, improve food security, and provide training for farmers. Export-Oriented Agriculture : Providing accurate recommendations can help farmers growing crops for export meet quality and yield requirements, boosting competitiveness in global markets. |
| **12. Briefly provide the market potential of idea/innovation** | Large Agricultural Sector: Agriculture employs around 58 of India’s workforce and contributes approximately 17-18 to the GDP. There’s a strong need for innovative solutions to enhance productivity and efficiency. Increasing Demand for Food: With a growing population expected to reach 1.5 billion by 2030, the demand for food is projected to rise significantly. This creates opportunities for technologies that optimize crop yields and ensure food security. Government Initiatives: The Indian government has launched various schemes to promote digital agriculture, such as the Digital India initiative and the Pradhan Mantri Krishi Sinchai Yojana, creating a conducive environment for adopting technological innovations. Rising Adoption of Technology: There is a growing acceptance of technology among farmers, especially with the proliferation of smartphones and the internet, which facilitates the adoption of IoT and AI solutions in agriculture. Sustainability Focus: As environmental concerns rise, farmers are increasingly looking for sustainable farming practices. Your system can contribute to resource-efficient agriculture, aligning with global sustainability trends. |
| **13. Uploaded Proposal** | View/Download |