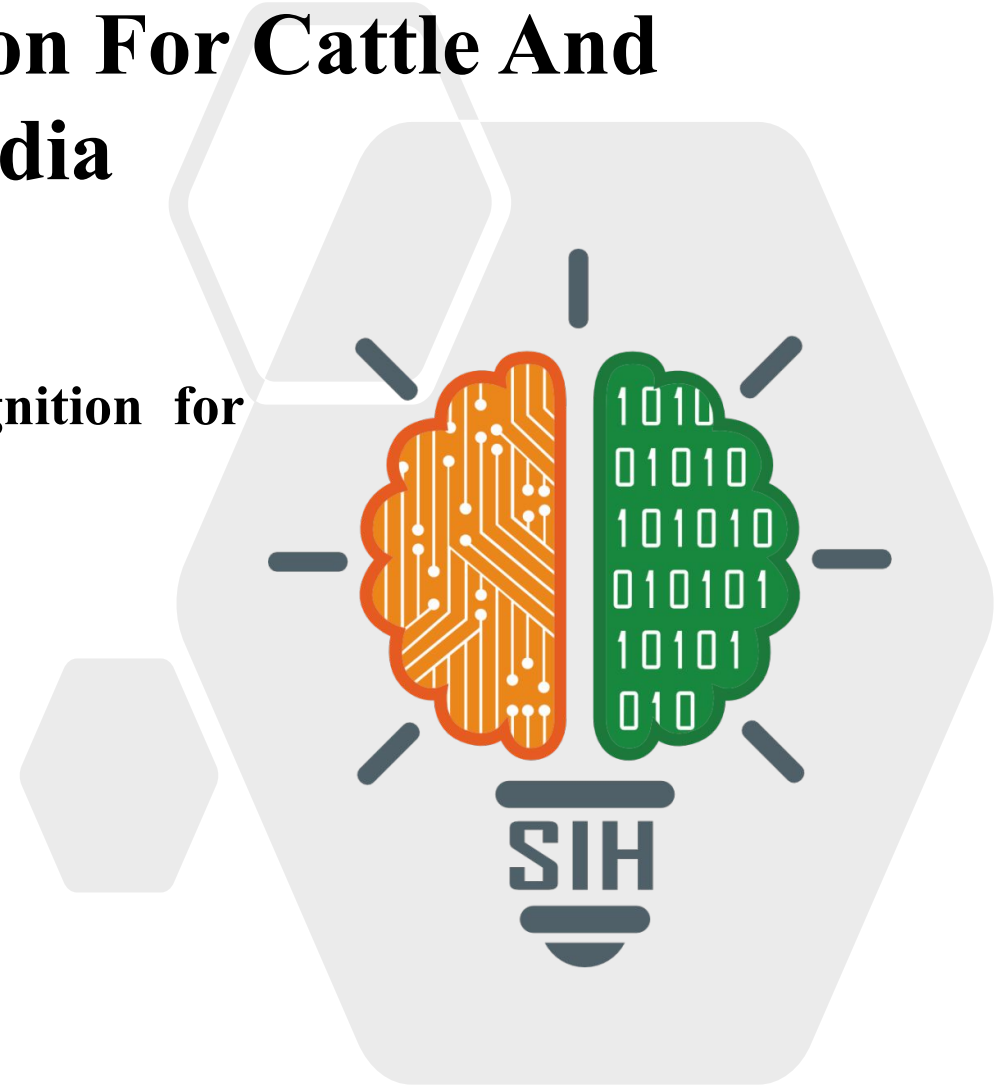
SMART INDIA HACKATHON 2025

Image Based Breed Recognition For Cattle And Buffaloes Of India

- **Problem Statement ID - SIH25004**
- **Problem Statement Title - Image based breed recognition for cattle and buffaloes of India.**
- **Theme - Agriculture, Foodtech & Rural Development**
- **PS Category - Software**
- **Team ID -**
- **Team Name (Registered on portal) - PashuVision**



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PashuVision: Smart breed identification for India's diverse cattle and buffalo population.

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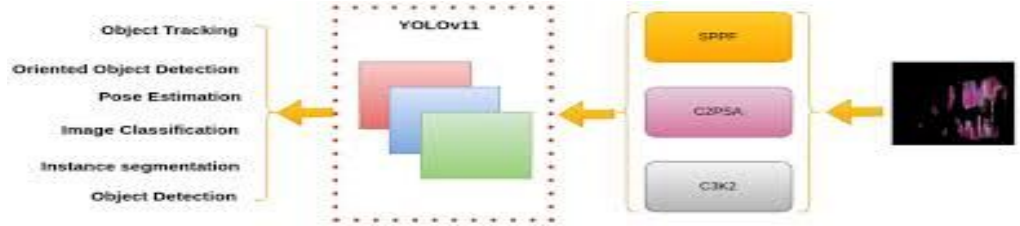
Proposed solution:

1. AI-based system for cattle & buffalo breed recognition.
2. Uses **YOLO11n-cls** for classification after detection.
3. Integrated with Bharat Pashudhan App (BPA).
4. Dynamic feedback loop for continuous model improvement.



Uniqueness of our solution:

- First solution to integrate AI breed recognition with BPA.
- Dynamic learning model – improves accuracy via FLW feedback.
- Supports both indigenous and crossbred breeds.
- Reduces dependency on extensive training of FLWs.
- Scalable to other livestock species in the future.

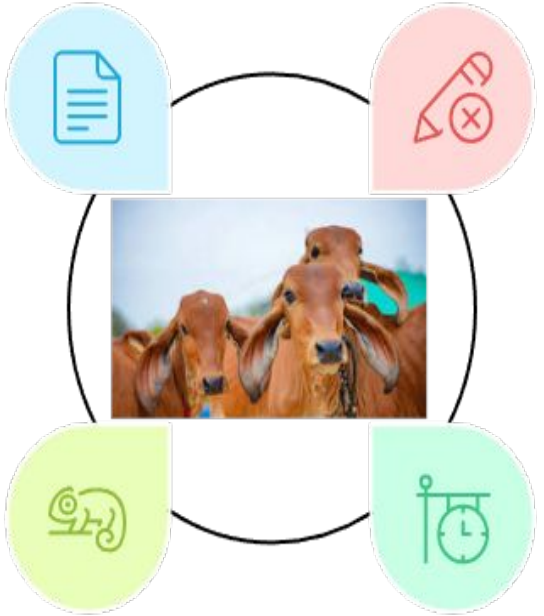
How our solution addresses the problem?

Standardized Dataset

Creates a verified dataset for policy and research

Manual Error Elimination

Reduces inaccuracies in breed identification



Diverse Handling

Adapts to various poses, lighting, and environments

Real-Time Suggestions

Provides immediate breed suggestions during data entry

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TECHNICAL APPROACH

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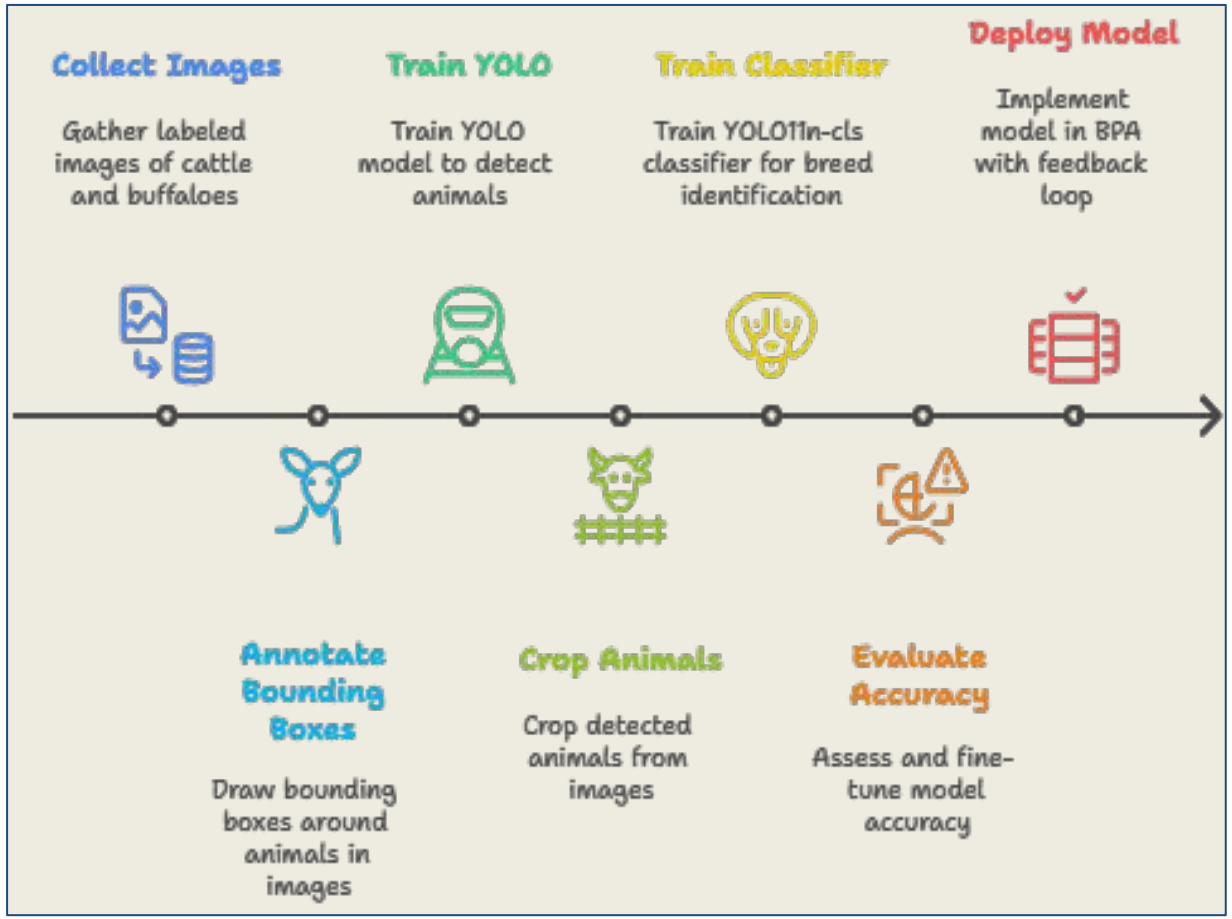
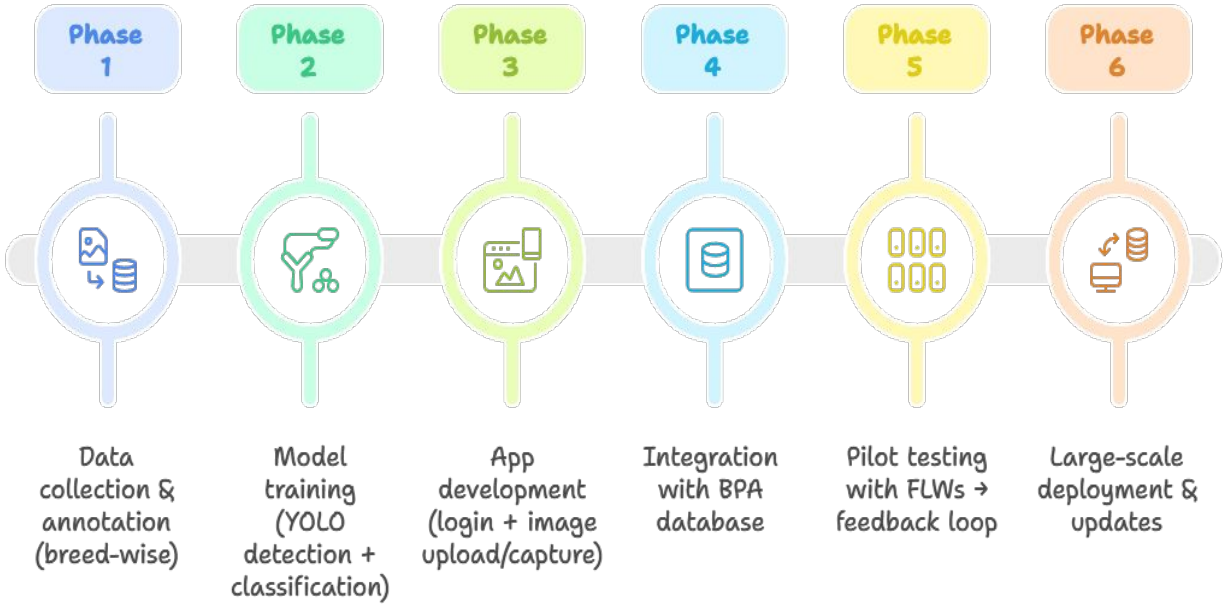
Methodology:



Technologies used:

- YOLOv8 + YOLO11n-cls (detection + classification).
- Python, Ultralytics YOLO- model training.
- Mobile App Interface – for FLWs to capture/upload images.
- Database + Feedback System – continuous learning.
- Cloud/Server Integration – scalable deployment.

Project Implementation Timeline



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FEASIBILITY AND VIABILITY

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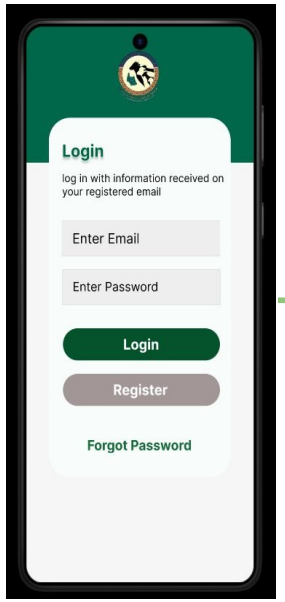

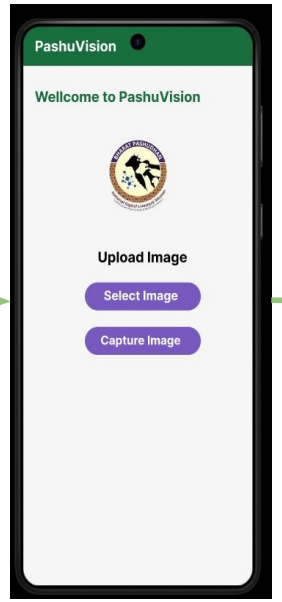

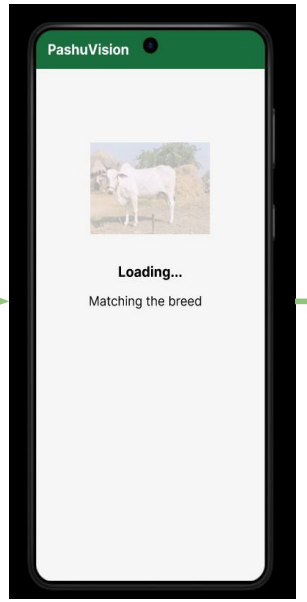

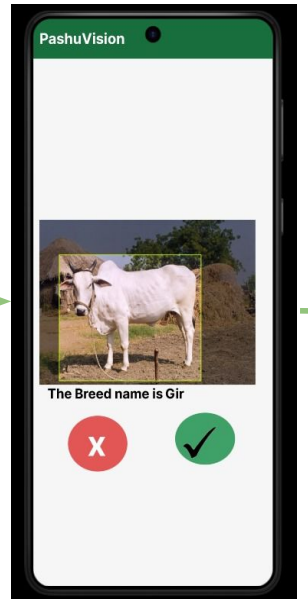

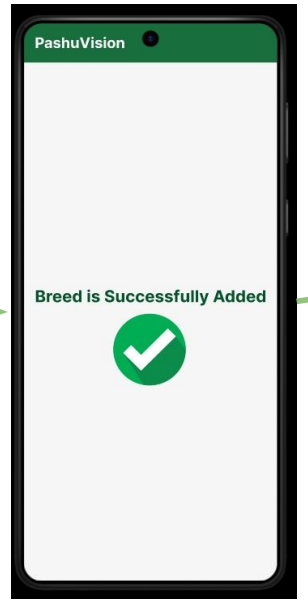

Final integration

BHARAT PASHUDHAN
National Digital Livestock Mission
A DAHD-Government of India & NDDB Joint Venture

Potential Challenges & Risks	Strategies for Overcoming Challenges
Limited availability of breed-wise labeled images	Partner with NBAGR & NDDB for dataset access
Misclassification in rare/visually similar breeds	Use feedback loop & expert verification to refine labels
FLW adoption resistance due to technical unfamiliarity	Provide minimal-training, easy-to-use UI for FLWs
Data privacy & storage concerns	Implement secure cloud storage & privacy-preserving methods

Feasibility of our Idea:

- Mobile-first design → easy adoption by FLWs.
- Uses **existing AI frameworks (YOLO)** → technically achievable.
- Data collection possible via **NBAGR datasets + field images** .
- Dynamic training ensures **long-term sustainability** .

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IMPACT AND BENEFITS

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Accurate & Reliable: Easy breed identification for FLWs with minimal errors.

Data-Driven Decisions: Trusted BPA data for government planning and policy.

Better Livestock Management: Supports farmers in breeding, nutrition, and health.

Advances Research & AI: Standardized dataset fuels research and continuously improving AI.

Impact on Target Audience

FLWs
Easy and reliable tool for breed identification.
1

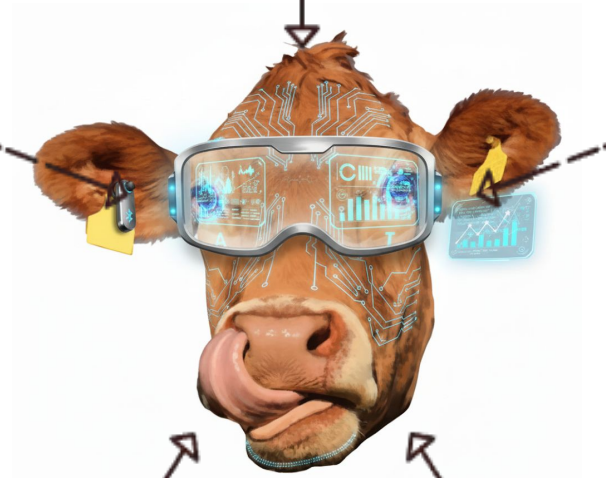
Government
Accurate BPA data for policy and planning.
2

Farmers
Better breeding, nutrition, and disease control support.
3

Researchers
Access to a high-quality livestock dataset.
4

Standardized Breed Identification
Ensures consistent and accurate breed identification

Livestock Development Programs
Supports genetic improvement and growth



Accuracy and Trust in Data
Enhances reliability and confidence in BPA data

Dynamic AI System
Continuously improves through learning

Reduced Training Dependency
Minimizes reliance on manual expertise

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RESEARCH AND REFERENCES

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