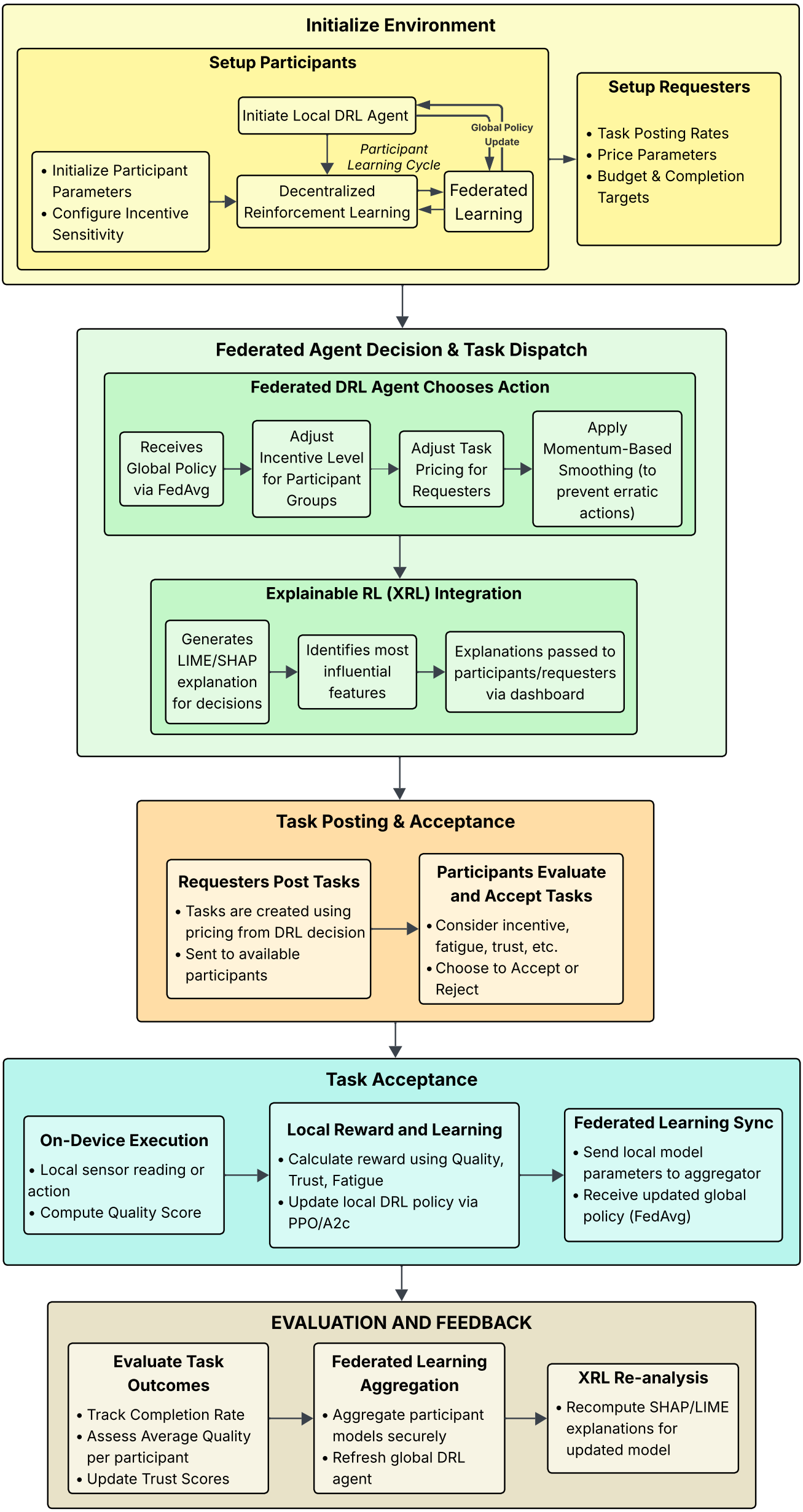
Initialize Environment
Setup Participants
Initiate Local DRL Agent
Global Policy Update
Participant Learning Cycle
• Initialize Participant Parameters
• Configure Incentive Sensitivity
Decentralized Reinforcement Learning
Federated Learning
Setup Requesters
• Task Posting Rates
• Price Parameters
• Budget & Completion Targets
Federated Agent Decision & Task Dispatch
Federated DRL Agent Chooses Action
Receives Global Policy via FedAvg
Adjust Incentive Level for Participant Groups
Adjust Task Pricing for Requesters
Apply Momentum-Based Smoothing (to prevent erratic actions)
Explainable RL (XRL) Integration
Generates LIME/SHAP explanation for decisions
Identifies most influential features
Explanations passed to participants/requesters via dashboard
Task Posting & Acceptance
Requesters Post Tasks
• Tasks are created using pricing from DRL decision
• Sent to available participants
Participants Evaluate and Accept Tasks
• Consider incentive, fatigue, trust, etc.
• Choose to Accept or Reject
Task Acceptance
On-Device Execution
• Local sensor reading or action
• Compute Quality Score
Local Reward and Learning
• Calculate reward using Quality, Trust, Fatigue
• Update local DRL policy via PPO/A2c
Federated Learning Sync
• Send local model parameters to aggregator
• Receive updated global policy (FedAvg)
EVALUATION AND FEEDBACK
Evaluate Task Outcomes
• Track Completion Rate
• Assess Average Quality per participant
• Update Trust Scores
Federated Learning Aggregation
• Aggregate participant models securely
• Refresh global DRL agent
XRL Re-analysis
• Recompute SHAP/LIME explanations for updated model