Hackathon Evaluation Criteria
AI Agent Jury

Scoring Method

The AI evaluation is based on two core tasks:

- Optimization Task — Warehouse Operations Simulation
- Prediction Task — Demand Forecasting

Final AI score is calculated out of 100.

1. Optimization Task — Warehouse Operations Simulation

Objective

Participants must simulate warehouse optimization decisions based on operational data.
Teams will be provided with:

- Sequence of ingoing and outgoing products
- Current warehouse storage state
- Available operational resources

The AI agent must compute optimized storage assignments, operational movements, and routing strategies.

1.1 Input Data Example

Example of ingoing and outgoing product sequence:

Date	Product	Flow Type	Quantity
01-01-2026	Product A	Ingoing	120
02-01-2026	Product B	Outgoing	40
03-01-2026	Product C	Ingoing	75
04-01-2026	Product D	Outgoing	30
05-01-2026	Product E	Ingoing	60

This sequence must be processed chronologically by the optimization engine.

1.2 Operational Variables

Optimization must take into consideration configurable warehouse constraints:

- Number of available chariots
- Chariot capacity
- Storage slot availability
- Product weight
- Product demand frequency
- Distance to expedition zone
- Floor level constraints

Teams must clearly document assumptions and constraint handling.

1.3 Routing and Congestion Handling

Beyond storage optimization, teams may enhance their simulation by integrating operational routing intelligence.

Expected Considerations

- Chariot route path generation
- Shortest path computation between zones
- Multi-chariot coordination
- Congestion detection in warehouse corridors
- Dynamic rerouting when paths intersect
- Expedition zone traffic management
- Idle vs active chariot positioning

Solutions may include graph routing, heuristic optimization, or AI-driven path planning.

1.4 Expected Optimization Output Format

The solution must generate explicit operational instructions.

Example Output

- Product A: Receipt → Storage → Location 0H-01-01
- Route: Receipt Zone → Corridor B → Lift 1 → Floor 0H
- Product B: Picking → Expedition Zone
- Route: Rack B7-0A-02-03 → Expedition Track
- Product C: Receipt → Storage → Location 1N-C07

Each decision must be justified by optimization logic (distance minimization, demand proximity, congestion avoidance, etc.).

1.5 Optimization Evaluation Criteria

Criterion	Weight Consideration
Distance optimization efficiency	High
Storage allocation logic	High
Picking path optimization	High
Constraint handling (capacity, slots, floors...)	Medium
Route path generation	Medium
Congestion handling strategies	Medium
Simulation completeness and realism	High

2. Prediction Task — Demand Forecasting

Objective

Participants must build a forecasting model capable of predicting product demand.
Teams will receive historical demand data covering periods up to January 2026.
The required output is the demand prediction for:

$$08\text{-}01\text{-}2026 \rightarrow 08\text{-}02\text{-}2026$$

2.1 Required Output Format

Predictions must follow this exact structure:

Date	id_produit	quantite_demande
09-01-2026	SKU_001	45
10-01-2026	SKU_002	30
11-01-2026	SKU_003	52
12-01-2026	SKU_004	20
13-01-2026	SKU_005	61

Submissions not respecting this format may be penalized.

2.2 Forecasting Evaluation Criteria

A. Model Performance & Reliability

Global Accuracy (WAPE)

- Measures overall demand prediction accuracy
- Metric: Weighted Absolute Percentage Error
- Strong baseline target: WAPE 50%

Forecast Bias & Inventory Risk

- Under-forecasting risk (stock-outs, delivery failures)
- Over-forecasting risk (dead stock, storage cost)

Data Robustness

- Cold start handling
- Missing time-steps resilience
- Sparse demand patterns
- Outlier tolerance

B. Operational Logic & Integration

- Automation of preparation orders
- Day-ahead forecast triggering
- Supervisor validation capability
- Override support
- Confidence scoring
- Justification reasoning

C. AI Explainability (XAI)

- Feature importance visualization
- Contextual demand explanations
- Transparent reasoning outputs
- Decision flow diagrams:

$$\text{Historical Data} \rightarrow \text{Forecast Model} \rightarrow \text{Preparation Orders}$$

3. Reinforcement Learning Extension (Optional)

Teams may implement Reinforcement Learning (RL) to enhance forecasting or optimization performance over time.

Objective

Leverage feedback loops from warehouse operations to improve decision accuracy dynamically.

Possible Applications

- Storage placement learning
- Dynamic picking optimization
- Route congestion avoidance
- Demand forecasting refinement
- Chariot allocation efficiency

Evaluation Considerations

- Learning strategy definition
- Reward function design
- Training simulation realism
- Adaptation to operational feedback
- Performance improvement over time

Architecture Requirements

- Scalable training pipeline
- Modular AI service integration
- Separation between inference and learning layers
- Ability to update models without system downtime

RL implementation is optional but may strengthen the overall AI system depth and innovation.

Final AI Score Summary

Optimization Task	50%
Prediction Task	50%
Total	100%