Optimizing Trading Strategies with Reinforcement Learning

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Agenda

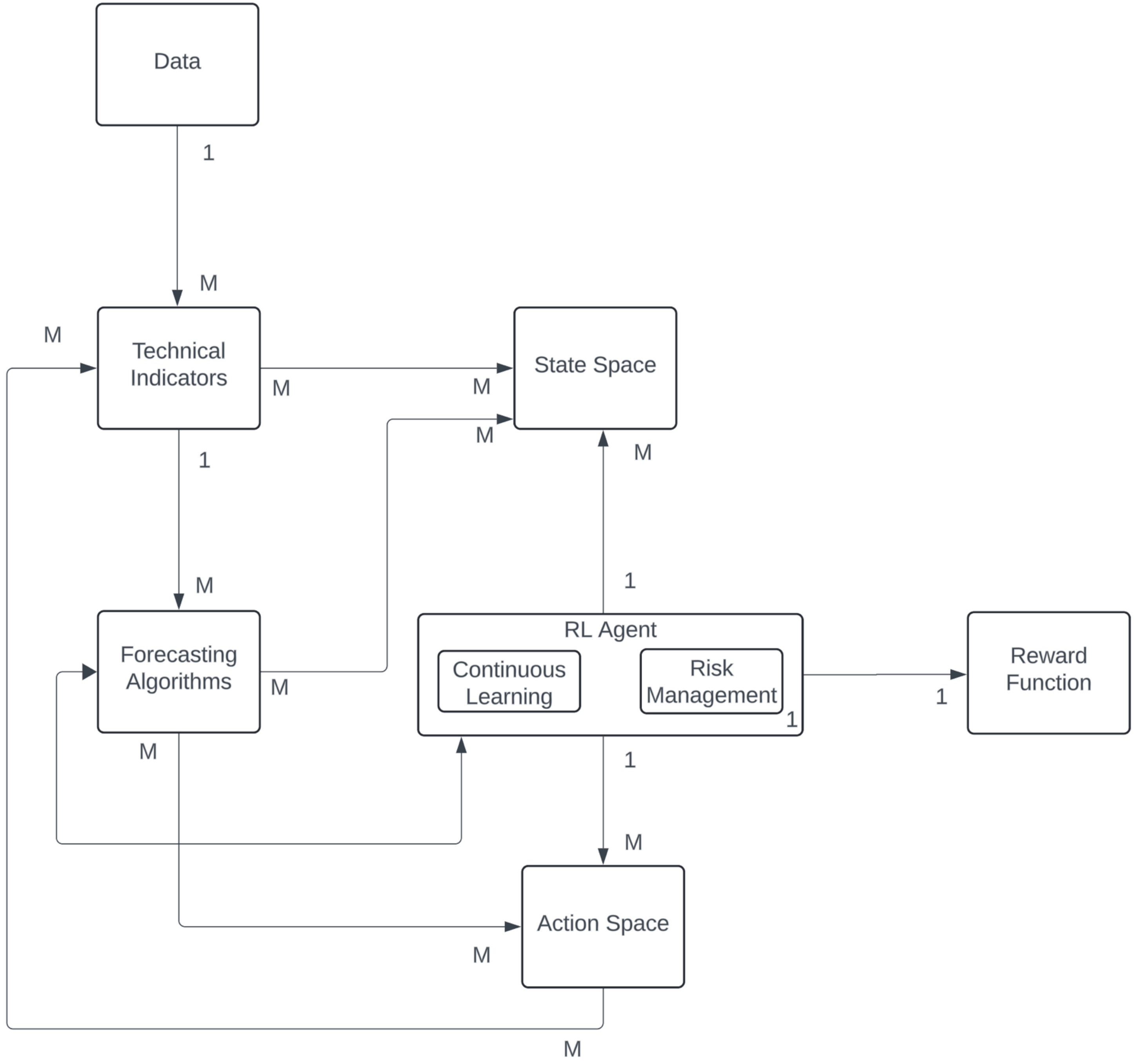
- Overview
- Updated Domain and architecture Models
- Deliverables
- Gantt Chart

Overview

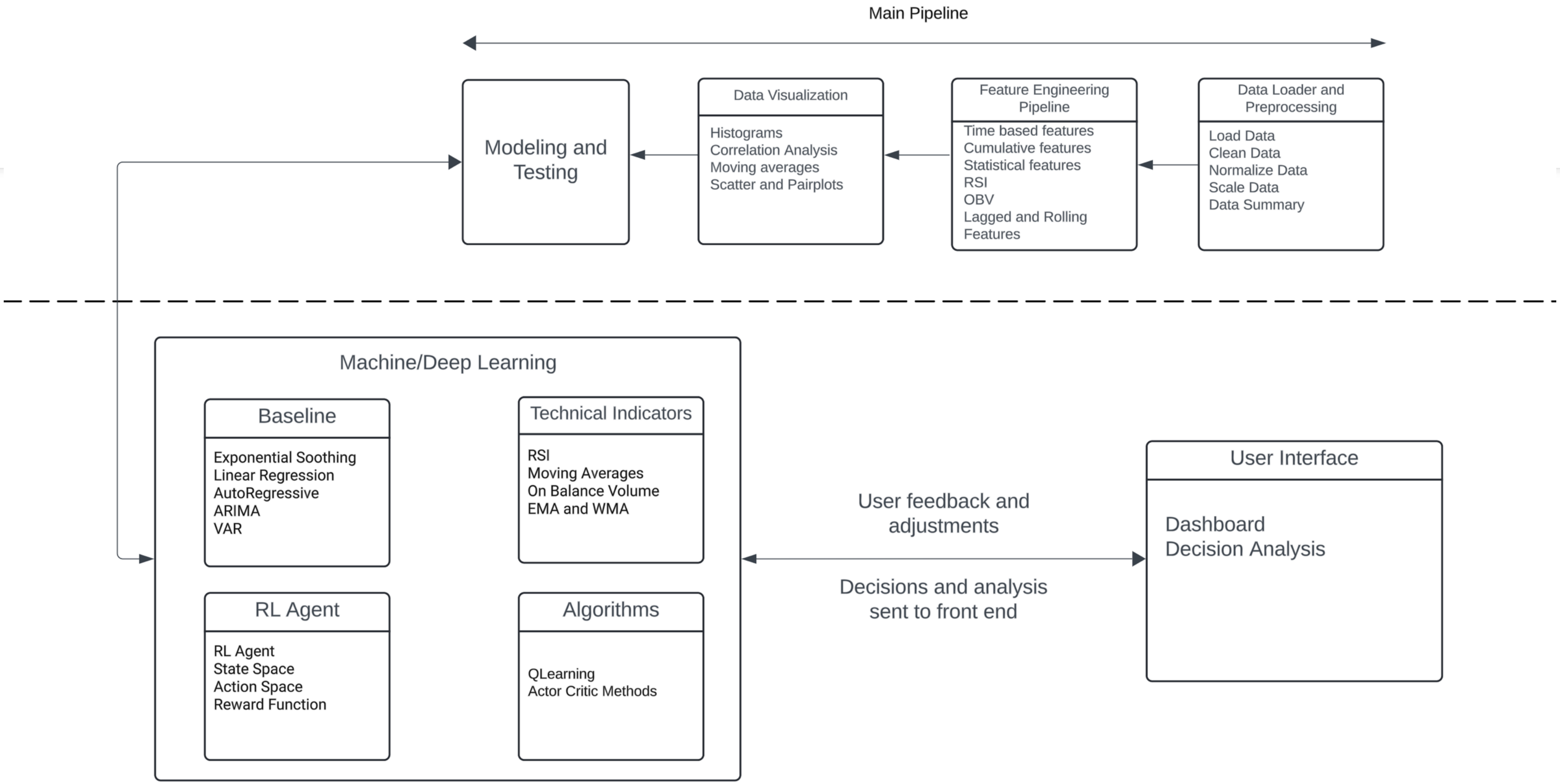
Proposed Project

- Develop an agent to learn trading strategies for the DJI stocks leveraging reinforcement learning.
- Create a system that can adapt to market changes and optimize strategic decisions in real time aiming to maximize returns.
- Evaluate trading strategy performances using metrics and choose which the model will use.

Domain Model


Data
1
M
Technical Indicators
State Space
M
M
M
M
1
M
M
Forecasting Algorithms
M
RL Agent
Continuous Learning
Risk Management
1
1
Reward Function
1
M
1
M
Action Space
M
M

Architecture Model


Main Pipeline
Modeling and Testing
Data Visualization
Histograms
Correlation Analysis
Moving averages
Scatter and Pairplots
Feature Engineering Pipeline
Time based features
Cumulative features
Statistical features
RSI
OBV
Lagged and Rolling Features
Data Loader and Preprocessing
Load Data
Clean Data
Normalize Data
Scale Data
Data Summary
Machine/Deep Learning
Baseline
Exponential Soothing
Linear Regression
AutoRegressive
ARIMA
VAR
Technical Indicators
RSI
Moving Averages
On Balance Volume
EMA and WMA
RL Agent
RL Agent
State Space
Action Space
Reward Function
Algorithms
QLearning
Actor Critic Methods
User feedback and adjustments
Decisions and analysis sent to front end
User Interface
Dashboard
Decision Analysis

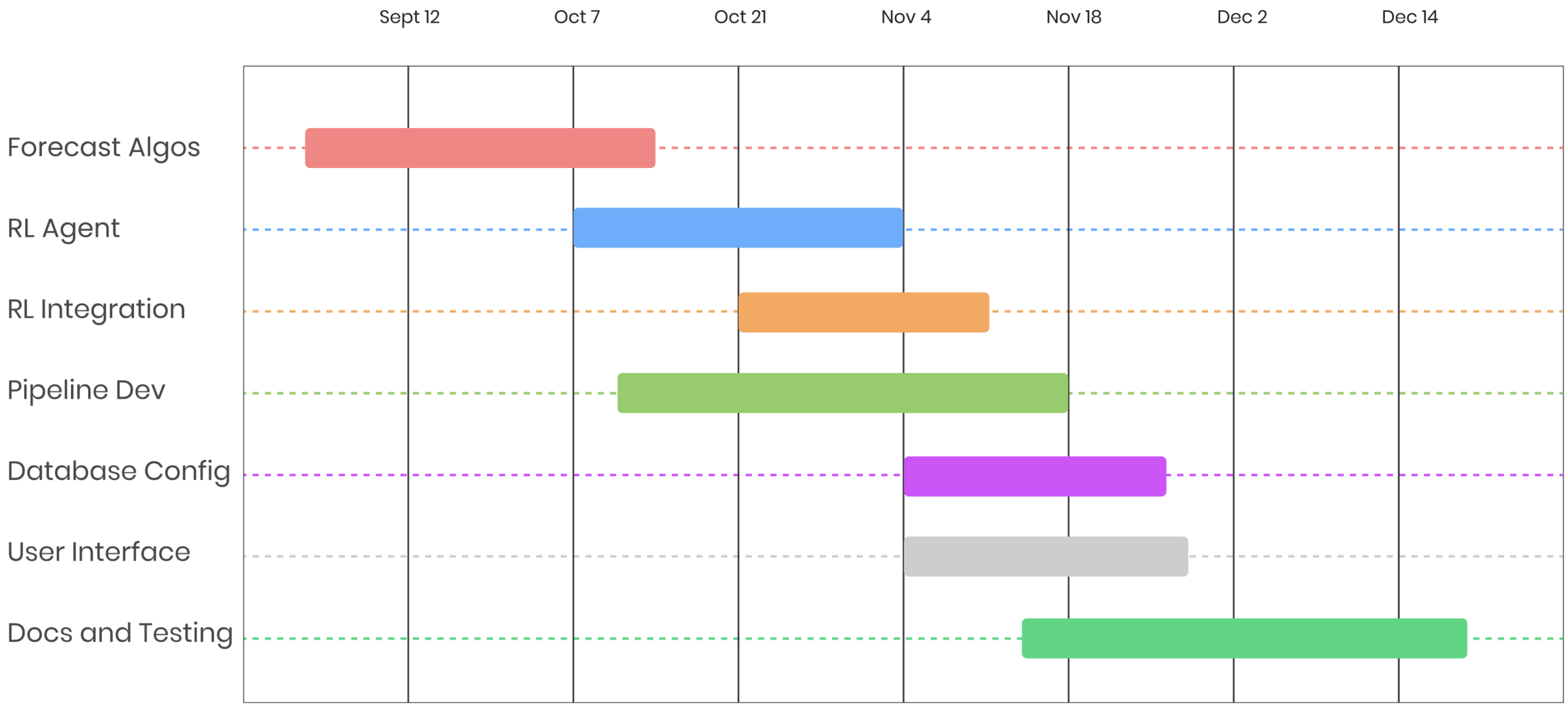
Deliverables

- Forecasting Algorithms [Almost]
  - AR, ARIMA, VAR
  - LSTM
- Pipeline Dev
  - DataLoader, DataPreprocessing, FeatureEngineering [Done]
  - DataModeling, Testing [Pending]

Deliverables By Stand up

- Finalize Forecasting Strategies
- RL Agent algorithms testing
- Modeling pipeline

Gantt Chart



Sept 12
Oct 7
Oct 21
Nov 4
Nov 18
Dec 2
Dec 14
Forecast Algos
RL Agent
RL Integration
Pipeline Dev
Database Config
User Interface
Docs and Testing

Thank you