UM Hackathon 2025

Team Error 404

Members:

- Lim Beng Rhui
- Ng Xuan Jack
- Chan Chun Ming
- Eu Jun Hong

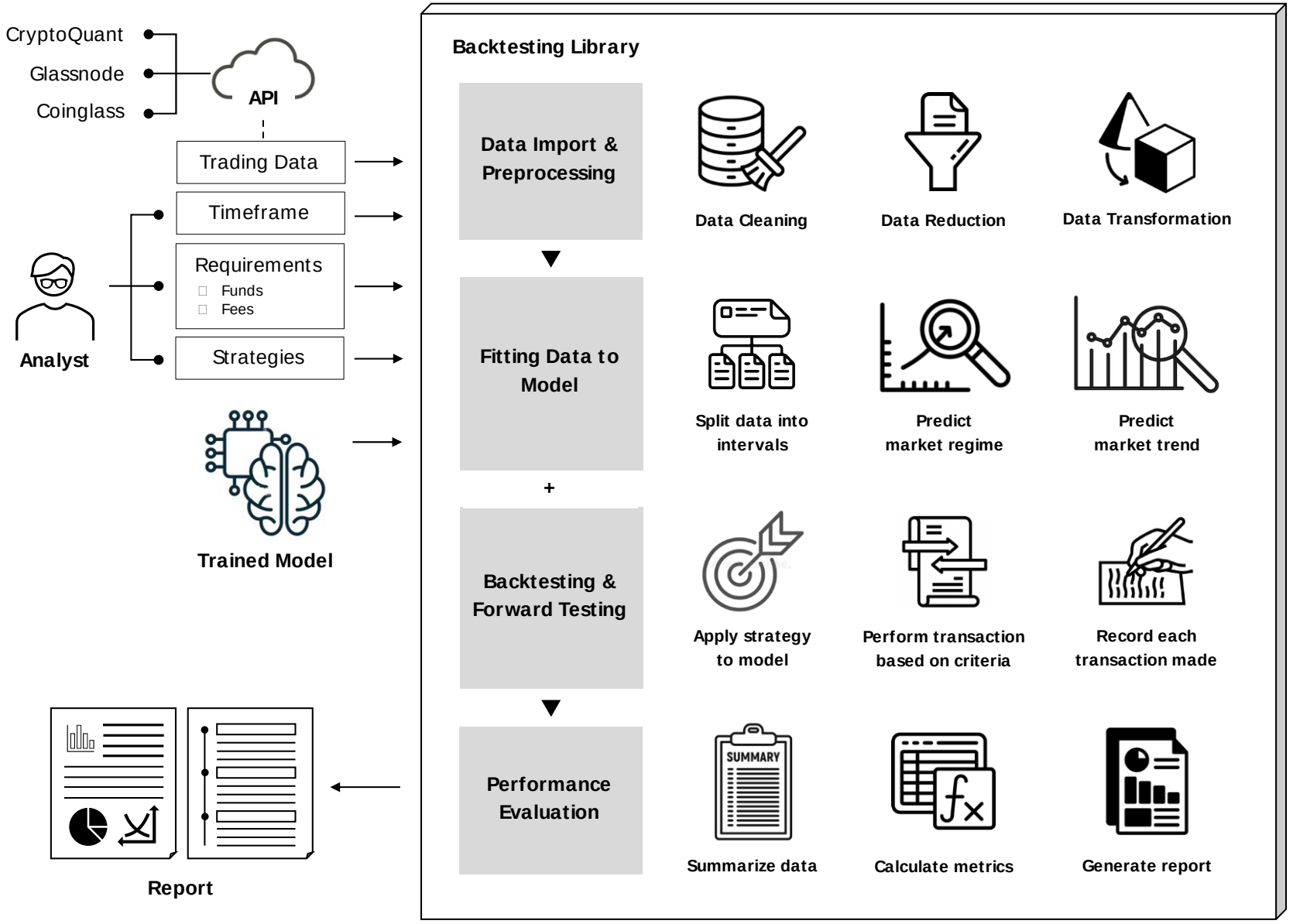
Conceptual Diagram

Three components:

- Input
- Backtest library
- Output

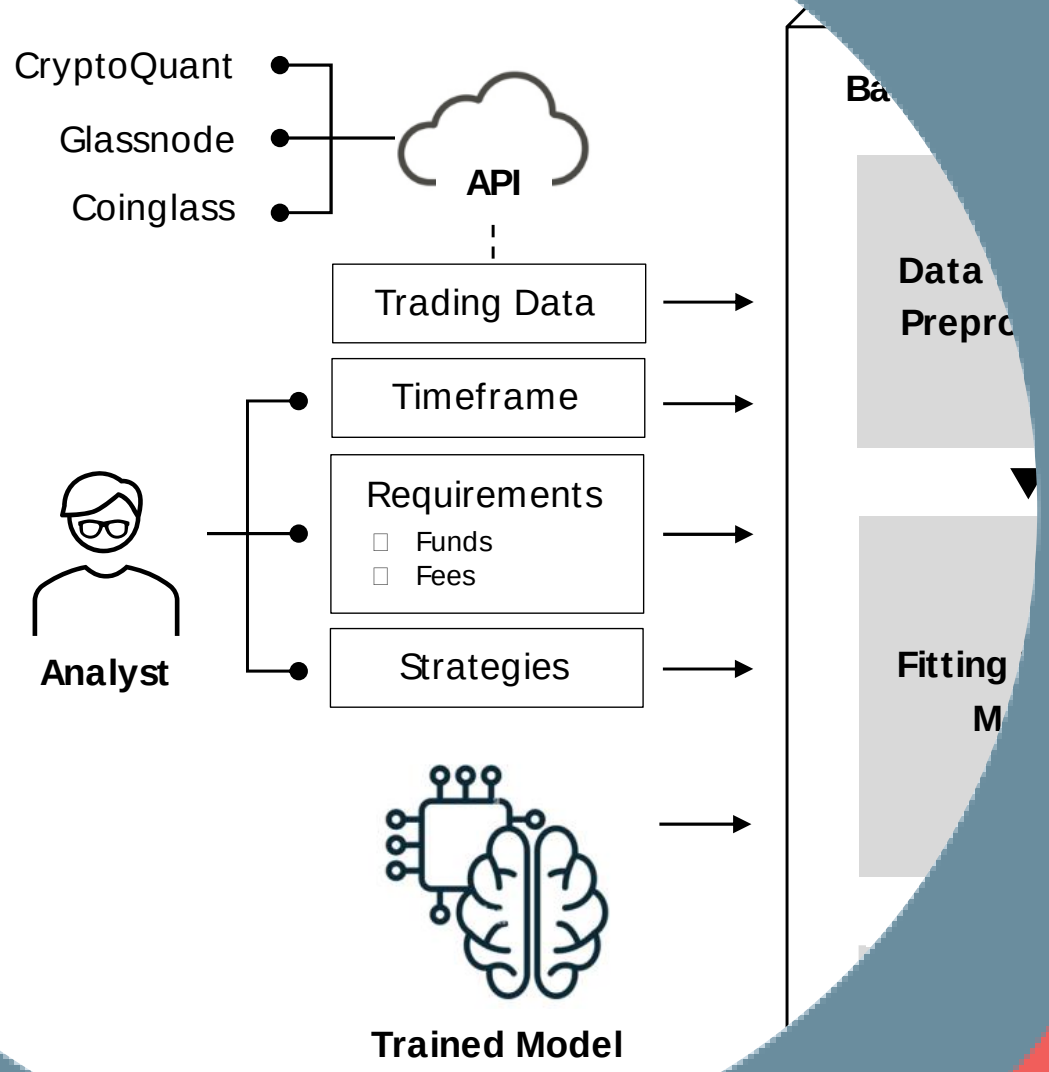
Additional library:

- `pandas`
- `backtrader`
- `scikit-learn`



Input

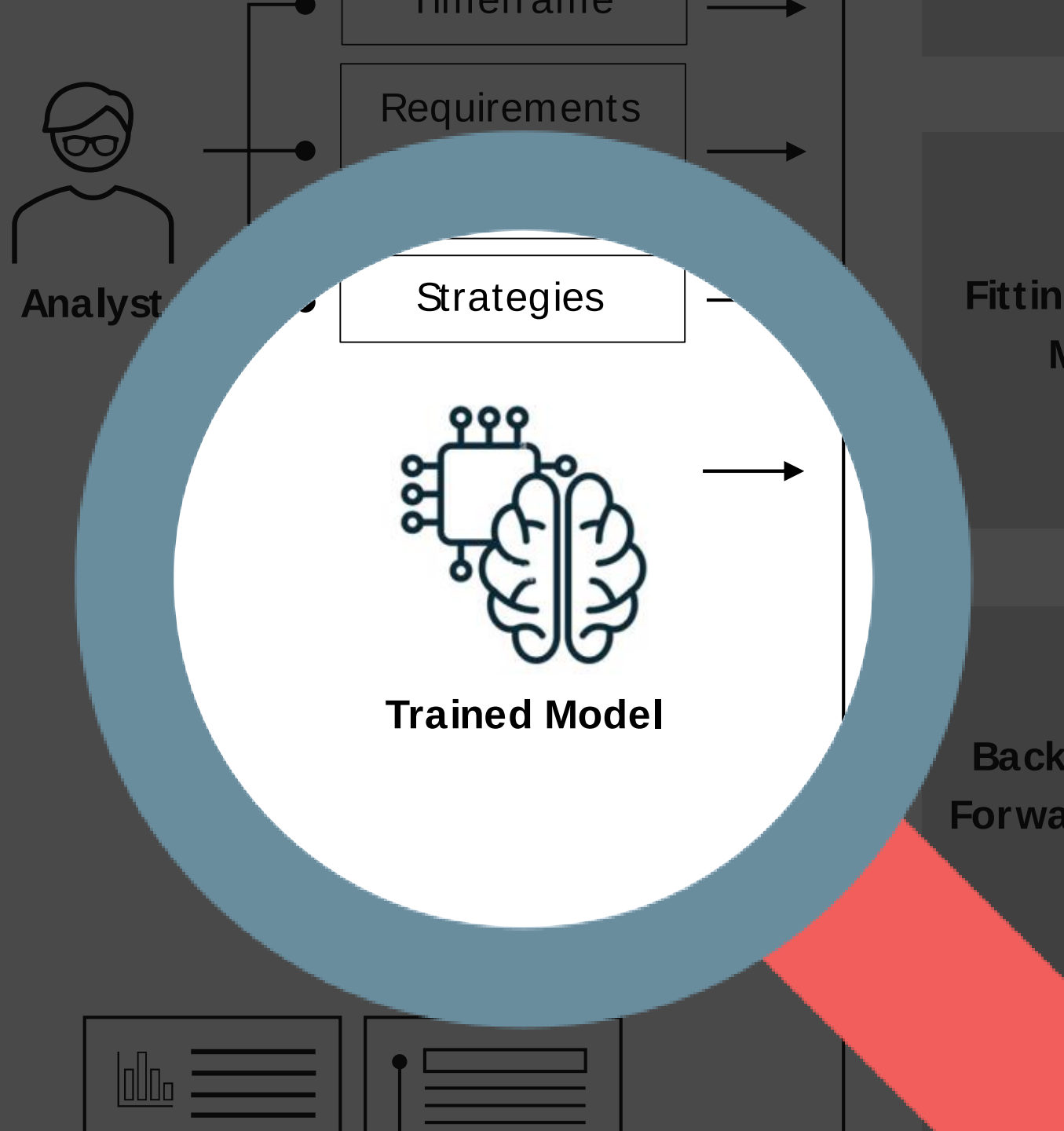
- Trading data
- Timeframe
- Requirements
  (e.g. funds and fees)
- Strategies
- Trained model



Trained Model

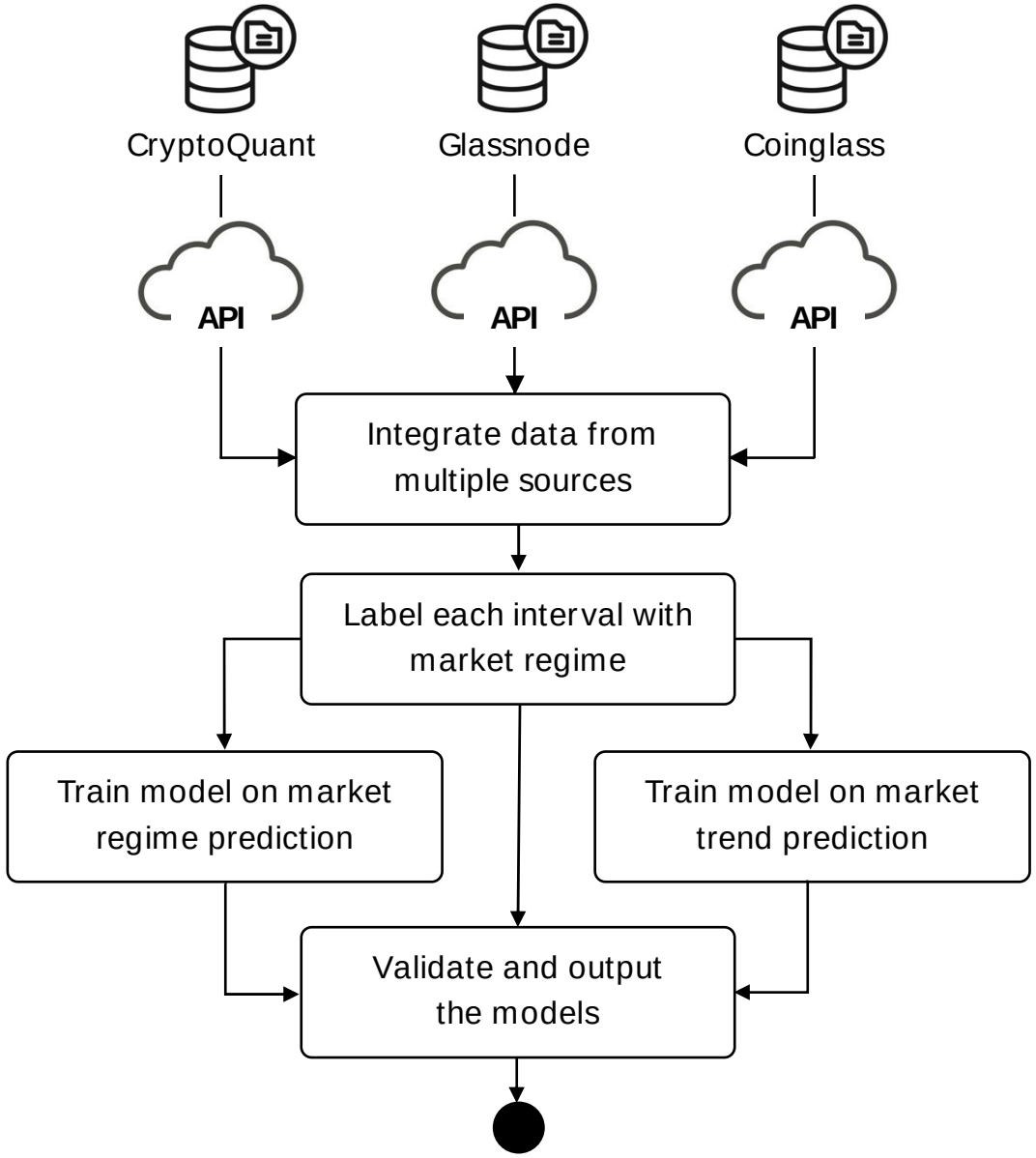
Three components:

- Identify and label market regime
- Predict future market regime
- Predict market trend based on regime



Model Training Flow

This is how we train our ML models.



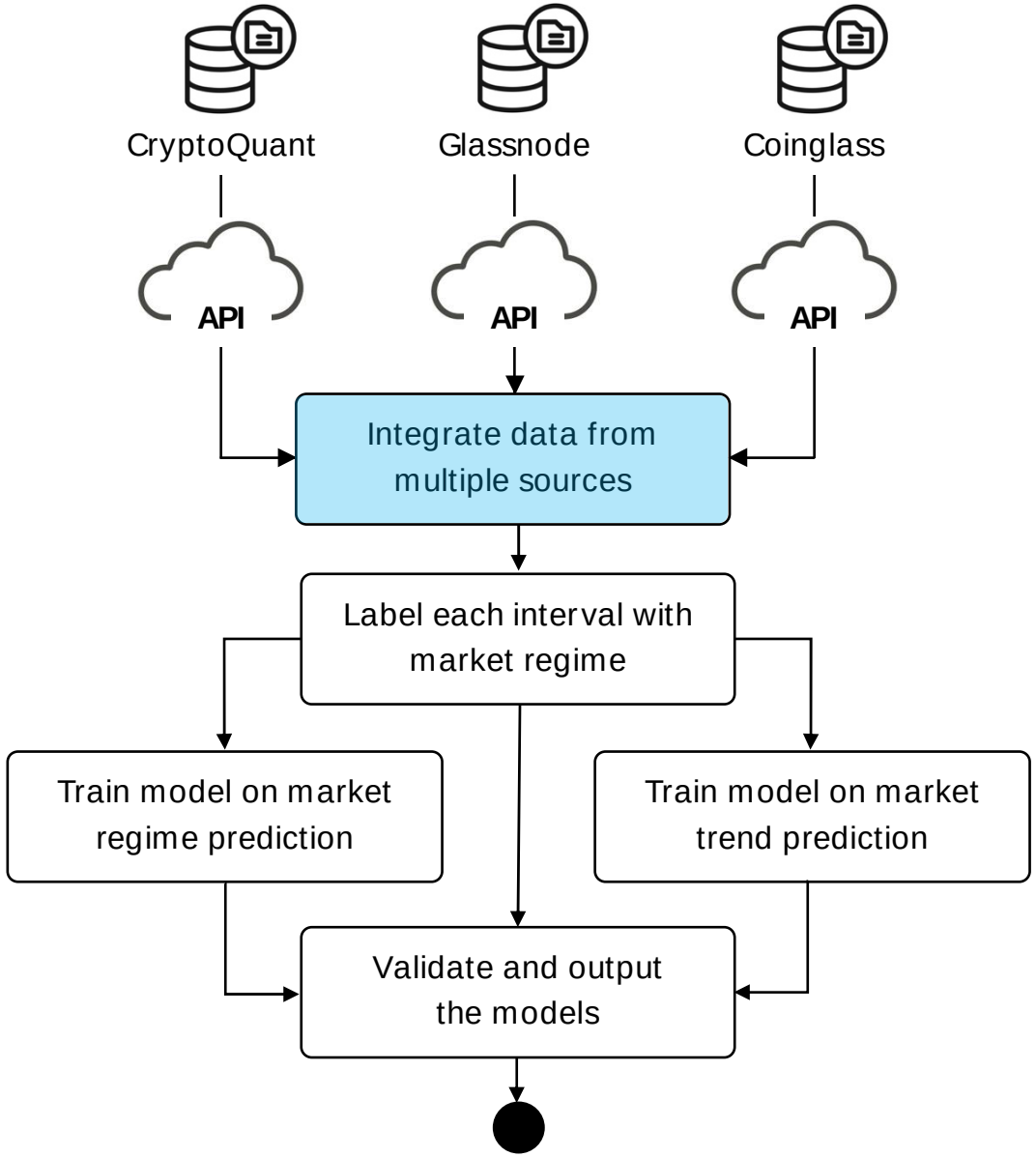
Model Training Flow

Data source:

- CryptoQuant
- Glassnode
- Coinglass

Actions:

- Combine datasets
- Remove unused attributes
- Preprocessing



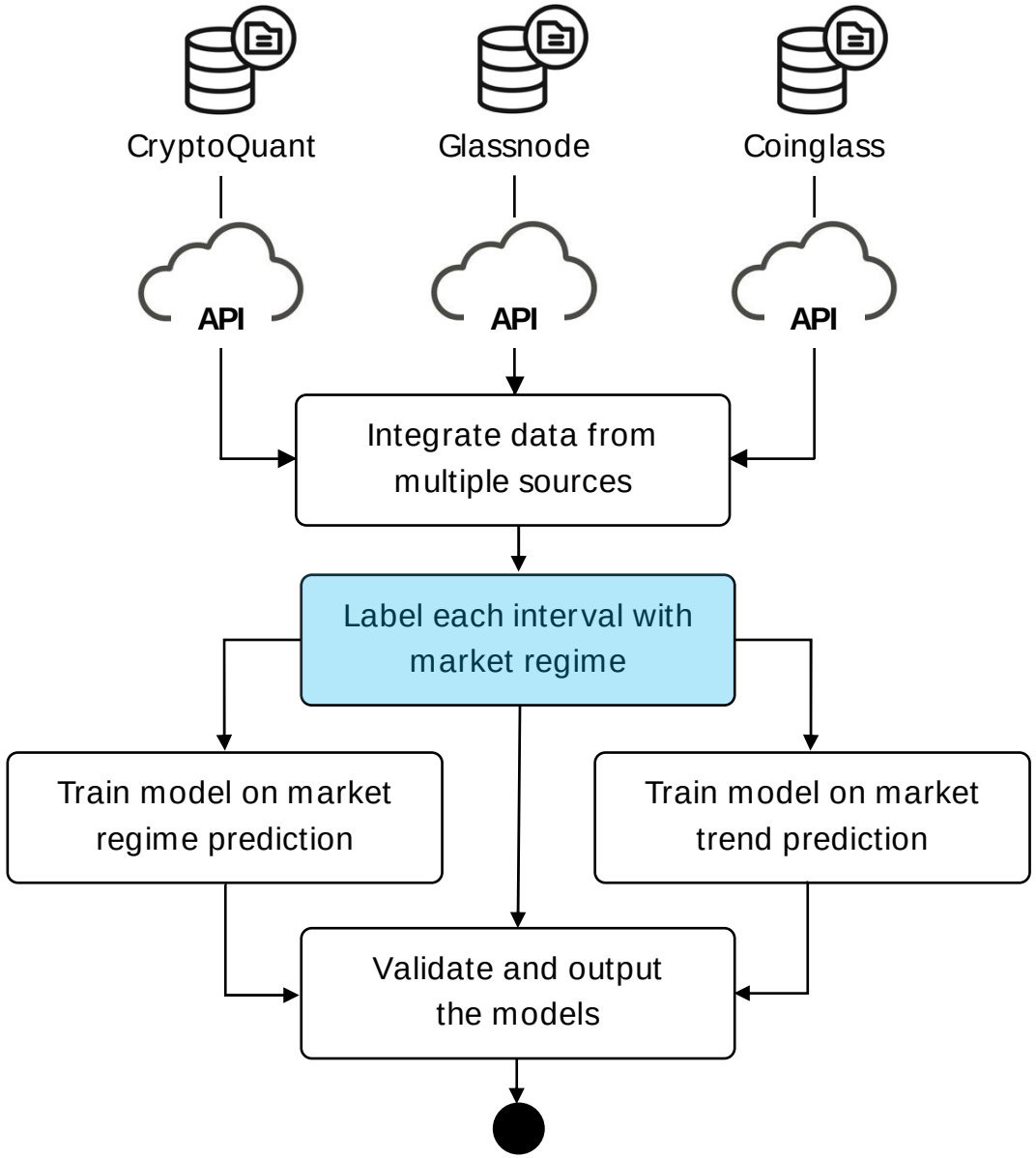
Model Training Flow

Types of market regime:

- Bull
- Bear
- Neutral

Algorithms:

- HMM models
- Clustering models
  (e.g. k-means algorithm)



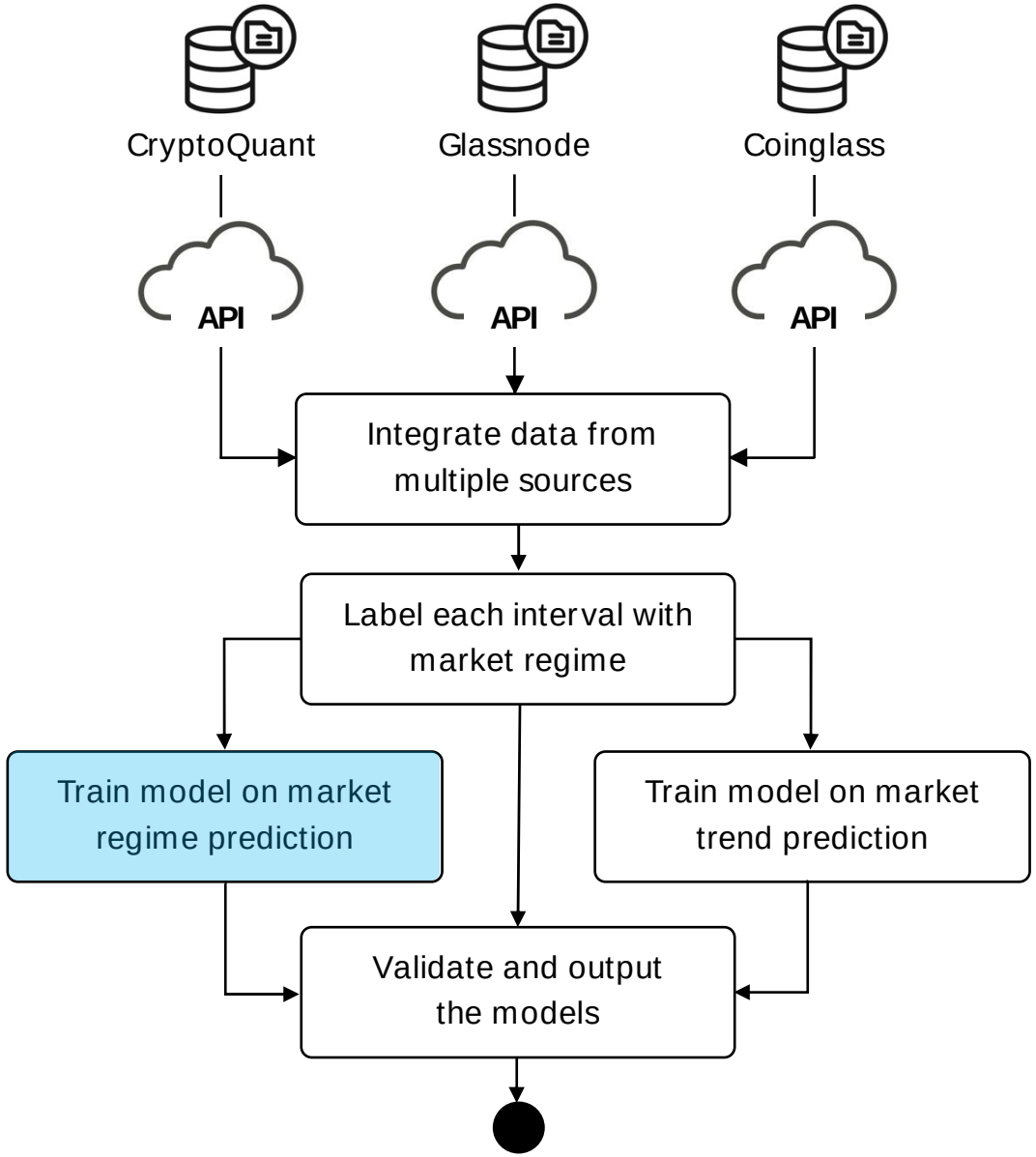
Model Training Flow

Actions:

- Split dataset into training and testing sets
- Apply classification algorithm
- Evaluate model and improvise

Algorithms:

- Random forest
- Neural network



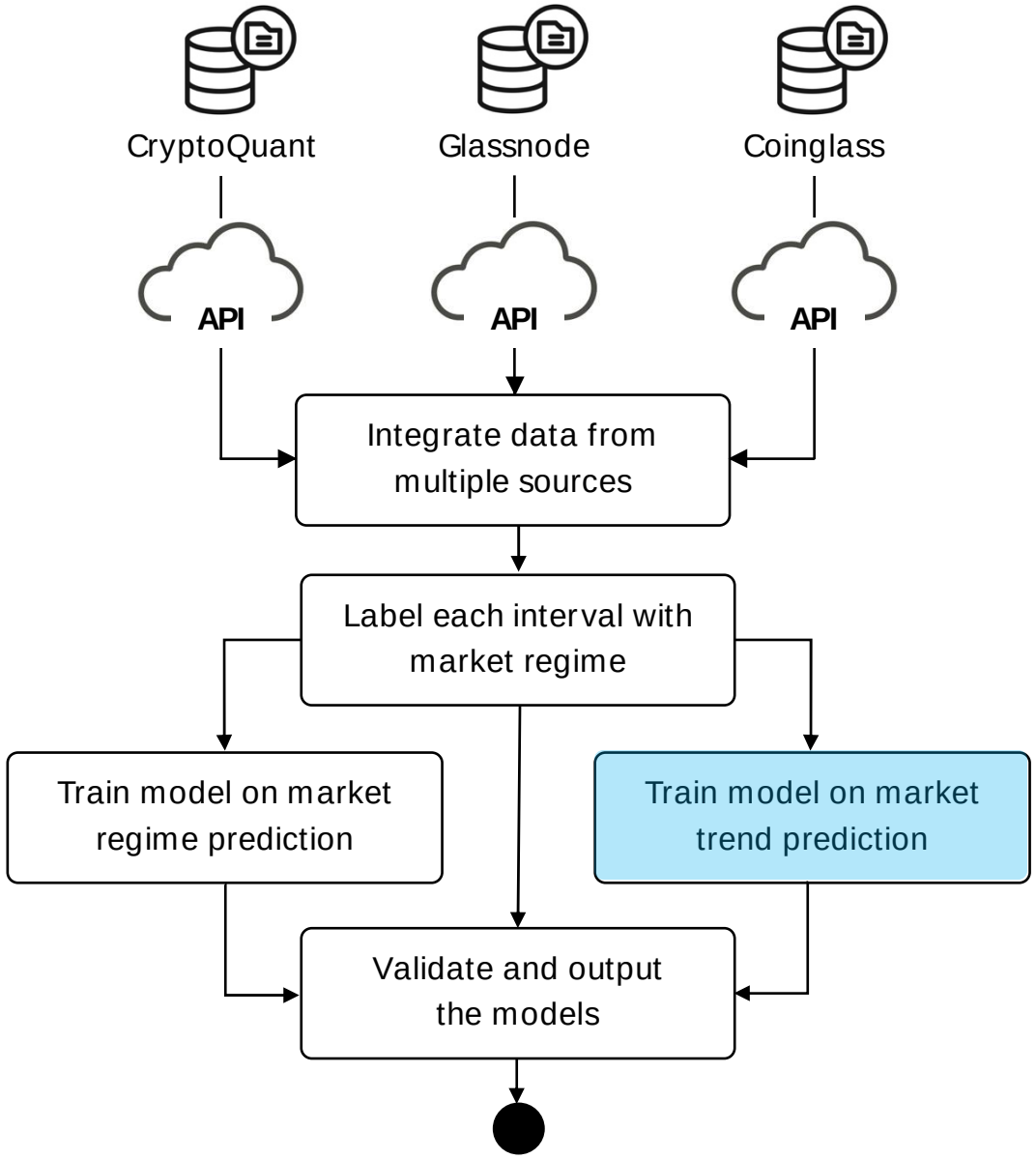
Model Training Flow

Actions:

- Split dataset into training and testing sets
- Apply regression or time-series algorithm
- Evaluate model and improvise

Algorithms:

- Polynomial regression
- LSTM model



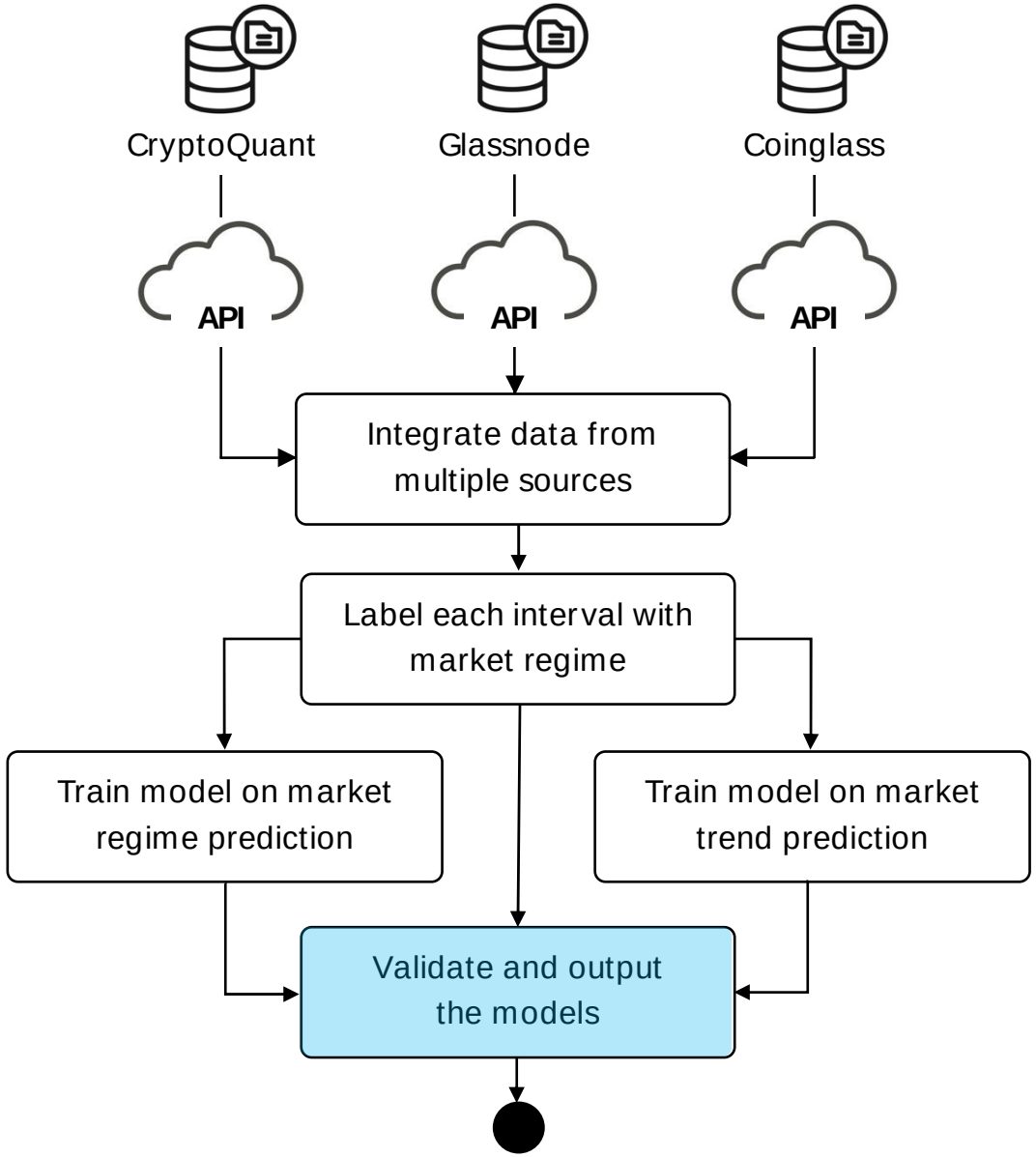
Model Training Flow

Actions:

- Perform final evaluation
- Save models to be used in backtest library

Approach:

- Hybrid model
- Output models separately



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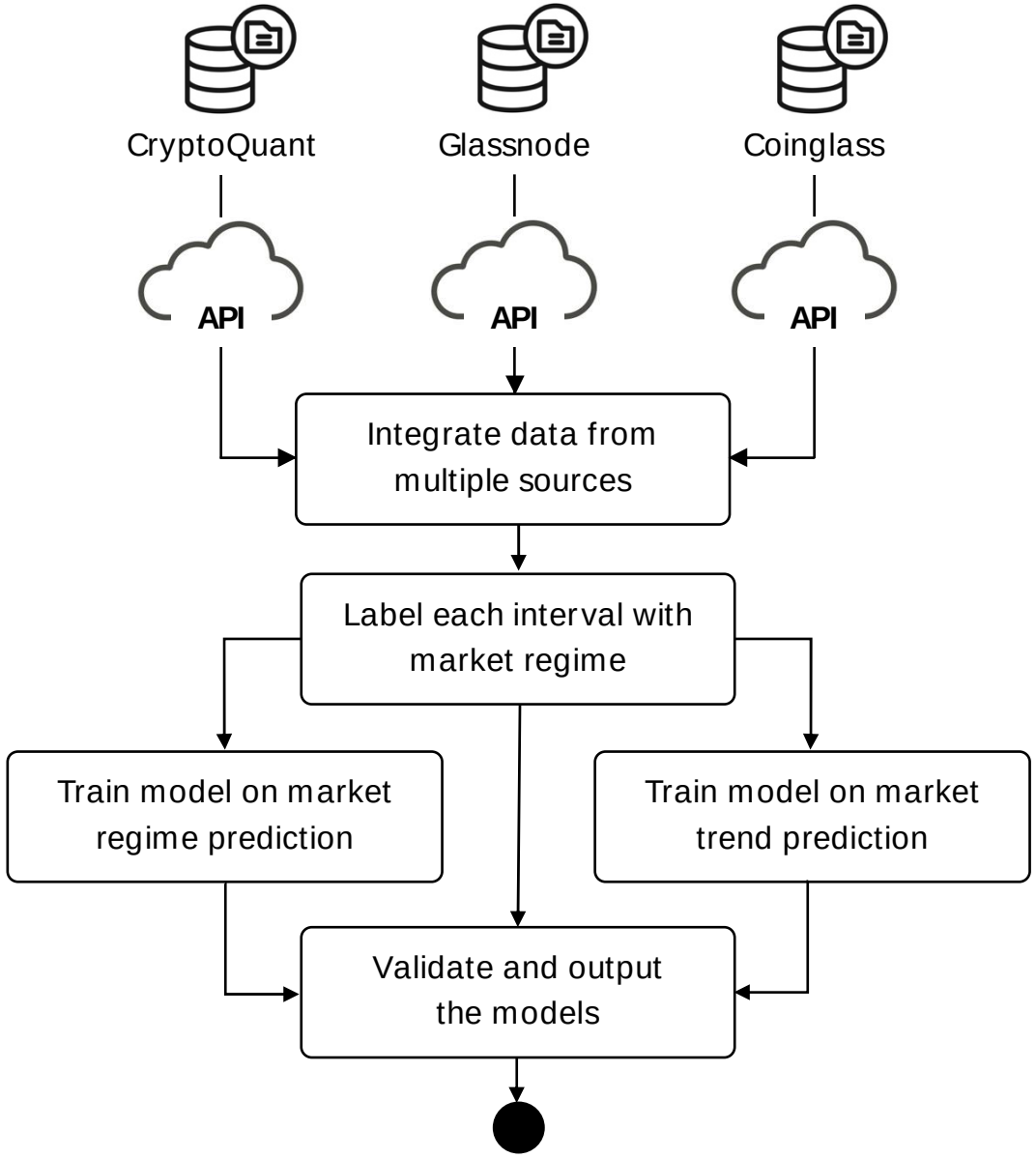

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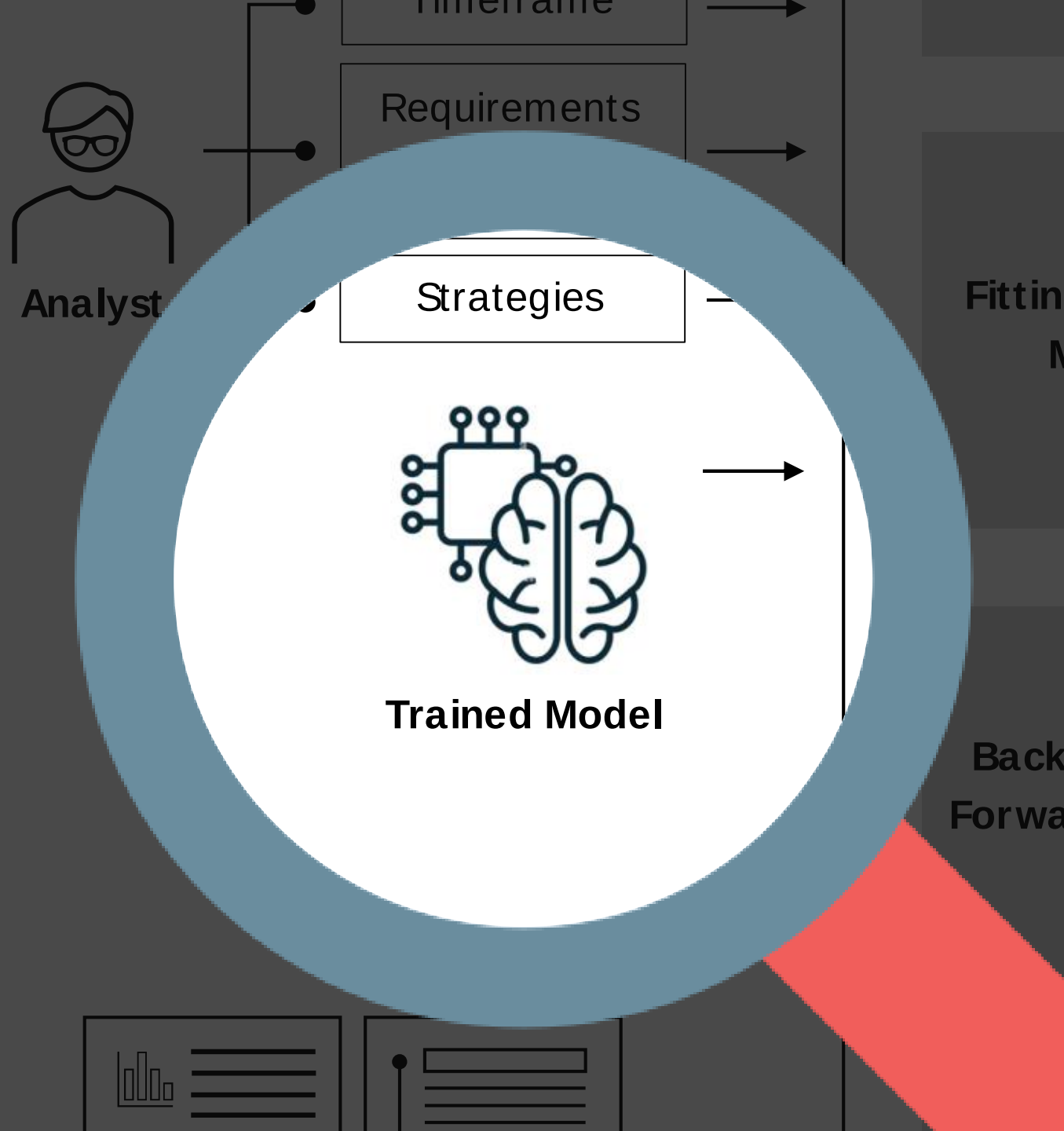
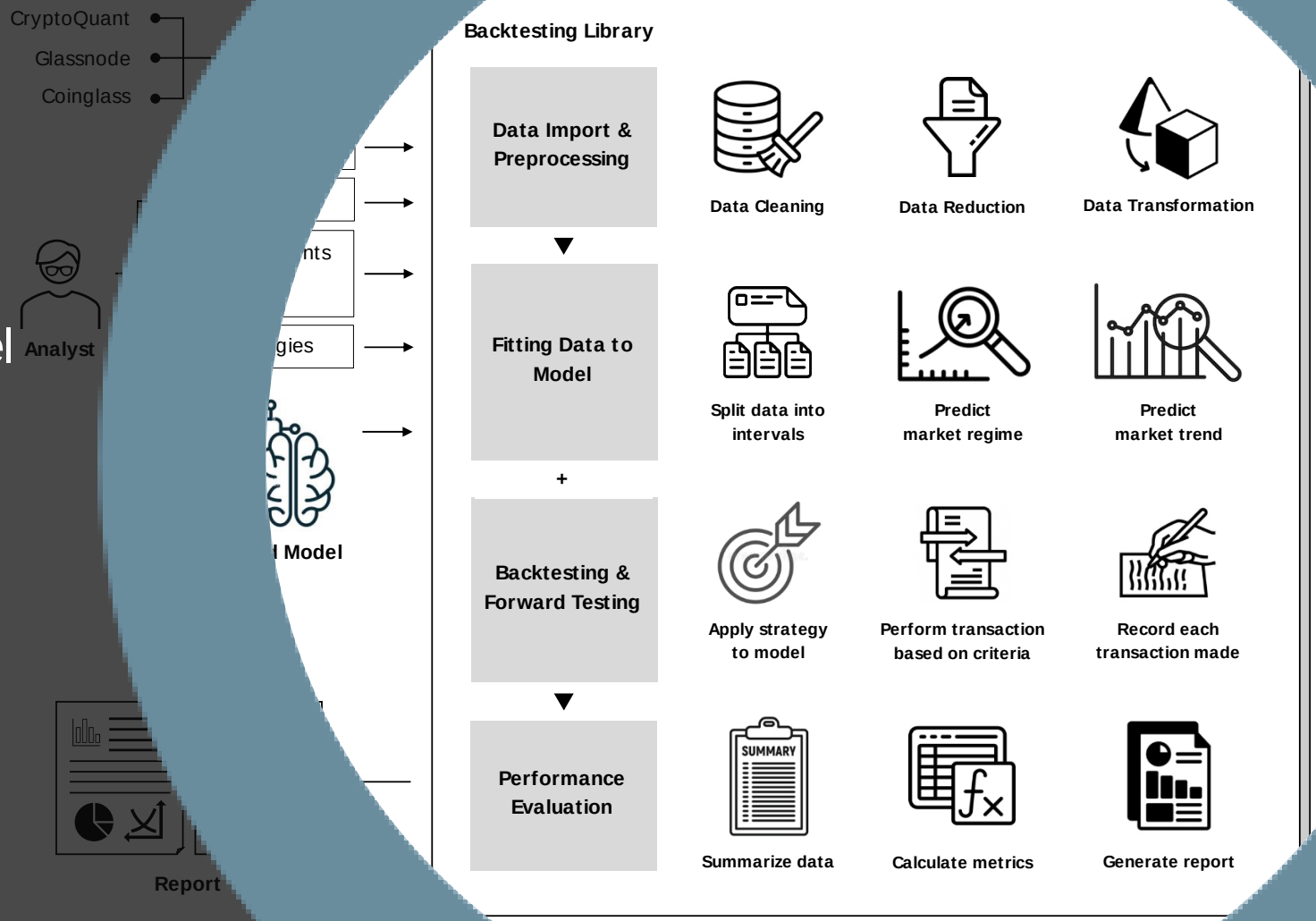


Backtest Library

Four components:

- Data import and preprocessing
- Fitting data to model
- Backtesting and forward testing
- Performance evaluation

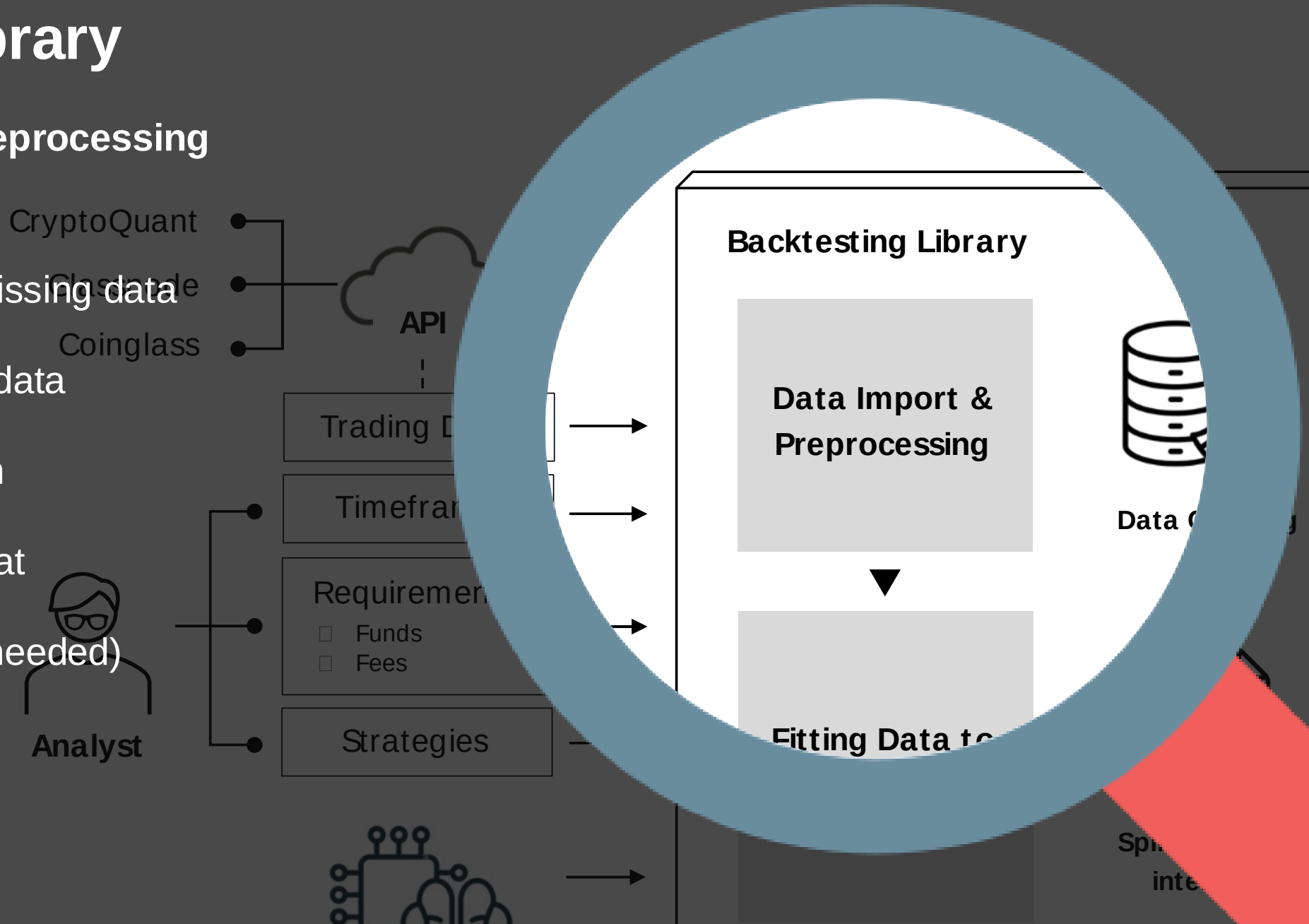


Backtest Library

Data Import and Preprocessing

Actions:

- Remove null or missing data
- Filter out unused data
- Feature extraction
- Correct data format
- Normalization (if needed)



Backtest Library

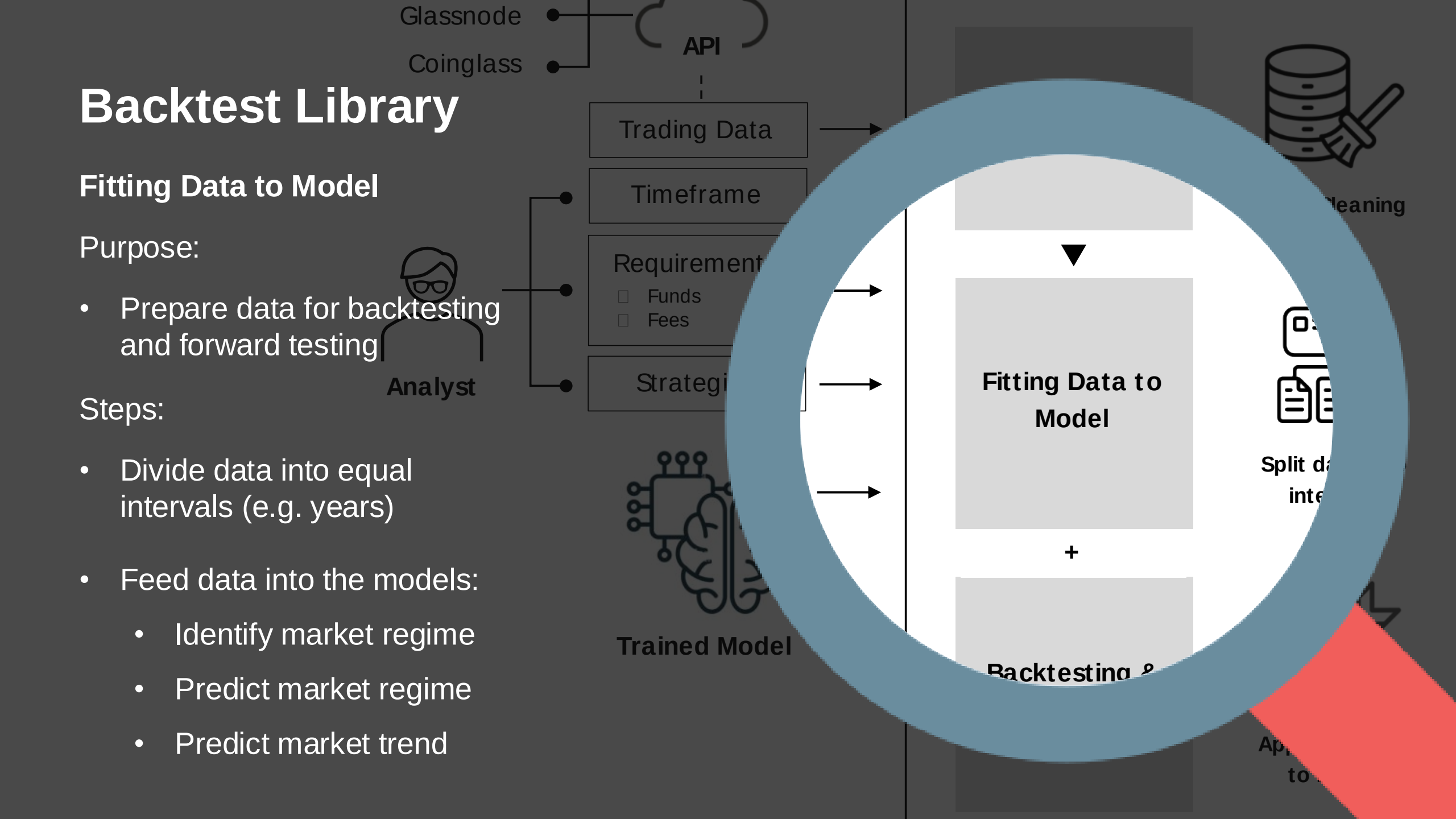
Fitting Data to Model

Purpose:

- Prepare data for backtesting and forward testing

Steps:

- Divide data into equal intervals (e.g. years)
- Feed data into the models:
  - Identify market regime
  - Predict market regime
  - Predict market trend

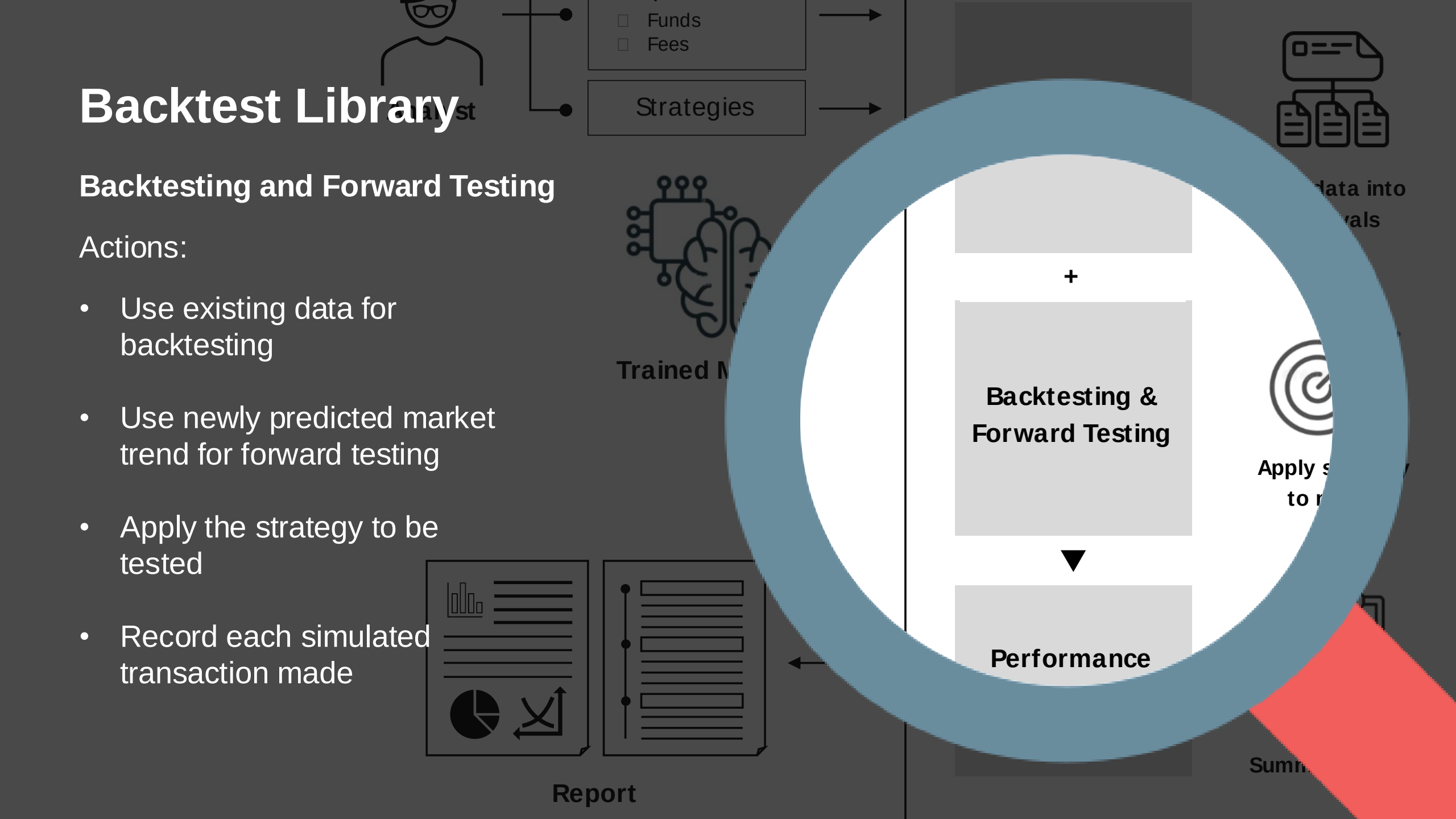


Backtest Library

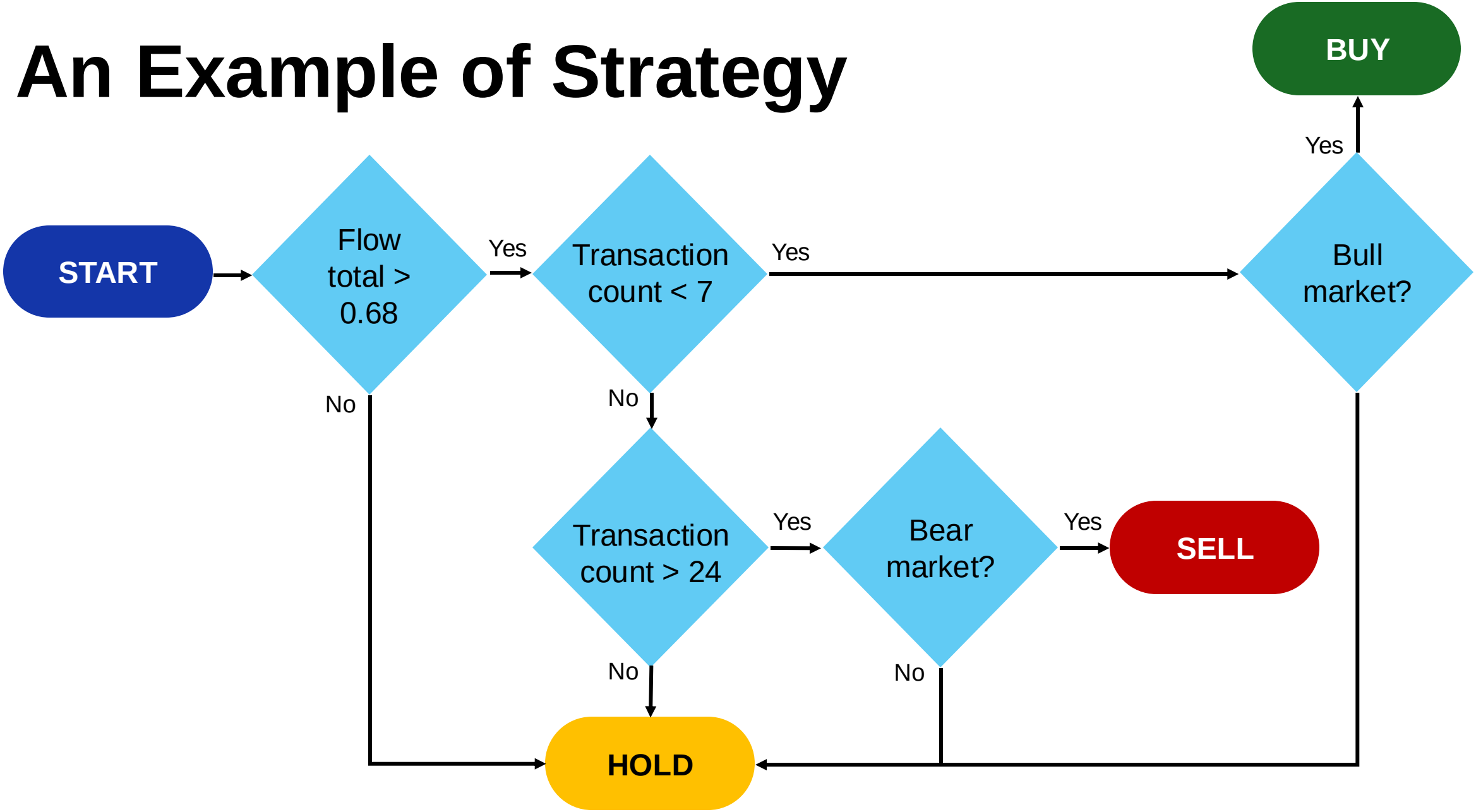
Backtesting and Forward Testing

Actions:

- Use existing data for backtesting
- Use newly predicted market trend for forward testing
- Apply the strategy to be tested
- Record each simulated transaction made



An Example of Strategy



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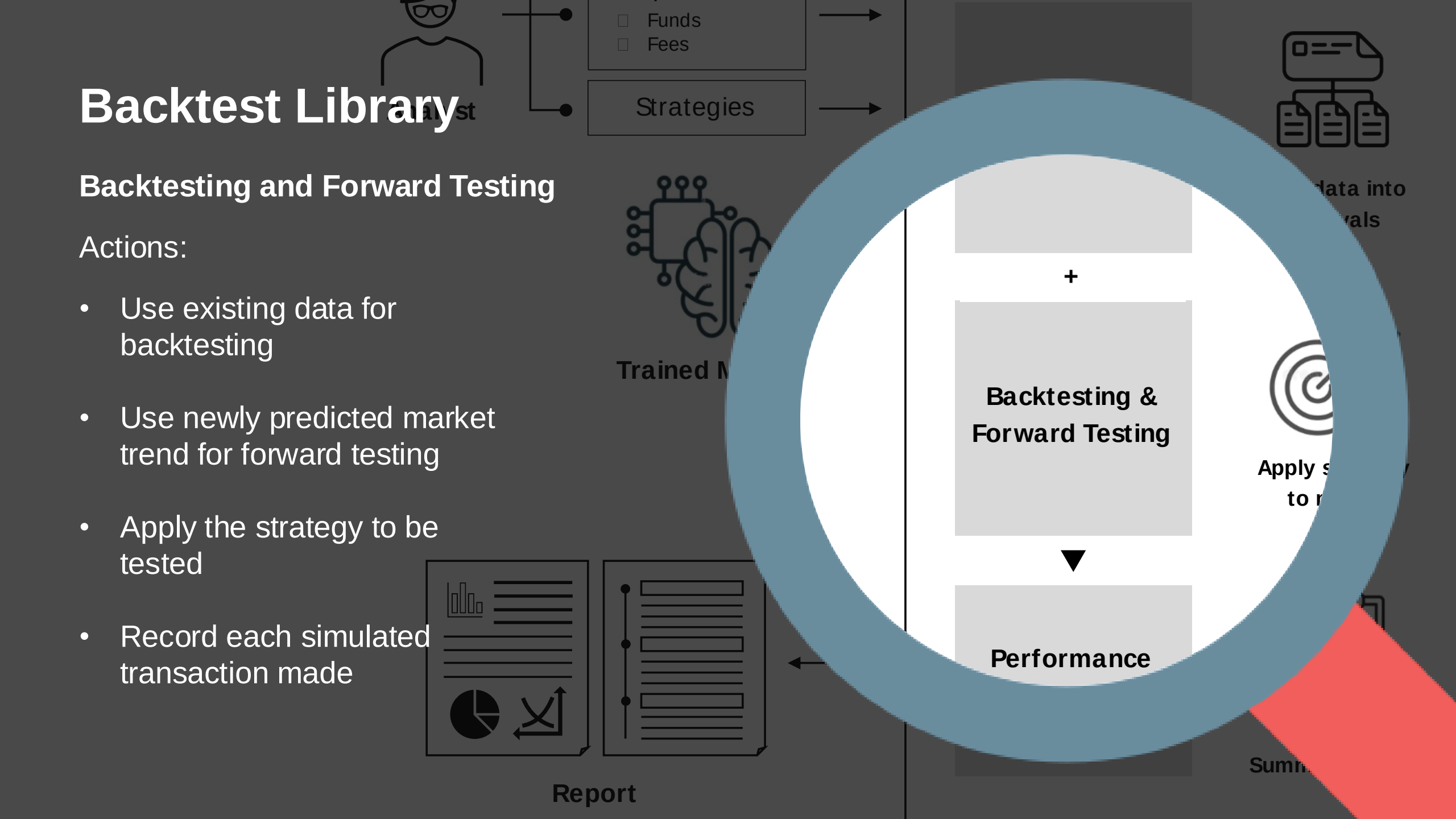
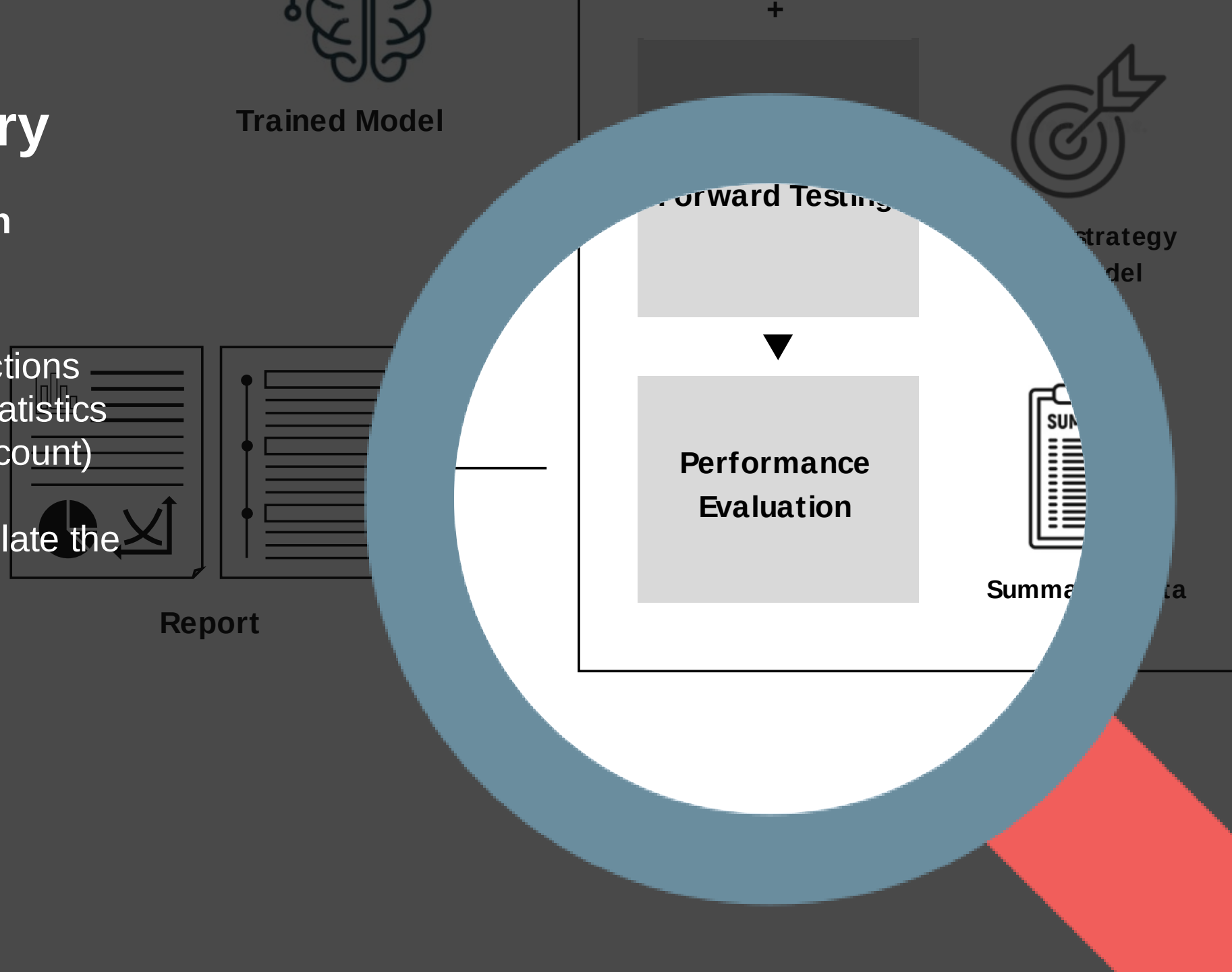


Backtest Library

Performance Evaluation

Actions:

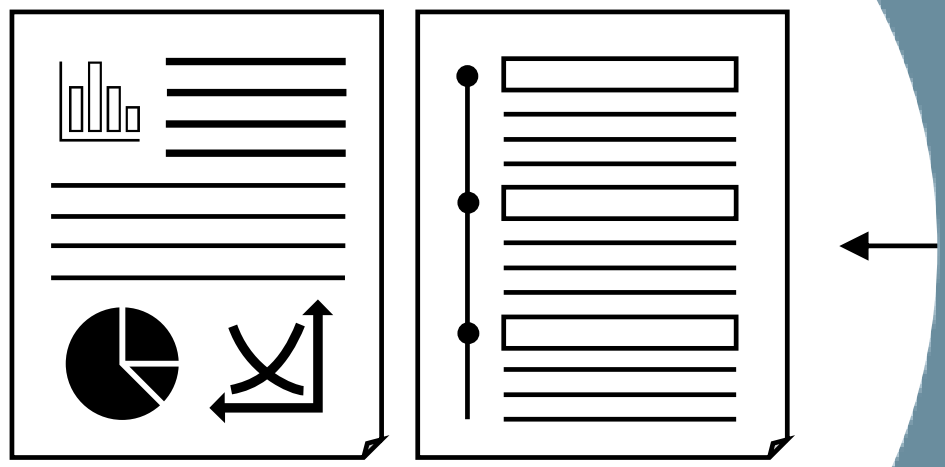
- Summarize all transactions made and calculate statistics (e.g. total transaction count)
- Apply formula to calculate the associated metrics
- Generate report



Output

Prepare report with details like:

- Performance metrics:
  - Sharpe ratio (SR)
  - Maximum drawdown (MDD)
  - Profit and Loss (PnL)
- Graphs and charts
  - Equity curve
  - Trade signal timeline
- Full list of trade records / transactions



Report


thank you