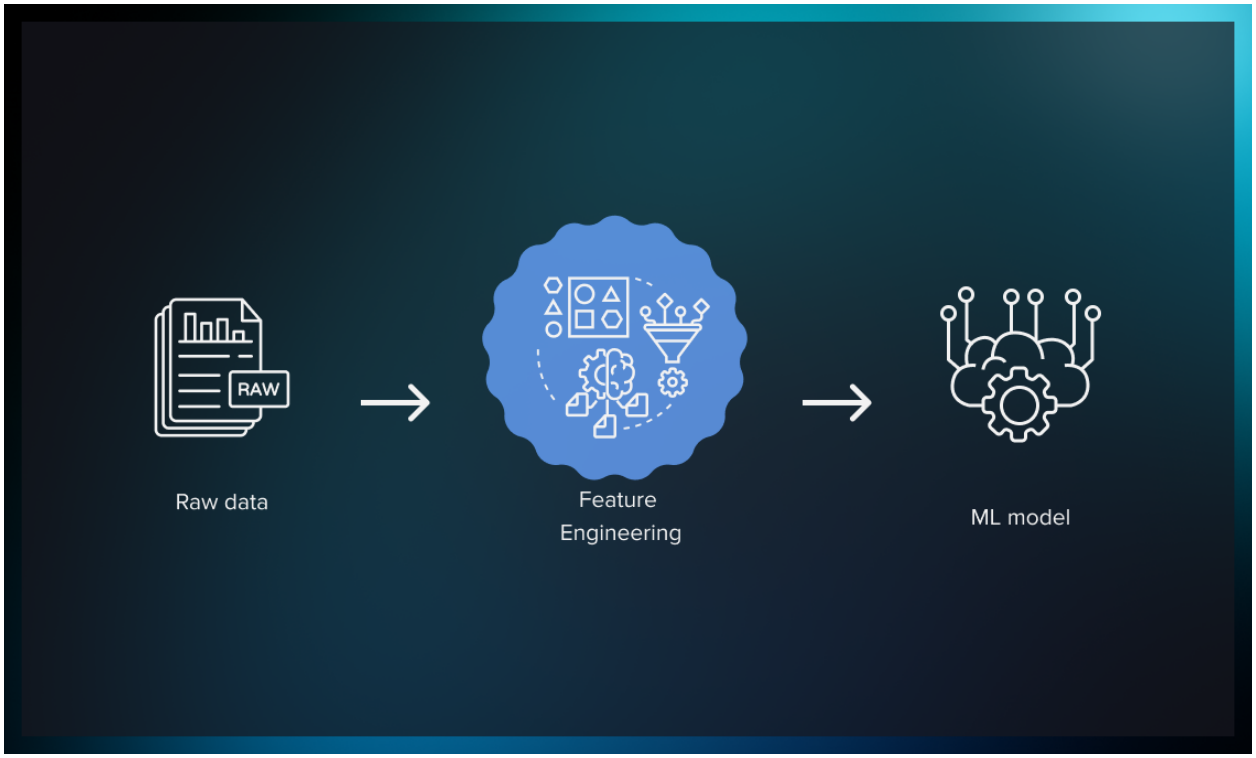
Building a stock price prediction model involves several key steps, including feature engineering, model training, and evaluation. Here's a high-level overview of each step:

1. **Feature Engineering:**

Feature engineering is the process of selecting and creating relevant input variables (features) for your stock price prediction model. It's a critical step because the quality of your features can significantly impact the model's performance. Here are some common features used in stock price prediction:

- **Historical Prices**: Include data such as daily, weekly, or monthly open, high, low, and close prices.
- **Volume**: Consider the trading volume for each time period.
- **Technical Indicators**: Create indicators like moving averages, relative strength index (RSI), and stochastic oscillators.
- **Fundamental Data**: Incorporate information such as earnings reports, financial ratios, and economic indicators.
- **Market Sentiment**: Utilize news sentiment analysis or social media sentiment to gauge market sentiment.
- **Lagged Features**: Use lagged (historical) values of the target variable, as autoregressive features can be valuable.

Additionally, you may need to handle missing data, normalize or scale features, and ensure the data is in a suitable format for modeling.



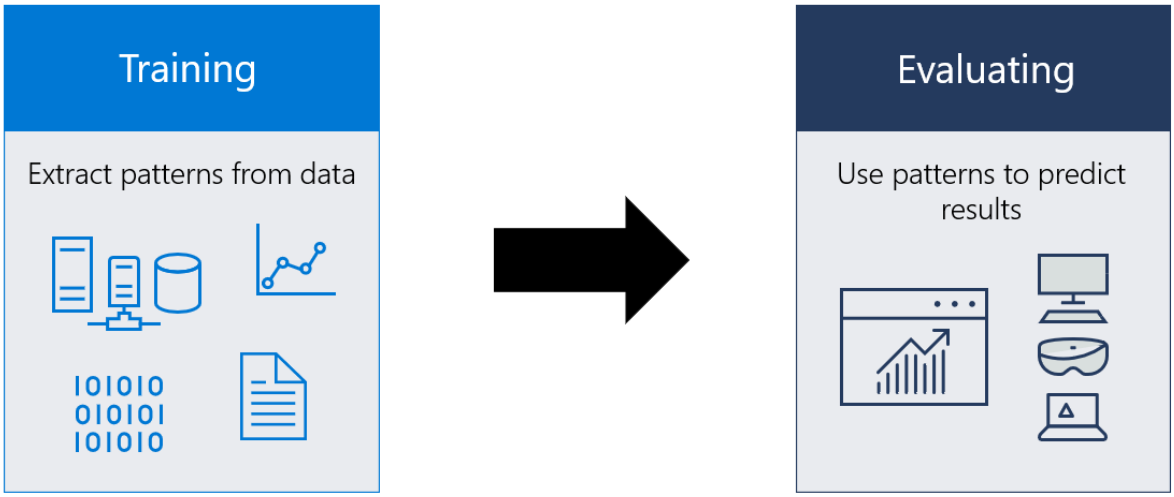
2. **Model Training:**

After feature engineering, you need to select a machine learning or deep learning model to train on your data. Common models used for stock price prediction include:

- **Linear Regression**: A simple model that can be used for basic predictions.
- **Time Series Models**: ARIMA (AutoRegressive Integrated Moving Average) and GARCH (Generalized Autoregressive Conditional Heteroskedasticity) models are popular for time series forecasting.

- **Machine Learning Models**: Decision trees, random forests, support vector machines, and gradient boosting models like XGBoost and LightGBM.
- **Recurrent Neural Networks (RNNs)**: LSTM (Long Short-Term Memory) and GRU (Gated Recurrent Unit) networks for sequential data.
- **Convolutional Neural Networks (CNNs)**: Useful when working with image-based data.

You'll split your data into training, validation, and test sets. Train your model on the training data and fine-tune hyperparameters. Consider using time series cross-validation techniques if you're working with time series data.



3. **Evaluation:**

Model evaluation is crucial to assess the performance of your stock price prediction model. Common evaluation metrics for regression tasks like stock price prediction include:

- **Mean Absolute Error (MAE)**: The average absolute difference between predicted and actual prices.
- **Mean Squared Error (MSE)**: The average squared difference between predicted and actual prices.
- **Root Mean Squared Error (RMSE)**: The square root of MSE, providing a measure in the same units as the target variable.
- **R-squared (R2)**: A measure of how well the model fits the data, with 1 being a perfect fit.

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Additionally, consider using visualizations, such as time series plots, to compare predicted and actual prices.

It's important to note that stock price prediction is a complex and challenging task, and no model can guarantee accurate predictions. Market conditions can change rapidly due to various factors, including unforeseen events. Therefore, it's important to use these models cautiously and consider other risk management strategies when trading or investing in the stock market.