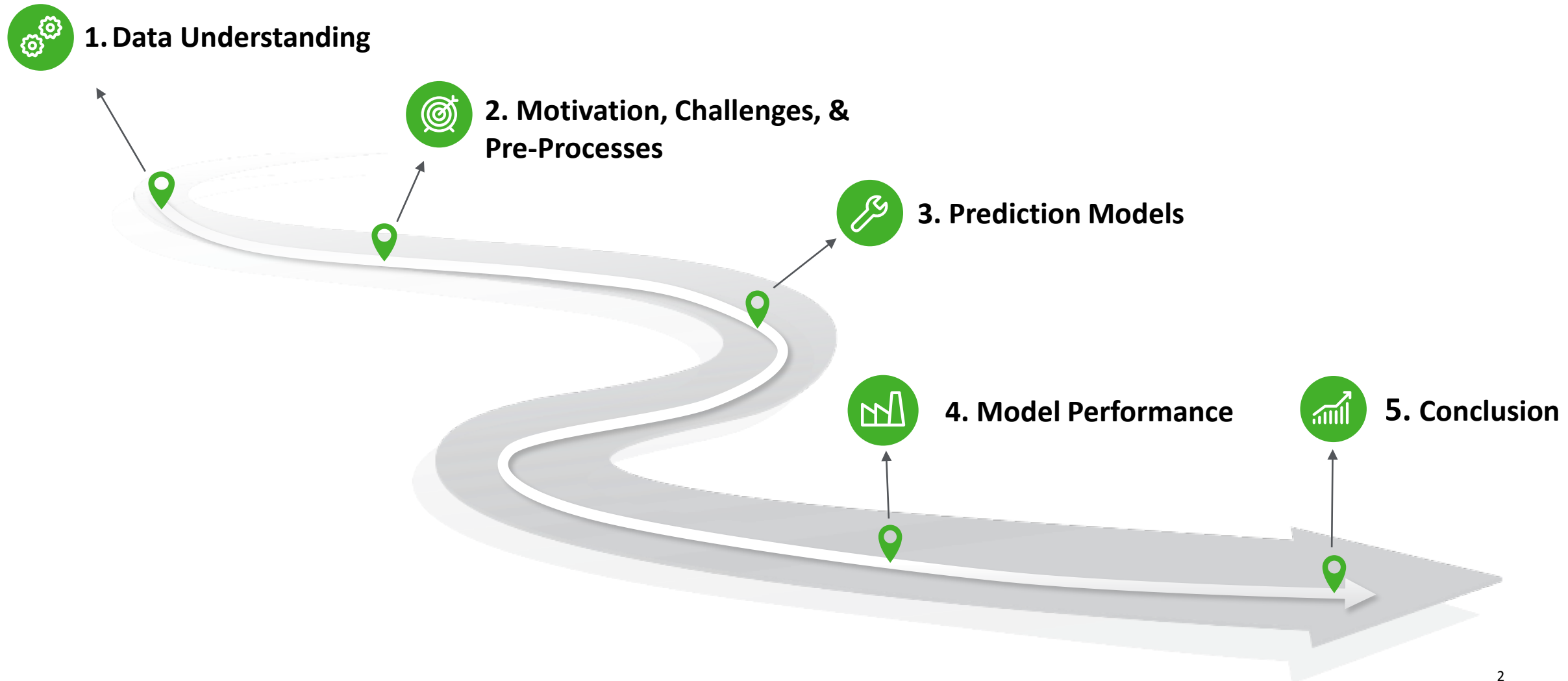


Optimal Machine Failure Prediction Model For Toyota

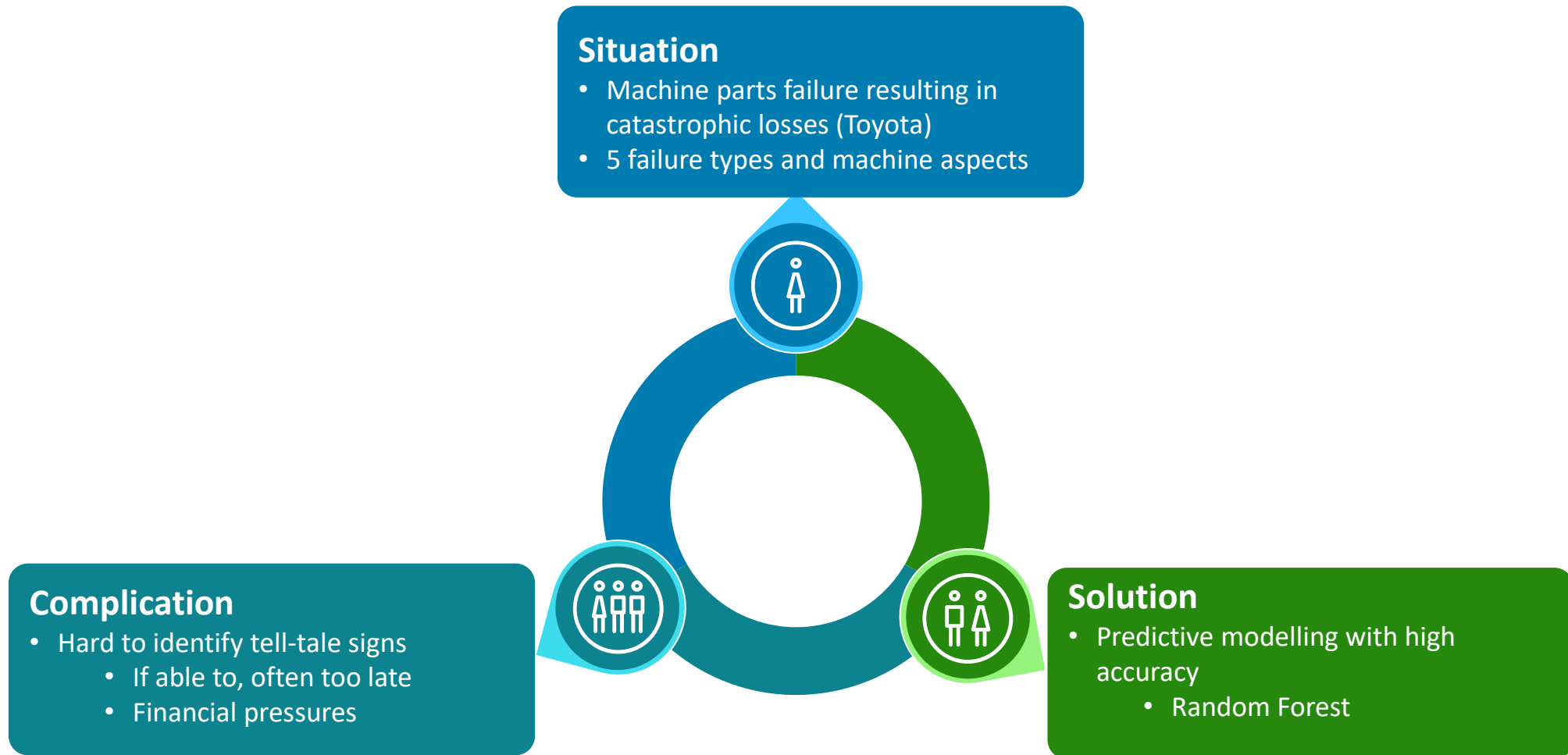
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Agenda



Data Understanding

Significance of machine failure in vehicles



Motivations, Challenges, and Pre-processes

Importance of pre-processing techniques

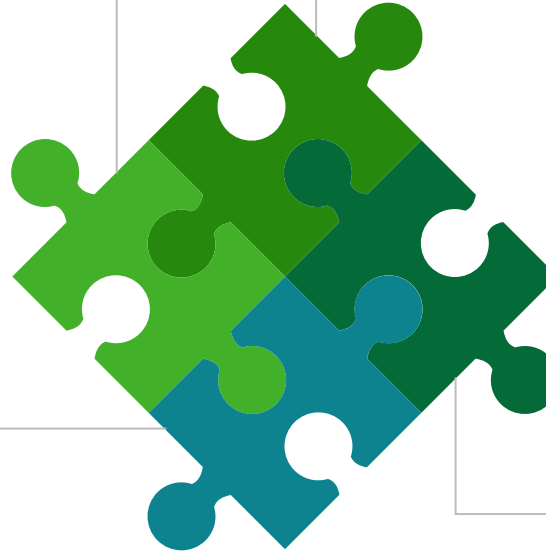
Challenges

- Imbalanced Dataset
- Categorical and Continuous
- Multiple failure types
- Data on different scales



Pre-Processing Techniques

- Resampling techniques
- Binary Transformation
- Scaling of data
- Failure type consolidation



Motivation

- Uniform preprocessing techniques to ensure comparability



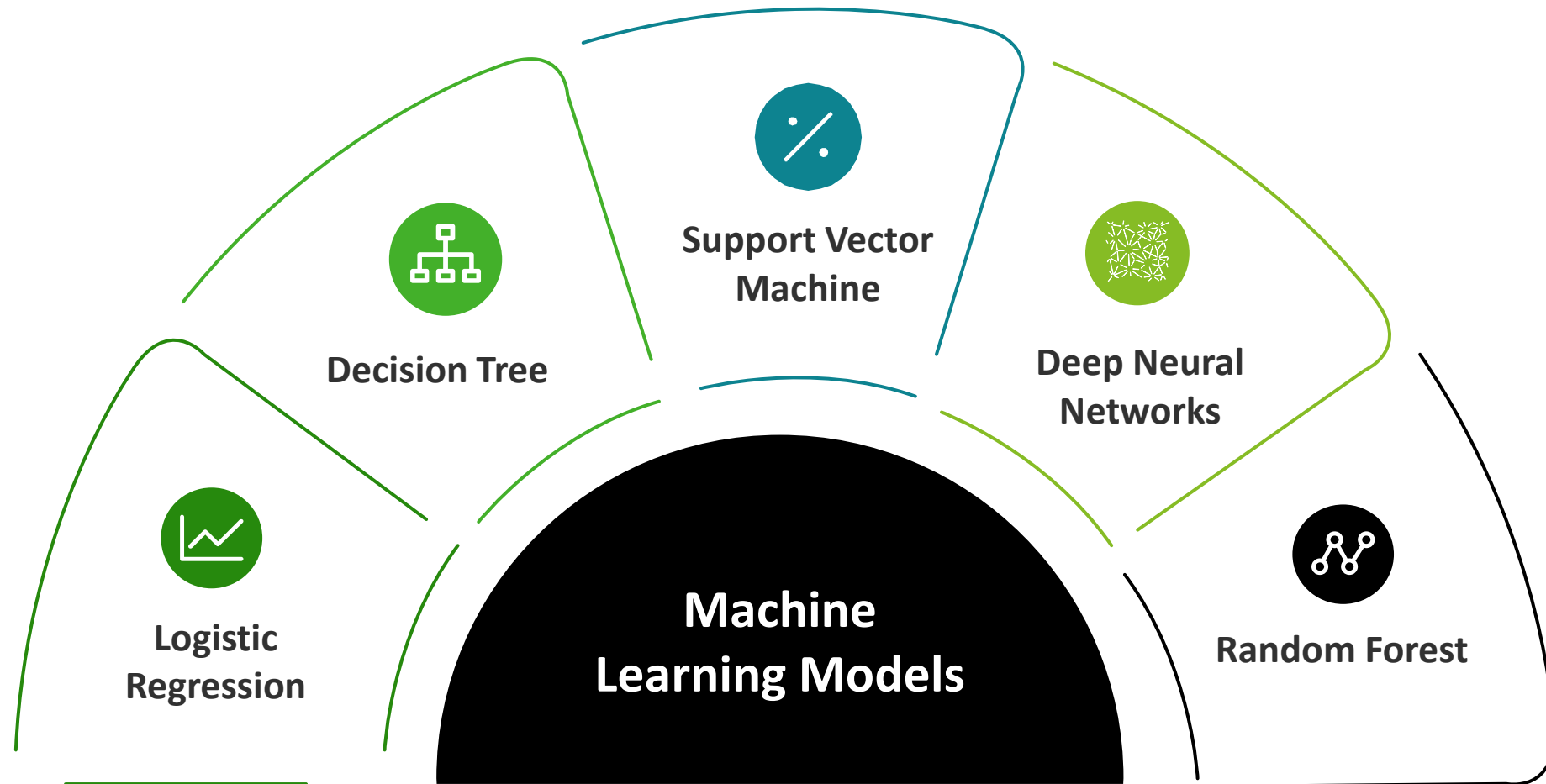
Results

- Preprocessed dataset optimized for model training



Prediction Models

Selecting ML models for predicting machine failure

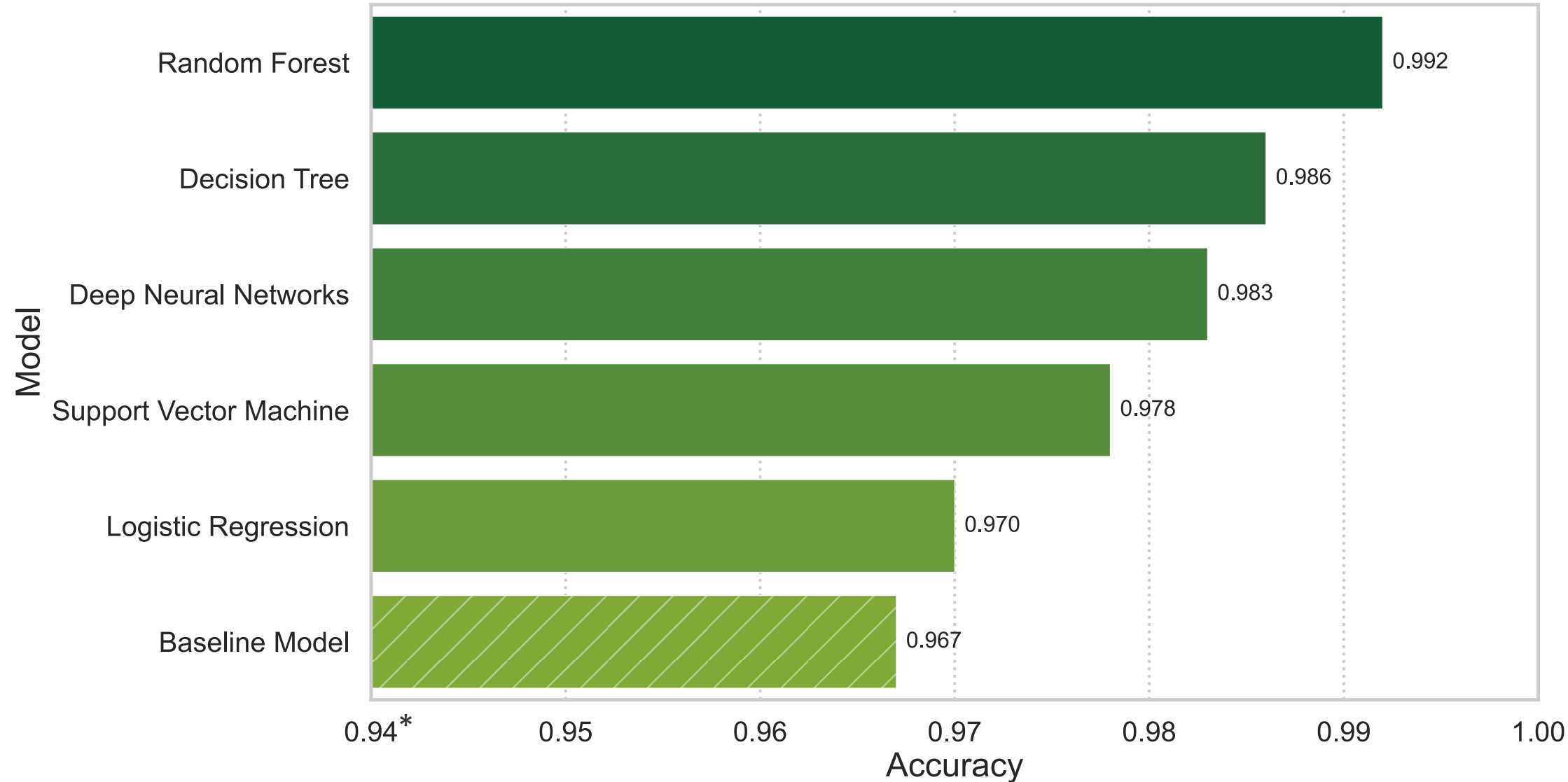


Model Performance

Holdout set accuracy before tuning

* Starts at 0.94; ticks represent 0.01 change

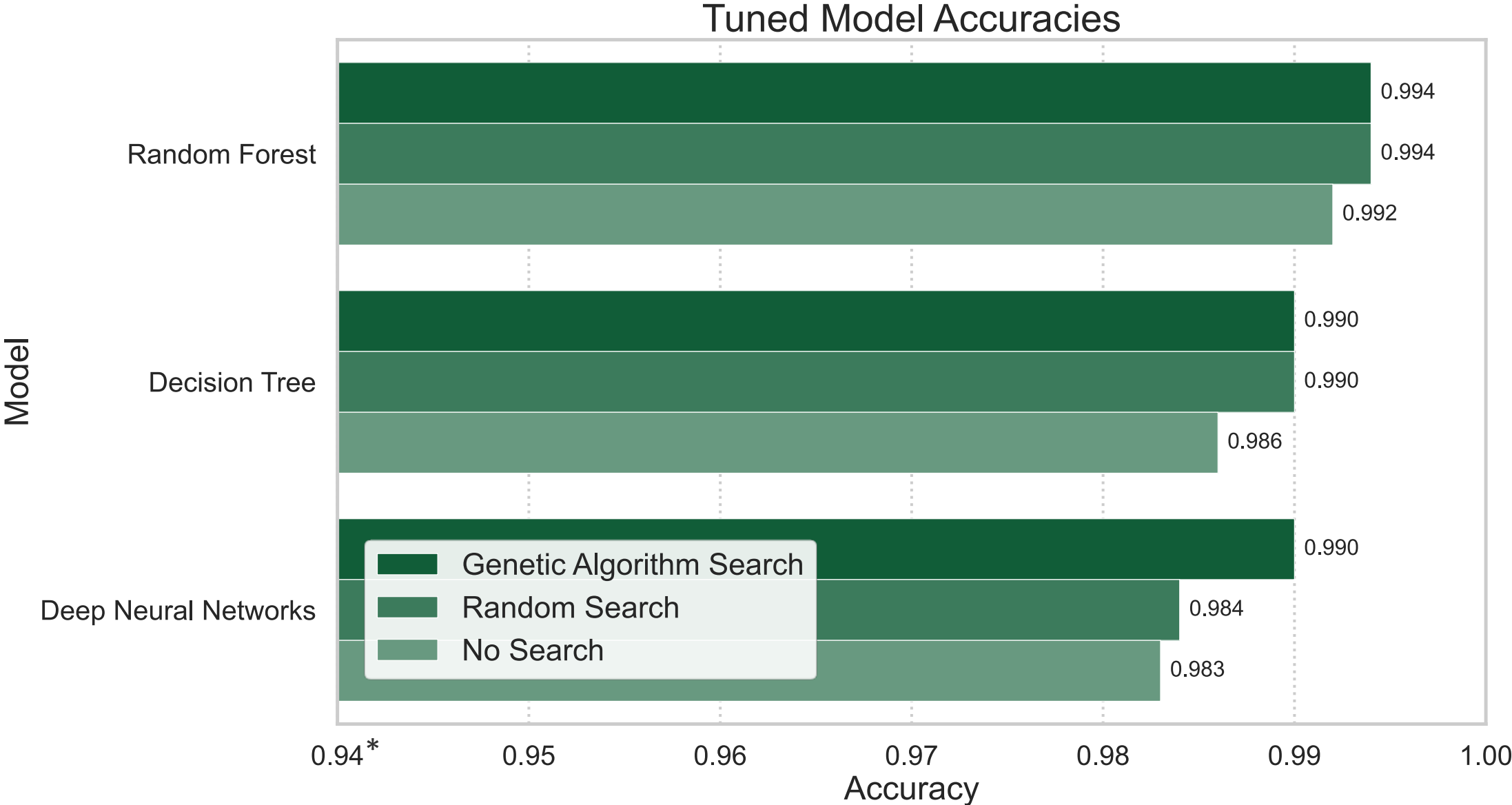
Untuned Model Accuracies



Model Performance

Holdout set accuracy after tuning

* Starts at 0.94; ticks represent 0.01 change



Model Performance

Confusion matrix



Precision: 0.97

Recall: 0.86

F1 Score: 0.91

Precision: 0.83

Recall: 0.86

F1 Score: 0.84

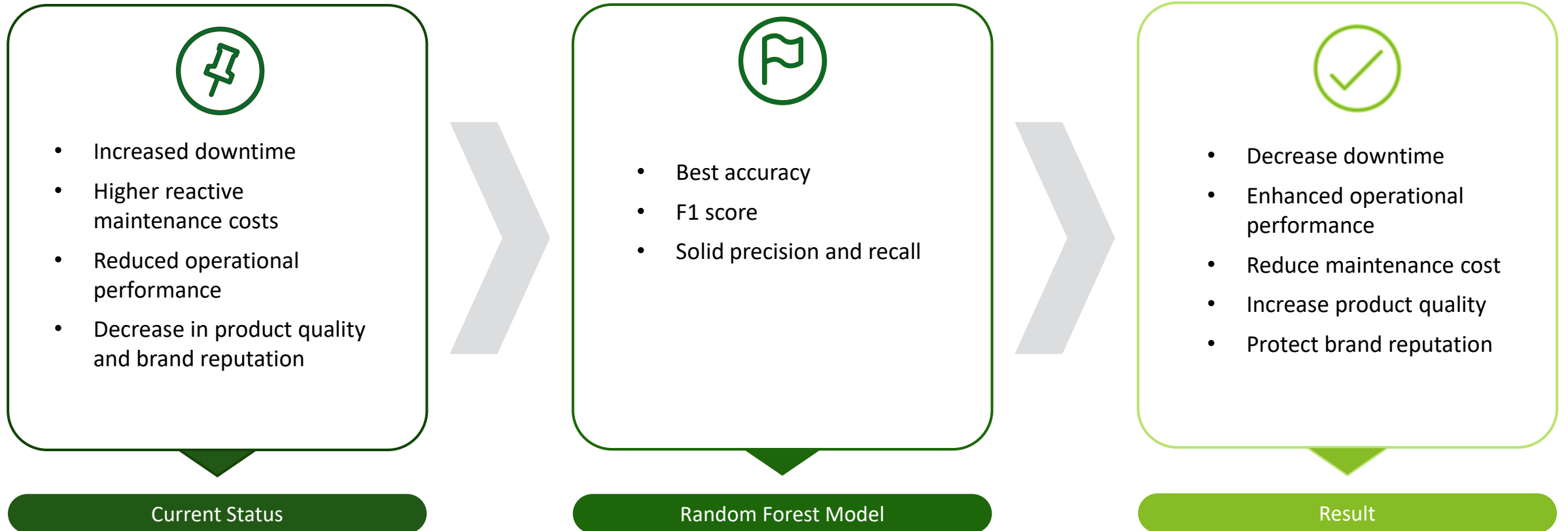
Precision: 0.88

Recall: 0.80

F1 Score: 0.84

Recommendation

Random Forest Model is the most optimal choice for Toyota in predicting machine failures





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Thank You For Considering
Our Recommendation

Any Additional Questions?