Decision model overview

This information provides a high-level overview of the models used for decisions within the Blue Prism® Decision plugin for Blue Prism® Hub 4.7. This covers the underlying approach to both rules-based and machine learning (ML) model-based training and accuracy statistics, for a business user to understand without any data science or statistical background.

Decision generates outputs depending on the inputs provided, they are processed in the following order:

- If any user-defined rule matches the input, the decision associated with the rule is used.
- Otherwise, if the input is identical to one of the training inputs, the decision associated with that training input is made.
- For all other inputs, the ML model decides.

Rules-based model

Rules are hard-coded decisions that apply to inputs that match the specified criteria. Although business logic can be encoded in rules, this is not recommended as it can lead to additional rule maintenance as the decision-making logic evolves. However, there are circumstances in which hard-coded decisions are appropriate.

A rule is a decision associated with a defined condition. The condition determines which inputs the rule applies to. The decision is made when the rule is activated by an input that matches the condition.

Machine Learning model

For all decisions that are not covered by rules or existing training inputs, Decision uses a machine learning (ML) model. The ML model makes decisions based on the most similar inputs in the training data.

There are two phases when training the ML model:

1. **The training phase** — The model asks the user what decision should be taken for inputs that are selected by the model.
2. **The calibration phase** — The user asks the model what decisions it would make for certain inputs. The user can validate or correct the model's decisions.

Accuracy and calibration

Calibration of ML models is a crucial part of training and Decision provides the user with metrics to facilitate calibration. The user has access to a global measure of accuracy that represents how well the model is expected to perform on new inputs. This accuracy is presented on a scale from 0 to 1, where 1 is the most accurate.

The user is also shown the level of confidence for individual training samples. This represents how confident the model would have been about the decision if it had not already seen it. Training samples with low confidence indicate areas where there is a low level of data for Decision to make a more confident assessment to create an output. It may be beneficial to provide more training samples in these regions through the Calibrate stage.

The training and calibration of the model is an iterative process. If the model is considered to be not accurate enough, or has a low confidence, the user can carry out further training and calibration of the model until the required threshold is reached.