



# Delivery confidence assessment for UK Government major projects and programmes using machine learning techniques.

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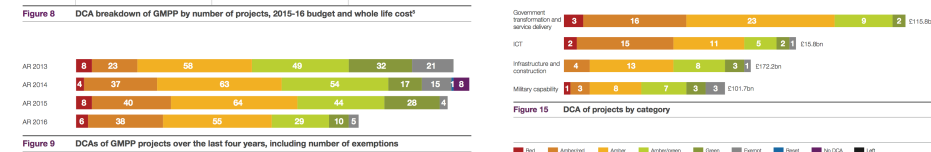
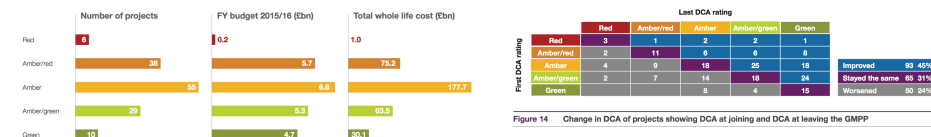
# Delivery confidence assessment for UK Government major projects and programmes using machine learning techniques.

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## What is delivery confidence assessment?

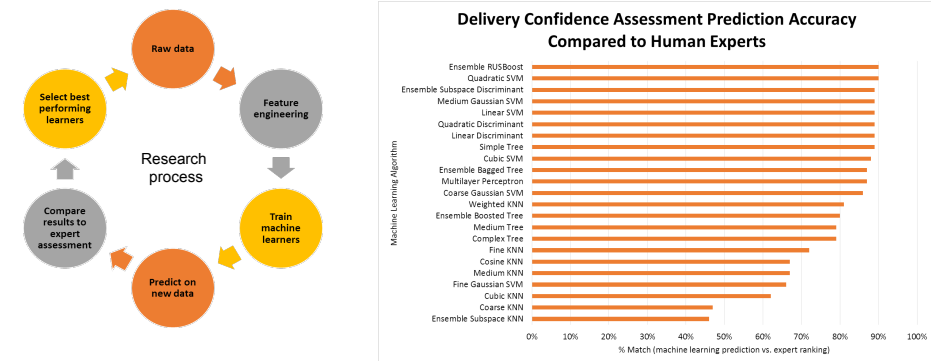
The delivery confidence assessment (DCA) is the IPA's assessment of a project's likelihood of achieving its aims and objectives on time and on budget. It is a five-point scale ranging from green for projects where successful delivery appears highly likely, to red where successful delivery appears likely to be unachievable unless urgent and substantive action is taken. We review projects quarterly and include evidence from independent assurance reviews as part of our delivery confidence assessment.



The DCA represents a snapshot assessment at a specific point in time and is designed to help projects and programmes succeed by focusing attention where most support is needed. The IPA will normally provide additional support to red and amber/red projects, for instance by providing additional expert support as required, and organising follow-up assurance reviews to check that the project team is taking the right action.

## Early results - predicting delivery confidence through machine learning methods

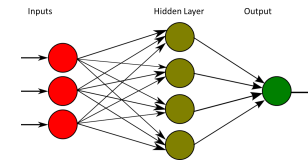
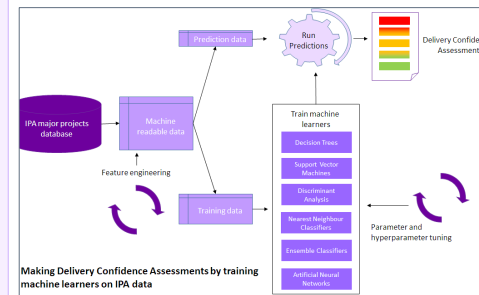
This research investigates whether machine learning can make delivery confidence assessments as accurately as human experts in IPA.



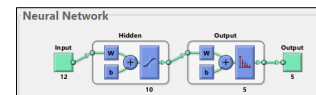
Training and validation: 81% training with k-fold cross validation on 20 folds; 18% held-out validation set on unseen data

Predictive accuracy of 23 machine learners. Early results only.

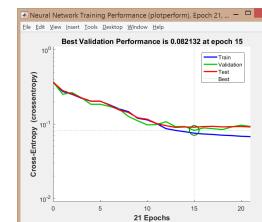
## Numerical Methods



A typical feedforward artificial neural network architecture

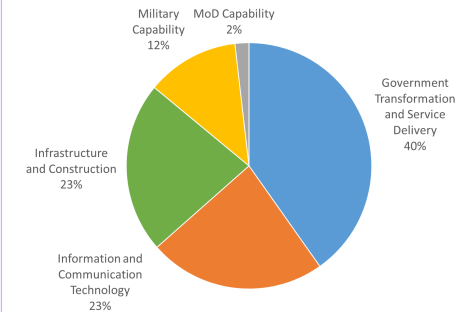


An artificial neural network model used for research. Tan sigmoid transfer function in one hidden layer and softmax transfer function in the output layer.



Training performance after 20 epochs on an artificial neural network. Minimise cross-entropy error function. 438 training samples; 100 validation samples. Larger sample size currently being investigated.

## Sources of IPA Project Data



## Initial research findings

- Early results are promising showing 91% prediction accuracy for the best performer
- Benefits may include faster, higher quality decision making, faster corrective action, and improved data standards.
- Further experiments required to increase reliability
- Other project data from other countries will broaden validity of machine learning



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