

# Data-Led Government: Harnessing the power of data science for public sector reform

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# Who we are and what we do

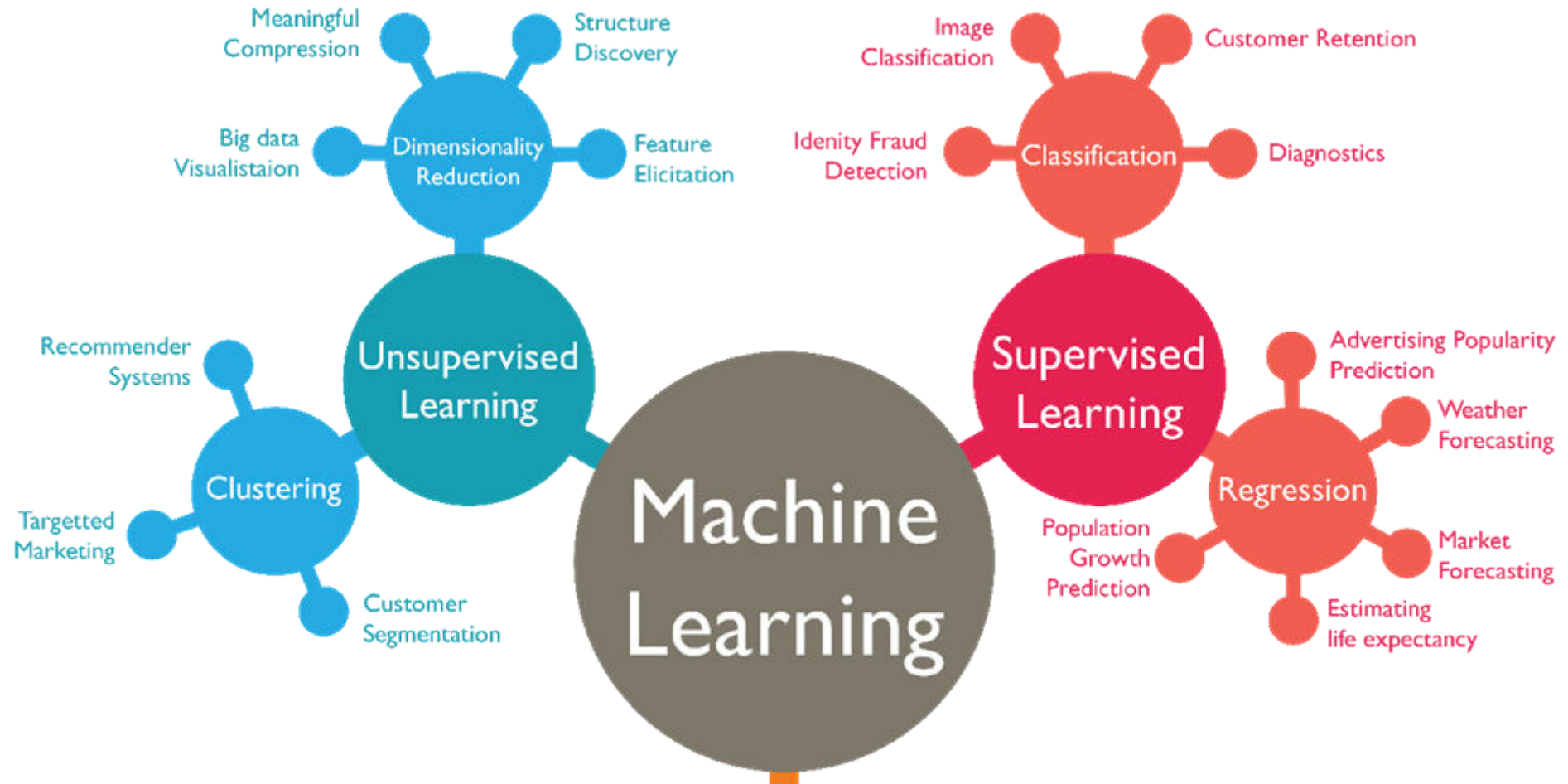
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1. Behavioural science
2. Rigorous evaluation
3. Data science



# What is data science?



# Data science is often applied locally...



*Based on 'Anticipatory Government' in Deloitte (2019). Government Trends 2020.*

# ... but national initiatives are taking off



## Key elements

- R&D
- Capacity building
- AI for business
- AI for public sector

*National AI Strategies across the world (OECD, 2019)*

# Our experience

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We have been conducting data science projects since 2017, including:



A suite of projects with the UK Cabinet Office to pilot data science approaches in government, for example to target scarce **resources for inspections**.



Projects with a series of local governments, including on **adult & children's social care**.



An analysis of **over 11 million calls** to the UK's 111 service (which is a service for health issues which are lower than an emergency).



An analysis of **5 major companies' gender pay gaps** and their determinants to target interventions to reduce issues in recruitment, promotion and retention.



# **Applications of data science in the public sector**



# What are the major applications of data science?

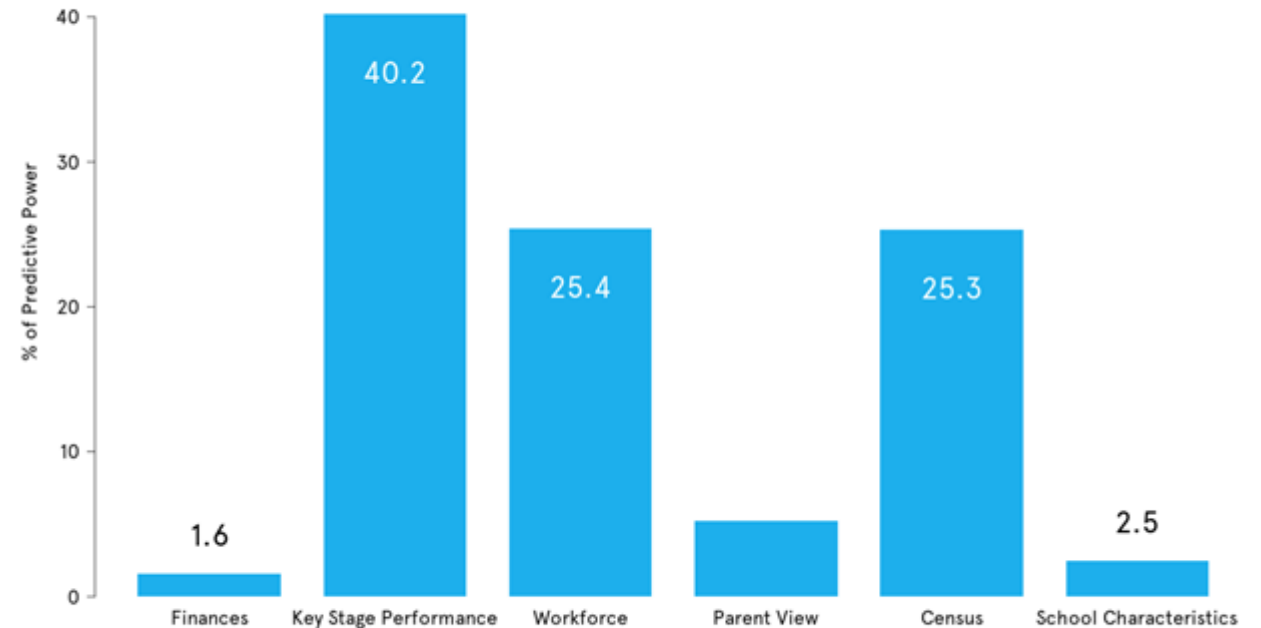
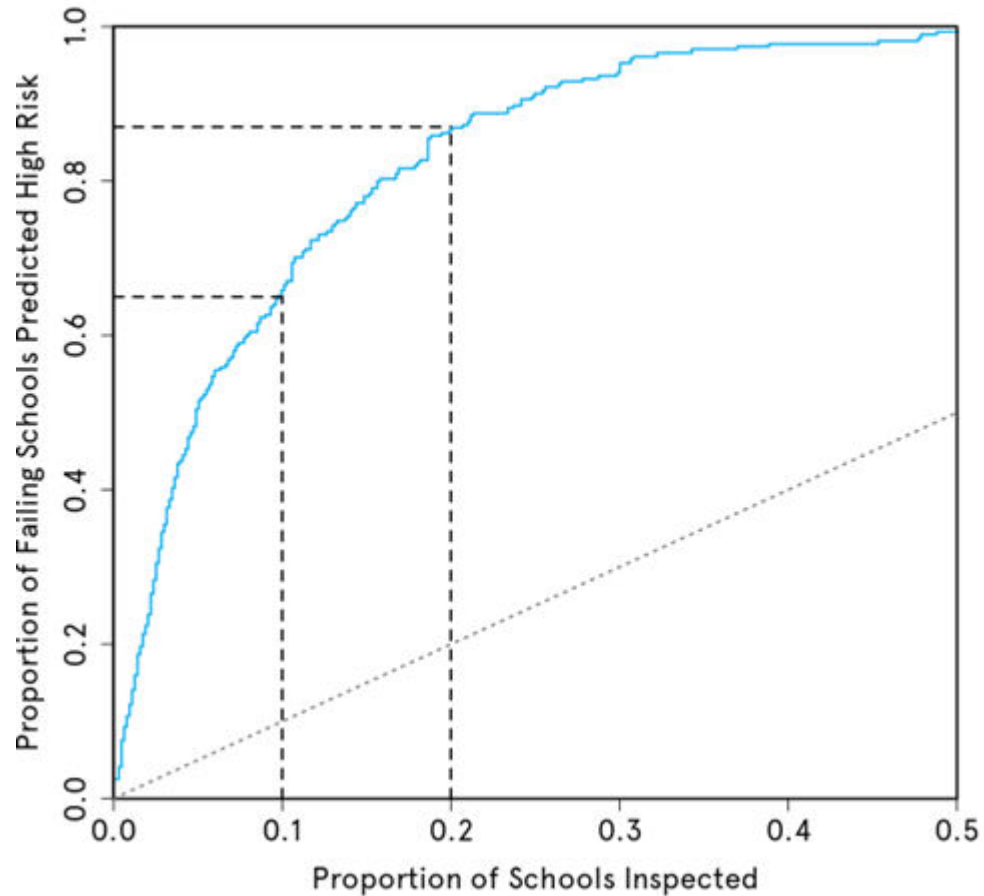


- 1. Planning services
- 1. Target service provision
- 1. Improve decision making
- 1. Evaluate government programmes



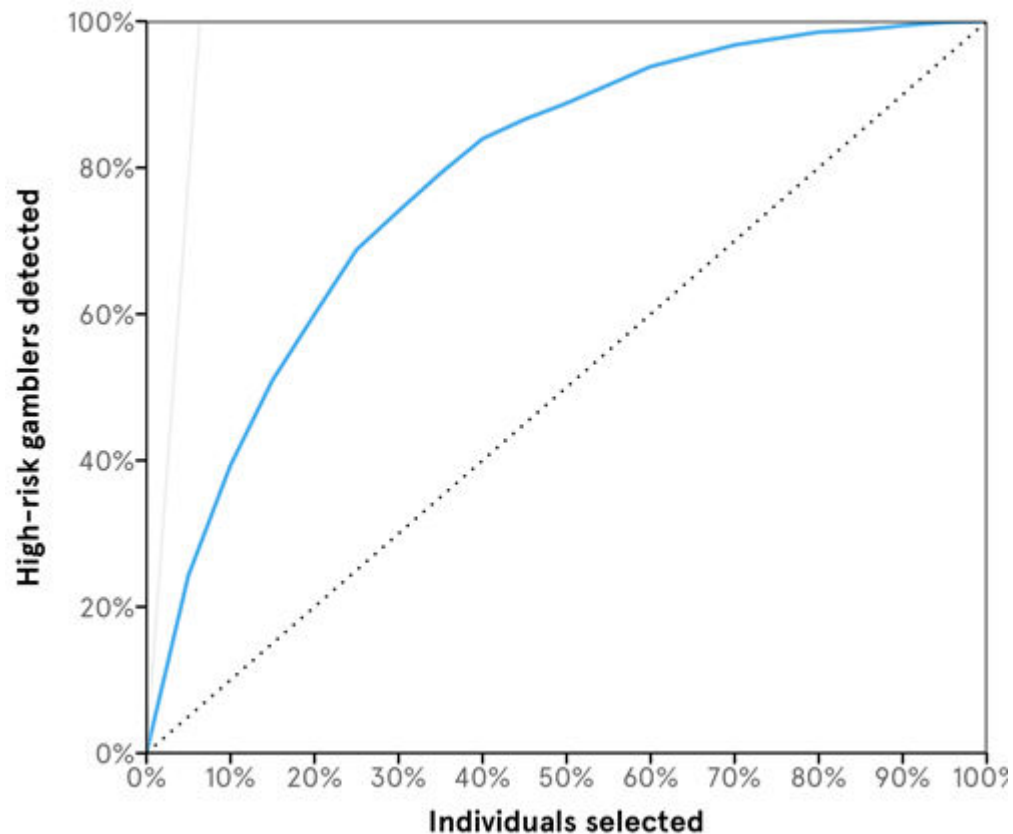


# 1.Planning services: Targeting school inspections



Based on 10% of inspections, we would catch 60% of inadequate schools. The model uses past exam results, workforce statistics and the characteristics of the local area.

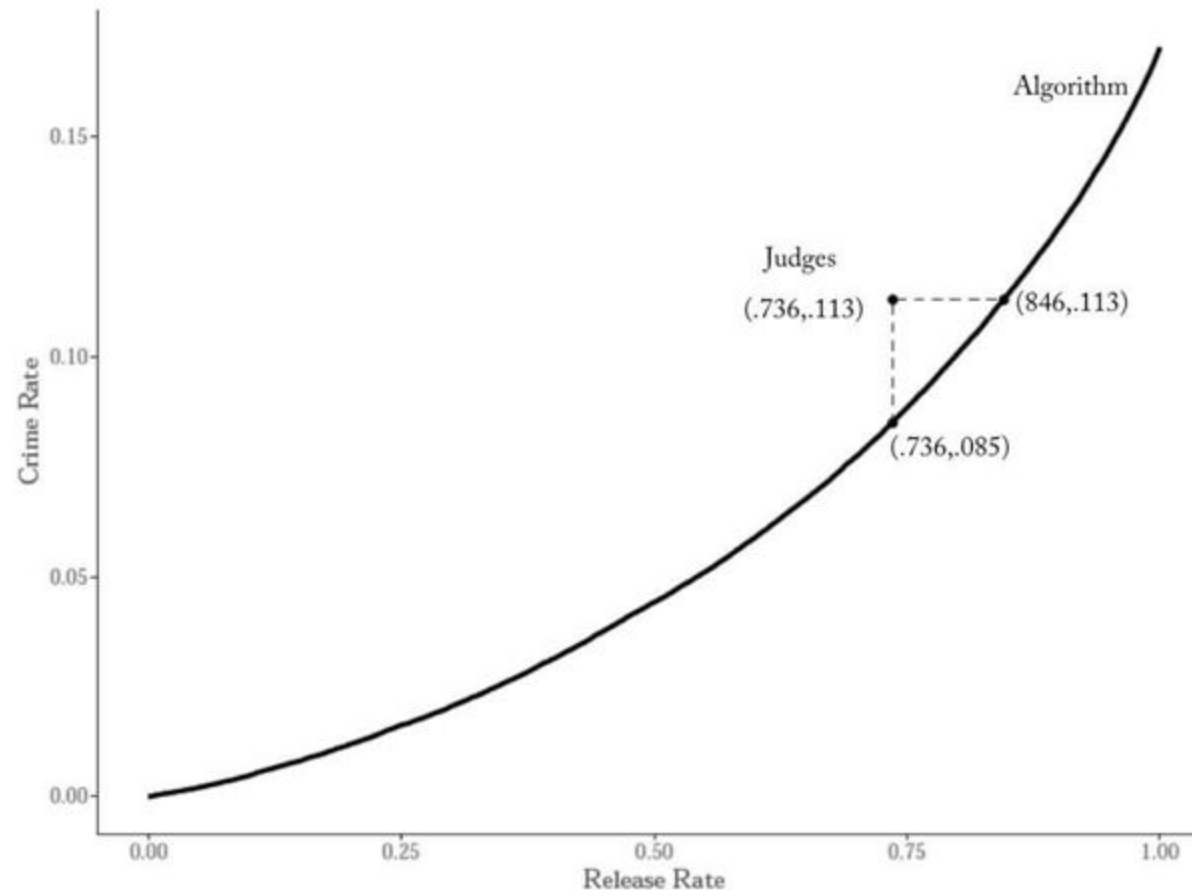
## 2.Targeting Service Provision: Finding vulnerable gamblers



Group of features	Importance
Stakes	57.7%
Demographics	12.5%
Returns	11.4%
Temporal (time and day)	10.9%
Deposits	5.8%
Withdrawals	1.7%

If we target the top 20% riskiest users, we would pick up 60% of problem gamblers. This is based on primarily on the stakes they bet and demographic information.

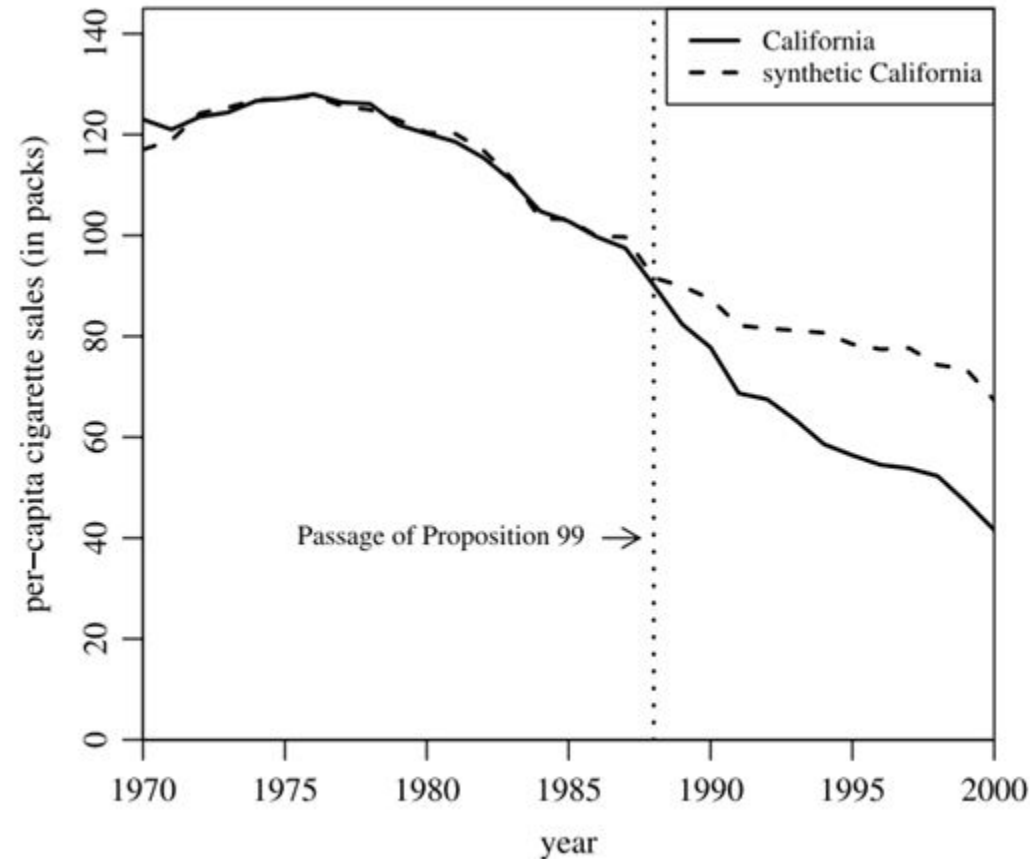
### 3.Improving decision-making: Judges' bail decisions



*Kleinberg et al. 2017*

With an algorithm, it is possible to either reduce crime for the same level of releases by a quarter, or release 15% more defendants for the same level of crime.

## 4. Evaluate government programmes: Cigarette taxes



We can evaluate policy changes by predicting what would have happened if they did not occur, for instance in this paper they show that cigarette taxes reduced pack sales by 25%.

# Challenges



## Data infrastructure



- Accessibility
- Analytical environment
- Implementation of models in practice

## Skills



- Technical skills
- Policy skills
- Management skills

## GDPR



- Lawful basis - public task
- Right to appeal against AI decisions
- Compliance with other rights

## Algorithmic bias

JAMES RIVELLI	ROBERT CANNON
Prior Offenses 1 domestic violence aggravated assault, 1 grand theft, 1 petty theft, 1 drug trafficking	Prior Offense 1 petty theft
Subsequent Offenses 1 grand theft	Subsequent Offenses None
LOW RISK 3	MEDIUM RISK 6

Existing bias in the data (due to police bias) or a small amount of ethnic minority cases in the data, can lead to biased predictions.





# **Embedding data science in the public sector**

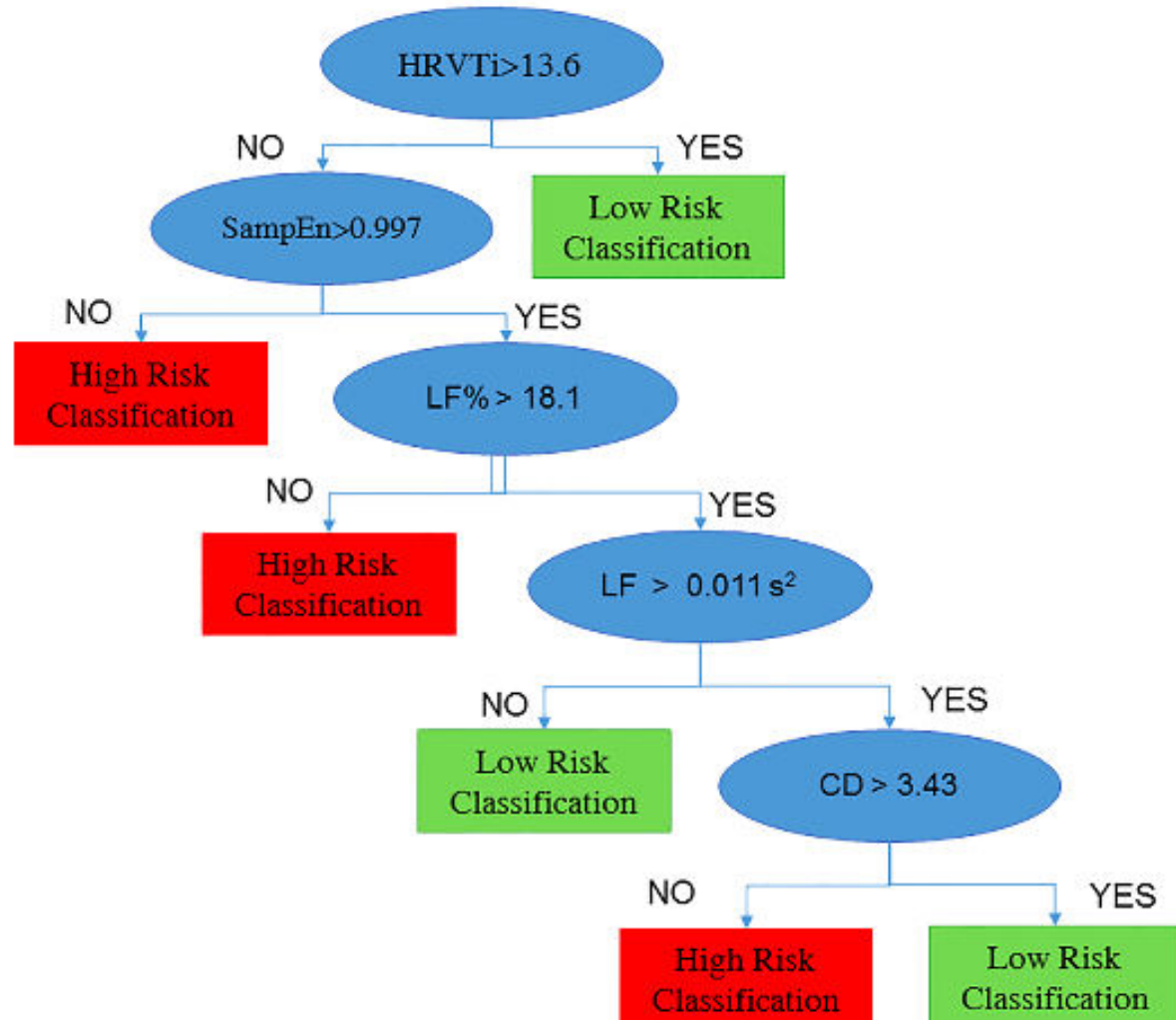
# How can we embed data science in daily practice?

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- 1. Decision aids
- 1. Case management systems
- 1. Dashboards

# Digital tools: Decision aids



## Possible applications

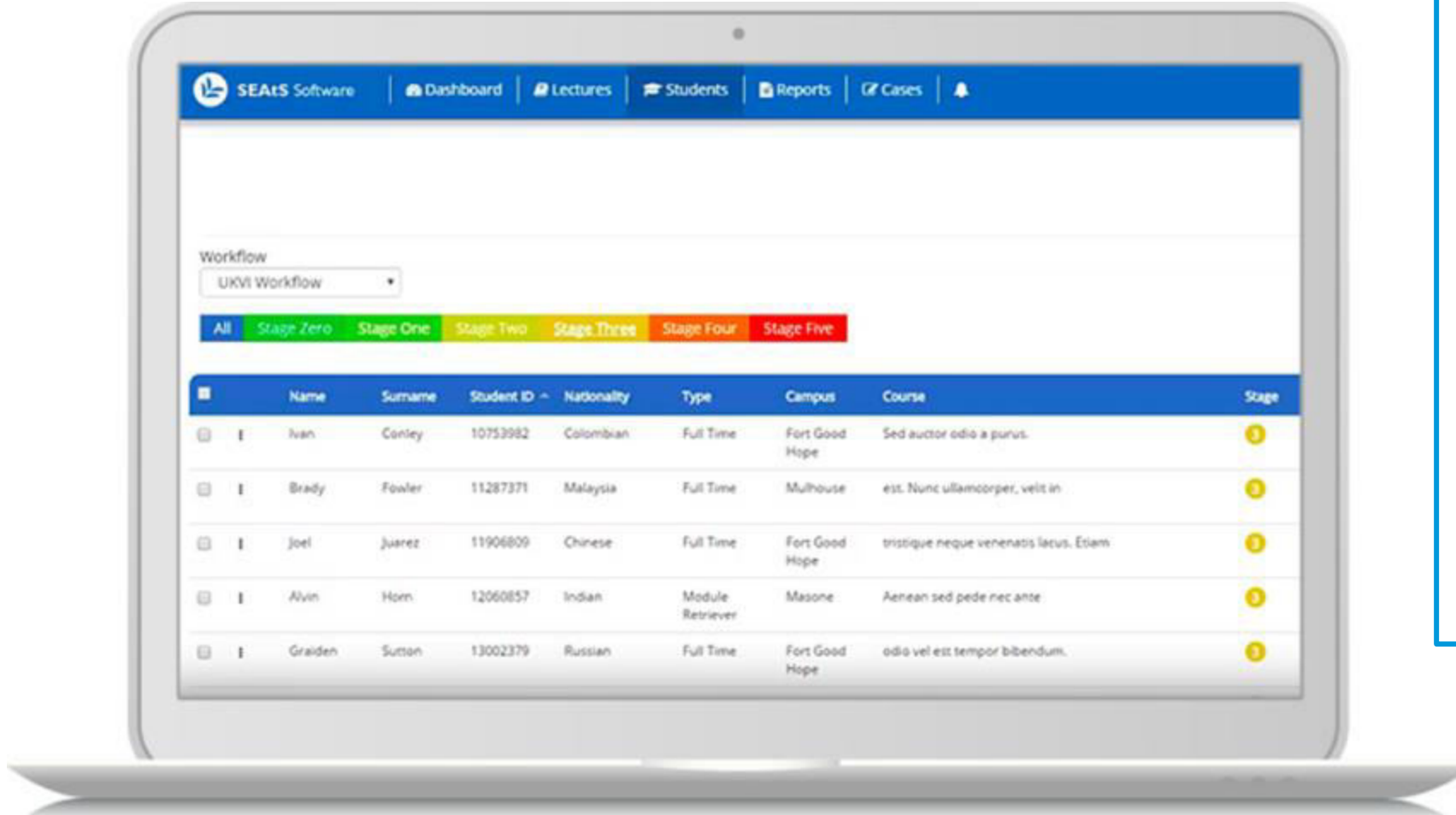


Supporting frontline public sector workers' decision-making



Supporting citizens' decision-making (e.g. about the use of services)

# Digital tools: Case management systems



## Possible applications



Management of student performance



Children and adult social care case management



Patient care management



Legal case management

# Digital Tools: Data dashboards



## Possible applications



Monitoring of KPIs across government



Decisions about future policies



Optimisation of the provision of public services



Improving transparency and public engagement



# Data-led government: Vision for the future



## Example: Data-enabled healthcare ecosystem





# Thank you for your attention.

## Contact details

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In partnership with



Cabinet Office