Oxford to Cambridge
Integrated Water Management Framework

Interrogation of planning applications

Further research

Interrogation of planning portals by Artificial Intelligence

This work was completed as part of our Forecasting future non-domestic water demand project. The wider project developed forecasting methods to help planners better anticipate water demand in fast-growing business sectors. The findings will inform developing guidance for WRMP29. Along with forecasting future demand, to understand future development pressures, the team trialled Artificial Intelligence (AI)-driven extraction of planning data across 3 local authorities in the Oxford to Cambridge area.

Interrogation of planning portals by AI to support non household demand forecasts

Summary of task 6

We explored the potential of using AI (Artificial Intelligence) to search planning portals for non-household planning applications. The extracted data could then be used to inform the development of more accurate water demand forecasts. A Proof-of-Concept tool was developed to replicate human decision-making logic when navigating and interpreting planning portal content.

Define Key Words → Launch planning portal webpage → Search using keywords → Filter results to inlcude only "Full" or "Outline" planning applications → Assess results using AI to understand if likely to have water impact → Download application documents for relevant applications → Review documents using AI for water Impact evidence

Case study: Planning portal search for Data Centre applications

A targeted search was conducted across the planning portals of Greater Cambridge Shared Planning, Buckinghamshire Council (Aylesbury Vale Area) and North Northamptonshire Council (Corby), focussing on applications related to "Data Centres".

- 67 planning applications were identified
- 49 were excluded from further analysis, after being classified as "No Significant Increase Expected". This was typically because they involved minor infrastructure works to existing facilities.
- The remaining 18 applications were retained for further review, based on their potential to impact water demand.

Issue	Description	Mitigation
Scanned / handwritten forms	Poor Optical Character Recognition (OCR) accuracy, especially in older forms.	Use OCR with preprocessing; flag low-confidence records. More recent applications are all in electronic format.
Inconsistent document layouts	No fixed template for planning forms across local authorities even with the use of the same portal.	Use multiple keyword-based detection and fuzzy string matching.
Summary ambiguity	Some application summaries lack detail, if the keywords are not explicitly mentioned, then the search will not return the application.	Develop additional AI functionality to generate terms associated with keywords which may improve robustness of search.
Lack of water data	Lack of water data included in applications to allow for quick assessment.	Use the "floor space" figure that is usually present to create water usage figures.
Planning portals platform	We tested it on the IDOX platform, however, to apply the searching to other platforms would need modified coding of the tool.	Information on the IDOX website indicates 69% of UK local authorities use their solution. Research into the portals each of your target areas use is essential in the pre work of using this solution.

Interrogation of planning applications

Key messages

- AI can be effectively used to extract data from planning portals, to provide additional understanding of projected water demand over the coming years.
- Greater consistency in forms and platforms across Local Planning Authorities would make data extraction a lot easier and significantly enhance the efficiency and accuracy of data.
- Current building use codes lack the precision needed to be able to be reliably determine the end use of developments, limiting their value for water demand forecasting.
- Water demand is not a required field, so data needs to be interpreted and infer usage from other indirect metrics such as building type, scale and proposed operational use.
- Manual validation would still be recommended to ensure the accuracy and relevance of AI-generated outputs.