Research Methods

The research will be quantitative and the method to be used will be “Experiment” (Dawson, 2015: 28).

Metadata to build the ontology will be collected from Ministry of Justice (2020). Noy & McGuiness (2001) will be referenced alongside analysis of the metadata to create a domain ontology, excluding instances, using four separate metadata sets; crown court, magistrates’ court, prison service and probation service.

Exploratory data analysis (EDA) will be performed using Python in a Jupyter Notebook on anonymised recidivism data from National Institute of Justice (N.D.) to identify correlations between protected attributes such as ethnicity and gender and other attributes, and indeed correlations with recidivism. Hypotheses will be created from the EDA about relationships between the attributes. The hypotheses will be tested for statistical significant using R. Based upon the results, attributes in the ontology will be classified according to their risk of creating unethical biases. Some transformation will be required to approximate similar attributes between the UK metadata and the US actual data.

The final ontology will be evaluated, without instances, using an ontology evaluation framework such as Orbst et al (2007) or a method from Raad & Cruz (2015). The evaluation will be tested against findings of reliable predictors of recidivism from the literature review.

References

Dawson, C.W. (2015) *Projects in computing and information systems: a student's guide*. 3rd ed. Harlow: Pearson Education Limited.

Ministry of Justice (2020) Ministry of Justice: Data First. Available from: https://www.gov.uk/guidance/ministry-of-justice-data-first [Accessed 27 March 2024].

National Institute of Justice (N.D.) Recidivism Forecasting Challenge. Available from: https://nij.ojp.gov/funding/recidivism-forecasting-challenge [Accessed 27 March 2024].

Noy, N.F. & McGuinness, D.L. (2001) *Ontology Development 101: A Guide to Creating Your First Ontology*. Knowledge Systems Laboratory.

Obrst, L., Ceusters, W., Mani, I., Ray, S., & Smith, B. (2007). ‘The Evaluation of Ontologies’. in: Baker, C.J.O. & Cheung, K.H. (eds) *Semantic Web*. Boston, MA: Springer. 139-158.

Raad, J. & Cruz, C. (2015) ‘A survey on ontology evaluation methods’, *International Conference on Knowledge Engineering and Ontology Development, part of the 7th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management.* Lisbonne, Portugal, November.