Human-centred decision support based on new theory for personnel rostering

A Data Management Plan created using DMPonline.be

Creators: Pieter Smet, Greet Vanden Berghe

Affiliation: KU Leuven (KUL)

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Principal Investigator: Greet Vanden Berghe

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Project abstract:

Human resources experts unanimously point to the growing disconnect between what employees expect from a job and what companies offer in the 21st century. In today’s organizations, employees want robust and fair rosters and expect a level of autonomy in determining their rosters. Research on models and algorithms for personnel rostering has not caught up with these emerging challenges. At present, there is no satisfactory way of (mathematically) formulating and quantifying these human-centred problem characteristics, which consequently, also represents uncharted territory for algorithm development. This project aspires to (1) extend personnel rostering theory towards a more human-centred paradigm and (2) develop dedicated algorithms for the identified problem classes. The project will lead to a proof-of-concept implementation in which the developed models and algorithms will demonstrate the new human-centred results across complementary case studies.

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Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

Dataset name / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
		Indicate: ***N****(ew data) or* ***E****(xisting data)*	Indicate: **D**(igital) or **P**(hysical)	Indicate: **A**udiovisual **I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify)		Indicate: <1GB <100GB <1TB <5TB >5TB NA	
NMBS data	Data required to construct planning for the NMBS case	N	D	N, T	json, csv	<1GB	
Toba HR data	Data required to construct planning for the Toba HRcase	N	D	N, T	xml	<1GB	
Rostering datasets	Existing datasets for rostering problems	E	D	N, T	xml, json, csv	<1GB	
Computational results	Results generated from computational experiments on algorithm performance	N	D	N, T	json, csv	<100GB	
Case interviews	Interviews with employees/planners from cases	N	D	T	pdf	<1GB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

Curtois-Qu rostering dataset: http://www.schedulingbenchmarks.org/
NSPLib: https://www.projectmanagement.ugent.be/research/personnel_scheduling/nsp
INRCII: https://mobiz.vives.be/inrc2/

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.

- No

Will you process personal data? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).

- No

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- No

The data specified in this DMP is not part of a patentably invention.

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material or Data transfer agreements, Research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g. in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, codebook.tsv etc. where this information is recorded).

All problem data will be captured in the json format specified.
Based on distributions of variables identified in the data collected from the companies, we will generate similar synthetic data sets.
Readme files will be included in the code files. All data and code will be stored in KU Leuven repositories.

Will a metadata standard be used to make it easier to find and reuse the data?
If so, please specify which metadata standard will be used.

If not, please specify which metadata will be created to make the data easier to find and reuse.

- No

Data Storage & Back-up during the Research Project

Where will the data be stored?

- OneDrive (KU Leuven)

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS for my storage solution

Is there currently sufficient storage & backup capacity during the project?

If no or insufficient storage or backup capacities are available, explain how this will be taken care of.

- Yes

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

We will store data in the personal OneDrive folders which are protected from unauthorized access.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

We do not foresee costs specific to data storage and backup. The KU Leuven OneDrive storage will be used and is sufficiently large.

Data Preservation after the end of the Research Project

Which data will be retained for 10 years (or longer, in agreement with other retention policies that are applicable) after the end of the project?

In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

- All data will be preserved for 10 years according to KU Leuven RDM policy

Where will these data be archived (stored and curated for the long-term)?

- KU Leuven RDR
- Other (specify below)

In addition to KU Leuven RDR we will store data on public repositories such as Mendeley data or Zenodo when permitted.

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

We do not foresee any costs with the long-term storage of the data. The considered options for data preservation are free of charge or provided by KU Leuven at no cost.

Data Sharing and Reuse

Will the data (or part of the data) be made available for reuse after/during the project?
Please explain per dataset or data type which data will be made available.

- Yes, as open data

Only the synthetic data used in scientific papers and the computational results will be made publicly available during the project.

If access is restricted, please specify who will be able to access the data and under what conditions.

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Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)?

Please explain per dataset or data type where appropriate.

- Yes, privacy aspects

The data received by the participating companies (NMBS and Toba HR) will not be shared outside the research group.

Where will the data be made available?

If already known, please provide a repository per dataset or data type.

- KU Leuven RDR (Research Data Repository)
- Other data repository (specify below)

Mendeley data
Zenodo

When will the data be made available?

- Upon publication of research results

Which data usage licenses are you going to provide?

If none, please explain why.

none, synthetic data and computational results do not reveal any sensitive information; they must be shared to encourage dissemination

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.

- Yes, a PID will be added upon deposit in a data repository

What are the expected costs for data sharing? How will these costs be covered?

The considered services for data sharing are free to use, so no additional costs are expected.

Responsibilities

Who will manage data documentation and metadata during the research project?

Both project supervisors.

Who will manage data storage and backup during the research project?

Both project supervisors.

Who will manage data preservation and sharing?

Both project supervisors.

Who will update and implement this DMP?

Both project supervisors.