C3-MATE

A Data Management Plan created using DMPonline.be

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Project abstract:

In current practice, ergonomists use simplified checklist-based ergonomic risk assessment scales to quantify the risk of developing WMSDs in the workplace and to guide their ergonomic risk assessments. However, current risk assessments lack effectiveness, as evidenced by the high number of persisting WMSDs. For the past 4 years, our group intensively invested in developing an innovative, musculoskeletal model-based ergonomic risk assessment method (MATE) in the PhD of Arthur van der Have5. These recent research innovations are a solid basis to now take the next but highly needed step towards further validation of the MATE and development of MATE as a fully cloud-based service to support ergonomic risk assessments on the work floor. As evidenced from the letters of support, the ergonomics field in Flanders is willing to pay for such a tool as this would allow them to effectively move away from risk assessments based on checklist-based ergonomic risk assessment scale to a highly accurate and validated simulation-based tool that effectively reduces the prevalence of WMSDs.

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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	
Experimental data	IMU data measured by the ergonomists	N	D	SO	.mvnx	<1GB	0
Personal/demographic data	Data about the worker (age, gender, height, weight, injury prevalence and location of injury), the workplace (duration of the task, rest intervals) and the handling (load of the handled mass, lifting frequency)	N	D	N / T	.txt	<1GB	0
Estimations of the musculoskeletal model	Estimated outcome parameters based on the musculoskeletal model	N	D	M	.sto .mot	<1GB	0
Musculoskeletal model	The musculoskeletal model used for the calculations	E	D	M	.osim	<1GB	0

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:

We will not reuse existing data.

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.

- Yes, human subject data (Provide SMEC or EC approval number below)

Ethical approval will be requested within 6 months from the start of the study.
The approval number will be added to this DMP at a later stage.

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).

- Yes (Provide PRET G-number or EC S-number below)

Personal/demographic data, such as height, weight, gender, and injury prevalence, will be used in research, as described in the data management summary, but without a name and will therefore be pseudonymous.

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.

- Yes

The combination of the estimations of the musculoskeletal modeling and the injury prevalence will create IP. IP will be closely checked with Wim Declercq from LRD.

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.

- Yes

As the estimated values of the musculoskeletal modeling and the injury prevalence can generate IP, this will restrict us from sharing the data. Additionally, the aim is to make a commercial available tool that uses the IP to create value.

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).

Data processing occurs in a standardized, coded, and, therefore, automated manner. All required information is documented in OneNote and KU Leuven GitLab is used. Documentation on how to collect the data correctly and to use the tool will be provided via a webpage.

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.

- Yes

Only the metadata concerning the title and some keywords will be made available using the RDR metadata standard (DataCite) without sharing data that should be protected. This will be discussed with LRD

Data Storage & Back-up during the Research Project

Where will the data be stored?

- Other (specify below)

All data will be AES encrypted and accessible only by Kevin Vandenheede and Arthur van der Have on a local server.

How will the data be backed up?

- Personal back-ups I make (specify below)

The system will automatically make backups every week.

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.

- No (explain solution below)

A large budget is foreseen to buy storage and backup capacity. The size of the storage and backup capacity depends on the usage of the tool by the users.

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

All data will be AES encrypted and only accessible by Kevin Vandenheede en Arthur van der Have and the PIs (Benedicte Vanwanseele and Ilse Jonkers)

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

For the initial start-up of the server and data storage, €3000 is foreseen from the project's budget. Once the tool is up and running, users will pay a fee to use the tool, which will cover the costs for storage and backup

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 25 years according to CTC recommendations for clinical trials with medicinal products for human use and for clinical experiments on humans

Data will generate IP. It will be stored as long as possible to create value for the company. This data will also be used to recalibrate the ergonomic thresholds, generating IP. This recalibration will be performed after each 500 uploads, and a reevaluation of the need to store all this data will be performed.

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

- Other (specify below)

Data will not be archived, but will remain active, as all data will be used to reevaluate the ergonomic thresholds at certain timepoints in order to improve estimation accuracies.

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

At the moment, there is no idea of the costs as this will depend on the number of users of the tool. Users will pay a fee to use the tool, which will cover these costs. When the user is no longer using the tool, the data will still be stored but the costs are not covered by the user anymore. This problem will be discussed with LRD and should be tackled in the business plan.

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.

- No (closed access)

As data will generate IP, the data will be stored as long as possible in order to create value for the company and therefore not shared.

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

Data will be closed, access will only be granted to the researchers on the project.

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, intellectual property rights
- Yes, privacy aspects

Where will the data be made available?

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

- Other (specify below)

The data is closed because of intellectual property rights

When will the data be made available?

- Other (specify below)

Will not be made available

Which data usage licenses are you going to provide?

If none, please explain why.

- Other (specify below)

Will not be made available

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.

- No

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

Data will not be shared.

Responsibilities

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

The researcher (Arthur van der Have) and software engineer (Kevin Vandeneende) will
be responsible for data documentation & metadata, under supervision of the PI's (Ilse Jonkers and Benedicte Vanwanseele).

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

The researcher (Arthur van der Have) and software engineer (Kevin Vandeneende) will
be responsible for data data storage and backup under supervision of the PI's (Ilse Jonkers and Benedicte Vanwanseele).

Who will manage data preservation and sharing?

The PI's (Ilse Jonkers and Benedicte Vanwanseele) will manage data preservation and sharing.

Who will update and implement this DMP?

The researcher (van der Have Arthur) will be responsible for updating and implementing this DMP under supervision of the PI's (Ilse Jonkers and Benedicte Vanwanseele).