

BIAS

Mitigating biases
of AI in the
labour market



Deliverable 1.2

Data Management Plan v. 1

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1. Executive Summary

BIAS: Mitigating Diversity Biases of AI in the Labour Market is a 4-year Horizon Europe Research and Innovation Action (RIA). Artificial Intelligence (AI) is increasingly deployed in the labour market to recruit, train, and engage employees or monitor for infractions that can lead to disciplinary proceedings. One type of AI is Natural Language Processing (NLP) based tools that can analyse text to make inferences or decisions. However, NLP-based systems face the implicit biases of the models they are based upon that they learn. Such bias can be already encoded in the data used for machine learning training, which contains the stereotypes of our society, and thus be reflected inside the models and the decision-making.

This can lead to partial decisions that run contrary to the goals of the European Pillar of Social Rights in relation to work and employment and the United Nations' Sustainable Development Goals.

Despite a strong desire in Europe to ensure equality in employment, most studies of European labour markets have concluded that there is discrimination across many factors such as gender, nationality, or sexual orientation. Therefore, addressing how AI used in the labour market either contributes to or can help mitigate this discrimination is of great importance. That is the main concern of the BIAS project.

D1.2 is the first version of the required Data Management Plan that outlines preliminary procedures for the storage and sharing of research data. It is delivered during Month 6 of BIAS. It will be formally revised in M29 and M47 of BIAS. However, it will be a living document and revised as needed throughout project implementation.





2. Introduction and overview of work

This deliverable was prepared following internal consultations with consortium members and extensive consultation with the Research Data Office and IT security and legal offices at NTNU for advice regarding formal data processing agreements, security, and privacy concerns.

Additionally, the project has consulted with the SIKT: Norwegian Agency for Shared Services in Education and Research,¹ which regulates the collection of personal data in social science research in Norway. SIKT evaluates the legal basis of collecting data, approves informed consent forms and data storage and security plans. BIAS will do a formal notification of SIKT in advance of any activity that involves the collection of personal data. Some of these reviews are currently underway, and their results cannot be reported on in this deliverable.

2.1 Structure

This Data Management Plan will provide a comprehensive overview of data to be generated, used, or re-used by Work Package. WP1: Project Management and WP7: Dissemination, Communication and Exploitation will neither generate nor use research data and so are not included in the Work Package by Work Package overview. Section 2 provides summary of activities that will generate or use data for ease of reference.

Sections 3–9 are based on the official Horizon Europe Data Management Plan template.² Questions from the template that are relevant for the BIAS DMP are reproduced in *orange, italicized font*.

2.2 WP2: Stakeholder involvement, needs analysis, and co-creation

Survey of worker experiences with AI: A survey for workers on their experiences with AI will be conducted with at least 4,000 responses across all EU countries as well as Iceland, Norway, Switzerland, and Türkiye. The survey is translated into all relevant languages for these countries. The results of these surveys will help inform the design and execution of co-creation activities with workers, HRM employees, and AI developers.

Expert interviews: WP2 includes a series of expert interviews with AI and HRM Experts about their views of AI in HRM. These are semi-structured qualitative interviews where participants both answer a series of questions with pre-defined answers and have the opportunity to share their views in open-ended responses to the questions. The interviews are not recorded, but notes are taken during the interviews and summaries of interviews are prepared for each country.

Co-creation workshops: A series of co-creation workshops in all project countries except Ireland and Portugal will be held engaging workers, union representatives, HRM employees, AI developers, and other relevant stakeholders to provide input for the development of new bias identifying and bias mitigating software in WP3. This will include generation of lists of words or phrases in their respective languages that can signify bias in an employment context.

2.3 WP3: Technical development of proof-of-concept system

WP3 concerns developing new **bias identification and mitigation modules** utilizing

¹ <https://sikt.no/en/home>

² https://www.openaire.eu/images/Guides/HORIZON_EUROPE_Data-Management-Plan-Template.pdf





both **Case Based Reasoning (CBR)** and **Natural Language Processing (NLP)**. This development will be based on existing publicly available language models, data provided by project partner Farplas, and inputs derived from survey of workers, expert interviews, and co-creation activities in WP2. Insights from ethnographic interviews in WP4 will be included in the final iterations of technical development.

2.4 WP4: Ethnographies and SSH mapping of biased AI experiences on gender & diversity

WP4 will consist of a series of in depth, semi-structured **ethnographic interviews** with employees, HR managers, and AI developers in Iceland, Norway, Italy, the Netherlands, and Türkiye. The results of this will inform final iterations of technical development in WP3 as well as capacity building and awareness raising activities in WP5.

2.5 WP5: Capacity building and raising awareness for AI and HRM community

WP5 will consist of developing a series of **awareness raising** and **capacity building** activities to disseminate the results of the project, the importance of addressing algorithmic bias, and practical tips for doing so. **Awareness raising** activities will be held online and target the general public and are primarily concerned with educating about the realities of algorithmic biases and how they can be combatted. **Capacity building** activities will be held during physical sessions and target HRM and AI practitioners and give specific advice on how they can recognize and address these challenges in their professional practice. Insights from both activities will be used to create a freely-available MOOC.

2.6 WP6: Commercialization and exploitation of technologies

WP6 will consist of developing an exploitation plan including valorization of BIAS results and developing a business plan for a commercially viable product for use in AI-powered online recruitment settings with a pathway towards regulatory approval in order to ensure BIAS has the largest impact possible. This will include a workshop with the standardization body CEN CENELEC on the topic of bias for AI in the workplace, based on the IEEE guidance document and British Standard (BS) 8611:2016 “Robots and Robotic Devices. Guide to the ethical design and application of robots and robotic systems.”

3. Data summary

3.1 Data reuse

Will you re-use any existing data and what will you re-use it for? State the reasons if re-use of any existing data has been considered but discarded.

WP2: Stakeholder involvement, needs analysis, and co-creation

WP2 involves a survey of workers on their experiences with AI. The results of these surveys will help inform the design and execution of co-creation activities with workers, HRM employees, and AI developers. We considered reusing survey answers from Eurobarometer surveys, but it was concluded that these surveys were too general to provide meaningful data and have therefore decided to design our own survey as originally intended. The results of these Eurobarometer survey play a supporting role in





our framing of the issues in the survey and future work.

WP3: Technical development of proof-of-concept system

WP3 concerns developing new bias identification and mitigation modules utilizing both

Case Based Reasoning (CBR) and Natural Language Processing (NLP). We will reuse publicly available word embeddings and data models as detailed in Table 1:

Table 1: Language models used in WP3

NAME	DESCRIPTION
Fasttext word embeddings	Pre-trained static word embeddings available in 157 languages. ³
BERT-based Models	Pre-trained language model (contextualized word embeddings) available in different variants and languages. ⁴

Additionally, project partner Farplas will provide two data sets drawn from records of applicants to open positions over the past two years. This will consist of two datasets that will be drawn from Farplas records and processed by Farplas before transfer for research purposes by the Norwegian University of Science and Technology (NTNU) and Bern University of Applied Sciences (BFH)

The first data set will consist of approximately 400 hand curated and manually de-identified records. This dataset is detailed in Table 2. Most values already exist as discrete fields in the raw data; those that do not will be manually created by Farplas prior to transfer.

Table 2: Manually curated Farplas hiring dataset

DATA DESCRIPTION	TYPE/POSSIBLE VALUES	ANONYMIZATION
Cover letter	Exact cover letter	Any names and address (other than city) manually removed
City of residence	City	Address values manually removed except for city
Gender	M/f/no response/other	None
Age	Exact age (persons under 18 will be excluded)	Birthdate will be transformed into age at time of application
University	Exact name	None
Experience (for each type of task)	(task-id(year of experience); task-id(year of experience).....)	None
Gap in CV	How many years? Is there a justified reason?	None

³ Grave, E., Bojanowski P., Gupta P., . . . Mikolov T. (2018) Learning Word Vectors for 157 Languages.arXiv:1802.06893. <https://ui.adsabs.harvard.edu/abs/2018arXiv180206893G>

⁴ Devlin, J., Chang M.-W., Lee K., Toutanova K. (2018) BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding.arXiv:1810.04805. <https://ui.adsabs.harvard.edu/abs/2018arXiv181004805D>





Relatives working in Farplas	y/n?	None
Worked in Farplas earlier?	y/n?	None
Self-declared Disability	y/n; possible identification of disability	None
Nationality	Name of country	None
Hired	Yes/no or other information about how far candidates advanced in the process	None
Military Service	Done or postponed	None
Expected Salary		None

The 2nd dataset as detailed in Table 3 will consist of up to 70 000 records that will not be hand curated but will be manually anonymized prior to transfer. Other fields will not be included in this dataset, but some information may incidentally be included in the cover letter.

Table 3: Non-manually curated, but manually anonymized, Farplas hiring dataset

DATA DESCRIPTION	TYPE/POSSIBLE VALUES	ANONYMIZATION
Gender	M/f/no response/other	None
Cover letter	Exact cover letter	Any directly personally identifying information such as names or exact addresses will be manually removed
Nationality	Name of country	None
Hired	Yes/no or other information about how far candidates advanced in the process	None

WP4: Ethnographies and SSH mapping of biased AI experiences on gender & diversity

No reuse of existing data was contemplated or will be undertaken.

WP5: Capacity building and raising awareness for AI and HRM community

No reuse of existing data was contemplated or will be undertaken.

WP6: Commercialization and exploitation of technologies

No reuse of existing data was contemplated or will be undertaken.

3.2 Data Type





What types and formats of data will the project generate or re-use?

WP2: Stakeholder involvement, needs analysis, and co-creation

Table 4: WP2 data type

Survey of workers	
Data Type	Data Format
Survey response	CVS spreadsheet
Expert interviews	
Data Type	Data Format
Interview responses to pre-defined questions	CVS spreadsheet
Written summary of interviews by country	Text document
Co-creation activities	
Data Type	Data Format
Co-creation workshop methodology	Text document, Slide presentations to be used in workshop
Notes from co-creation workshops	Word document
Words and phrases that indicate bias	CSV spreadsheet

WP3: Technical development of proof-of-concept system

Table 5: WP3 data types

Farplas hiring data	
Data Type	Data Format
Application records	CSV spreadsheet
Notes on hiring procedures	Text document
NLP research	
Data Type	Data Format
Bias detection and mitigation for training data	Computer code
Bias detection and mitigation for word embeddings/language models	Computer code
CBR research	
Data Type	Data Format
Case Base devised from Farplas data	Database
CBR system	Computer code

WP4: Ethnographies and SSH mapping of biased AI experiences on gender & diversity

Table 6: WP4 data types

Ethnographic interviews	
Data Type	Data Format
Interview recordings	Sound recordings
Anonymized verbatim transcripts	Text document
Fieldnotes from interviews	Text document

WP5: Capacity building and raising awareness for AI and HRM community

Table 7: WP5 data types

Awareness raising events





Data Type	Data Format
Awareness raising course materials	Text document of course outline, Slide presentations, videos
Awareness raising activities	Text document of notes from sessions, audio/video recording of webinar presentations
Capacity building events	
Data Type	Data Format
Capacity building course materials	Text document of course outline, slide presentations, videos
Capacity building activities	Text document of notes from sessions, audio/video recording of presentations
MOOC	
Data Type	Data Format
MOOC course content	Text document of course notes; Slide presentations and videos integrated into MOOC

WP6: Commercialization and exploitation of technologies

Table WP6 data types

CEN CENELAC workshop	
Data Type	Data Format
Workshop agreement	Word document
Workshop results	Word document of notes from workshop

Non-research contact information of stakeholders

BIAS will create a series of National Labs of 100 experts in AI development or HRM in each partner country. These national lab members will be invited to take part in BIAS activities and will be consulted for advice when appropriate. Additionally, many citizen stakeholders will be engaged during many activities. BIAS will, with consent, collect contact information for each of these people and record notes of important conversations or interactions to be available to other project partners. These will be stored in a Raiser’s Edge Customer Relationship Management database with restricted access to project partners.

3.3 Purpose of data

What is the purpose of the data generation or re-use and its relation to the objectives of the project?

Survey of workers: Discover a baseline of to what extent workers across Europe have experienced AI in an employment context and what their opinions of such use is. Will inform co-creation activities, technical development, ethnographic interviews, awareness raising, and capacity building efforts

Expert interviews: Discover a baseline of to what extent experts in the AI and HRM fields across Europe believe AI is used in employment contexts and to gauge their opinions of such use. Combined with worker experiences, will inform co-creation activities, technical development, ethnographic interviews, awareness raising, and capacity building efforts.





Co-creation activities: Will provide a more nuanced view of workers and AI developers experiences of AI in employment contexts with a special consideration towards technical development and business validation. Will also inform ethnographic interviews, awareness raising, and capacity building activities. Will also provide specific words and phrases useful in NLP research

Farplas hiring data: Will be the primary basis for training bias identifying and mitigating NLP and CBR systems. Raw data from applications will be used as training data for NLP research. Curated datasets combined with notes on Farplas hiring procedures will create a case base that will be used in CBR research.

Ethnographic interviews: Will provide one of the largest qualitative datasets specifically about bias, AI, and employment useful for BIAS researchers and others to advance the fields of Science and Technology Studies, Worker Studies, and related fields. Will also inform technical development, awareness raising, and capacity building activities as well as plans for commercial exploitation.

Awareness raising activities: Will provide content for materials that can educate about algorithmic bias in employment contexts after completion of BIAS project, including the MOOC. Will inform plans for commercial exploitation.

Capacity building activities: Will provide content for materials that can educate about algorithmic bias in employment contexts after completion of BIAS project, including the MOOC. Will inform plans for commercial exploitation.

MOOC: Will provide a platform for the knowledge of BIAS to be exploited post-project.

CEN CENELAC workshop: Will provide mechanism for BIAS project results to inform future regulation and standardization efforts.

3.4 Data size

What is the expected size of the data that you intend to generate or re-use?

Most data is in the form of Excel spreadsheets, .CVS files, or word documents and is expected to be of negligible size. Audio recordings of ethnographic interviews will be deleted once anonymized verbatim transcripts are made. Recordings of some aspects of awareness raising and capacity building activities may be larger, but total data is estimated to be under 1TB.

3.5 Origin and provenance

What is the origin/provenance of the data, either generated or re-used?

Survey of workers: Responses from survey takers across Europe.

Expert interviews: Notes and interview question responses generated during interviews with identified experts.

Co-creation activities: Notes from workshops conducted with interested stakeholders in partner countries.

Farplas hiring data: Application records from job applicants to open Farplas positions in 2021–2022.





Farplas hiring procedures and case base: Small curated dataset of Farplas hiring decisions and conversations with Farplas HR team regarding their hiring procedures.

Fasttext language model: <https://fasttext.cc/> (publicly available)

BERT-based language models: <https://huggingface.co/> (publicly available)

Ethnographic interviews: Interviews with volunteer informants in the indicated countries.

Awareness raising activities: Notes from and content created for online awareness raising events designed to engage everyday citizens.

Capacity building activities: Notes from and content created for physical capacity building events in project partner countries designed to engage HRM employees and AI developers.

MOOC: Content created during awareness raising and capacity building activities that is deemed to be most useful for disseminating project learning following completing of the project.

CEN CENELAC workshop: Notes generated during and in preparation for workshop.

3.6 Data Utility

To whom might your data be useful ('data utility'), outside your project?

In general raw data may be of interest to other academic researchers and AI developers. Other constituencies may have a vested interest in conclusions drawn from this data, but could conceivably be interested in conducting their own analyses of the data in certain contexts. However, as described below much of the data is internal in nature and this will not be made public in raw form.

Survey of workers: Other academic researchers, policymakers, HR managers at companies, union leaders, AI developers

Expert interviews: Other academic researchers, policymakers

Co-creation activities: Other academic researchers, policymakers, HR managers at companies, union leaders, AI developers, other research projects considering co-creation activities with similar methods or goals.

Farplas hiring data and case base: Other academic researchers and AI developers, especially in NLP and CBR.

Ethnographic interviews: Other academic researchers, especially those engaged in worker studies and STS; AI developers, union representatives, HR managers at companies.

Awareness raising activities: General public interested in issues of AI and employment, other projects planning similar activities

Capacity building activities: AI developers, HR managers at companies, policymakers, other research projects planning similar activities





MOOC: Anyone who would like to learn results and best practices developed during the project in a structured manner, likely HR managers at companies and AI developers.

CEN CENELAC workshop: Policymakers and standardization bodies, AI developers

4. FAIR data

Much of the content regarding metadata and repositories is preliminary and will be updated in future revisions of the Data Management Plan

4.1 Making data findable including provisions for metadata

Will all data be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why, clearly separating legal and contractual reasons from intentional restrictions. Note that in multi-beneficiary projects it is also possible for specific beneficiaries to keep their data closed if opening their data goes against their legitimate interests or other constraints as per the Grant Agreement.

Much of the data outlined above consists of internal reports or summaries of activities which are necessary for carrying out BIAS project activities and which do have research value internal to BIAS but are not useful for other researchers to have direct access to it. We currently have plans to make the results and conclusions from all of these activities public, which will also contain sufficient information on the methodology for researchers to evaluate how the conclusions were generated. These are detailed further in Section 5: Other research outputs.

Some data is sufficiently structured and comprehensive that it would be of use to other researchers and interested parties to perform independent analyses. These include:

- Survey of workers
- Lists of words and phrases that indicate BIAS derived from co-creation workshops
- Anonymized transcripts of ethnographic interviews

Furthermore, the core training dataset of Farplas hiring records would be of interest to other researchers. However, we initially intended to keep this data confidential due to concerns regarding Farplas' business interests. We will have discussions with Farplas to determine if any of the data can be made available while mitigating those concerns. If possible, we will make as much of the data as possible available.

Concerning the anonymized transcripts of ethnographic interviews, we recognize that practices for openly sharing qualitative data, especially interview data, is still a new concept, and there have been questions about the utility or ethical nature of such data sharing.⁵ We are reviewing recent literature about open data practices for qualitative interviews and will make determinations about what precisely to make accessible and

⁵ Tsai, A. C., Kohrt, B. A., Matthews, L. T., Betancourt, T. S., Lee, J. K., Papachristos, A. V., Weiser, S. D., & Dworkin, S. L. (2016). Promises and pitfalls of data sharing in qualitative research. *Social Science & Medicine*, 169, 191-198. <https://doi.org/10.1016/j.socscimed.2016.08.004>





how to make it available.^{6,7, 8}

Will data be identified by a persistent identifier?

All data made publicly available as well as results, pre-prints, papers etc. will be identified by a persistent identifier.

Will rich metadata be provided to allow discovery? What metadata will be created? What disciplinary or general standards will be followed? In case metadata standards do not exist in your discipline, please outline what type of metadata will be created and how.

We will create rich metadata to allow discovery of the data. At a minimum, we plan to include the following in the metadata: dataset name, DOI, dataset description, data utility, type, keywords for search/discovery, scale, origin, license, version number, personal data/anonymized data, standards used, data sharing policy, achieving and preservation, project name, grant agreement number.

The interdisciplinary nature of BIAS means that there is not a single standard for metadata. We will consult the DataCite Metadata Schema for what makes the most sense for our research data.⁹

Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?

Yes

Will metadata be offered in such a way that it can be harvested and indexed?

Yes

4.2 Making data accessible

Will the data be deposited in a trusted repository?

All openly available data will be deposited in a trusted repository that will assign the data an identifier resolved into a digital object.

At this time we are evaluating which repository to use. During application phase we identified Zenodo as a possible candidate. The Bern University of Applied Sciences is a

⁶ Mozersky J, Walsh H, Parsons M, McIntosh T, Baldwin K, DuBois JM. Are we ready to share qualitative research data? Knowledge and preparedness among qualitative researchers, IRB Members, and data repository curators. IASSIST Q. 2020 Jan 8;43(4):952. doi: 10.29173/iq952. PMID: 32205903; PMCID: PMC7089584.

⁷ Mannheimer, S., Pienta, A., Kirilova, D., Elman, C., & Wutich, A. (2019). Qualitative Data Sharing: Data Repositories and Academic Libraries as Key Partners in Addressing Challenges. *American Behavioral Scientist*, 63(5), 643–664. <https://doi.org/10.1177/0002764218784991>

⁸ Tsai, A. C., Kohrt, B. A., Matthews, L. T., Betancourt, T. S., Lee, J. K., Papachristos, A. V., Weiser, S. D., & Dworkin, S. L. (2016). Promises and pitfalls of data sharing in qualitative research. *Social Science & Medicine*, 169, 191-198. <https://doi.org/10.1016/j.socscimed.2016.08.004>

Antonio MG, Schick-Makaroff K, Doiron JM, Sheilds L, White L, Molzahn A. Qualitative Data Management and Analysis within a Data Repository. *Western Journal of Nursing Research*. 2020;42(8):640-648. doi:10.1177/0193945919881706

⁹ DataCite Metadata Working Group. (2021). DataCite Metadata Schema Documentation for the Publication and Citation of Research Data and Other Research Outputs. Version 4.4. DataCite e.V. <https://doi.org/10.14454/3w3z-sa82>





member of OLOS¹⁰ housed in Switzerland, that matches FAIR and OAIS standards. The Swiss National Science Foundation has also identified several suitable repositories.¹¹ NTNU also hosts its own repository that can accept data.¹²

We will also partner with the AI on Demand Platform¹³ to communicate BIAS results. Once the nature of this platform is clarified we can consider if some data or results will be placed here in addition to long-term repositories or if results and data present in the repositories outlined above will be linked to on the AI on Demand Platform.

If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.

At present we plan to release data in conjunction with publications. At the conclusion of the project, the partners will determine the best way to make available any data outlined above that has not been released in conjunction with publications available. Plans for releasing data in conjunction with or independently of publications will be detailed in future updates of this Data Management Plan.

Will the data be accessible through a free and standardized access protocol?

All data made accessible will be available through the standard protocol of the chosen repositories. All data will be made available with a Creative Commons license.

If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?

At present we do not believe this will be applicable

How will the identity of the person accessing the data be ascertained?

At present we do not believe this will be applicable

Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?

At present we do not believe this will be applicable

Will metadata be made openly available and licenced under a public domain dedication CC0, as per the Grant Agreement?

Yes

How long will the data remain available and findable? Will metadata be guaranteed to remain available after data is no longer available?

At present we do not see a need to remove the data from the repository, and we will deposit data in a repository that guarantees long term storage. Therefore the second question is not applicable.

Will documentation or reference about any software be needed to access or read the

¹⁰ <https://olos.swiss>

¹¹ <https://www.snf.ch/en/WtezJ6qxuTRnSYgF/topic/open-research-data-which-data-repositories-can-be-used>

¹² <https://dataverse.no/dataverse/ntnu>

¹³ <https://www.ai4europe.eu>





data be included? Will it be possible to include the relevant software (e.g. in open source code)?

Software will be documented with README files for each component, describing the structure of the repository and the different subcomponents, as well as how to use the software component (requirements of libraries, which commands to execute, system requirements such as operating system, etc.). The format and unities of the datasets, if applicable, will be described in the metadata. In the metadata, also a description of how the data was generated and processed will be contained.

4.3 Making data interoperable

What data and metadata vocabularies, standards, formats or methodologies will you follow to make your data interoperable to allow data exchange and re-use within and across disciplines? Will you follow community-endorsed interoperability best practices? Which ones?

We will use used data formats such as comma-separated values or .txt documents that we expect different communities to be able to process.

In case it is unavoidable that you use uncommon or generate project specific ontologies or vocabularies, will you provide mappings to more commonly used ontologies? Will you openly publish the generated ontologies or vocabularies to allow reusing, refining or extending them?

At present we do not believe this will be applicable

Will your data include qualified references¹⁴ to other data (e.g. other data from your project, or datasets from previous research)?

At present we do not believe this will be applicable

4.4 Increasing data re-use

How will you provide documentation needed to validate data analysis and facilitate data re-use (e.g. readme files with information on methodology, codebooks, data cleaning, analyses, variable definitions, units of measurement, etc.)?

As mentioned above, software will be documented with README files for each component and a description of how the data was generated and processed will be contained in the metadata. The interview guide used to conduct ethnographic interviews will be provided with interview data. Information on the co-creation methodology used to generate the bias wordlists will also be included.

Will your data be made freely available in the public domain to permit the widest re-use possible? Will your data be licensed using standard reuse licenses, in line with the obligations set out in the Grant Agreement?

As mentioned above, all data that is of use to other researchers will be made freely

¹⁴ A qualified reference is a cross-reference that explains its intent. For example, X is regulator of Y is a much more qualified reference than X is associated with Y, or X see also Y. The goal therefore is to create as many meaningful links as possible between (meta)data resources to enrich the contextual knowledge about the data. (Source: <https://www.go-fair.org/fair-principles/i3-metadata-include-qualified-references-metadata/>)





available in the public domain under a Creative Commons license. We will additionally consider whether Farplas hiring data can be made available without compromising their legitimate business interests.

Will the data produced in the project be useable by third parties, in particular after the end of the project?

Yes, data will be placed in repositories and usable by third parties

Will the provenance of the data be thoroughly documented using the appropriate standards?

Specific standards do not yet exist for such interdisciplinary work, especially for qualitative interview data. As stated above, such information will be made available in metadata and readme files.

Describe all relevant data quality assurance processes.

5. Other research outputs

In addition to the management of data, beneficiaries should also consider and plan for the management of other research outputs that may be generated or re-used throughout their projects. Such outputs can be either digital (e.g. software, workflows, protocols, models, etc.) or physical (e.g. new materials, antibodies, reagents, samples, etc.)

Bias detection and mitigation modules for word embeddings and language models developed during WP3 will be publicly released through the Bern University of Applied Science's Github account or another suitable platform to release software.

The MOOC developed in WP5 will be hosted and freely available on DigiTouch's platform to allow for longevity following the conclusion of the project. The MOOC will also be promoted on the AI on Demand Platform

All research results will be made open access through deposition in an identified repository. Additionally, we will target publishing in fully open access journals when possible.

6. Allocation of resources

What will the costs be for making data or other research outputs FAIR in your project (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.)? How will these be covered? Note that costs related to research data/output management are eligible as part of the Horizon Europe grant (if compliant with the Grant Agreement conditions)

Due to the limited size of data, we expect the costs to be negligible.

We anticipate that most publications will be able to be made Open Access through the Norwegian government's agreements with scientific publishers. However, we have budgeted €30 000 for Open Access publications for any publications that cannot be made Open Access through these schemes.

Who will be responsible for data management in your project?





NTNU as Project Coordinator will be responsible for data management. The Principal Investigator and Project Administrator have and will continue to consult closely with the NTNU Research Data Office and Legal Advisors regarding data management issues. We will also work closely with the partners that generate data regarding the management of such data.

How will long term preservation be ensured? Discuss the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept and for how long)?

We will deposit data in repositories that guarantee long term retention of data, such as Zenodo which preserves data in perpetuity. Digiotech commits to maintaining the MOOC for at-least 10 years beyond the project conclusion.

7. Data Security

What provisions are or will be in place for data security (including data recovery as well as secure storage/archiving and transfer of sensitive data)?

This project will follow the NTNU and Norwegian standards for data security, which are generally more stringent than what would apply to other project partners.

NTNU follows the Norwegian policies for data classification and data security of research data. This categorizes data into four levels of sensitivity: Open, Internal, Confidential, and Strictly Confidential.¹⁵

- **Open:** Information may be available to anyone without special access rights.
- **Internal:** The information must have some level of protection and may be accessible to both external and internal personnel with controlled access rights. This category is used when there is a possibility for causing certain damage to the institution or a cooperation partner, if the information becomes known to unauthorized persons. Examples of such information may be certain work documents, information exempt from public disclosure, personal data, grades, larger student assignments, examination answer papers, research data and research work.
- **Confidential:** This category is used when there is a possibility for causing damage to the public interests, the institution, an individual or a cooperation partner, if the information becomes known to unauthorized persons. The information must thus have strict access rights. Examples of such information may be certain strategy papers, sensitive personal data, health information, examination question papers prior to the examination, certain types of research data and research work.
- **Strictly confidential:** Strictly confidential is used when there is a possibility for causing significant damage to the public interests, the institution, an individual or a cooperation partner, if the information becomes known to unauthorized persons. The information should have the highest level of access rights. Examples of such information can be large amount of health information used in research.

¹⁵ <https://www.sikresiden.no/en/preventive/securinginformation#> ; <https://i.ntnu.no/wiki/-/wiki/English/Data+storage+guide>





NTNU has different standards for secure storage and access at each classification tier.¹⁶

All BIAS research data has been deemed to be “Internal” with the exception of audio recordings of ethnographic interviews, which are “Confidential”.

Most data will be stored on an NTNU maintained Microsoft Teams site, where all project partners have password-protected access.

NTNU and the University of Iceland will collect audio recordings of ethnographic interviews. Each party will be responsible for storing these securely in encrypted format prior to their transcription. No other partner will have access to the audio recordings. NTNU will utilize TSD—a platform for storing sensitive research data maintained by the University of Oslo—or a similar system for storing audio recordings. The University of Iceland will utilize a similar service. Once interviews have been anonymized and transcribed, the audio recordings will be deleted and the transcripts shared on the BIAS Microsoft Teams site.

As detailed above, Farplas hiring data will be stored on a federated platform with data centres Luxemburg, Frankfurt, and Paris maintained by Digiotech working with service provider GCore Labs S.A.. The data will only be made available to employees at NTNU, BFH for AI research and technical development. The data will be sent and stored in encrypted form and access restricted using password protected SSH keys.

Personal contact data of experts, citizen participants, or other external individuals contacted for networking purposes or participation in BIAS activities or events will be stored in The Raiser’s Edge CRM database maintained by Blackbaud Inc. All project partners will have individual password-protected accounts with Blackbaud to access The Raiser’s Edge. Blackbaud has a GDPR compliant data processing agreement.

Will the data be safely stored in trusted repositories for long term preservation and curation?

Yes.

8. Ethics

Are there, or could there be, any ethics or legal issues that can have an impact on data sharing? These can also be discussed in the context of the ethics review. If relevant, include references to ethics deliverables and ethics chapter in the Description of the Action (DoA).

All Social Science research in Norway that involves the collection of personal data is required to be reviewed by SIKT, which evaluates whether plans for storage, sharing, and informed consent are in compliance with Norwegian law and GDPR. Such review also encompasses interview guides and questionnaires to determine if personal data is gathered during research activities. If SIKT determines that personal data is gathered, the exact wording of informed consent forms and procedures are reviewed and approved. All BIAS activities will be submitted to SIKT for review.

Thus far we have submitted information about the Expert Interviews and Survey of Workers, and SIKT has determined that neither activity gathers personal data.

¹⁶ <https://i.ntnu.no/wiki/-/wiki/English/Data+storage+guide>





SIKT is currently reviewing our proposed transfer and research using Farplas hiring data.

Research with Farplas hiring data has been reviewed by the NTNU Research Data Office and legal advisers who have determined that it is legal for us to receive such data. BIAS research involving such data is in the public interest as outlined in Article 6(1)e of GDPR. Furthermore, the data processed is low-risk data as outlined in Article 6(4)d of GDPR and there are appropriate safeguards put in place as outlined in Article 6(4)e including encryption, controlled access, and pseudonymisation. However, there is an ethical concern regarding Farplas hiring data because individuals included in those datasets will not be asked for their informed consent. NTNU does not have any ethical review committees for such research activities. The BFH Research Commission does have an Ethics Advisory Group. We have submitted a request for review to this Ethics Advisory Group. We will not transfer Farplas hiring data until we receive a response from the Ethics Advisory Group and SIKT.

Will informed consent for data sharing and long-term preservation be included in questionnaires dealing with personal data?

SIKT has determined that the survey of workers does not gather personal data. Informed consent of the ethnographic interviews will include consent for data sharing and long-term preservation.

9. Other Issues

Do you, or will you, make use of other national/funder/sectorial/departmental procedures for data management? If yes, which ones (please list and briefly describe them)?

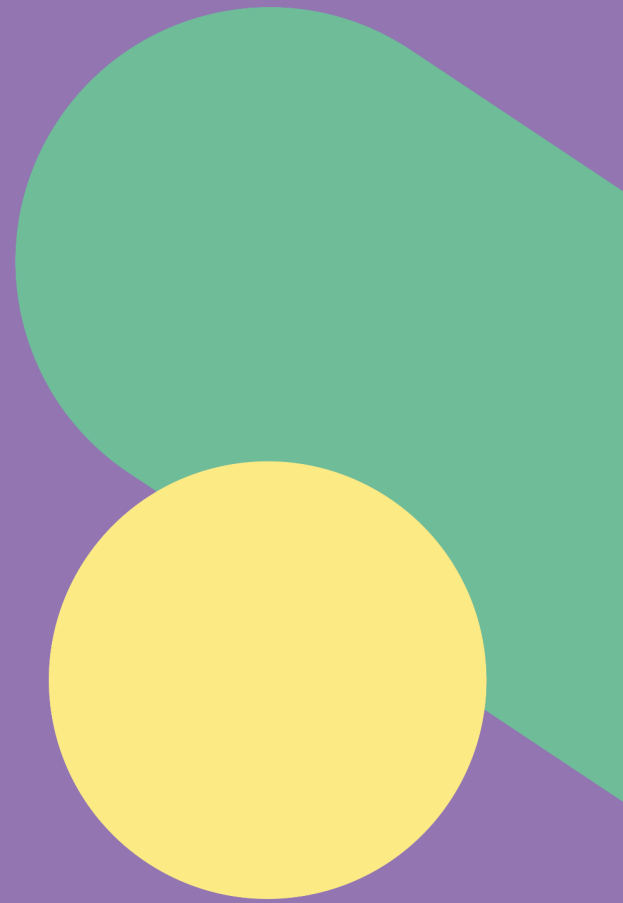
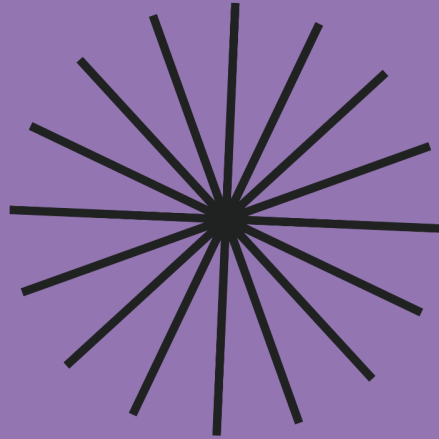
As stated above, we are engaging with the NTNU Research Data Office and Legal Advisors, as well as SIKT, for advice and direction regarding BIAS research data. This has included advice regarding legal agreements between partners that need to be in place regarding various data. Following these discussions, they have determined that the following agreements are necessary, which are currently in the process of being drafted and executed:

- Personal contact information for citizen participants, experts, and others consulted regarding project:
 - Joint controllership agreement between all project partners
- Farplas hiring data:
 - Data transfer agreement between FARPL and NTNU/BFH
 - Joint controllership agreement between NTNU and BFH
 - Joint data processing agreement between NTNU/BFH and Digiotouch
 - Data processing agreement between Digiotouch and GCore



BIAS

Mitigating biases
of AI in the
labour market



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