

# Machine-actionable Software Management Plans – High Potentials or Just Gimmicks?

Dr. Yves Vincent Grossmann  
[grossmann@mpdl.mpg.de](mailto:grossmann@mpdl.mpg.de)  
Max Planck Digital Library

10. RDMO Community Meeting  
11<sup>th</sup> September 2023, Karlsruhe

<https://doi.org/10.17617/2.3525097>





MAX PLANCK  
digital library



# What's machine-actionable/-readable?




- *“Data in a data format that can be automatically read and processed by a computer, such as CSV, JSON, XML, etc. Machine-readable data must be structured data.”*  
<https://opendatahandbook.org/glossary/en/terms/machine-readable/>
- “Machine-Actionability refers to the information that is consistently structured so that machines can be programmed against such a structure.” <https://ds-wizard.org/machine-actionability>
- It's complicated, see [https://rdmkit.elixir-europe.org/machine\\_actionability.html](https://rdmkit.elixir-europe.org/machine_actionability.html)

# Machine-Actionable Data Management Plans

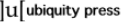


## Interconnecting Systems Using Machine-Actionable Data Management Plans – Hackathon Report

SPECIAL COLLECTION:  
RESEARCH DATA ALLIANCE  
PRACTICE PAPER

JOÃO CARDOSO   
LEYLA JAEEL CASTRO   
TOMASZ MIKSA 

*\*Author affiliations can be found in the back matter of this article*



### ABSTRACT

The common standard for machine-actionable Data Management Plans (DMPs) allows for automatic exchange, integration, and validation of information provided in DMPs. In this paper, we report on the hackathon organised by the Research Data Alliance in which a group of 89 participants from 21 countries worked collaboratively on use cases exploring the utility of the standard in different settings. The work included integration of tools and services, funder templates mapping, and development of new serialisations. This paper summarises the results achieved during the hackathon and provides pointers to further resources.

**CORRESPONDING AUTHOR:**  
João Cardoso  
Universidade de Lisboa,  
Instituto Superior Técnico &  
INESC-ID, Lisboa, Portugal  
joao.m.cardoso@tecnico.ulisboa.pt

**KEYWORDS:**  
Data management plans;  
machine-actionable data  
management plans; semantic  
web; community practice;  
open science

**TO CITE THIS ARTICLE:**  
Cardoso, J, Castro, LJ and  
Miksa, T. 2021. Interconnecting  
Systems Using Machine-  
Actionable Data Management  
Plans – Hackathon Report.  
Data Science Journal, 20: 35,  
pp. 1–11. DOI: <https://doi.org/10.5334/dsj-2021-035>

Cardoso, J, Castro, LJ and Miksa, T. 2021. Interconnecting Systems Using MachineActionable Data Management Plans – Hackathon Report. Data Science Journal, 20: 35, pp. 1–11. DOI: <https://doi.org/10.5334/dsj-2021-035>, CC BY 4.0.



## Application Profile for Machine-Actionable Data Management Plans

SPECIAL COLLECTION:  
RESEARCH DATA ALLIANCE  
RESEARCH PAPER

TOMASZ MIKSA   
PAUL WALK   
PETER NEISH   
SIMON OBLASSER   
HOLLYDAWN MURRAY   
TOM RENNER   
MARIE-CHRISTINE JACQUEMOT-PERBAL   
JOÃO CARDOSO 

TROND KVAMME   
MARIA PRAETZELLIS   
MAREK SUCHÁNEK   
ROB HOOFT   
BENJAMIN FAURE   
HANNE MOA   
ADIL HASAN   
SARAH JONES 



### ABSTRACT

This paper presents the application profile for machine-actionable data management plans that allows information from traditional data management plans to be expressed in a machine-actionable way. We describe the methodology and research conducted to define the application profile. We also discuss design decisions made during its development and present systems which have adopted it. The application profile was developed in an open and consensus-driven manner within the DMP Common Standards Working Group of the Research Data Alliance and is its official recommendation.

**CORRESPONDING AUTHOR:**  
Tomasz Miksa  
TU Wien & SBA Research,  
Austria  
miksa@ipz.tuwien.ac.at

**KEYWORDS:**  
application profile; machine-  
actionable; data management  
plans; common standards; machine-  
actionable; RDA

**TO CITE THIS ARTICLE:**  
Miksa, T, Walk, P, Neish, P,  
Oblasser, S, Murray, H,  
Renner, T, Jacquemot-Perbal,  
M-C, Cardoso, J, Kvamme, T,  
Praetzelis, M, Suchánek, M,  
Hoof, R, Faure, B, Moa, H,  
Hasan, A and Jones, S. 2021.  
Application Profile for Machine-  
Actionable Data Management  
Plans. Data Science Journal,  
20: 32, pp. 1–17. DOI: <https://doi.org/10.5334/dsj-2021-032>

Miksa, T, Walk, P, Neish, P, Oblasser, S, Murray, H, Renner, T, Jacquemot-Perbal, M-C, Cardoso, J, Kvamme, T, Praetzelis, M, Suchánek, M, Hoof, R, Faure, B, Moa, H, Hasan, A and Jones, S. 2021. Application Profile for MachineActionable Data Management Plans. Data Science Journal, 20: 32, pp. 1–17. DOI: <https://doi.org/10.5334/dsj-2021-032>, CC BY 4.0.

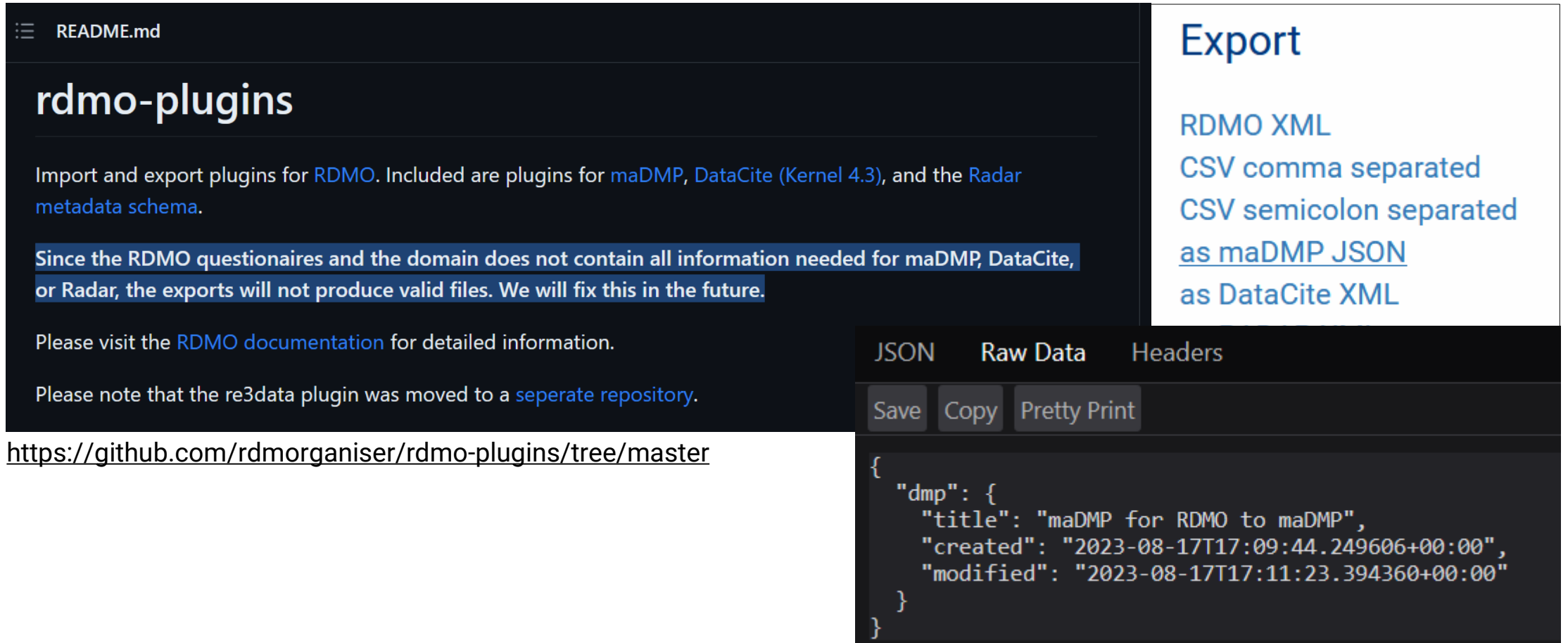
# RDA DMP Common Standard for machine-actionable Data Management Plans

The screenshot shows the GitHub repository page for 'RDA-DMP-Common-Standard'. The repository is public and has 22 watchers, 31 forks, and 54 stars. It is currently on the 'master' branch, with 4 other branches and 2 tags. The repository was created by TomMiksa and has 280 commits. The file list includes folders for 'assets/css', 'docs', 'examples/JSON', and 'ontologies', and files for '.gitignore', 'CITATION.cff', 'LICENSE.md', 'README.md', and '\_config.yml'. The 'About' section describes it as 'Official outputs from the RDA DMP Common Standards WG' and lists links for 'Readme', 'Unlicense license', 'Cite this repository', 'Activity', '54 stars', '22 watching', and '31 forks'. The 'Releases' section shows 'Version 1.1' as the latest release, dated Nov 11, 2020.

File/Folder	Commit Message	Time Ago
assets/css	Update style.scss	4 years ago
docs	Update links.md	last year
examples/JSON	Example 10	5 months ago
ontologies	updated readme	last year
rda_dmp_common_standard_doc_ge...	updated docs to remove link to github pages	4 years ago
.gitignore	Update .gitignore	3 years ago
CITATION.cff	Update CITATION.cff	2 years ago
LICENSE.md	Create LICENSE.md	4 years ago
README.md	Distribution description	3 years ago
_config.yml	Set theme jekyll-theme-cayman	4 years ago

<https://github.com/RDA-DMP-Common/RDA-DMP-Common-Standard>

# maDMPs in RDMO



The screenshot shows the GitHub README for the 'rdmo-plugins' repository. The main content area is dark-themed and contains the following text:

Import and export plugins for [RDMO](#). Included are plugins for [maDMP](#), [DataCite \(Kernel 4.3\)](#), and the [Radar metadata schema](#).

Since the RDMO questionnaires and the domain does not contain all information needed for maDMP, DataCite, or Radar, the exports will not produce valid files. We will fix this in the future.

Please visit the [RDMO documentation](#) for detailed information.

Please note that the re3data plugin was moved to a [seperate repository](#).

<https://github.com/rdmorganiser/rdmo-plugins/tree/master>

An 'Export' menu is open on the right side, listing the following options:

- RDMO XML
- CSV comma separated
- CSV semicolon separated
- [as maDMP JSON](#)
- as DataCite XML

Below the export menu, there are tabs for 'JSON', 'Raw Data', and 'Headers'. The 'JSON' tab is selected, and a 'Save' button is visible. Below the tabs, a JSON object is displayed in a dark-themed code editor:

```
{
  "dmp": {
    "title": "maDMP for RDMO to maDMP",
    "created": "2023-08-17T17:09:44.249606+00:00",
    "modified": "2023-08-17T17:11:23.394360+00:00"
  }
}
```

# maSMP

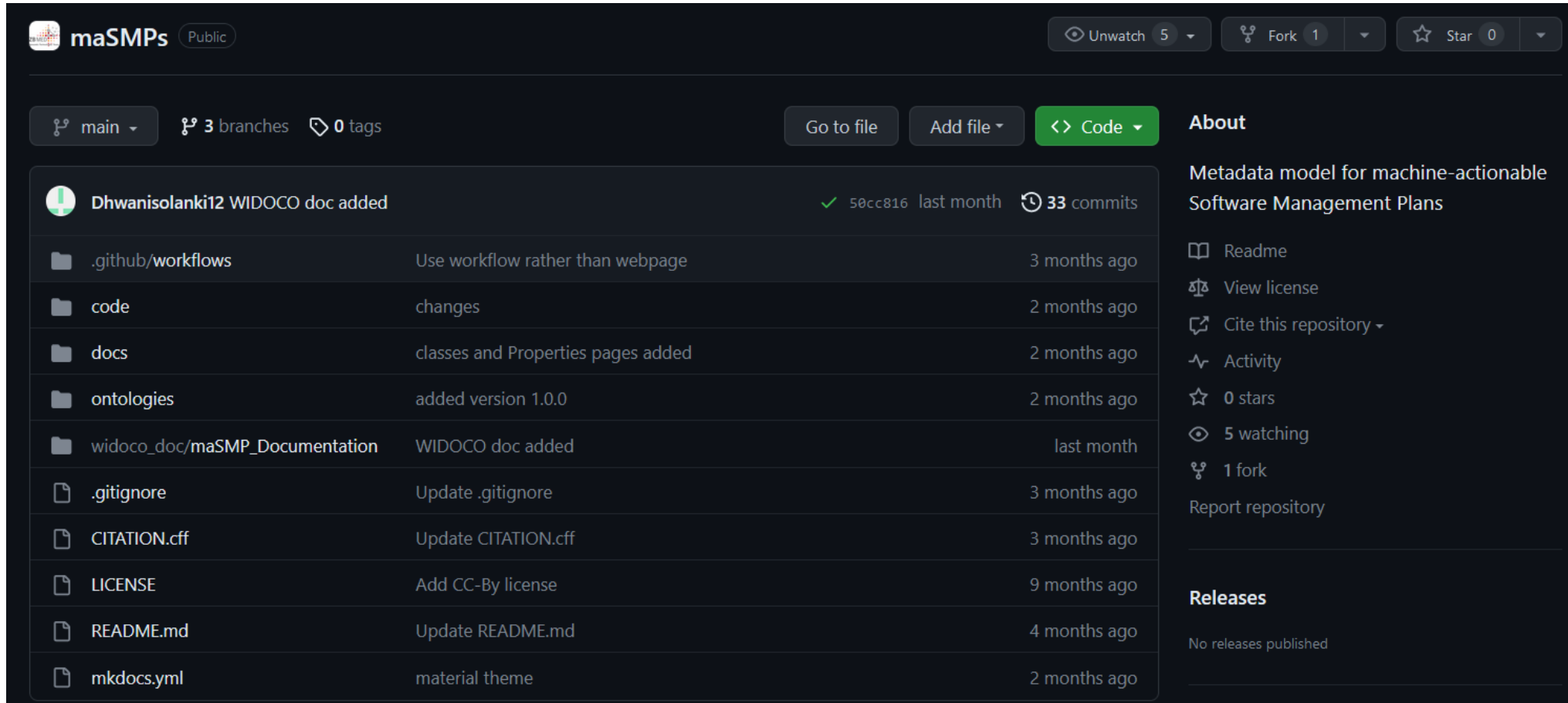
The screenshot shows a Zenodo record for the 'machine-actionable Software Management Plan Ontology (maSMP Ontology)'. The record is dated June 28, 2023, and is marked as 'Open Access'. The title is 'machine-actionable Software Management Plan Ontology (maSMP Ontology)'. The authors listed are Giraldo Olga, Geist Lukas, Quiñones Nelson, Solanki Dhvani, Rebholz-Schuhmann Dietrich, and Castro Leyla Jael. The abstract states: 'We have defined a metadata model in the form of an ontology representing the necessary metadata elements for a maSMP. The metadata model includes entities involved in software management planning, such as an SMP itself, software source code, software release, documentation, authors and their relations. We are reusing terms mainly from schema.org and from DCSD, with some few additions of our own.' There is an 'Acknowledgments' section mentioning funding from the European Union's Horizon 2020 programme and the Deutsche Forschungsgemeinschaft (DFG). A file named 'maSMP\_ontology\_v1.owl' (53.2 kB) is available for download. The 'Citations' section shows 'No citations'.

Giraldo Olga, Geist Lukas, Quiñones Nelson, Solanki Dhvani, Rebholz-Schuhmann Dietrich, & Castro Leyla Jael. (2023). machine-actionable Software Management Plan Ontology (maSMP Ontology) (1.0.0). Zenodo. <https://doi.org/10.5281/zenodo.8089518>, CC BY 4.0.

The screenshot shows a Zenodo record for the 'Workshop machine-actionable Software Management Plans'. The record is dated June 27, 2023, and is marked as 'Open Access'. The title is 'Workshop machine-actionable Software Management Plans'. The authors listed are Giraldo, Olga; Cardoso, João; Martin del Pico, Eva; Gaignard, Alban; Geist, Lukas; Grossmann, Yves Vincent; Psomopoulos, Fotis; Papadopoulou, Elli; Solanki, Dhvani; Castro, Leyla Jael. The abstract states: 'Workshop machine-actionable Software Management Plans'. The organizer is the Semantic Technologies team at ZB MED Information Centre for Life Sciences. The place is Cologne. The date is 2023.05.31. The participants/authors of this report are listed with their ORCID IDs. A list of participating institutions is provided: 1 ZB MED Information Centre for Life Sciences, 2 RDA DMP Common Standards Working Group, 3 BSC-CNS, 4 CNRS, 5 Max Planck Digital Library, 6 Centre for Research and Technology Hellas, 7 ATHENA Research Center / OpenAIRE.

Giraldo, Olga, Cardoso, João, Martin del Pico, Eva, Gaignard, Alban, Geist, Lukas, Grossmann, Yves Vincent, Psomopoulos, Fotis, Papadopoulou, Elli, Solanki, Dhvani, & Castro, Leyla Jael. (2023). Workshop machine-actionable Software Management Plans. Zenodo. <https://doi.org/10.5281/zenodo.8087357>, CC BY 4.0.

# Metadata model for machine-actionable Software Management Plans



The screenshot shows the GitHub interface for the repository 'maSMPs'. At the top, it indicates the repository is 'Public' and shows interaction buttons: 'Unwatch 5', 'Fork 1', and 'Star 0'. Below this, the current branch is 'main', with '3 branches' and '0 tags' available. A navigation bar includes 'Go to file', 'Add file', and a highlighted 'Code' button. The main content area displays a commit history table with columns for commit details, commit ID, time, and commit count. The right sidebar contains an 'About' section with the repository description and links for 'Readme', 'View license', 'Cite this repository', 'Activity', '0 stars', '5 watching', and '1 fork'. A 'Releases' section at the bottom of the sidebar states 'No releases published'.

Commit Message	Commit ID	Time	Commits
Dhwanisolanki12 WIDOCO doc added	50cc816	last month	33
.github/workflows		Use workflow rather than webpage	3 months ago
code		changes	2 months ago
docs		classes and Properties pages added	2 months ago
ontologies		added version 1.0.0	2 months ago
widoco_doc/maSMP_Documentation		WIDOCO doc added	last month
.gitignore		Update .gitignore	3 months ago
CITATION.cff		Update CITATION.cff	3 months ago
LICENSE		Add CC-By license	9 months ago
README.md		Update README.md	4 months ago
mkdocs.yml		material theme	2 months ago

Specially by Leyla Jael Castro (ZB Med): <https://github.com/zbmed-semtec/maSMPs>

# Metadata model for machine-actionable Software Management Plans

## Properties in 'contact'

Name	Description	Cardinality	Example Value
<code>contact</code>	Contact person for the SMP	1	Elizabeth Smith contact@example.com

## Properties in 'contributor'

Name	Description	Cardinality	Example Value
<code>contributor</code>	The contributors of code, planning and data involved in the software project	0..*	Elizabeth Smith, Adam Miller

## Properties in 'funding'

Name	Description	Cardinality	Example Value
<code>funding</code>	Who is funding the project	0..*	

Specially by Leyla Jael Castro (ZB Med): <https://github.com/zbmed-semtec/maSMPs>



# Advantages

- Standardised answers can be evaluated by machine
- Unification and standardisation of responses
- Better comparability of maSMP among each other
- ...

# Disadvantages

- One is rather dependent on standardised answers → fewer free fields in RDMO catalogues → and narrowing answer options
- Technically it is much more complicated than non-machine-readable management plans
- Are input and output for the development in a good ratio?
- ...

# Current Use Scenarios

?

# Possible Use Scenarios

- Automated filling of SMPs
- Autosuggestion for SMPs
- Fully and rich metadata push for SMP publication
- Evaluation of research software projects, i.e. by research institutions
- Monitoring of funders regarding deliverables
- ...

# Thank you for your attention!

Remarks, questions etc. afterwards: [grossmann@mpdl.mpg.de](mailto:grossmann@mpdl.mpg.de)