

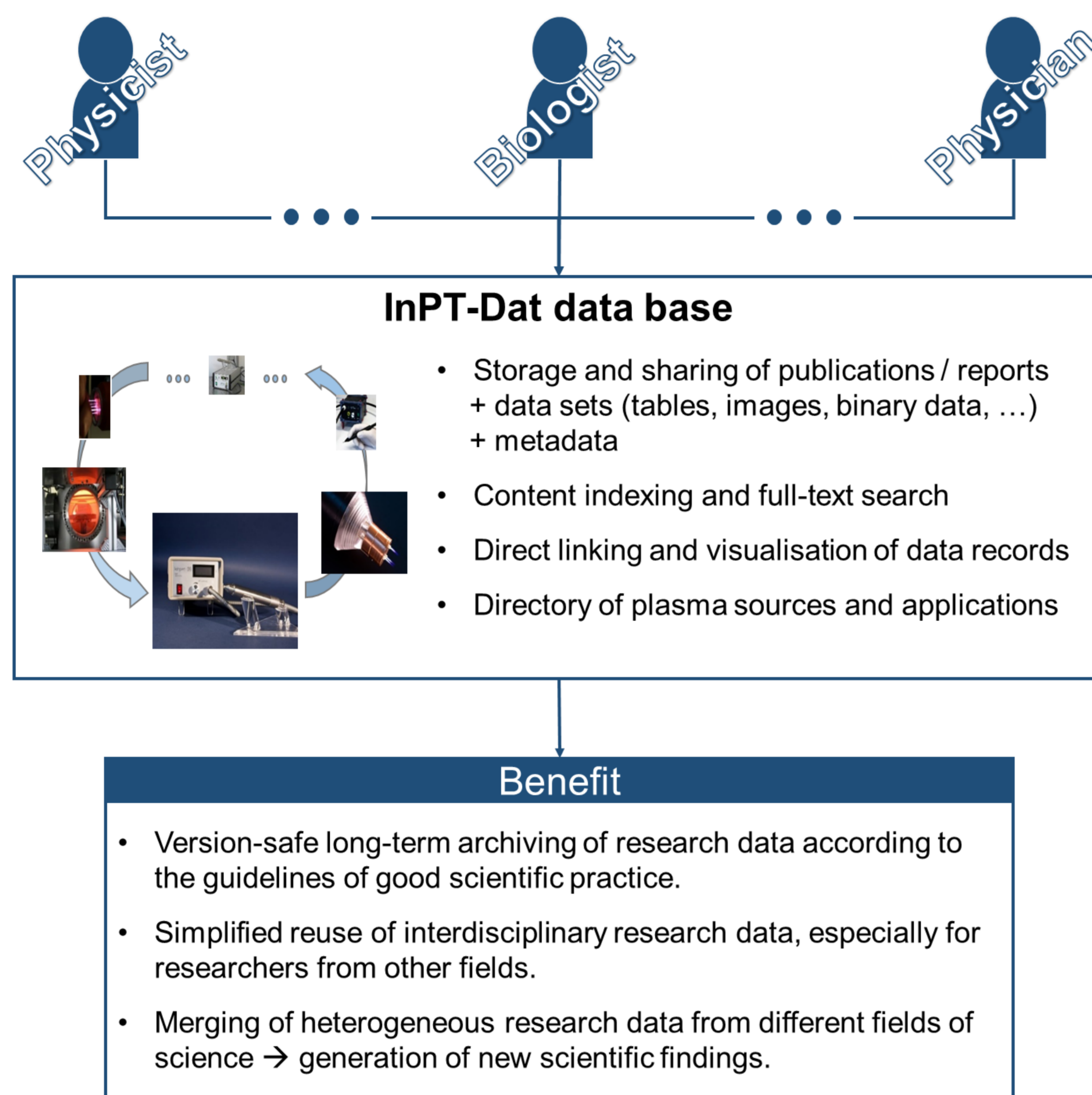


Progress of the research data management platform InPT-Dat

Introduction

- The project InPT-Dat („Interdisziplinäre Plasmatechnologie-Datenplattform“) aims to tackle the question of how research results in the different fields of low-temperature plasma physics (physics, chemistry, biology, medicine and very recently agriculture) can effectively be linked together and made accessible and reusable for scientists and industry in the different fields.
- The goal of the project is to establish a research data management platform for the collection and provision of research data from all fields of low-temperature plasma science and technology.

Conception of the data management platform



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Summary and future plans

- The Drupal based open data platform DKAN is used to establish an institutional research data management platform at INP Greifswald.
- An extension to the Dublin Core metadata scheme is developed to account for the interdisciplinary requirements in plasma technology.
- The integrated DKAN features and Drupal modules for direct data access and online visualization will be used for linking related data.
- As a long-term goal the data platform is planned to be opened for external usage including the option for third-parties to add data sets.

Solution approach

- Development of a web-based information platform on the basis of existing repository software.
- Evaluation of selected repository software systems (open source): DSpace, Invenio, Islandora / Samvera (Fedora), DKAN, CKAN:

DSpace

Pros

- Widely used and recognized in scientific communities;
- Use of well accepted metadata standards
- Built-in Metadata harvesting

Cons

- No direct linking of data records provided
- Difficult to adapt to the specific requirements

INVENIO

Pros

- Use of well accepted metadata standards
- Extended metadata export features (BibTeX, EndNote, ...)

Cons

- Mostly for literature data
- Difficult to adapt to the specific requirements

Plasma

Pros

- Use of well accepted metadata standards
- Built-in Metadata harvesting
- Advanced data linking features

Cons

- Complex modular structure
- Strong conceptual changes between different versions

CKAN

Pros

- Easy to adapt to specific requirements
- Advanced preview features for different data types

Cons

- Mostly used in public sector
- Non-standard metadata scheme
- No direct linking of data records provided

dkan

Pros

- Easy to adapt to specific requirements (full Drupal functionality)
- Advanced preview features for different data types
- Linking of data sets possible

Cons

- Mostly used in public sector
- Metadata harvesting features related to public sector

➤ DKAN was chosen as a basis for the data platform.

- Extension of the Dublin Core metadata standard according to the interdisciplinary requirements of plasma technology

Status of the data management platform

- Problem specific adjustment of DKAN in progress
- Metadata fields for plasma technology added
- Customized ingest workflow implemented
- Successful integration of Apache Solr for efficient full-text search and faceted search features

Example of faceted search

Data set with additional resources and metadata

Plasma-deposited fluorocarbon polymer films on titanium for preventing cell adhesion: a surface finishing for temporarily used orthopaedic implants

The design of a titanium implant surface should ideally support its later application in clinical use. Temporarily used implants have to fulfil requirements different from permanent implants: they should ensure the mechanical stabilization of the bone stock but in trauma surgery they should not be integrated into the bone because they will be removed after fracture healing. Finishing of the implant surface by a plasma-fluorocarbon-polymer (PFPP) coating is a possible approach for preventing cell adhesion of osteoblasts. Two different low pressure gas-discharge plasma processes, microwave (MW 2.45 GHz) and capacitively coupled radio frequency (RF 13.56 MHz) plasma, were applied for the deposition of the PFPP film using a mixture of the precursor octafluoropropane (C3F8) and hydrogen (H2). The thin films were characterized by x-ray photoelectron spectroscopy.

Data and Resources

- Finke2016p234002.pdf: The use of metallic implants in orthopaedic and trauma...
- Dataset: Experimental data used for the analysis.
- Film thickness - Figure 4: Figure 4. Film thickness of PEP-films deposited in different C3F8/H2 ratios...
- Finke2016p234002_Figure_7: Figure 7. MG-63 cell growth after 24 h on PEP-MW films deposited with...
- Gas flow vs. film thickness: Experimental data shown in Figure 4.

Field	Value
Publisher	PLASMA SURFACE TECHNOLOGY(POT)
Authors	Finke, Birgit Tetrich, Holger Rehl, Henrike Walschus, Uwe Schlosser, Michael
Modified Date	2018-02-16
Release Date	2018-02-16
Identifier	Oed68591-b1c3-41a9-afb7-b8a665f983d
Language	English (United States)
License	License Not Specified
Public Access Level	Public
Plasmasource name	crrf (low pressure) microwave (low pressure) V55G, Plasma finish, Germany
Plasmasource application	film deposition

References

https://lucene.apache.org/
http://www.dspace.org
http://invenio-software.org
http://fedora-repository.org
https://ckan.org
https://getdkan.org

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