CSC

ICT Solutions for Brilliant Minds

Research.fi – the Finnish research information hub

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Contents

Background and targets

Background

- Finnish HEIs, research institutions, research funders, research infrastructures etc. are constantly collecting enormous amounts of research metadata. Considerable resources spent.

- Still, the research information has been difficult to locate and use at national level, and anyone needing information has to search in several different places.

- Researchers are forced to enter the same information in several different places, such as funders' systems, research data services, publication repositories, CV services. Also, when changing organisation, they have to re-enter their data once registered in the old organization.

- Also national databases exist (e.g. VIRTA Publication Information Service and national Fairdata services) but they have been developed in silos since they have served different purposes.
    - The use of information has primarily put an emphasis on its use in Ministry's funding allocation to HEIs as well as in the evaluation, steering and statistics compilation of research.
    - Open science policy has put emphasis on open access publishing and research data sharing

Towards the Finnish Research Information Hub

- In 2017, the Ministry of Education and Culture authorised CSC to implement and coordinate a **national service,** which compiles metadata on, for example, publications, research data, research infrastructures, researchers, projects and research groups.
- The project was carried out between 2017-2020
- The public portal Research.fi was launched in 2020
- The development continues in phases.

Targets

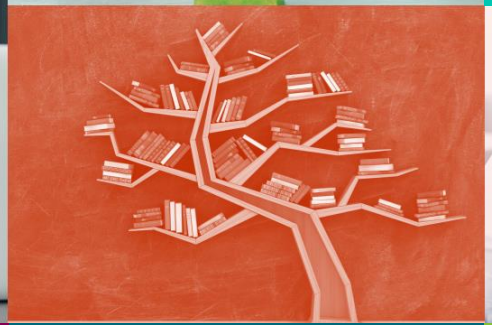
1. The details of researchers, publications, research datasets, research projects and research infrastructures available in one place.

2. Less reporting and administrative work as the data is available in a single location and information flows between services.

3. Results of both publicly and privately funded research openly accessible.

4. Benefits researchers, research organizations, funding agencies, public administration and citizens.

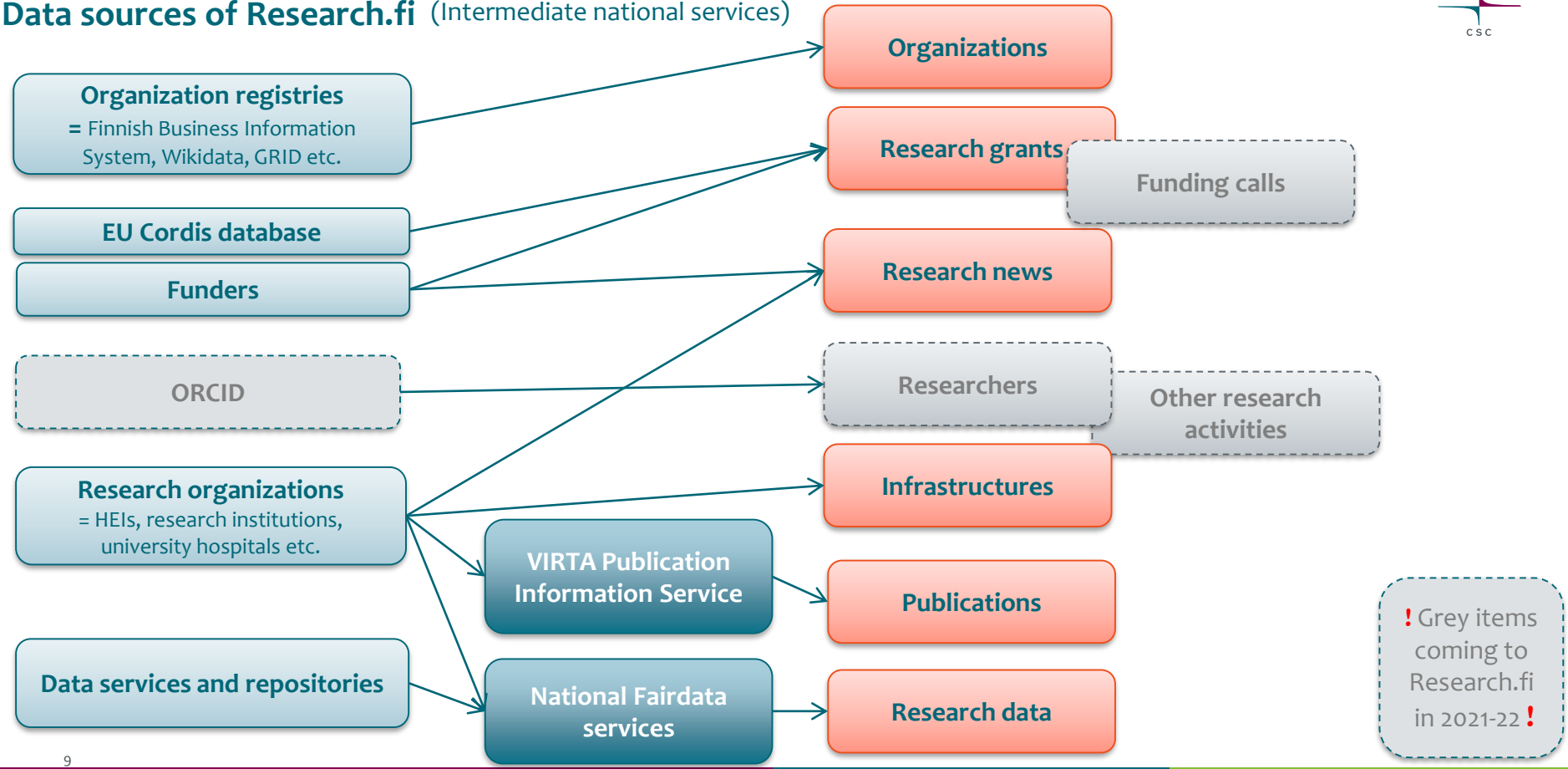
Information flows in the Finnish Research Information Hub




Universities
Universities of applied sciences
Research institutes
Research funders
Flows of information
International connectivity
Hae tietoa tutkimuksesta Suomessa
Research.fi
The Finnish Research Information Hub
Researcher's MyData

Metadata in Research.fi

Data sources of Research.fi (Intermediate national services)



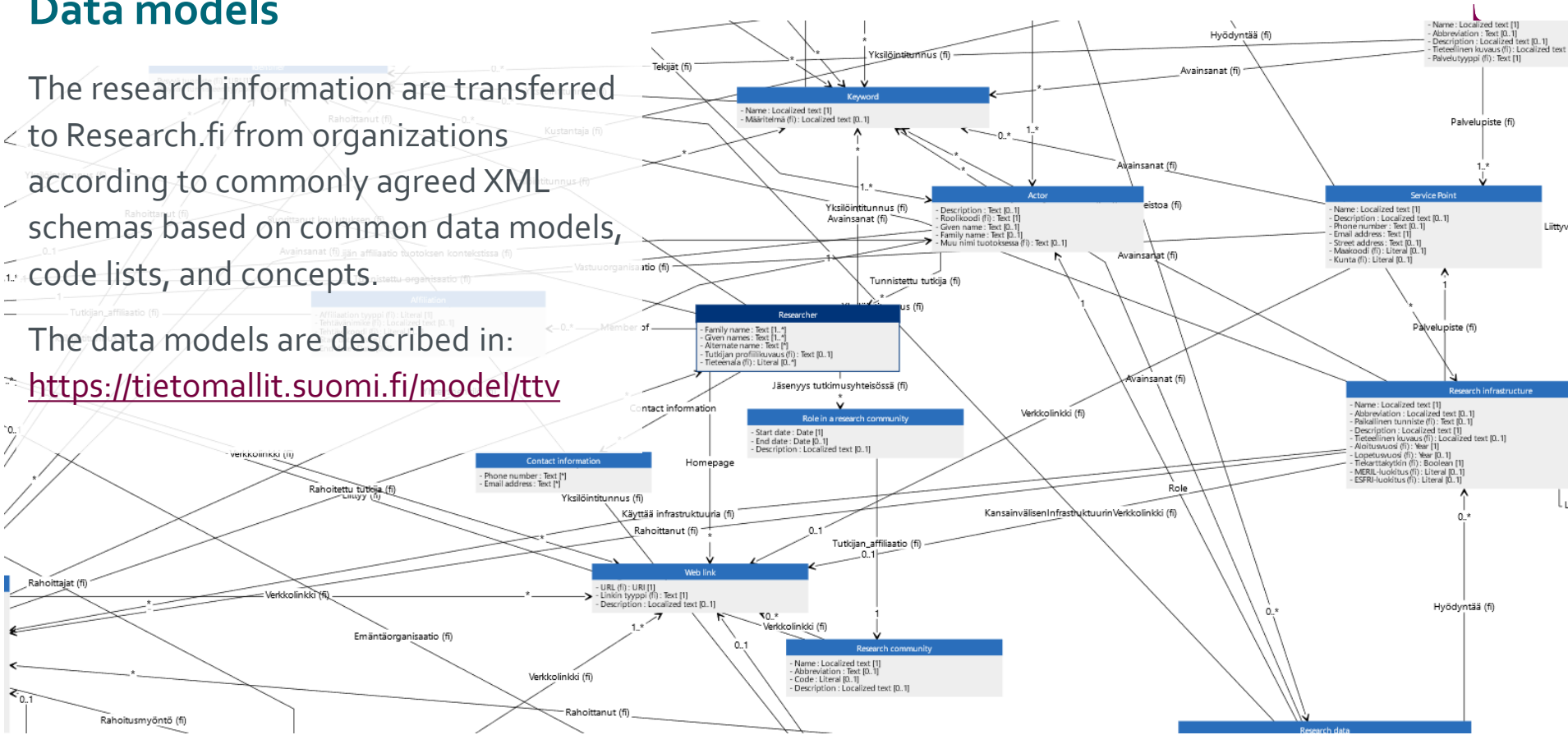
Data transfer

- Most of the organizations transfer their information from their CRISes or other registers automatically on a daily basis.
- No data is entered in Research.fi manually
  - Exception: For research infrastructures' metadata, an input form has been implemented.
- Submitting information is mainly voluntary. Only the reporting of publications is mandatory for higher education institutions.

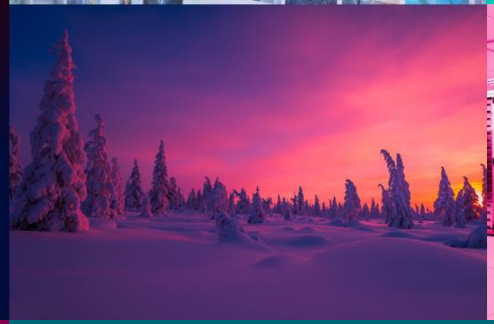
Data models

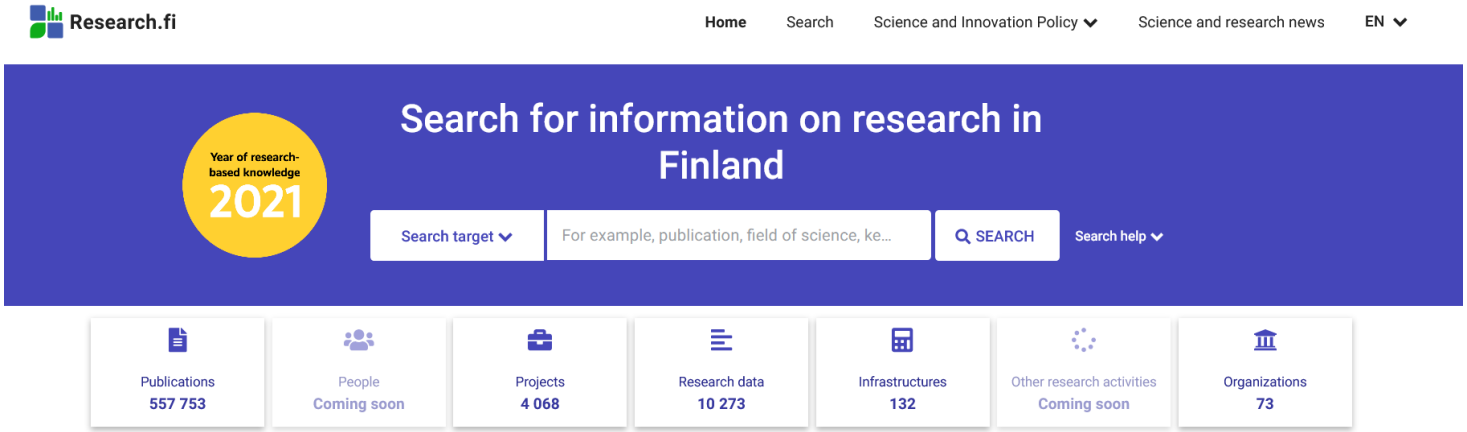
The research information are transferred to Research.fi from organizations according to commonly agreed XML schemas based on common data models, code lists, and concepts.

The data models are described in: https://tietomallit.suomi.fi/model/ttv



Research.fi – current features





The public portal for the Finnish research information hub, **Research.fi**, was launched in June 2020

Currently, it contains information on on the Finnish research system, publications, research data, and research infrastructures, funded projects, research news, and statistical information on the development of research resources and impact.

Example: Search results on publications

Publications	People	Projects	Research data	Infrastruct
557 753	Coming soon	4 068	10 273	132

Publications - *557 753*

What publication information is included in the service?

Show as image

Filter results

- Year of publication
- + Organization
- + Field of science
- + Publication type
- Publication format
- Publication audience
- Parent publication type

PUBLICATION NAME	AUTHORS	PUBLICATION CHANNEL	YEAR
Descriptive complexity of #P functions:A new perspective Peer-reviewed · Open access DOI 10.1016/j.jcss.2020.04.002	Durand, Arnaud; Haak, Anselm; Kontinen, Juha; Vollmer, Heribert	Journal of Computer and System Sciences	2021
Model-based identification and analysis of hot metal desulphurisation Open access	Vuolio, Tero	Acta Universitatis Ouluensis Series C Technica	2021
Effectiveness and Predictors of Outcome for Psychotherapeutic Interventions in Clinical Settings Among Adolescents Peer-reviewed · Open access DOI 10.3389/fpsyg.2021.628977	Gergov, Vera; Lindberg, Nina; Lahti, Jari; Lipsanen, Jari; Marttunen, Mauri	frontiers psychology	2021
Indicators of site loss from a migration network:Anthropogenic factors influence waterfowl movement patterns at stopover sites	Xu, Yanjie; Kieboom, Mattias; Lammeren, Ron J. A. van; Si, Yali; Boer, Willem F. de	Global Ecology and Conservation	2021

GIVE FE

Declining peatland bird numbers are not consistent with the increasing Common Crane population

Example: Publication's metadata

Year of publication	2020
Authors	Fraixedas, Sara; Lindén, Andreas; Husby, Magne; Lehikoinen, Aleksi
Organizations and authors Show more detail	University of Helsinki Lehikoinen Aleksi Fraixedas Sara Novia University of Applied Sciences Lindén Andreas Natural Resources Institute Finland Lindén Andreas

Publication type	Publication format	Parent publication type	Audience
	Article	Journal	Scientific
	Peer-reviewed	**MINEDU's publication type classification code**	
	Peer-Reviewed	A1 Journal article –refereed	

Publication channel information	Journal	Parent publication name	Volume
	journal ornithology	Journal of Ornithology	161

http://urn.fi/URN:NBN:fi-fe2020060240133

http://hdl.handle.net/10138/317904

http://urn.fi/URN:NBN:fi-fe2020060240133

SEARCH FOR THE PUBLICATION ELSEWHERE

Google Scholar CrossRef

SEARCH FOR ITEMS RELATED TO THE PUBLICATION (COMING SOON)

People Infrastructures

Projects Other research activities

Research data Organizations

REFER

Copy references

Projects - *4 067*

Example: Search results on funded projects

Show as image

Filter results

Starting year

+ Organization

Funder

+ Funding instrument

+ Field of science

Themes

Filters (1): Year of publication: 2021 to

Clear filters

PROJECT NAME	FUNDER	RECIPIENT	STARTING YEA
FuncBio4D - Functional bio-based 4D manufacturing	Innovaatiorahoituskeskus Business Finland	VTT Technical Research Centre of Finland Ltd	2021
Digital Ideologies Interrogating the politics of information systems	Kone Foundation	Matti Nelimarkka, University of Helsinki	2021
High efficient localized photon sources	European Union	Tampere University	2021
"Lockdown Diary": Everyday Life under Covid-19: a visual-cultural and academic exploration of 5 countries during the pandemic	Kone Foundation	Frank Trentmann, University of Helsinki	2021
GDPR Complaint Blockchain Service Design and Value Creation	Innovaatiorahoituskeskus Business Finland	LUT University	2021
Stalinin vainojen muistot	Kone Foundation	Suomalaisen Kirjallisuuden	2021

Example: EU project's metadata

< Back to search results

TOWARDS RESEARCH EXCELLENCE AND INNOVATION CAPACITY IN STUDING LAKE ECOSYSTEMS FUNCTIONAL STRUCTURES AND CLIMATE CHANGE IMPACT

Acronym	TREICLAKE
Project description	Within the field of aquatic ecology, the Estonian University of Life Sciences (EMU) through the Chair of Hydrobiology and Fishery and Centre for Limnology (CL) has steadily improved its ability to describe the ecological processes in Estonian lakes. However, in order to reach the... Show more
Starting year	2021
End year	2023

Granted funding			
	University of Jyväskylä	215 625 €	Participant
	AARHUS UNIVERSITET (DK)	215 625 €	Participant
	EESTI MAAULIKOOL (EE)	468 500 €	Coordinator
Amount granted		**899 750 €**	

Funder	European Union
Funding instrument	Coordination & support action
Framework programme	Horizon 2020 Framework Programme
Call	**Programme part** Twinning of research institutions (H2020-EU.4.b.) **Topic** Twinning (WIDESPREAD-05-2020) **Call ID** H2020-WIDESPREAD-2020-5

Other information	
Funding decision number	951963

PROJECT WEBSITE

https://cordis.europa.eu/project/id/

RELATED TO THIS PROJECT (COMING SOON)

Publications | Infrastructures
People | Other research activities
Research data | Organizations

SHARE

Copy link

SOURCE OF PROJECT INFORMATION

European Union

Example: Search for science news

Science and research news

What news are included in the service?

Latest | Search for news

Search for news

Filter news

- Organization
- University
- University of Applied Sciences
- Research institute
- Funder
- Other

Search for news... | Search

1 321 search results

PERUS-SKENE-hanke kehittää alue- ja yhdyskuntarakenteen muutoksen seurannan ja ennakoinnin työkaluja

18.05.2021 — Aalto-yliopisto

Valtioneuvoston tutkimus- ja selvityshanke "PERUS-SKENE" tutkii vuosina 2021-2022, kuinka yhdyskuntarakenteen kehityksen seuranta voidaan yhdistää ennakointityöhön.

Yliopiston koronavalo Turussa punainen, Raumalla ja Porissa keltainen

18.05.2021 — Turun yliopisto

Koronavalomalli määrittää koronavirukselta suojautumisen tason Turun yliopistossa. Yliopisto on tällä hetkellä koronavalomallin tasolla punainen Turun kampuksella ja koronavalomallin tasolla keltainen Rauman ja Porin kampuksilla.

Luonnonvarakeskus on jälleen luonnontieteiden opiskelijoiden halutuin työpaikka

18.05.2021 — Luonnonvarakeskus

Luonnonvarakeskus (Luke) on kolmatta vuotta peräkkäin luonnontieteiden opiskelijoiden halutuin työpaikka, ...

Artikkeli Luonnonvarakeskus on jälleen luonnontieteiden opiskelijoiden halutuin työpaikka julkaistiin ensimmäisen kerran

Maatalouslaskennan tuloksista julkaistaan viisi eri tilastoa

18.05.2021 — Luonnonvarakeskus

Ensimmäiset maatalouslaskennan tulokset maa- ja puutarhatalouden energiankulutuksesta on julkaistu. Maatalouslaskennan ...

Vaikeudet yhdistää työ ja perhe-elämä ovat riski henkiselle jaksamiselle

18.05.2021 — Terveyden ja hyvinvoinnin laitos

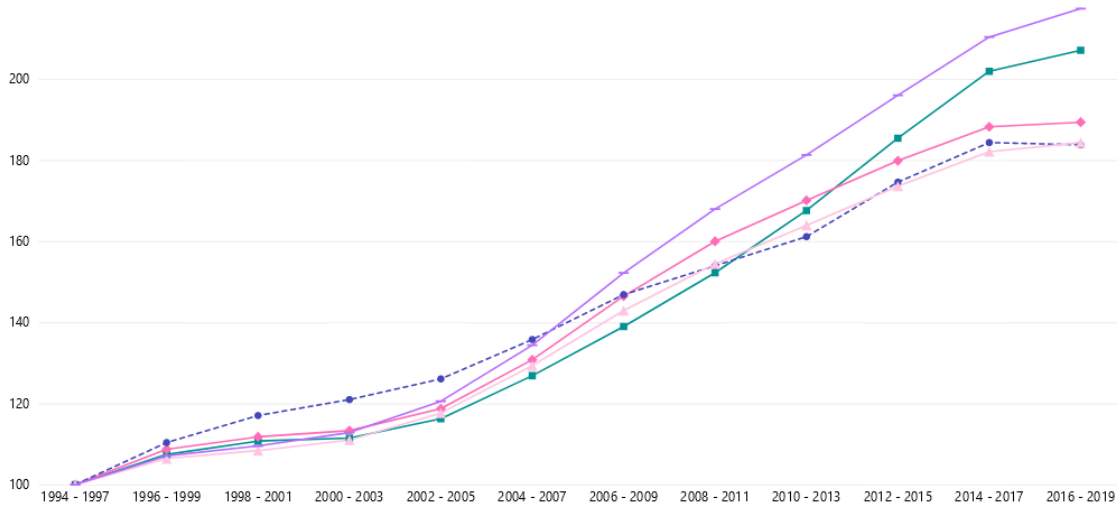
Tyytyväisyys omaan työhön ja perhe-elämään sekä näiden kahden yhdistämiseen ovat merkittäviä tekijöitä työssäkäyvien naisten ja miesten psyykkisessä hyvinvoinnissa.

Publications in Finland, in reference country groups and in reference countries

Example: Figures on Finnish science and research

Keyboard user help

Country group: Multiple se...
Main discipline: All
Discipline: All
Select a starting four-year ...: 1992-1995
Select: Country groups | Countries



Microsoft Power BI

The development of the publication count of Finnish scientific publications is compared to the development of reference country groups and reference countries. The publication counts have been given in proportion to the first selected four-year period. You can examine the development of country groups and individual countries separately.

Publication counts have increased in the entire world. Most of the increase has taken place in China. The increase in the Finnish publication count is in line with the other Nordic countries.

ADDITIONAL INFORMATION

Source:
Web-of-Science-based data (WoS) of Clarivate Analytics, Bibliometric computing CSC Oy, 2021

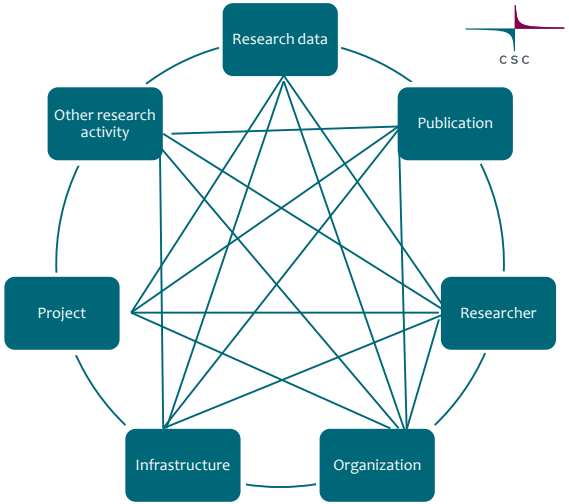
Research.fi – next steps

Upcoming features in Research.fi in 2021-2022

- Open funding calls from funders, current Aurora system to be integrated in Research.fi
- More funders and other data providers to be involved
- Topic modelling of projects, publications etc.
- More visualizations on funding, organizations, etc.
- **Linkages between publications, data, projects etc. ("research graph")**
- **Semantic search**
- **Researchers' profile tool**

Links between publications, data, projects etc.

- In addition to plain metadata, Research.fi aims to provide **information on interlinking** between research outputs, e.g.
  - What publications and research data have been produced in a project?
  - On which research data a publication is based?
  - Which organizations are involved in the maintenance of an infrastructure?
  - What research infrastructure has been used to produce a research data?
  - In which projects a researcher has been involved?
- **Where the links are created**?
  - When the researcher reports the results of the project to the funder
  - When a researcher inputs information in CRIS
  - When the researcher reports research output to the infrastructure owner
  - When the researcher stores a data in a data repository



-> Links from original information sources transferred to Research.fi along with metadata, e.g. research data's metadata contains publications' DOIs

Semantic search

- Semantic search functionality is currently under development in Research.fi
- All the existing information needs semantic enrichment (=annotation)
  - Publications, projects etc. are annotated with concepts according to certain ontologies.
- Automatic language detector and NLP (Natural Language Processing) used as tools
  - e.g. *Annif* by the Finnish National Library (https://annif.org/)
- The more descriptive information, the richer the annotation. For example, currently in the research database the project descriptions, but only the keywords and title of the publications (not abstract)

Example: Annotation of keywords for a project.

Project metadata in Research.fi

Identified keywords by Annif tool

Waste Heat Recovery Through Near-Field Thermophotonics

Acronym	TPX-Power
Project description	Waste heat generated by industry, transport, data processing and other energy i processes form enormous energy streams that is typically hard to exploit despi abundancy. In most cases the low-to-medium exhaust temperaturess of the pro Show more
Starting year	2021
End year	2024
Granted funding	Aalto University 960 152 €
	VTT Technical Research Centre of Finland Ltd 703 048 €
	TF2 DEVICES B.V. (NL) 349 750 €
	STICHTING KATHOLIEKE UNIVERSITEIT (NL) 808 652 €
	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS (FR) 601 397 €
Amount granted	**3 423 001 €**
Funder	European Union
Funding instrument	Research and Innovation action
Framework programme	Horizon 2020 Framework Programme

INPUT TEXT

Waste Heat Recovery Through Near-Field Thermophotonics

Waste heat generated by industry, transport, data processing and other energy intensive processes form enormous energy streams that is typically hard to exploit despite their abundancy. In most cases the low-to-medium exhaust temperaturess of the processes make energy re-harvesting challenging with presently available technologies using expensive and bulky mechanical turbines or the emerging solid state thermophotovoltaic (TPV) or thermoelectric (TE) systems. In WASTE-NET we aim to demonstrate a new disruptive approach to thermal energy recovery, ideally allowing a large power density and a competitive energy harvesting efficiency even for low temperature energy streams. The approach harnesses the thermodynamics of electroluminescence (EL), near field (NF) photon transport and photovoltaic (PV) energy production to convert the very recent advances in intracavity thermophotonic (TPX) cooling into a new heat engine technology. The NF TPX heat engines use the superthermal emission from an electrically excited light emitting diode (LED) heated by waste heat, to illuminate a PV cell kept at ambient temperature. This configuration can enable a substantial performance boost compared to existing technologies. To access this potential we build a multidisciplinary consortium providing access to the complementary expertise needed to combine the necessary elements from LEDs, solar cells and NF physics. If successful, WASTE-NOT can demonstrate and set on motion the development of a cost- and power-efficient heat energy harvesting technology with unprecedented possibilities throughout the sectors where waste heat is produced. At best the technology could nearly double the efficiency of combustion engines and provide a pollution

PROJECT (VOCABULARY AND LANGUAGE)

YSO NN ensemble English

MAX # OF SUGGESTIONS

10 15 20

Get suggestions

annif

SUGGESTED SUBJECTS

- lost heat
- wastes
- energy efficiency
- heat energy
- energy production (process industry)
- energy technology
- technology
- renewable energy sources

Researchers' profile tool

- The most significant future feature in Research.fi is the "researcher's profile tool," which enables researchers to create and control their profiles in Research.fi by signing in with their ORCID.
- No content will be entered manually but automatically imported from 1) researcher's home organization, 2) ORCID profile after researcher's content.
- Researcher's profile can include e.g. names, affiliations, contact details, education, expertise, and academic merits. It is also possible to connect already existing publications, research data, projects etc. in Research.fi.
- The researchers can choose what information they want to display on Research.fi and decide which third parties (e.g., funders or universities) their information may be disclosed to.
- The aim is to implement the tool in the early 2022.

Example of researcher's profile in Research.fi

Tutkija, Tiina

ORCID-tunniste https://orcid.org/0000-0010-5521-0000

Muut nimet Timpuri, Tiina

Tutkimustoiminta

Tutkimustoiminnan kuvaus
Lorem ipsum dolor sit amet, consectetur adispiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Tincidunt lobortis feugiat vivamus at augue.

Tieteenalat
Biolääketieteet

Avainsanat
hoitoresistenssi, diagnostiikka, cancer

Affiliaatio 1

Helsingin yliopisto

Yksikkö
Lääketieteellinen tiedekunta

Nimike
Professori 2018 -
Vanhempi tutkija 2016 - 2018

Tutkimusyhteisö
Medicum
Doctoral Programme in Population Health

Rooli tutkimusyhteisössä
Professori 2018-
Ohjaaja tohtoriohjelmassa 2017-

Affiliaatio 2

Turun yliopisto

Yksikkö
Biolääketieteen laitos
BioCity

Nimike
Dosentti 2016 -
Tutkija 2015 - 2016

Koulutus

Tutkinnon nimi
PhD

Tutkinnon organisaatio
Turun yliopisto

Muu koulutus
-

Contact details

YHTEYSTIEDOT

- Linkedin-profiili
- tiina.tutkija@helsinki.fi
- +358505555550000

Scopus Author ID: 00001050600

ResearcherID: G-1051-1921

Interest in collaboration with other academics, business, media

YHTEISTYÖ

- [x] Tiedotusvälineet voivat ottaa minuun yhteyttä
- [x] Olen kiinnostunut yhteistyöstä muiden tutkijoiden ja tutkimusryhmien kanssa
- [x] Olen kiinnostunut yhteistyöstä yritysten kanssa
- [x] Olen kiinnostunut toimimaan tieteellisten julkaisujen vertaisarvioijana

Publications, data, projects etc.

TUTKIJAN

- Julkaisut
- Infrastruktuurit
- Aineistot
- Muut tutkimusaktiviteetit
- Hankkeet
- Organisaatiot

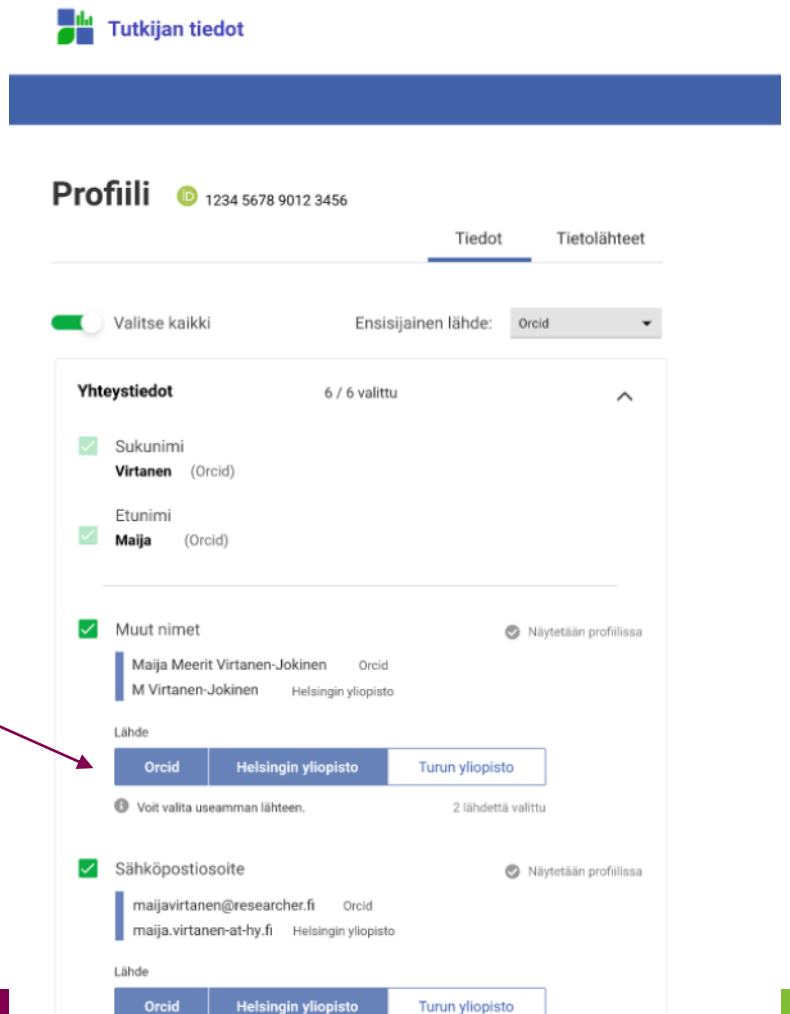
JAA

Kopioi linkki

Names, description, fields, affiliations, education

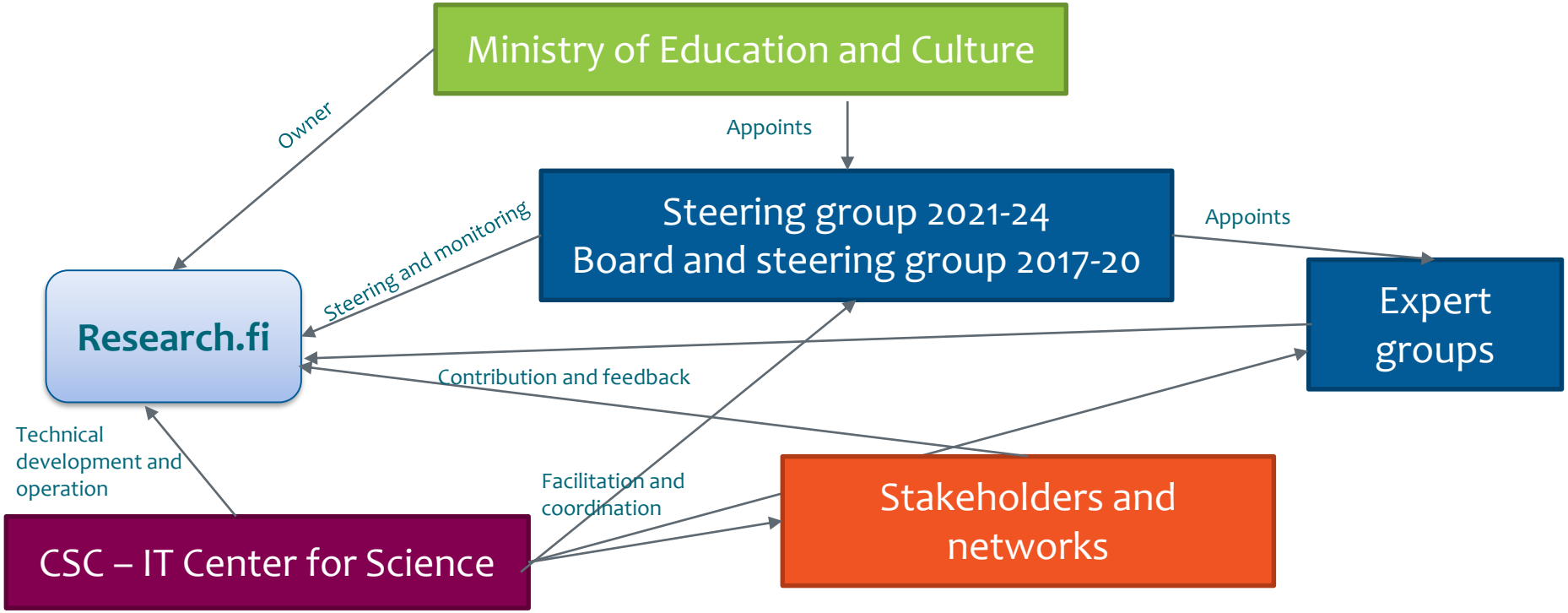
Researcher's profile tool

Researcher can choose which information and from which source they want to display in Research.fi



Organization of the Finnish Research Information Hub

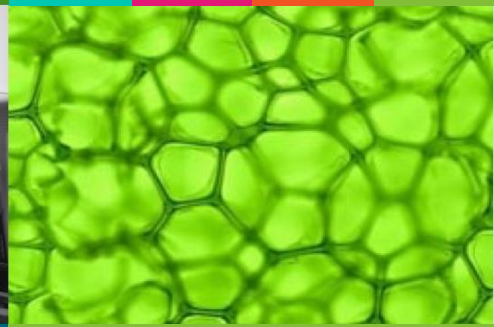
Research.fi - organization



A separate law on the Finnish research information hub

- Various criteria for processing personal data have been applied to transferring and displaying research information in Research.fi.
- Responsibilities and the legal base of processing need to be clarified.
- The Ministry of Education and Culture is currently preparing a separate law on the research information hub. It will give legal basis for:
  - research performing and supporting organizations to transfer their information to the hub and the Ministry to publish them in Research.fi
  - disclosing data through API if the other party has the right to process the data

Lessons learned



Lessons learned

- **Collaboration and commitment of stakeholders**
  - Close collaboration and communication with information providers and users necessary.
    - The work of the expert groups has been very fruitful and has increased participants' interest and commitment with Research.fi.
    - Plenty of interviews with different user groups (service design)
  - Organizations need clear incentives to join, as there will be costs for them in implementing the data transfer.
  - Carrots: national visibility, benefits for researchers, reuse of other organizations' information, integrations to external services
- **Data models**
  - Defining common information models between very different kind of systems is the most time-consuming part of the work and needs long-lasting collaboration among various stakeholders
    - Which information is available? Which information should be included/excluded? Which fields should be mandatory? Categorization of scientific fields?
  - Not many of the original data sources are using e.g. CERIF and there are lots of specific national and local codes used for different purposes

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Thank you for your attention!

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