

OpenRiskNet

RISK ASSESSMENT E-INFRASTRUCTURE

WP3 Training, Support, Dissemination

Iseult Lynch (UoB), Thomas Exner and Lucian Farcas (EwC)

General Assembly and Final Consortium meeting
22 October 2019, Amsterdam (The Netherlands)

OpenRiskNet: Open e-Infrastructure to Support Data Sharing, Knowledge Integration and *in silico* Analysis and Modelling in Risk Assessment
Project Number 731075



WP3 Objectives

Dissemination efforts to raise the awareness of the new e-infrastructure and to reach general acceptance:

- **Communicate** the scientific and technical background, capabilities and input specifications
- Produce detailed **documentation** of the implementation steps performed on the best-practice examples
- Provide **training** on implementation of databases and tools (workshops and and hackathons), on how to use e-infrastructure (schools and data hackathons)
- Provide technical **support** for implementations of services
- Produce **guidelines** and **templates**
- Collect **protocols**
- Supporting the generation of **reports** for **regulatory** purpose
- Plan for maintenance of the services, data management and the overall **sustainability** of OpenRiskNet.

WP3 Tasks

ID	Title	Partners involved	Start month	End Month	Deliverables
T3.1	Documentation of Core Infrastructure and Deployment	IM, EwC, JGU, CRG, UM, UoB, NTUA, Fraunhofer, UU, VU, INERIS	7	18	D3.2
T3.2	Support Infrastructure	UU, EwC, JGU, CRG, UM, UoB, NTUA, Fraunhofer, VU, IM, INERIS	7	36	D3.3
T3.3	Training on Service Integration and Infrastructure Usage	UM, UoB, UU, EwC, JGU, CRG, NTUA, Fraunhofer, VU, IM, INERIS	13	36	D3.4; D3.5
T3.4	Guidelines and Training on Standard File Formats, Ontology Usage, Quality Control and Protocolling	UoB, UM, EwC, JGU, CRG, NTUA, Fraunhofer, UU, VU, IM, INERIS	13	36	D3.4; D3.5
T3.5	Dissemination, Exploitation, Data Management and Sustainability Plan	EwC, JGU, CRG, UM, UoB, NTUA, Fraunhofer, UU, VU, IM, INERIS	1	36	D.3.1; D.3.6

WP3 Deliverables

ID	Deliverable	Due month	Lead partner	Type	Dissemination level
D3.1	Initial version of data management plan Version 2 updated at M24 https://doi.org/10.5281/zenodo.2558117	6	EwC	ORDP: Open Research Data Pilot	Public ✓
D3.2	First documentation of the core e-infrastructure https://doi.org/10.5281/zenodo.1483397	12	IM	Report	Public ✓
D3.3	Fully functional support Infrastructure Version 2 updated at M24 https://doi.org/10.5281/zenodo.2558122	12	UU	Demonstrator	Public ✓
D3.4	Dissemination & Training Activities (Intermediate Report) https://doi.org/10.5281/zenodo.1479649	18	NTUA	Report	Public ✓
D3.5	Dissemination & Training Activities (Final Report)	36	UoB	Report	Public 🧑
D3.6	Data management, maintenance and sustainability plan	36	EwC	Report	Public 🧑

WP3 Milestones

ID	Milestone	Due month	Lead partner	Means of verification
MS1	Detailed plan for the dissemination and exploitation of the project results	6	EwC	Consortium agrees on dissemination plan ✓
MS4	Fully functional support infrastructure	12	UoB	Support tools publicly accessible ✓
MS6	Guidelines and templates established for data exchange formats	18	EwC	Specifications are reported on project website ✓

WP3 Performance Metrics

Title	Status M36
Number of workshops and hackathons (Successful delivery ≥ 2 (until M18) and ≥ 5 (until M36) training workshops or hackathons)	9 workshops and hackathons have been organised or supported, 2 internal events and 7 external events.
Acceptance of support facilities	The support functions for OpenRiskNet are functional and available, consisting of a helpdesk , a wiki , and an issue tracker . On top the service catalogue and the Library support the user in finding and accessing the resources.
Positive feedback from external participants at the workshops and hackathons	External participants at the training events, hackathons and workshops showed great interest in the solutions provided by OpenRiskNet and reaffirmed the development plans.
Active participation to conferences and meetings (Successful delivery ≥ 5 (until M18) and ≥ 10 (until M36) participation in conferences)	OpenRiskNet partners participated in >30 conferences, meetings or other events , with presentations or posters or attending the sessions. The materials produced for these events are documented in the Library.

D3.6 Dissemination & Training Activities (Final Report)

- Draft (continuation of D3.4 at M18)
<https://docs.google.com/document/d/1hoVsOajeouH8x4HTrzUg7ynCjJhqfVgBvPZM2w5PQIY/edit>
- To be aligned with PEDR
- Structure:
 - Dissemination & Training Activities
 - Events
 - Organisation of webinars
 - Organisation of workshops, trainings and hackathons
 - Participation at conferences and workshops
 - Resources and training materials (Library)
 - Tutorials
 - Peer-reviewed publications
 - Other dissemination and networking activities
 - Public communication
 - Development of project website
 - Interactions with EU e-infrastructure projects and initiatives

Task 3.1 - Documentation of Core Infrastructure and Deployment

The architecture of OpenRiskNet is based on **Kubernetes** for distributed container orchestration with some OpenShift specific add-ons:

- The Core OpenRiskNet Infrastructure Components are **Single Sign On (SSO)** for authentication and authorisation
- Consolidated logging and metrics are provisioned as part of the initial OpenRiskNet reference site <https://home.prod.openrisknet.org/>
- **Let's Encrypt** certificates were chosen for HTTPS connections to OpenRiskNet services.
- As an extension over plain **Kubernetes**, OpenRiskNet offers **Continuous Integration and Continuous Deployment (CI/CD)** functionality
- **GitHub** used as OpenRiskNet code repository

GitHub

- OpenRiskNet code repository: <https://github.com/OpenRiskNet/> (for both, **developers** and **end-users**)
- OpenRiskNet Wiki <https://github.com/OpenRiskNet/home/wiki> (the main resource for developer documentation in the OpenRiskNet project)



home
OpenRiskNet wiki and core resources
● Jupyter Notebook 7 ★ 13 26 0 Updated 18 hours ago

workshop
Material for the Deployment Workshop
● Shell 0 ★ 0 3 0 Updated 23 hours ago

notebooks
A collection of Jupyter and Sagemik notebooks developed for OpenRiskNet
● Jupyter Notebook 4 ★ 1 2 0 Updated yesterday

okd-orchestrator
Forked from InformaticaMatters/okd-orchestrator
An Orchestrator for RedHat's OpenShift/OKD container runtime
● Python 3 ★ 0 0 0 Updated 6 days ago

landing_page
Temporary website for reference site
● HTML 2 ★ 0 0 0 Updated 15 days ago

jupyter-notebook-images
Repository for customized jupyter notebook images for OpenRiskNet
● Dockerfile 1 ★ 0 0 0 Updated on Jul 17

nf-toxomix
Forked from evanfoden/nf-toxomix
OpenRiskNet pipeline for TGX case study: toxicology predictions based on transcriptomic profiles
● Groovy 1 ★ 0 0 0 Updated on May 21

openapi-examples
Example openapi definitions by OpenRiskNet partners.
● Groovy 3 ★ 0 1 0 Updated on May 20

tess
Repository with metadata info about events and tutorials to be harvested by ELDIRR TESS.
● MIT 0 ★ 0 1 0 Updated on Mar 4

openshift-api-swagger
Forked from sabre1041/openshift-api-swagger
Swagger UI for the OpenShift API
● HTML 9 ★ 0 0 0 Updated on Mar 1

orn-query-tester-defaults
2 ★ 0 0 0 Updated on Feb 6

ChemIdConvert
Forked from DouglasConnors/ChemIdConvert
Chemical identifier conversion REST API
● HTML 2 ★ 0 0 0 Updated on Jan 14

example-java-servlet
Simple deployment example for Java servlet based app
● Java 0 ★ 0 0 0 Updated on May 17, 2018

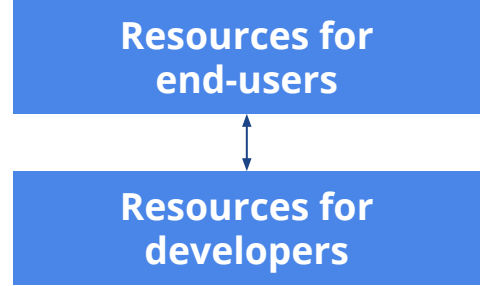
orn-ontology
Forked from egeme/orn-ontology
Risk Assessment Ontology
1 ★ 0 1 0 Updated on Nov 24, 2017

Wiki

Home
Adding Authentication
Annotating API to make it queryable
Annotating your service to make it discoverable
CI CD environment
Deployment Guidelines
Development Guidelines
Glossary
Modelling IC50 results
Tips and tricks
Use Cases
UseCase 2 Pseudocode
Writing OpenAPI and JSON LD descriptors



Task 3.2 - Support Infrastructure



Issue Tracker: GitHub

Wiki: GitHub (key resource for supporting developers, both internal and external to the project)

Automatic testing for the virtual environments: Jenkins

Helpdesk service: <https://openrisknet.freshdesk.com/>

- Frequently asked questions (FAQ),
- Getting Started guide
- Form to ask questions / filing support tickets, where specified OpenRiskNet staff are responsible for handling and delegating issues

Glossary: GitHub (list of terms or abbreviations with their definition, relevant to the project)

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Issue Tracker: GitHub <https://github.com/OpenRiskNet/home/issues>

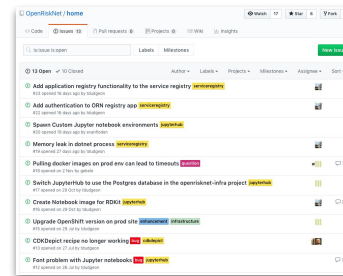
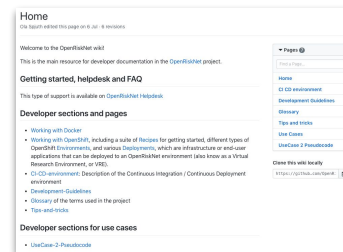
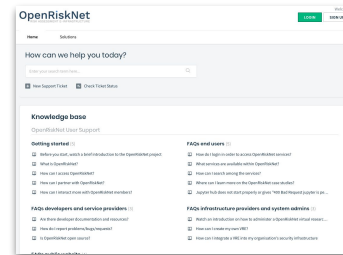
Automatic testing for the virtual environments: Jenkins

<https://github.com/OpenRiskNet/home/tree/master/openshift/deployments/jenkins>

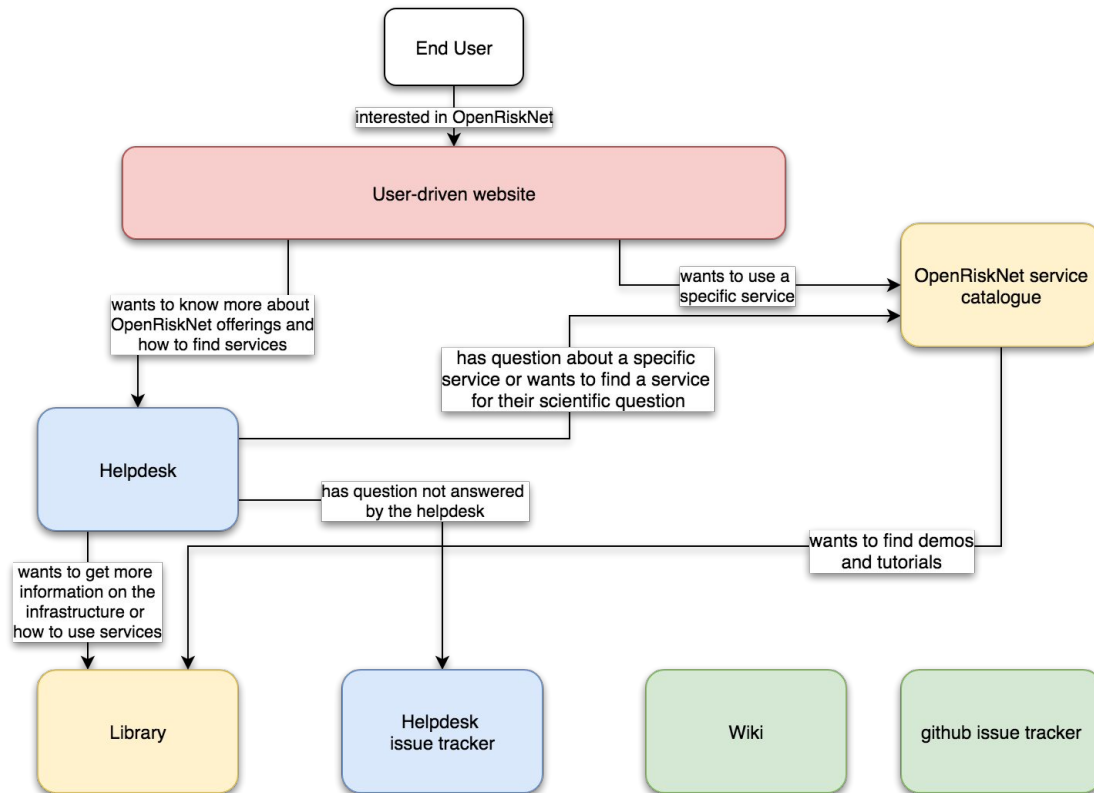
OpenRiskNet Services catalogue

<https://openrisknet.org/e-infrastructure/services/>

OpenRiskNet Library: <https://openrisknet.org/library/>



Support Infrastructure: end-users



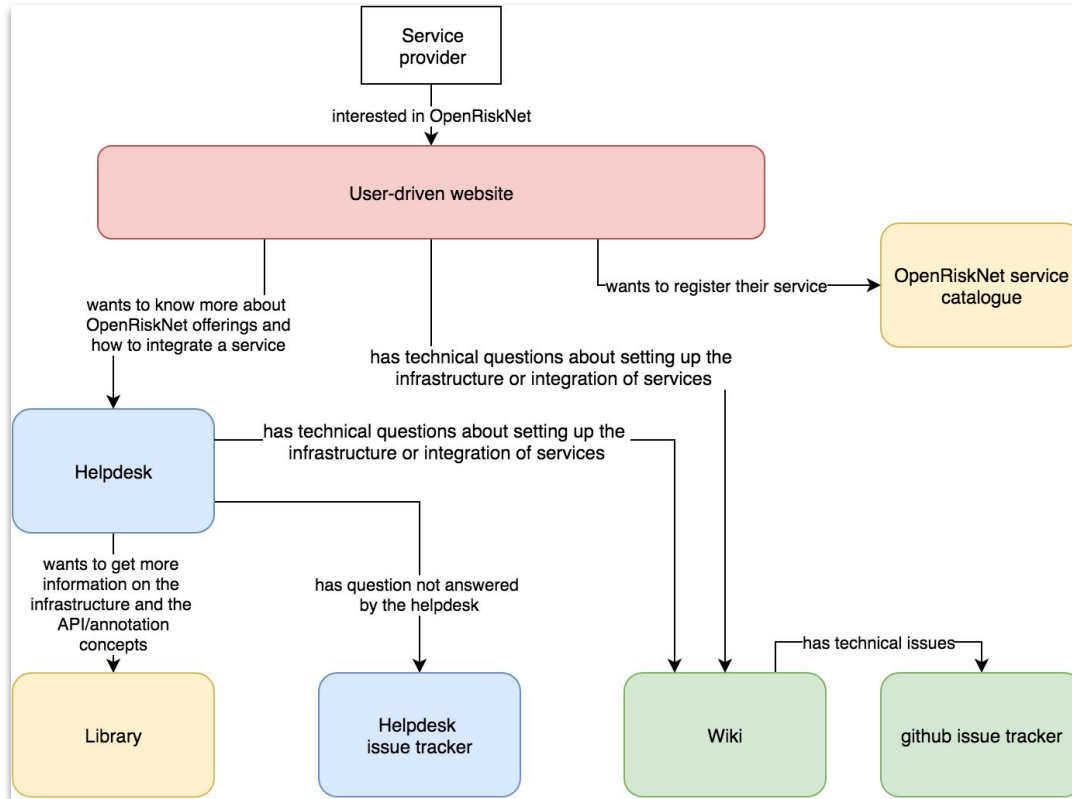
Resources for end-users

For scientists and members of academia, industry or regulatory agencies who would like to use the infrastructure for their predictive toxicology and risk assessment tasks.

[MORE →](#)

<https://openrisknet.org/e-infrastructure/end-users/>

Support Infrastructure: service providers/developers



Resources for developers

For service developers, infrastructure providers or data managers who would like to integrate their databases and software tools into the OpenRiskNet infrastructure.

[MORE --](#)

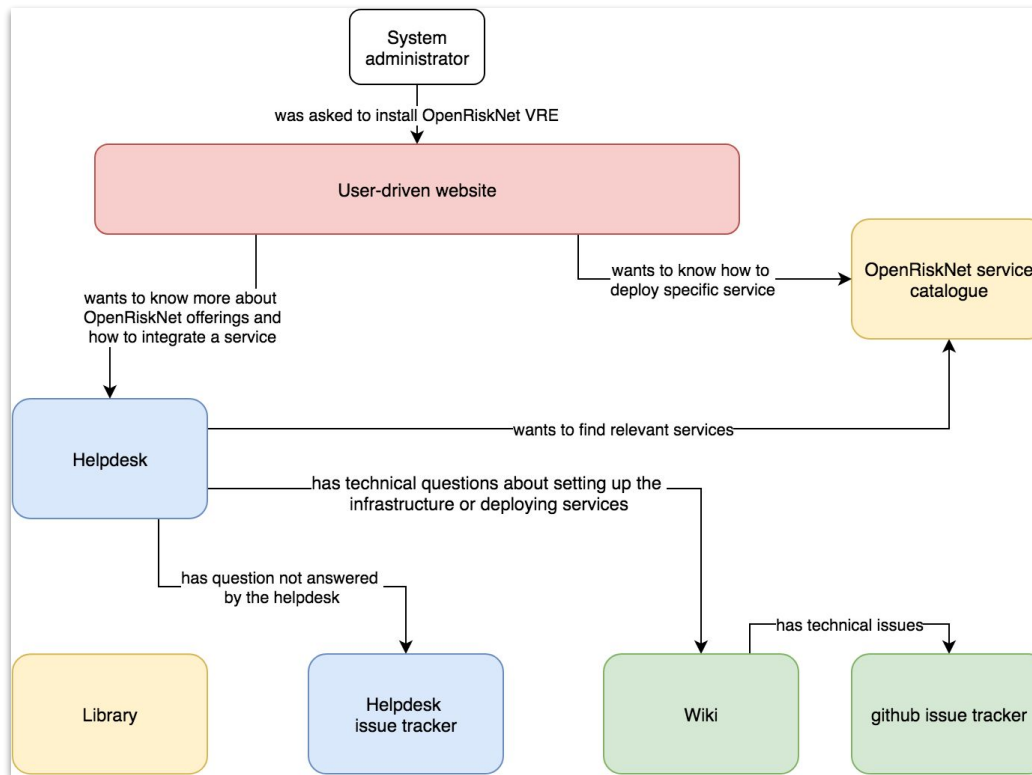
<https://openrisknet.org/e-infra-structure/developers/>

Support Infrastructure: systems administrators

Resources for developers
For service developers, infrastructure providers or data managers who would like to integrate their databases and software tools into the OpenRiskNet infrastructure.

[MORE →](#)

<https://openrisknet.org/e-infrastructure/developers/>



Task 3.3 - Training on Service Integration and Infrastructure Usage

- Develop **manuals, tutorials and training** material for the setup and usage of the virtual environment of e-infrastructure instances as well as integration of additional tools based on the documentation generated in Task 3.1.
- Organise **training workshops and hackathons**
 - **Implementation hackathons:** core developers and service integrators work on the integration of specific services and provide feedback for e-infrastructure optimisation
 - **Data hackathons:** end users will bring data and case studies and work together with the service providers and core developers to execute the case studies inside the e-infrastructure

Task 3.4 - Guidelines and Training on Standard File Formats, Ontology Usage, Quality Control and Protocolling

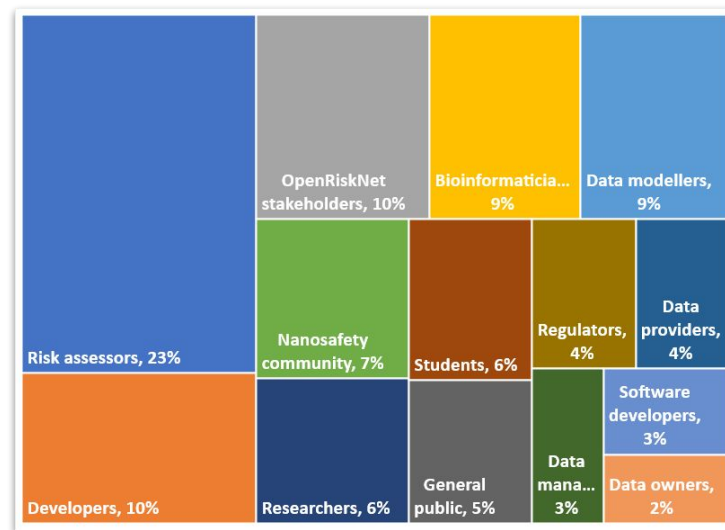
Adoption of standards in data management, annotation, quality and reproducibility.

- Develop **guidelines for file formats, the usage of ontologies, quality control** for data and tools including measurements of uncertainty and protocolling of experimental and *in silico* procedures.
- Organise workshops to **train users outside of the consortium** and foster a general acceptance and adoption of these guidelines.
- Make the **data schemata of the OpenRiskNet services openly available** (including data/metadata file templates), which can be used as starting points for the generation of new databases but also modelling tools.

Task 3.5 - Dissemination, Exploitation, Data Management and Sustainability Plan

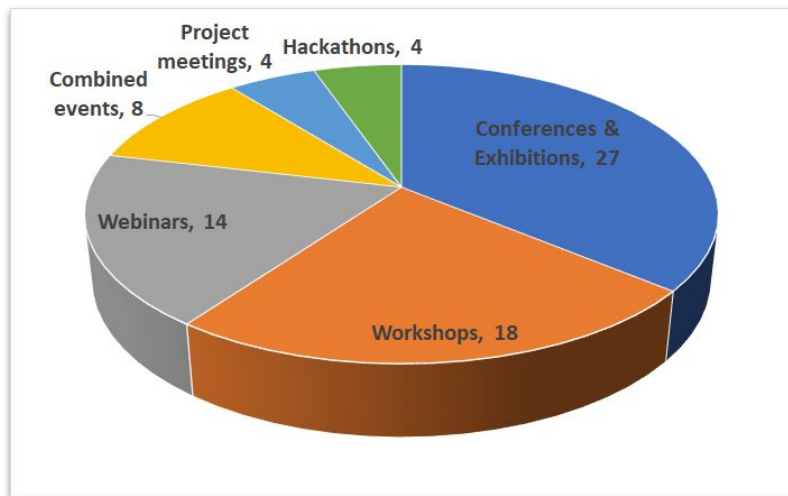
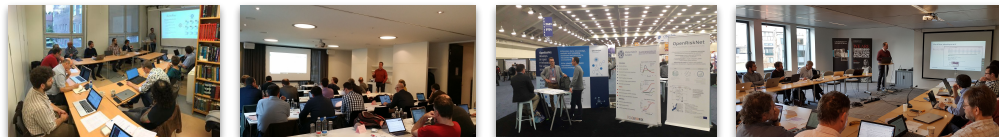
This task coordinated the dissemination and exploitation of the outcomes of the OpenRiskNet e-infrastructure to all stakeholders

- **Events:** <https://openrisknet.org/events/>
 - Conferences
 - Hackathons
 - Project meetings
 - Symposiums
 - Trainings
 - Webinars
 - Workshops
- **Resources & training:** <https://openrisknet.org/library/>
 - Peer-reviewed publications
 - Posters
 - Presentations
 - Public communications
 - Reports
 - Tutorials
 - Webinar recordings
- **News and communication:** <https://openrisknet.org/news/>



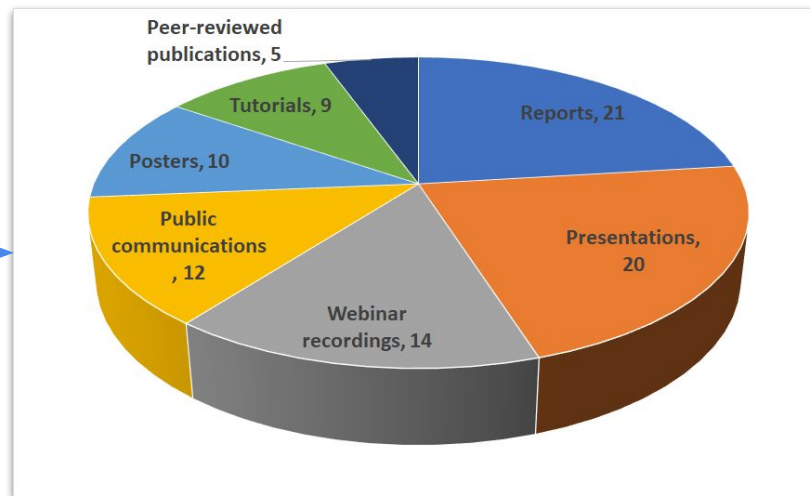
Distribution of resources to different **target audiences**

Dissemination activities



Events organised, co-organised and attended by OpenRiskNet members
(Total: **75** by M36)

- **Organiser: 22**
- **Co-organiser: 22**
- **Participation: 31**



Resources & training materials available in the OpenRiskNet library
(Total: **91** by M36)

Webinars

















- OpenRiskNet webinars series included live demonstrations on the e-infrastructure deployment and the risk assessment case studies
 - Introduction to OpenRiskNet
 - Deployment
 - Demo services and case studies
 - Semantic annotations
- All sessions were recorded and the materials (slides and video) were made available in the project Library

14 Sessions

~250 Attendees

Recordings & Slides available

1	 Introduction to OpenRiskNet project Edelweiss Connect, Switzerland 11:42
2	 Introduction to OpenRiskNet e-infrastructure Edelweiss Connect, Switzerland 30:14
3	 OpenRiskNet case studies and the implementation challenge Edelweiss Connect, Switzerland 50:26
4	 OpenRiskNet webinar: introduction, case studies and demo (Part 1) Edelweiss Connect, Switzerland 45:23
5	 OpenRiskNet webinar: demonstrations on services (Part 2) Edelweiss Connect, Switzerland 44:09
6	 OpenRiskNet deployment Edelweiss Connect, Switzerland 55:23
7	 Data curation demonstration Edelweiss Connect, Switzerland 48:54

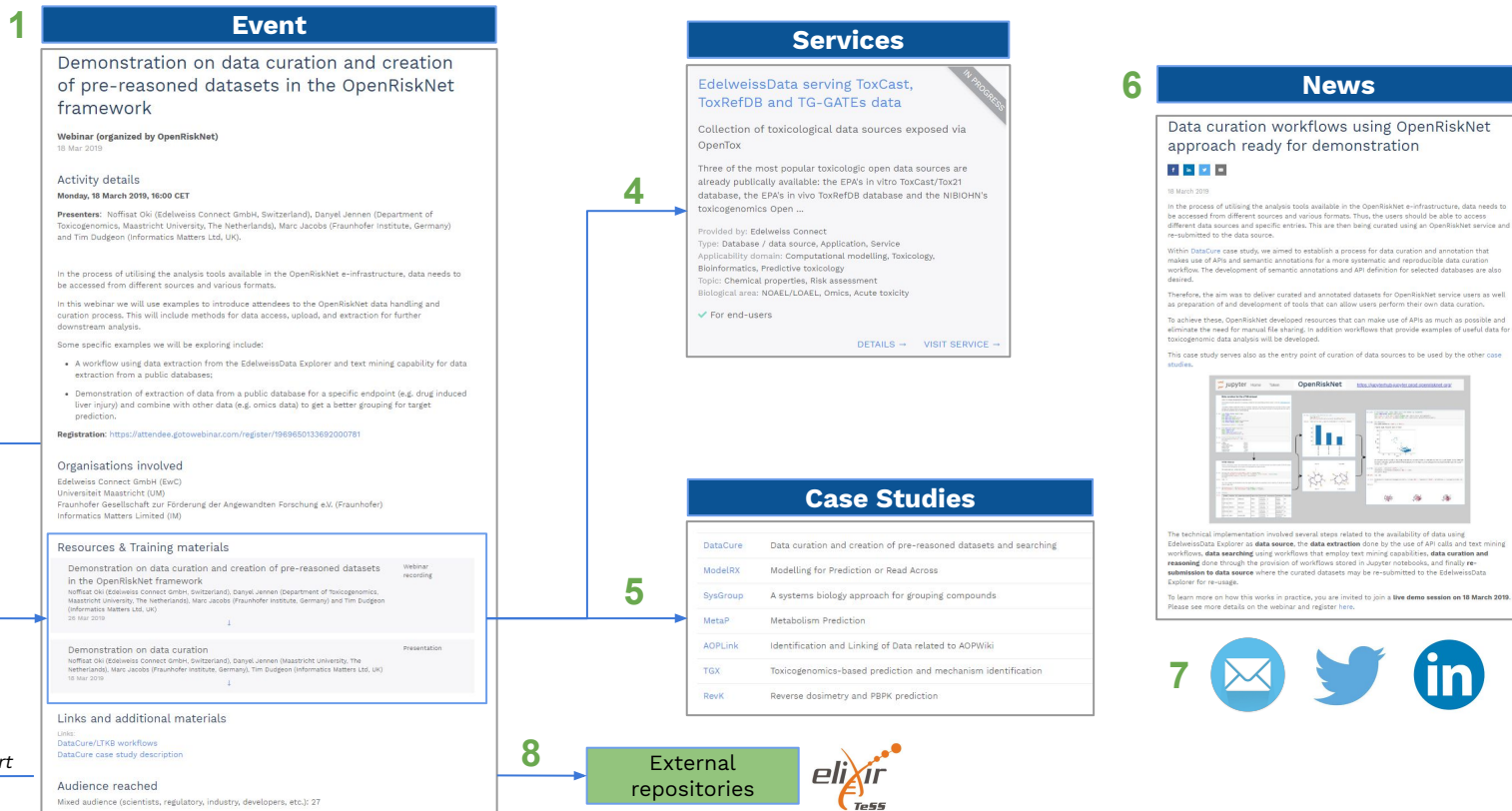
8	 Identification and linking of data related to AOPWiki Edelweiss Connect, Switzerland 52:06
9	 OpenRiskNet webinar: AOP Database Edelweiss Connect, Switzerland 51:42
10	 OpenRiskNet webinar: Semantic annotations Edelweiss Connect, Switzerland 55:23
11	 OpenRiskNet Webinar: Use Nextflow for toxicogenomics-based prediction Edelweiss Connect, Switzerland 54:11
12	 ORN Webinar: Deploying Applications to an OpenRiskNet Virtual Environment Edelweiss Connect, Switzerland 54:02
13	 OpenRiskNet webinar: Approach on modelling for prediction or read across Edelweiss Connect, Switzerland 56:48
14	 ORN Webinar: Connecting AOPs, knowledge and data with AOPLink workflows Edelweiss Connect, Switzerland 40:33

Webinars

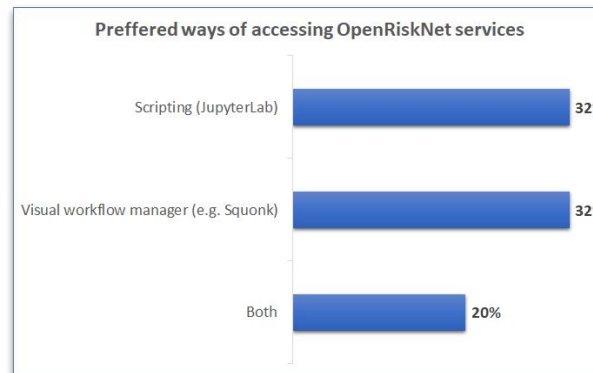
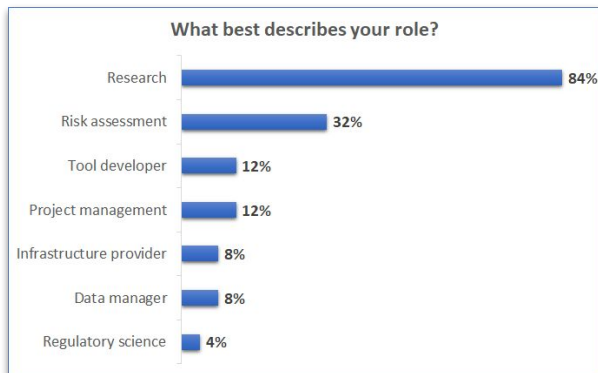
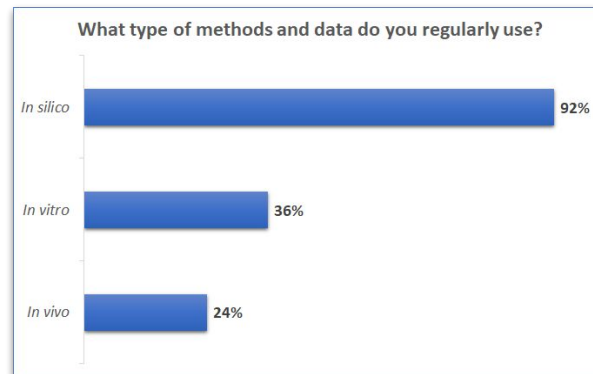
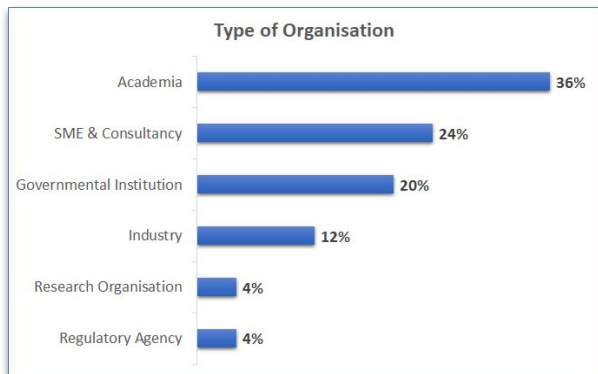


Topic	Date & Time
Introduction sessions to the OpenRiskNet e-infrastructure	Webinars description: <ul style="list-style-type: none">• Session 1 (24 Sep 2018)• Session 2 (27 Sep 2018)• Session 3 (4 Oct 2018)• Session 4 (30 Oct 2018)
Learn how to deploy the OpenRiskNet virtual research environment	Webinar description (25 Feb 2019)
Demonstration on data curation and creation of pre-reasoned datasets in the OpenRiskNet framework	Webinar description (18 Mar 2019)
Identification and linking of data related to AOPWiki (an OpenRiskNet case study)	Webinar description (26 March 2019)
The Adverse Outcome Pathway Database (AOP-DB)	Webinar description (8 April 2019)
How to describe OpenRiskNet services and their functionality by semantic annotation	Webinar description (13 May 2019)
Use of Nextflow tool for toxicogenomics-based prediction and mechanism identification in OpenRiskNet e-infrastructure	Webinar description (27 May 2019)
Demonstration on OpenRiskNet approach on modelling for prediction or read across (ModelRX case study)	Webinar description (11 June 2019)
Combining neXtProt and WikiPathways strengths using SPARQL federated queries	Webinar description (12 June 2019)
Deploying Applications to an OpenRiskNet Virtual Environment	Webinar description (24 June 2019)
Connecting Adverse Outcome Pathways, knowledge and data with AOPLink workflows	Webinar description (15 July 2019)

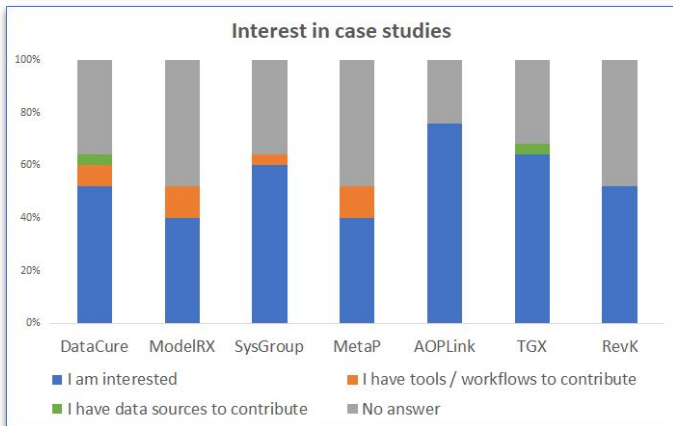
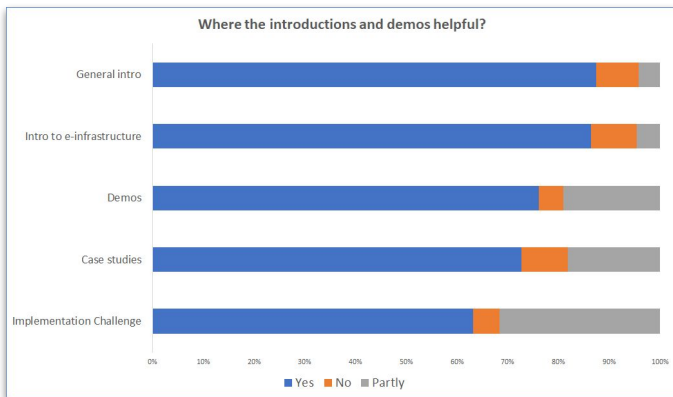
Example of resources generated, exploited and shared from the webinars



Webinars follow-up survey



Webinars follow-up survey



Suggestions from participants:

- Address more specific groups, e.g. only tool developers or only end users;
- Focused sessions, with more time focussing on case studies and demos;
- Cover different audiences (both end-users and developers);
- Follow a complete example on the e-infrastructure use;
- Build a story on how to use the integrated tools, in order to capture the attention of end users;
- The terminology may be added to explain the meaning of words in different modules;
- Allow access to the tools and support materials before the sessions;
- Explain in more detail the database access flows;
- *And many more...*

Workshops (RP2)

Workshop sessions during OpenTox Euro Conference (October 2018 Athens, Greece)

- **Hands-on Workshop on Biokinetics Modelling**
 - Biokinetics Modelling and Simulation
 - Unknown parameter estimation using Bayesian statistics
 - Introduction to PKSim modelling platform
 - Introduction to htk R package
 - Reverse dosimetry using control theory
 - Biokinetics modelling through the Jaqpot platform

Resources & Training materials

Biokinetics Modelling: use, form, inputs and outputs of PBPK models
Harry Sarimveis, Aris Dokoumetzidis, Pantelis Karatzas, Philip Doganis, Periklis Tsiros, Nikolas-Marios Katrilsis, Georgia Tsiliki
9 Oct 2018

Tutorial

— Workshop files



- **Building risk assessment workflows with OpenRiskNet**

Activity details

This workshop aims at providing the users with experience on using the OpenRiskNet infrastructure for risk assessment. Users will investigate a problem from nanosafety, studying a panel of nanoparticles (including dry powders of oxides of titanium, zinc, cerium and silicon, dry powders of silvers, suspensions of polystyrene latex beads and dry particles of carbon black, nanotubes and fullerene, as well as diesel exhaust particles). The OpenRiskNet infrastructure will be employed to generate models on the toxicity of studied nanoparticles, more specifically the Jaqpot platform for modelling, available at <http://www.jaqpot.org>.

Organisations involved

Edelweiss Connect GmbH (EwC)
National Technical University of Athens (NTUA)

Links and additional materials

Website:
<http://www.opentox.net/events/opentox-euro-2018/s6>

Links:
[Jaqpot modelling platform](#)
[Workshop documents](#)



Workshop

Creating powerful workflows combining data and software services demonstrated on risk assessment case studies

OpenRiskNet

RISK ASSESSMENT E-INFRASTRUCTURE

23 - 24 October 2019, Amsterdam, Netherlands | <https://openrisknet.org/>

Final OpenRiskNet Workshop: Creating powerful workflows combining data and software services demonstrated on risk assessment case studies

Workshop (organized by OpenRiskNet)

23 – 24 Oct 2019 / Amsterdam, NL

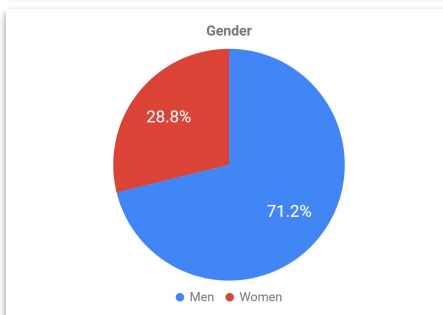
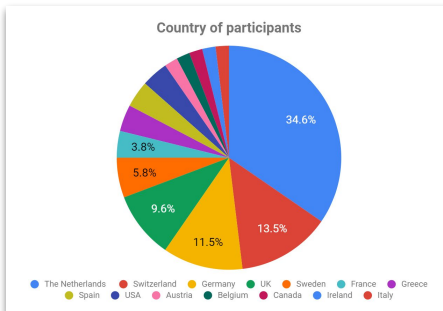
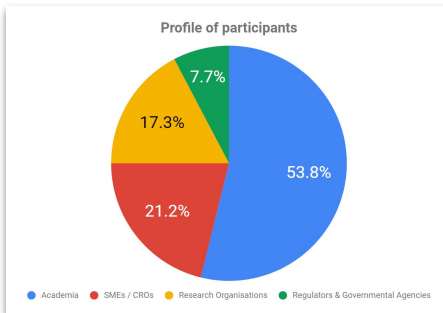
Activity details

Venue: Vrije Universiteit, Auditorium, O|2 Human Life Sciences building, De Boelelaan 1108, 1081 HZ Amsterdam, The Netherlands ([Map](#))

Booklet (agenda, abstract, additional information): [OpenRiskNet Final Workshop](#)

- Lectures, demo & hands-on trainings
- Associated partners session
- EU infrastructures & sustainability session
- Posters session

<https://openrisknet.org/events/74/>



Training & Guidelines on Standard File Formats, Ontology Usage, Quality Control and Protocolling (RP2)

1st NanoCommons Hackathon on “Ontological Annotation of Datasets”

Hackathon (co-organized by OpenRiskNet)

9 Oct 2018 / Athens, GR

Activity details

The 1st NanoCommons Hackathon on “Ontological Annotation of Datasets” was co-organised by H2020 projects NanoCommons and OpenRiskNet. The hackathon took place during the afternoon on 9 October 2018 in conjunction with the next NanoCommons Consortium Meeting (8-9 October 2018) and the OpenTox Euro Conference (8-11 October 2018) in Athens, Greece. The participants worked using their own or mock datasets and search through established ontologies (e.g. eNanoMapper Ontology) for ontological annotations. The participants also learn how to prepare electronic files (e.g. JSON) containing the raw data and the ontological metadata.

Organisations involved

Edelweiss Connect GmbH (EwC)
Universiteit Maastricht (UM)
The University Of Birmingham (UoB)
National Technical University of Athens (NTUA)

Links and additional materials

Website:

<https://www.nanocommons.eu/1st-nanocommons-hackathon-ontological-annotations-of-datasets/>

OpenRiskNet/NanoCommons ontology meeting

Hackathon, Workshop (co-organized by OpenRiskNet)

13 – 14 Dec 2018 / Brussels, BE

Activity details

The goal of this meeting is to get a picture of the ongoing ontology activities in the toxicology area, harmonize these efforts and the developed ontologies therein, and extend the existing toxicology ontology to support OpenRiskNet and NanoCommons tasks. Part of this will be the ontological annotation of OpenRiskNet Application Programming Interfaces (APIs) as used on their [cloud](#). Other goals include extension of the ontology with missing terms (if any), potentially write up guidance documents, and annotation of data sets (possible via OpenRiskNet data APIs). The detailed information and agenda are available below.

Topics:

1. What ontologies are out there and can we combine them to a toxicology application ontology.
2. Data and software schema: How much ontology do we need to annotate complex services.
3. Ontology Hacking.

The complete agenda is attached below.

Registration

Organisations involved

Edelweiss Connect GmbH (EwC)
Johannes Gutenberg-Universität Mainz (JGU)
Universiteit Maastricht (UM)
The University Of Birmingham (UoB)
National Technical University of Athens (NTUA)
Fraunhofer Gesellschaft zur Förderung der Angewandten Forschung e.V. (Fraunhofer)
Uppsala Universitet (UU)
Informatics Matters Limited (IM)



How to describe OpenRiskNet services and their functionality by semantic annotation

Webinar (organized by OpenRiskNet)

13 May 2019



Activity details

Monday, 13 May 2019, 16:00 CEST

Presenter: Thomas Exner (Edelweiss Connect GmbH, Switzerland)

Providing the data and software services within OpenRiskNet virtual environment and make the functionality available via application programming interfaces (APIs) already allows for the development of advanced workflows providing solutions to complex risk assessment tasks (demonstrated in the case studies [webinars](#)). However, identification and selection of the most appropriate service, understanding their functionality and format the input and output still need manual investigation and programming/scripting skills. To be able to automate these tasks, OpenRiskNet is exploring semantic annotation on different levels.

After a short introduction to ontologies applicable to service annotation, we will first demonstrate high-level annotation, which gives the information for the OpenRiskNet registry service to index the service and to make it findable for users and gives basic categorisation like dataset, algorithm and model. Then we will show low level annotation, which will be used for dataset and input/output harmonisation so that the user but more important other services can understand the information provided/required and how to access it. Finally, first approaches to define the middle layer providing metadata describing the service in more detail like available toxicity domains, available endpoint as well as gene/pathway/AOP associations will be shown.

Registration: <https://register.gotowebrinar.com/register/836537431881200140>

Organisations involved

Edelweiss Connect GmbH (EwC)

Active participation in other major events (selection)

- **54th Congress of the European Societies of Toxicology (EUROTOX)**, 2 – 5 Sep 2018 / Brussels, BE
- **20th International Congress on In Vitro Toxicology (ESTIV)**, 15 – 18 Oct 2018 / Berlin, DE
- **SOT 58th Annual Meeting and ToxExpo**, 11 – 14 Mar 2019 / Baltimore, US
- **EOSC-hub Week**, 10 – 12 Apr 2019 / Prague, CZ
- **ISMB/ECCB 2019 - International Conference on Intelligent Systems for Molecular Biology & European Conference on Computational Biology**, 21 – 25 Jul 2019 / Basel, CH
- **Building EOSC through the H2020 projects current status and future directions**, 9 – 10 Sep 2019 / Brussels, BE

Complete list: <https://openrisknet.org/events/>

OpenRiskNet Part III: Modelling Services in Chemical/Nano-safety, Environmental Science and Pharmacokinetics Stefan Kramer, Philip Doganis, Denis Gebele, Atif Raza, Pantelis Karatzas, Haralampos Sarimveis, Jonathan Alvarsson, Ola Spjuth, Staffan Arvidsson, Thomas Exner, Lucian Farcac, Barry Hardy 28 Aug 2019 → doi: 10.7490/f1000research.1117419.1 ↓	Poster
OpenRiskNet Part II: Predictive Toxicology based on Adverse Outcome Pathways and Biological Pathway Analysis Marvin Martens, Thomas Exner, Nofisat Oki, Danyel Jennen, Jumamurat Bayjanov, Chris Evelo, Tim Dudgeon, Egon Willighagen 28 Aug 2019 → doi: 10.7490/f1000research.1117418.1 ↓	Poster
OpenRiskNet Part IV: WEKA Machine Learning Services for the Prediction of Half-Lives of Chemicals and Nanoparticle Transport Stefan Kramer, Denis Gebele, Atif Raza 28 Aug 2019 → doi: 10.7490/f1000research.1117420.1 ↓	Poster
OpenRiskNet Part I: Development of an open e-infrastructure predictive toxicology and risk assessment Thomas Exner, Lucian Farcac, Daniel Bachler, Nofisat Oki, Denis Gebele, Atif Raza, Stefan Kramer, Evan Floden, Cedric Notredam, Jordi Rambla, Danyel Jennen, Jumamurat Bayjanov, Egon Willighagen, Marvin Martens, Chris Evelo, Iseult Lynch, George Gkoutos, Philip Doganis, Pantelis Karatzas, Haralampos Sarimveis, Marc Jacobs, Ola Spjuth, Tim Dudgeon, Alan Christie, Frederic Bois, Daan Geerke, Paul Jennings, Barry Hardy 2 Aug 2019 → doi: 10.7490/f1000research.1117259.1 ↓	Poster

Peer-reviewed publications

Population pharmacokinetic reanalysis of a Diazepam PBPK model: a comparison of Stan and GNU MCSim

Periklis Tsiros, Frederic Y. Bois, Aristides Dokoumetzidis, Georgia Tsiliki and Haralambos Sarimveis

4 Apr 2019

[→ Article](#)



Introducing WikiPathways as a data-source to support Adverse Outcome Pathways for regulatory risk assessment of chemicals and nanomaterials

Marvin Martens, Tim Verbruggen, Penny Nyman, Roland Grafström, Lyle D. Burgoon, Hristo Aladjov, Fernando Torres Andón, Chris T. Evelo, Egon L. Willighagen

4 Dec 2018

[→ Article](#)



Predicting off-target binding profiles with confidence using Conformal Prediction

Samuel Lampa, Jonathan Alvarsson, Staffan Arvidsson, Mc Shane, Arvid Berg, Ernst Ahlberg, and Ola Spjuth

6 Nov 2018

[→ doi: 10.3389/fphar.2018.01256](#)



A confidence predictor for logD using conformal regression and a support-vector machine

Lapins M, Arvidsson S, Lampa S, Berg A, Schaal W, Alvarsson J, Spjuth O

3 Apr 2018

[→ doi: 10.1186/s13321-018-0271-1](#)



Semantic prioritization of novel causative genomic variants

Imane Boudelloua, Rozaimi B. Mahamad Razali, Maxat Kulmanov, Yasmeen Hashish, Vladimir B. Bajlic, Eva Goncalves-Serra, Nadia Schoenmakers, Georgios V. Gkoutos, Paul N. Schofield, Robert Hoehndorf

17 Apr 2017

[→ doi: 10.1371/journal.pcbi.1005500](#)



Selected conferences proceedings and posters

Toxicology Letters
Volume 295, Supplement 1, 10 October 2018, Page S104

PO5-25

OpenRiskNet, an open e-infrastructure to support data sharing, knowledge integration and *in silico* analysis and modelling in risk assessment

T.E. Exner¹, A.J. Dekler¹, D. Baehler¹, L.R. Faraci¹, C.T. Evelo², E. Willighagen², D.G.J. Jennen³, M. Jabocs⁴, P. Doganis⁵, H. Sarimveis⁶, I. Lynch⁷, G. Gkoutos⁸, S. Kramer⁹, C. Notredame¹⁰, O. Spjuth¹¹, P. Jennings¹², T. Dudgeon¹³, F. Bois¹⁴, B. Hardy¹⁵

Toxicology Letters
Volume 295, Supplement 1, 10 October 2018, Pages S100-S101

PO5-16

Meta-analysis for genotoxicity prediction using data from multiple human *in vitro* cell models

J.R. Bajjanov¹, J.C. Kleijnans, D.G.J. Jennen

OpenRiskNet EdelweissConnect

RISK ASSESSMENT E-INFRASTRUCTURE

OpenRiskNet, an open e-infrastructure to support data sharing, knowledge integration and *in silico* analysis and modelling in predictive toxicology and risk assessment

Lucian Faraci¹, Denis Gebel², Evan Fioden³, Danyel Jenner⁴, Egon Willighagen⁵, Marvin Martens⁶, Chris Evelo⁷, Isoult Lynch⁸, Philip Doganis⁹, Haralambos Sarimveis¹⁰, Marc Jabocs¹¹, Ola Spjuth¹², Tim Dudgeon¹³, Frederic Bois¹⁴, Dean Gerner¹⁵, Thomas Exner¹⁶

Complete list: <https://openrisknet.org/library/>

Maastricht University

Faculty of Health, Medicine and Life Sciences

Expanding Adverse Outcome Pathway knowledge by creating AOP-Wiki RDF with semantic annotations to facilitate risk assessment of chemicals

Marvin Martens¹, Ryan Miller², Chris T. Evelo³, Egon Willighagen⁴

¹ Department of Bioinformatics - BiGCaT, NUTRIM, Maastricht University, The Netherlands
² Department of Bioinformatics, BiGCaT, NUTRIM, Maastricht University, The Netherlands
³ Maastricht Centre for Systems Biology (MCSBio), Maastricht University, The Netherlands

Maastricht University

Faculty of Health, Medicine and Life Sciences

Introducing WikiPathways to support Adverse Outcome Pathways for regulatory risk assessment

Marvin Martens¹, Tim Verbruggen², Penny Nyman^{3,4}, Roland Grafström⁵, Lyle D Burgoon⁶, Hristo Aladjov⁷, Fernando Torres Andón⁸, Chris T. Evelo⁹, Egon Willighagen¹⁰

¹ Department of Bioinformatics - BiGCaT, NUTRIM, Maastricht University, The Netherlands, ² Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden, ³ Department of Toxicology, Maastricht University, The Netherlands, ⁴ BiGCaT, NUTRIM, Maastricht University, The Netherlands, ⁵ Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden, ⁶ Department of Toxicology, Maastricht University, The Netherlands, ⁷ BiGCaT, NUTRIM, Maastricht University, The Netherlands, ⁸ Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden, ⁹ Department of Toxicology, Maastricht University, The Netherlands, ¹⁰ BiGCaT, NUTRIM, Maastricht University, The Netherlands, ¹¹ BiGCaT, NUTRIM, Maastricht University, The Netherlands, ¹² Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden, ¹³ Department of Toxicology, Maastricht University, The Netherlands, ¹⁴ BiGCaT, NUTRIM, Maastricht University, The Netherlands, ¹⁵ Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden, ¹⁶ Department of Toxicology, Maastricht University, The Netherlands

Tutorials

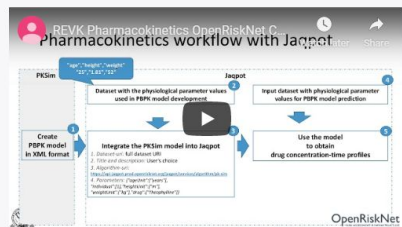
Selected tutorials

RevK Pharmacokinetics OpenRiskNet Case study using Jaqpot web modelling platform

Philip Doganis

15 Oct 2018

→ Video



Related services:

[Jaqpot GUI](#)

[Jaqpot API](#)

Target audience: Risk assessors, Researchers, OpenRiskNet stakeholders, Data modellers

Open access: yes

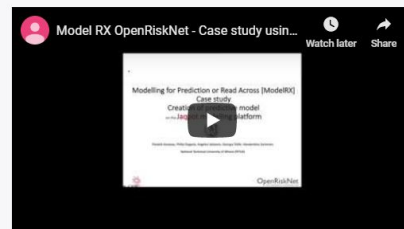
Licence: Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)

Organisations involved: NTUA

Model RX OpenRiskNet - Case study using Jaqpot web modelling platform

Philip Doganis

15 Oct 2018



Related services:

[Jaqpot GUI](#)

[Jaqpot API](#)

Target audience: Risk assessors, Researchers, OpenRiskNet stakeholders, Data modellers

Open access: yes

Licence: Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)

Organisations involved: NTUA

Workflow: Access TG-GATES data for selected compounds, select differentially expressed genes and identifier relevant pathways

Thomas Exner

13 Sep 2018

→ Workflow

Abstract:

Example workflow based on OpenRiskNet tools - Pathway identification workflow related to DataCure and AOPlink case studies. This notebook downloads TG-Gates data of 4 compounds and selects genes overexpressed in all sample. The Affymetrix probe sets are then translated into Ensembl gene identifiers using the BridgeDB service and pathways associated with the genes are identified using the WikiPathways service.

Related services:

[BridgeDb Identifier mapping service](#)

[EdelweissData](#) serving ToxCast, ToxRefDB and TG-GATES data

[BridgeDb Identifier mapping service \(variety of species\)](#)

[Jupyter Notebooks](#)

Tutorials OpenRiskNet public website

30 Oct 2018

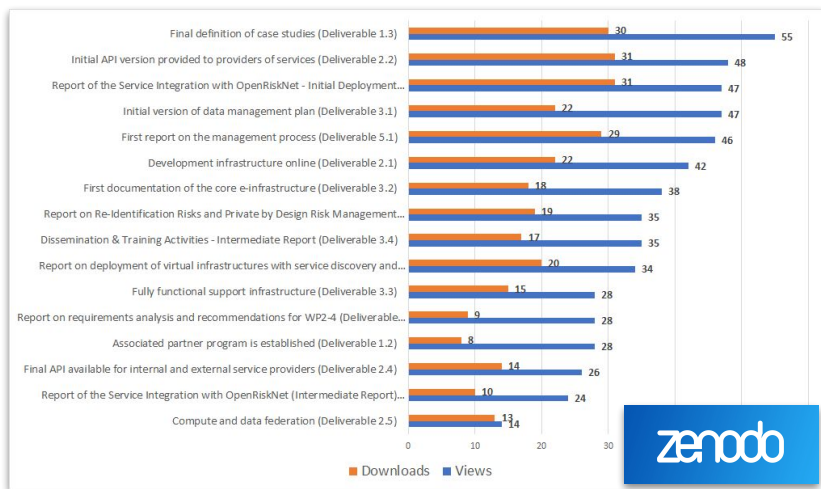
Abstract:

This document is addressed to OpenRiskNet and associated partners. Version 1 contains the following topics: How do I access the admin interface of the OpenRiskNet website?, How do I add and describe a new publication, training material or other resources?, How do I add and describe my services? and How do I add and describe a new event?

Webinar
recordings



Reports



Final definition of case studies (Deliverable 1.3)
 Jennings, Paul; Loner, Thomas; Parra, Lucien; Ock, In-Hyuk; Barthelemy, Henry; Dargatzis, Philip; Jansen, Danyel; Gerke, Oskar; Willmanns, Egon; Birk, Frederic; Reuterberg, Wolke; Dudgeon, Tim; Hardy, Barry
 7 Nov 2020
 doi: 10.5281/zenodo.1479127

Abstract:
 OpenRiskNet case studies are used to test and evaluate solutions provided by the project to the predictive toxicology and risk assessment community, especially regarding the usability of the developed Application Programming Interfaces (APIs) and the interoperability layer. These case studies will demonstrate the capabilities to satisfy the requirements of the different stakeholder groups, including researchers, risk assessors and regulators and present real-world applications such as systems biology approaches for grouping compounds, read-across applications using chemical and biological similarity, and identifying areas of concern based on in vitro and in silico approaches for compounds lacking any previous knowledge from animal experiments (ab initio case).

Publisher: OpenRiskNet
Target audience: Risk assessors, Researchers, Nanosafety community, OpenRiskNet stakeholders, Regulators
Open access: yes
Licence: attribution-nonexclusive 4.0 International (CC BY-NC 4.0)
Organisations involved: ERC, JGU, UM, NTUA, VU, IM, INERIS

OpenRiskNet Library:
<https://openrisknet.org/library/>

OpenRiskNet
 OpenRiskNet: Open e-Infrastructure to Support Data Sharing, Knowledge Integration and in silico Analysis and Modelling in Risk Assessment (731075)
 PROJECT EC OPEN ACCESS MANDATE FOR PUBLICATIONS AND RESEARCH DATA

Funding: H2020 | RIA
Start Date: 2016-12-01
End Date: 2019-11-30
Organization: Johannes Gutenberg University of Mainz | University of Birmingham | Fraunhofer UM UM UvA UvA NTUA MUI IM EwC Uppsala University
 Detailed project information (CORDIS) →

Publications (31)	+
Research Data (1)	+
Software (0)	+
Other Research Products (2)	+
Statistics	+
Metrics	+

Public communication, News articles and blog posts

OpenRiskNet Case Studies report into NanoSafety Cluster Newsletter 9 May 2019 → doi: 10.5281/zenodo.2652898	Public communication
OpenRiskNet factsheet 11 Dec 2018	Public communication
OpenRiskNet e-infrastructure available to end-users Lucian Farcas 9 Oct 2018 → Newsletter	Public communication
OpenRiskNet roll-up banner 12 Sep 2018	Public communication
OpenRiskNet flyer 1 Aug 2018	Public communication

OpenRiskNet Library: <https://openrisknet.org/library/>

News and Announcements

9 October 2019

Final Agenda of the Workshop

The **Final Agenda** and the **Abstracts Booklet** of the OpenRiskNet is available on the [web site](#).

[Read more →](#)

3 October 2019

Materials and tutorials for the Deployment Workshop available to participants

The **hands-on workshop** will show how to deploy containerised applications to an OpenRiskNet Virtual Environment. It provides background information and simple examples of deploying applications. Some basic understanding of using containers (e.g. Docker) is assumed.

[Read more →](#)

15 July 2019

OpenRiskNet webinars concluded

With ten webinar sessions organised in 2019 and four introduction sessions in 2018, OpenRiskNet outreached ~300 participants from different sectors and related areas like **risk assessment, e-Infrastructures, nanosafety, modelling, toxicology, AOPs or regulatory**.

All materials produced during these sessions (video recordings, slides, additional resources) are available online.

[Read more →](#)

8 July 2019

Reserve the dates for the Final OpenRiskNet Workshop: 23-24 October 2019

We are pleased to announce the final **OpenRiskNet workshop** that will be organised in **Amsterdam, The Netherlands on 23-24 October 2019**.

[Read more →](#)

OpenRiskNet website News section:

<https://openrisknet.org/news/>

OpenRiskNet e-infrastructure available to end-users

1 October 2018

The **e-infrastructure project OpenRiskNet** developing a platform providing data and modelling tools for predictive toxicology and risk assessment, is entering its second stage, in which the platform is made accessible to everyone. In the first phase, we developed advanced concepts and implemented these into the first version of the platform including building and deploying of **virtual research environments (VREs)** and integrating the first services for different tasks in risk assessment accessible by everyone for testing. The platform includes harmonised and partly semantically annotated data and modelling services, corresponding training material as well as seven risk assessment case studies, which are used to evaluate and optimize the infrastructure.

Current implementations and tools

The reference environment is available at <https://demo.grid.openrisknet.org/> equipped list of integrated services and example workflows, which show how to equip the benefits of the harmonisation and interoperability concepts.

Besides this reference instance, OpenRiskNet provides resources to enable its actual infrastructures populated with the applications and middleware making private cloud resources, as well as in-house server/workstations.

General assembly and consortium meeting 2018

1 November 2018

The **general assembly** of the OpenRiskNet Consortium will take place from **18th to 20th November 2018**. The program on project tasks and user stories will be presented and demonstrated to the project partners. The event will include also a **workshop training**.

Materials and resources from these events will be made available in the OpenRiskNet library. Additional activities or other opportunities interested to participate please contact us at: openrisknet@openrisknet.org.



OpenRiskNet e-infrastructure listed to EOSC and einfraCentral catalogues

OpenRiskNet e-infrastructure is listed as a service under the catalogues of European Open Science Cloud (EOSC) and European E-Infrastructure Services Gateway (einfraCentral).

The entries can be consulted here: [EOSC](#) and [einfraCentral](#).

Additional services, part of OpenRiskNet e-infrastructure, will be also listed.

Update: 2019-Feb-28: News posted by einfraCentral <http://einfracentral.eu/news/openrisknet-joined-eosc-catalogue>

New deliverables reports are publicly available

4 February 2019

Four new deliverables reports were made publicly available through Zenodo. The complete collection of reports by OpenRiskNet consortium are also accessible in the project's library under reports.

- Report on requirements analysis and recommendations for work (Deliverable 10)
- OpenRiskNet to EOSC Version 2017/02
- Associated partner program in stakeholder (Deliverable 12) final
- Initial version of data management plan (Deliverable 3.0) final
- July finalised support Infrastructure (Deliverable 3.0) final

OpenRiskNet and NanoCommons at SOT 2019

4 March 2019

The two sister infrastructure projects OpenRiskNet and NanoCommons will present the two complementary approaches to provide users with risk assessment data, software and workflows at the TechUp part of the **SOT 50th Annual Meeting** in Baltimore (10-14 March 2019).

Come and visit us to discuss how to use the OpenRiskNet platform and the deployed data and software on the public reference environment on an open access computer infrastructure and get access to expert info.

7 May 2019

The Terms of Use and the Privacy Policy were updated

The **Terms of Use** and the **Privacy Policy** of OpenRiskNet e-Infrastructure and website were updated based on the feedback received from the Data Protection Officer.

The new effective date is 7 May 2019.

Posts focused on case studies and demos

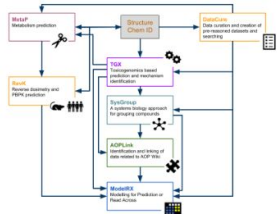
OpenRiskNet case studies enter final, test phase



31 January 2019

OpenRiskNet's work on case studies is entering the final phase with the focus on demonstrating infrastructure capabilities and on testing different risk assessment scenarios. The case studies provide examples and prototypes for solutions provided to the predictive toxicology and risk assessment community and demonstrate usage of the developed APIs and the interoperability features to build integrated workflows.

- **DataCure** - Data curation and creation of pre-reasoned datasets and searching
- **ModelRX** - Modelling for Prediction or Read Across
- **SysGroup** - A systems biology approach for grouping compounds
- **MetaP** - Metabolism Prediction
- **ADOLink** - Identification and Linking of Data related to AOPWiki
- **TGX** - Toxicogenomics-based prediction and mechanism identification
- **RevK** - Reverse dosimetry and PBPK prediction



These cases also demonstrate how OpenRiskNet offers customised approaches for the different stakeholder groups (e.g., researchers, risk assessors and regulators) and provides fit-for-purpose services and solutions to real-world applications (e.g., systems biology approaches for grouping compounds; read-across applications using chemical and biological similarity).

Users are invited to become familiar with the OpenRiskNet concept before using its services. Please see [Webinars recording](#) and consult the [case studies description](#) that point out the services available and specific training materials. Over next few months, live demonstrations will be organised through public webinars to allow users to interact with OpenRiskNet service-providers.

Data curation workflows using OpenRiskNet approach ready for demonstration



18 March 2019

In the process of utilising the analysis tools available in the OpenRiskNet e-infrastructure, data needs to be accessed from different sources and various formats. Thus, the users should be able to access different data sources and specific services. This can be achieved using an OpenRiskNet service and re-submitted to the data source.

Within literature case study, we aimed to establish a process for data curation and annotation that makes use of APIs and semantic vocabularies for a more systematic and reproducible data curation workflow. The development of semantic annotations and API definition for selected databases are also planned.

Therefore, the aim was to deliver curated and annotated datasets for OpenRiskNet service users as well as preparation of and development of tools that can allow users perform their own data curation.

To achieve these, OpenRiskNet developed resources that can make use of APIs as much as possible and minimise the need for manual file sharing. In addition, workflows that provide examples of useful data for biologists are also being developed.

This case study series also at the entry point of curation of data sources to be used by the other case studies.



The technical implementation involved several steps related to: **Identification** (Explore in data source), **Data extraction** (Workflows), **Data searching** (using workflows that employ test reasoning) **Core** (through the provision of workflows stored in submissions to data source where the curated datasets can be explored for re-use).

To guarantee on how this works in practice, you are invited. Please see more details on the webinar and register here.

The federation of computing and data resources between the OpenRiskNet e-infrastructure and public computational and data resources has now been demonstrated



21 May 2019

The OpenRiskNet Consortium develops the OpenRiskNet e-infrastructure for the harmonisation and improved interoperability of data and software tools in the area of predictive toxicology and risk assessment. It aims to combine interoperable web services providing data or analysis, processing and modelling tools communicating over well-defined and harmonised application programming interfaces (APIs), supplemented by a semantic interoperability layer added to every service to describe the functionality whilst guaranteeing the technical and semantic interoperability.

An important task in the project, related also to the TGX case study, involved the federation of compute and data resources between the OpenRiskNet e-infrastructure and external resources. The reference environment has been designed to be capable of handling the majority of requirements for users wishing to deploy and run services. However, specific situations demand solutions where either the computation, the data or both reside outside the OpenRiskNet e-infrastructure.



How to identify and link of data related to AOPWiki to support the Adverse Outcome Pathway approach

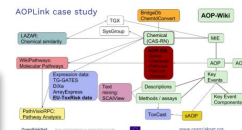


22 March 2019

The Adverse Outcome Pathway (AOP) concept has been introduced to support risk assessment [1]. An AOP comprises a number of biological events: a molecular initiating event (MIE) is followed by one or more key events (KEs), leading to the adverse outcome (AO). The AOPWiki [2] is a collaborative platform to exchange AOP-related knowledge.

The use of AOPs for regulatory purposes requires detailed validation and linking to existing knowledge [3]. Part of the development of AOPs is the search for data that supports the occurrence and biological plausibility of KEs and their relationships (KERs). This data can be found in literature and increasingly in databases.

AOPLink case study developed within OpenRiskNet framework, focuses on establishing links between AOPs and data that supports a particular AOP. This will allow finding AOPs related to experimental data, and finding data related to a particular AOP.



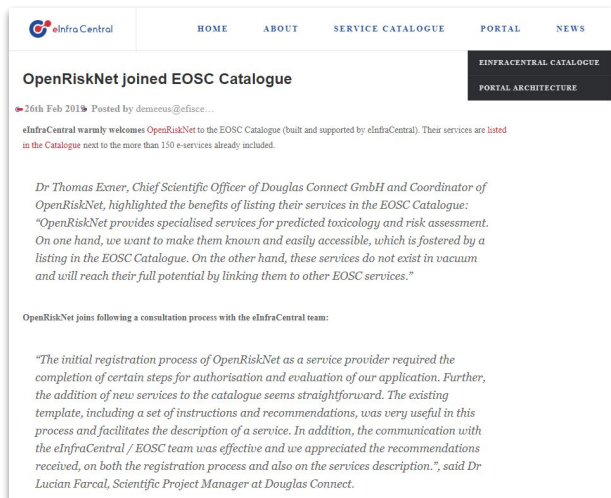
OpenRiskNet website News section:
<https://openrisknet.org/news/>

Interactions with other EU e-infrastructure initiatives

- **eInfraCentral:** disseminate OpenRiskNet platform (or individual services) to a larger audience and be able to compare and connect with very similar services
- **OpenAIRE:** common philosophy on open source, open access and open data.
- **ELIXIR:** Toxicology and risk assessment were recently accepted as an ELIXIR community due to an application almost completely driven by OpenRiskNet partners.
- **ELIXIR's Training Portal:**
https://tess.elixir-europe.org/content_providers/openrisknet
- **EU NanoSafety Cluster / NanoCommons:** nanosafety community is envisioned as one of the main beneficiaries of the OpenRiskNet services



Interactions with eInfraCentral and EOOSC



OpenRiskNet joined EOOSC Catalogue

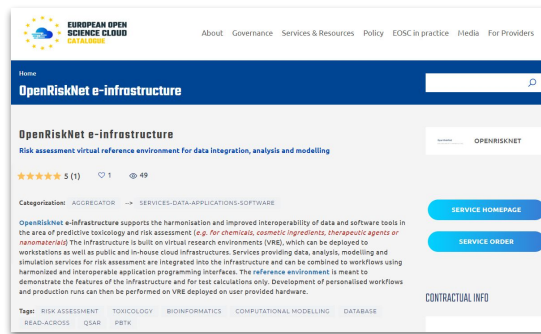
26th Feb 2019 Posted by demeneu@efisce...

eInfraCentral warmly welcomes OpenRiskNet to the EOOSC Catalogue (built and supported by eInfraCentral). Their services are listed in the Catalogue next to the more than 150 e-services already included.

Dr Thomas Exner, Chief Scientific Officer of Douglas Connect GmbH and Coordinator of OpenRiskNet, highlighted the benefits of listing their services in the EOOSC Catalogue: "OpenRiskNet provides specialised services for predicted toxicology and risk assessment. On one hand, we want to make them known and easily accessible, which is fostered by a listing in the EOOSC Catalogue. On the other hand, these services do not exist in vacuum and will reach their full potential by linking them to other EOOSC services."

OpenRiskNet joins following a consultation process with the eInfraCentral team:

"The initial registration process of OpenRiskNet as a service provider required the completion of certain steps for authorisation and evaluation of our application. Further, the addition of new services to the catalogue seems straightforward. The existing template, including a set of instructions and recommendations, was very useful in this process and facilitates the description of a service. In addition, the communication with the eInfraCentral / EOOSC team was effective and we appreciated the recommendations received, on both the registration process and also on the services description.", said Dr Lucian Farcal, Scientific Project Manager at Douglas Connect.



EUROPEAN OPEN SCIENCE CLOUD CATALOGUE

About Governance Services & Resources Policy EOOSC in practice Media For Providers

Home

OpenRiskNet e-infrastructure

Risk assessment virtual reference environment for data integration, analysis and modelling

★★★★★ 5 (1) 1 49

Category: AGGREGATOR → SERVICES-DATA-APPLICATIONS-SOFTWARE

OpenRiskNet e-infrastructure supports the harmonisation and improved interoperability of data and software tools in the area of predictive toxicology and risk assessment (e.g. for chemicals, cosmetic ingredients, therapeutic agents or nanomaterials). The infrastructure is built on virtual research environments (VRE), which can be deployed to workstations as well as public and in-house cloud infrastructures. Services providing data, analysis, modelling and simulation services for risk assessment are integrated into the infrastructure and can be combined to workflows using harmonised and interoperable application programming interfaces. The reference environment is meant to demonstrate the features of the infrastructure and for test calculations only. Development of personalised workflows and production runs can then be performed on VRE deployed on user provided hardware.

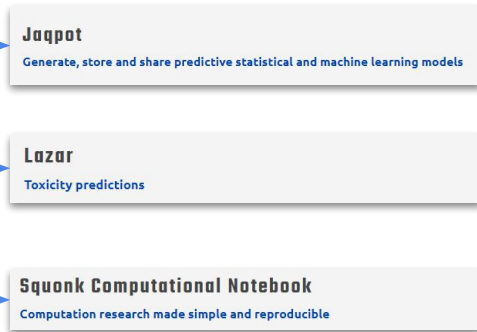
Tags: RISK ASSESSMENT TOXICOLOGY BIOINFORMATICS COMPUTATIONAL MODELLING DATABASE

READ-ACROSS QSAR PBTK

CONTRACTUAL INFO

SERVICE HOMEPAGE

SERVICE ORDER



- Jaqpot**
Generate, store and share predictive statistical and machine learning models
- Lazar**
Toxicity predictions
- Squonk Computational Notebook**
Computation research made simple and reproducible

Participation at EOOSC events (posters and introduction to OpenRiskNet):

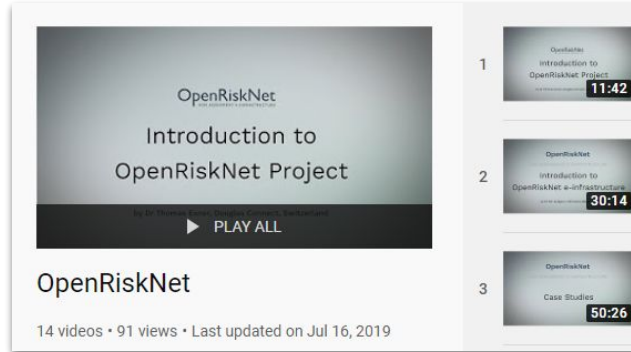
- **EOOSC-hub Week**, 10 – 12 Apr 2019 / Prague, CZ
- **Building EOOSC through the H2020 projects current status and future directions**, 9 – 10 Sep 2019 / Brussels, BE



Social Media

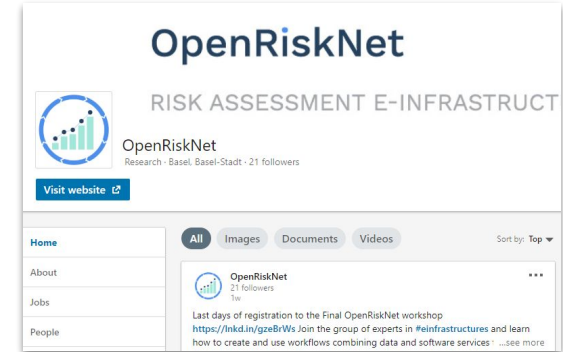


The screenshot shows the Twitter profile for OpenRiskNet (@openrisknet). The profile includes a bio: "Open e-Infrastructure to Support Data Sharing, Knowledge Integration and in silico Analysis and Modelling in Predictive Toxicology and Risk Assessment (P2020)". It also lists the website openrisknet.org, joined in October 2018, and born in March 5, 1980. The profile has 117 tweets, 175 following, 148 followers, 58 likes, 0 lists, and 0 moments. A pinned tweet from Oct 8 is visible, mentioning the final agenda and abstracts booklet for the @OpenRiskNet #workshop available on the event webpage openrisknet.org/events/TA/. The tweet lists activities: hands-on sessions and demos on case studies, lectures on different services for risk assessment, and e-infrastructures. It also notes the last days of registration.



The screenshot shows the YouTube channel for OpenRiskNet. The channel name is "OpenRiskNet" and the video title is "Introduction to OpenRiskNet Project". The video player shows a "PLAY ALL" button. Below the video, it states "14 videos • 91 views • Last updated on Jul 16, 2019". A list of three videos is shown on the right:

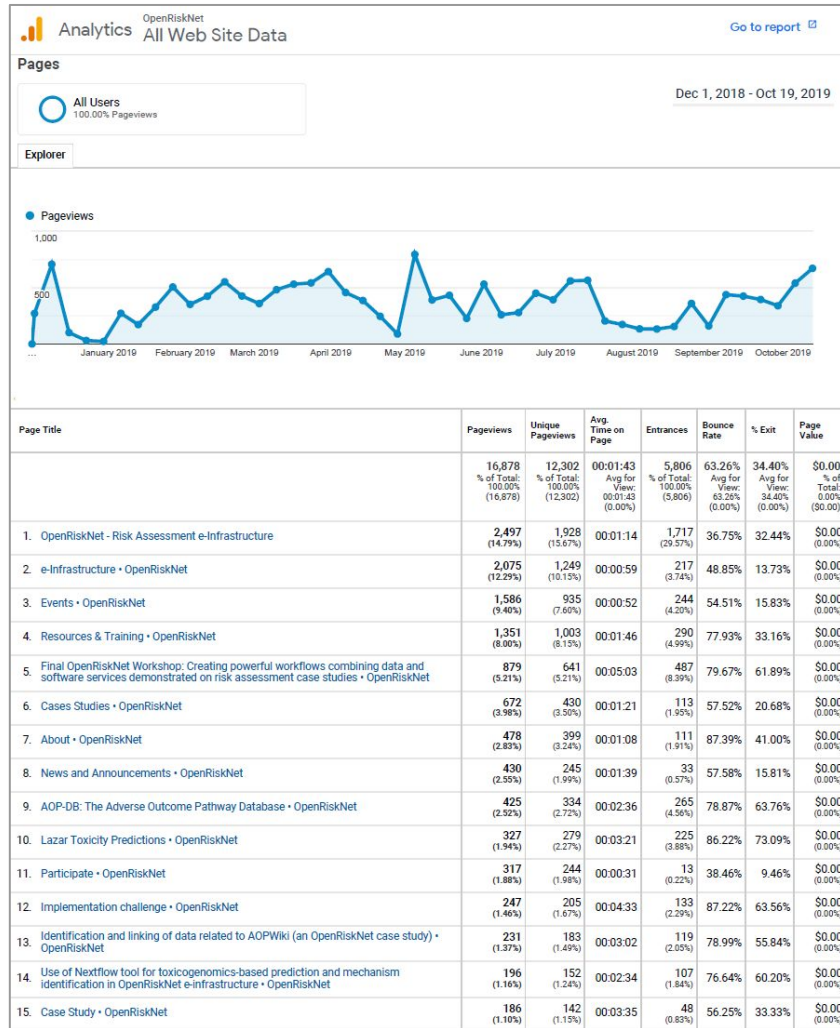
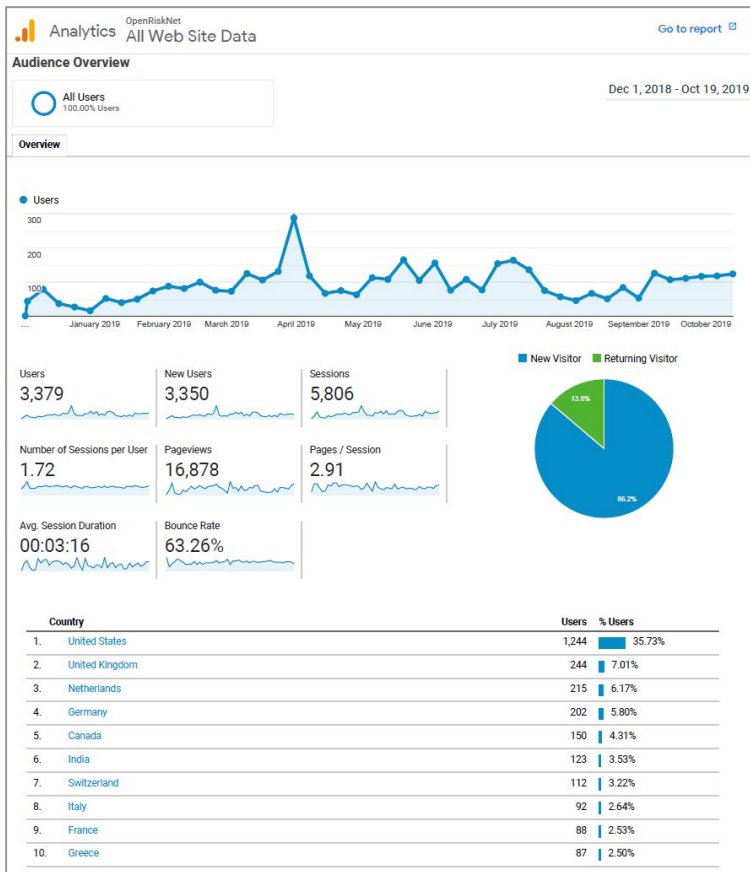
- 1. OpenRiskNet Introduction to OpenRiskNet Project (11:42)
- 2. OpenRiskNet Introduction to OpenRiskNet e-Infrastructure (30:14)
- 3. OpenRiskNet Case Studies (50:26)



The screenshot shows the LinkedIn profile for OpenRiskNet. The profile name is "OpenRiskNet" and the headline is "RISK ASSESSMENT E-INFRASTRUCTURE". The profile bio states "OpenRiskNet Research · Basel, Basel-Stadt · 21 followers". There is a "Visit website" button. The navigation menu includes Home, About, Jobs, and People. The "All" tab is selected, showing a post from OpenRiskNet (21 followers) with the text: "Last days of registration to the Final OpenRiskNet workshop <https://lnkd.in/gzeBrWs> Join the group of experts in #eInfrastructures and learn how to create and use workflows combining data and software services' ...see more".



Website analytics



Data Management Plan (DMP)

Deliverable 3.6 Final data management, maintenance and sustainability plan
https://docs.google.com/document/d/1Ag3e3gAFDix-WldfKEZT_tODC8Mj9lLkIPqXOVGmKns/edit#



Data Management Plan

General and specific information (e.g. for diXa, BridgeDb, WikiPathways, AOP-Wiki and ToxCast) are provided on the following areas:

- Data summary
 - Purpose of the data collection
 - Relation to the objectives of the project
 - Types and formats of data
 - Reuse of data
 - Origin of the data
 - Expected size of the data
 - Utility of data and models
- FAIR data
 - Making data findable, including provisions for metadata
 - Making data openly accessible
 - Making data interoperable
 - Increase data re-use (through clarifying licenses)
- Allocation of resources
- Data security
- Ethical aspects (incl. Deliverable 6.7, final DPO report)

The screenshot displays the OpenRiskNet (Horizon 2020 DMP) interface. At the top right, a progress bar shows 7/9 sections completed, with a note: "approx. 45% of available space used (max 10 pages)". Below this is a navigation menu with tabs: "Plan details", "Initial DMP" (selected), "Detailed DMP", "Final review DMP", "Share", and "Export". The main content area lists six sections, each with a plus sign icon on the right:

Section	Questions	Answers
1. Data summary	1 question	1 answered
2. FAIR data	4 questions	4 answered
3. Allocation of resources	1 question	0 answered
4. Data security	1 question	1 answered
5. Ethical aspects	1 question	1 answered
6. Other	1 question	0 answered

Plan for the Exploitation and Dissemination of Results (PEDR)

PEDR version 3

https://docs.google.com/document/d/18TrkUcPtDzPdY5TpCrMjKkOXcH0tF_yNJuu0r_0ICLE/edit#



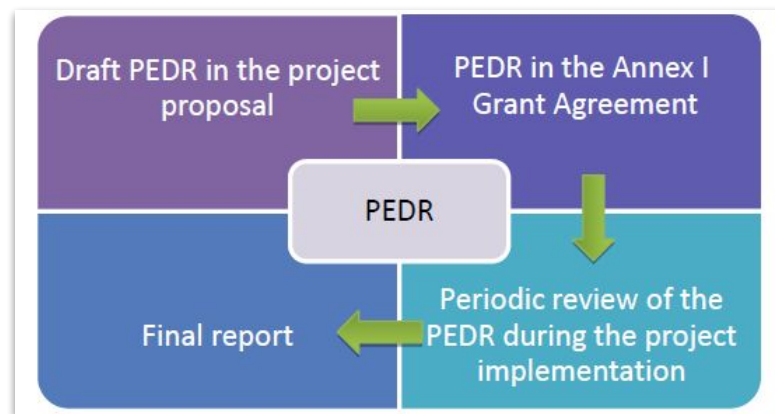
Plan for the Exploitation and Dissemination of Results (PEDR)

OpenRiskNet dissemination plan

- Dissemination and communication activities
- Dissemination performance metrics
- Reporting, tracking and sharing of dissemination activities
- Funding allocated for Dissemination and Communication activities

OpenRiskNet exploitation plan

- Virtual Organisation
- Sustainability plan



Sustainability

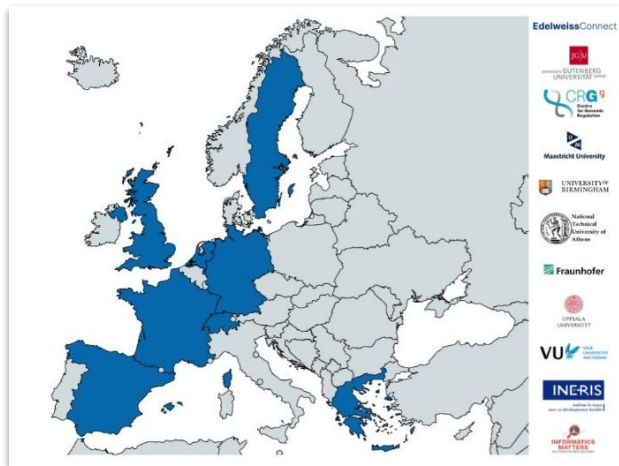
- Positioning OpenRiskNet as a major European provider of e-services for the toxicology community
 - Continuation in NanoCommons
 - Infrastructure in EU research projects
- Establishing toxicology and risk assessment as a major pan-European community with specific infrastructure needs
 - Listing on EOSC
 - Becoming a use case in EOSC-life
 - Collaborating with ENVRI
 - Trying to become part of a consortium of the remaining infrastructure calls (as a use case)
- Establishing OpenRiskNet as a place to offer and purchase data, predictive toxicology and risk assessment services
 - Service Model
 - Software Solution Consortium
 - Membership Model
 - Marketplace platform

Is it too early for this despite the good feedback we got from commercial service providers?

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