Open science and research Initiative in Finland

at RDA: Open Science and Open Data

Pirjo-Leena Forsström
Secretary-General, Development Director

OPEN SCIENCE AND RESEARCH

Content

- Why Openness Initiative?
- The Finnish context
- National and Global dimensions
- Starting point
- Building the expertise

Open Science can lead to surprising innovations

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Global projects of CERN →
HTML-language developed to solve document access, management and sharing challenges → **World Wide Web** developed

Derivation of high-quality information from text masses via tools like statistical pattern learning
→ Open **code for text mining** tools
→ Marketing, security, online media

Analysis of big data sets, e.g. High Energy Physics, Astronomy, Bioinformatics
→ **Big Data analytics tools** (grid technologies, C2MON)
→ https://indico.cern.ch/event/289770/
→ Banking, drug development etc.

Open Science and Research

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- Increasing the quality of science
- Developing new ways for collaboration
- Increasing impact of science
- Supporting life-long learning
- Increasing the innovation capacity
- Ensuring trust in science and research
- Developing citizen science

Available for research

Available for everyone

Machine-readable format

No costs

No re-use limitations

Open Science and Open Innovation

Open Science	Open Innovation
Promotes:	Promotes:
• Rapid diffusion of latest knowledge	• Rapid diffusion of latest knowledge
• Quality and transparency of scientific results	• Discovery and development of business models
• Embraces change and new ideas	• Embraces change and new ideas
• Open and broad engagement and participation in science	• Open and broad engagement and participation in innovation process

Digitalization challenges competence and support requirements for research

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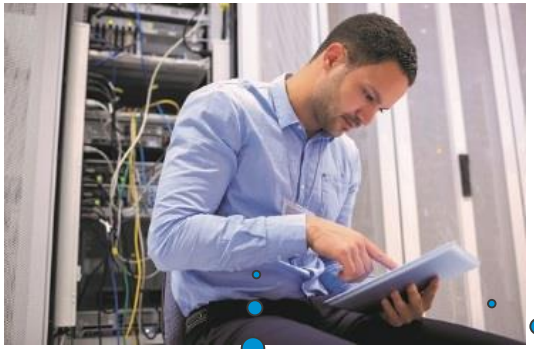
- Researchers interact with Publishers and Social Media to distribute publications
- Users find publications also via Open Access –journals and Open Data services

The actors have to consider



Competition

Merit

IPR

Costs

Plagiates

Visibility

Infrastructures

Modern Academic Workflows

Kramer, Bianca; Bosman, Jeroen (2015):
101 Innovations in Scholarly Communication
- the Changing Research Workflow. figshare.
http://dx.doi.org/10.6084/m9.figshare.1286826
Retrieved 20:05, May 25, 2015 (GMT)

The Finnish context

Goal: more dynamic HE and research sector

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Higher education reforms

- University reform 2009
- Polytechnic Reform
- Structural development of HEIs

Reform of science and research network

- Reform of state research institutes and research funding
- Academy of Finland
- Strengthening of the research infrastructures

Other developments

- Encouraging funding models
- Structural reform of VET
- Other political decisions related to macro-economic balance

Selected higher education facts about Finland

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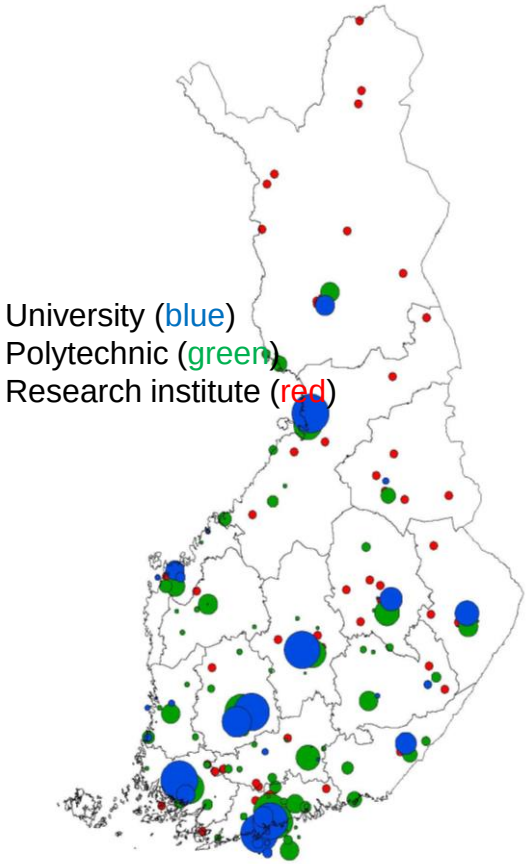
- Population of 5,4 million
- Higher education institution network covers the populated parts of the country
  - 14 universities (four in the great Helsinki area)
  - 24 polytechnics
- 18 research institutes and 5 university hospitals
- Student enrollment altogether ca. 316 000



Open Science and Research vision in Finland

Higher quality, more impact, more effective and more international science community

Actions of the Roadmap 2015

Reinforcing the intrinsic nature of science and research	• Evaluation of openness culture at the universities and polytechnics • Defining principles and guidelines for openness • Developing incentives for openness • Recognition of efforts in openness
Strenthening openness-related expertise	• Training activities, competence analysis, certificate • Manual for Open Science
Ensuring a stable foundation for the research process	• Development of common services and infrastructures: Service map, support for research data management, publication archives development, research infrastructure databank, long-term preservation and availability or reserach results
Increasing the societal impact of research	• Funding call ”Tieto käyttöön” • Developing indicators and measurements od openness

ATT-tiekartan keskeiset toimenpiteet 2015-2017

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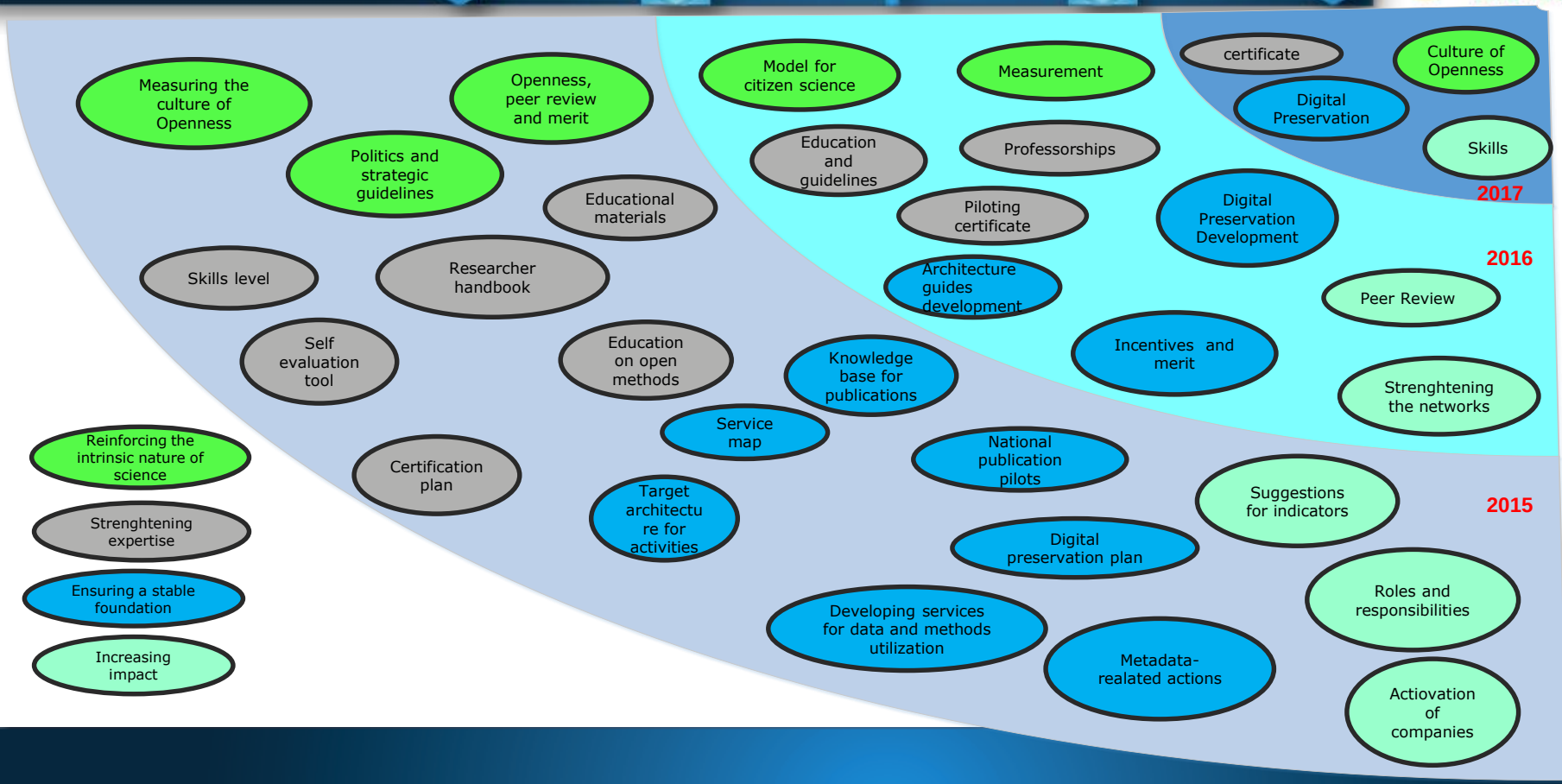

Objective 1: Reinforcing the intrinsic nature of science and research

Openness and repeatability increase the reliability and quality of science and research

2017

Reviewing progress
Monitoring maturity level of culture

2016

Rewiewing progress
Developing an evaluation model for citizen science

2015

Preparing policies and baselines to support RO activities
Suggestions for incentivising openess in peer-reviews and merits
Assessing the present state of openess in research environments

Objective 2: Strenthening openness-related expertise

Knowledge how to harness the opportunities afforded by openness to boost Finland's competitive edge

2017

Introducing certificate of Open Science
Providing openess training and guidance

2016

Piloting certificate for Open Science
Providing openess training and guidance
Establishing professorships focused on openess

2015

Starting to develop certificate for Open Science
Updating the Open Science and Research Manual
Analysing of current competency level - training packages and training

Objective 3: Ensuring a stable foundation for the research process

Structures and services enable new opportunities of openness to be harnessed in a timely manner and ensure a stable basis for research

2017

Putting into practice long-term preservation of research outputs

2016

Developing long-term preservation
Opening up new major national research data
Creating permanent opertaing model for open publication

2015

Developing cervices for utilization of open research data
Piloting of open publication of Finnish scientific publications
Publication of target architecture and developing shared practices for storage, distribution and publication of outputs & promoting service design and usability

Objective 4: Increasing the social impact of research

Open science and research creates new opportunities for researchers, decision-makers, business, public bodies and citizens

2017

Reviewing progress

2016

Introducing openess criterion for research funding
Promoting peer reviews of openess (national / international)

2015

Promoting clearer division of responsabilities in service production
Motivating companies and research organizations to develop businesss

Suggesting indicators to measure openess and use incentives to promote

Direct financial resources for Open Science and Research

- Research Data Survey Initiative
- Finnish Research Data Initiative
- Research LTP
- Infrastructure investments
- Open Science and Research Initiative

Total approx. 9 M€

2009-2014

- ATT initiative 2,5 M€
- Research LTP 1 M€
- Infrastructure 1,5 M€
- Funding call 1 M€
- Open data actions 2 M€

Total approx. 8 M€

2015

- ATT initiative 2,5 M€
- Research LTP 1 M€
- Infrastructure 1,5 M€

Total approx. 5 M€

2016

ATT initiative 1 M€
Research LTP 1 M€
Infrastructure 1 M€

Total approx. 3 M€

2017

National and Global dimensions

Working together

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- **Exhange of expertise:** easy carieer moves to and from science
  - to industry
  - To governement jobs
  - To support organizations (for example libraries)
- **Platforms for distribution and utilization of scientific results:** diffusion of knowledge, easy uptake of ideas
- **Sharing research infrastructures**: big investments, knowledge hubs

- **Funding instruments with same goal**
- **Clear guidelines for use**
- **Interoperable services and quality systems**
- **Increasing and maintaining expertise**

Promoting open science and research

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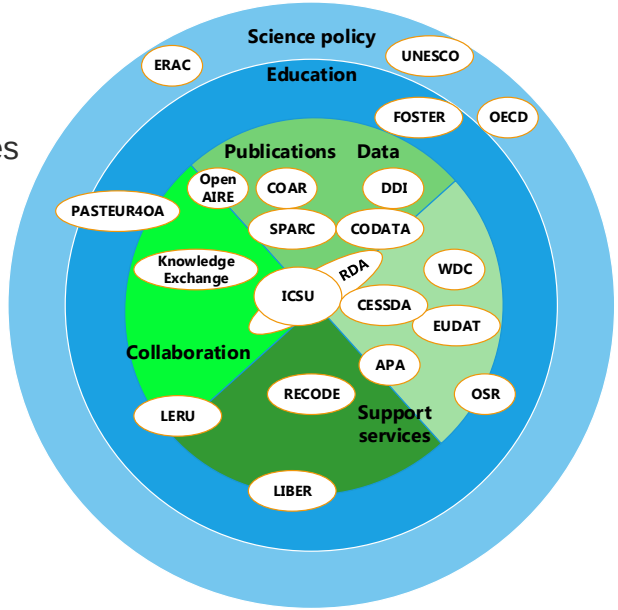
What is needed?

- Extensive involvement from the research community
- National and international cooperation and coordination
- Developing research environments, researcher services and research infrastructures
- Exploring new ways of working
- Science is global, even though it is supported mostly by national and local funding, via national education efforts, support services and infrastructures.
- Co-creation + clear roles



ATT-roadmap 2014-2017 will be successfull only if we work together

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- Nationally and internationally by
  - Identifying at each level which actions are needed to promote open science and research
  - Building together environments, infrastructures, services and policies
  - Sharing experiences and knolwedge and learning from mistakes
  - Committing to pragmatic and progressive development
  - Identifiying problems where national and/or international solutions are needed
  - Gathering infromation on progress and evidence of the benefits

Home page
openscience.fi

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Principles of promoting Open Science and Research

- Open operational model
- Solutions to shared problems
- Common and integrated services and infrastructures
- Centralized funding as a seed money
- Both individuals and organizations have their responsibilities
- National and international activities
- Follow-up, monitoring and adjustments, when necessary

Starting point

The Global Innovation Index 2015

Sept 17, 2015

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Efficiency Ratio	Rank	Median: 0.71
Switzerland	68.30	1	HI	1	EUR	1	1.01	2	
United Kingdom	62.42	2	HI	2	EUR	2	0.86	18	
Sweden	62.40	3	HI	3	EUR	3	0.86	16	
Netherlands	61.58	4	HI	4	EUR	4	0.92	8	
United States of America	60.10	5	HI	5	NAC	1	0.79	33	
Finland	59.97	6	HI	6	EUR	5	0.77	41	
Singapore	59.36	7	HI	7	SEAO	1	0.65	100	
Ireland	59.13	8	HI	8	EUR	6	0.88	12	
Luxembourg	59.02	9	HI	9	EUR	7	1.00	3	
Denmark	57.70	10	HI	10	EUR	8	0.75	49	

FINLAND 2015: 6. (2014: 4.)

The Global Innovation Index (GII) ranks the innovation performance of 141 countries and economies around the world, based on 79 indicators.

The GII is co-published by WIPO, Cornell University and INSEAD.

http://www.wipo.int/econ_stat/en/economics/gii/index.html#highlights

Our greatest strength: human resources

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INSEAD Global Innovation Index 2013 Human Capital and Research	World Economic Forum 2014-2015 Higher Education and Training	WEF and INSEAD The Networked Readiness Index 2013	Innovation Union Scoreboard 2014 Human Resources (Europe only)	World Economic Forum 2014-2015 Health and Primary Education
1. Finland	**1. Finland**	**1. Finland**	1. Sweden	**1. Finland**
2. Rep. of Korea	2. Singapore	2. Singapore	**2. Finland**	2. Belgium
3. Singapore	3. Netherlands	3. Sweden	3. Ireland	3. Singapore
4. Sweden	4. Switzerland	4. Netherlands	4. United Kingdom	4. New Zealand
5. Iceland	5. Belgium	5. Norway	5. Slovenia	5. Netherlands
6. United States	6. U. Arab Emirates	6. Switzerland	6. Latvia	6. Japan
7. Denmark	7. United States	7. United Kingdom	7. France	7. Canada
8. Israel	8. Norway	8. Denmark	8. Belgium	8. Ireland
9. Ireland	9. New Zealand	9. United States	9. Netherlands	9. Cyprus
10. Austria	10. Denmark	10. Taiwan, China	10. Denmark	10. Iceland

Implementing open science operating culture in HEI's in 2015

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- The operating culture was studied in four sections:
  - Strategic guidance
  - Policies and principles
  - Supporing openness
  - Reinforcing know-how
- The maturity assessment:
  - Basic information from openly available material on the web was collected to assess the open science operating culture in December 2014
  - This information base was improved with supplementary information from a survey to the HEIs, response rate 88%
  - The HEI's commitment and perceived challenges to the Open Science and Reseach roadmap was assessed

The overall maturity level of the open science operating culture in 2015

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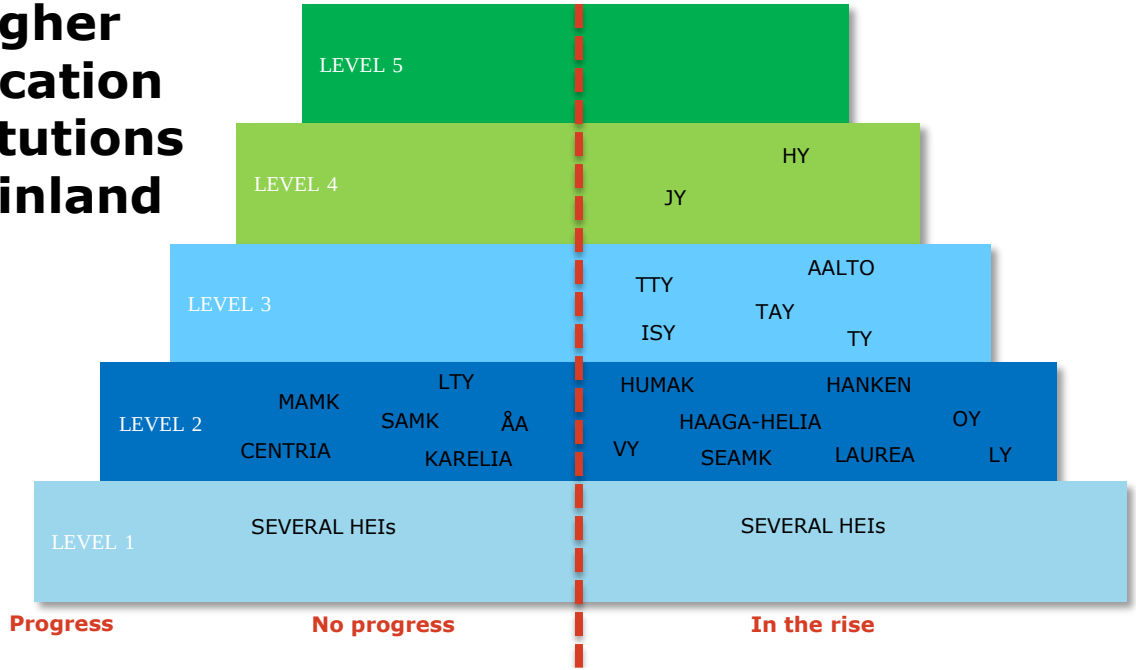
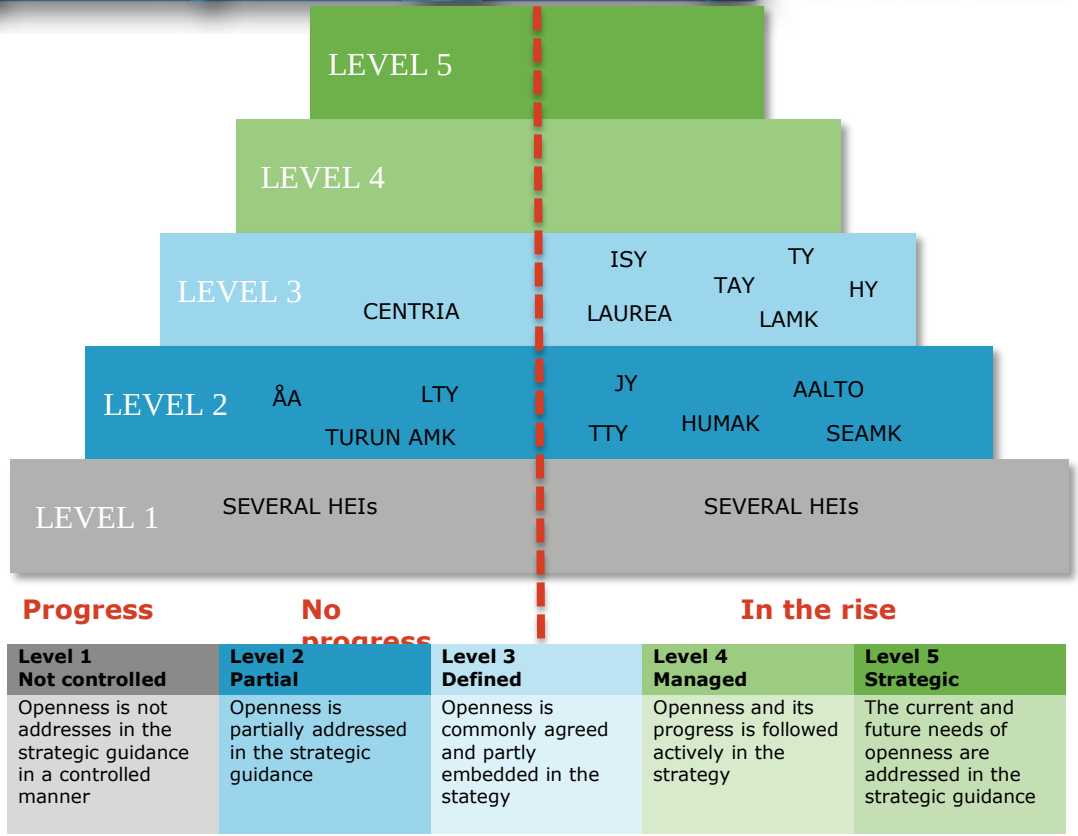
Higher education institutions in Finland



Level 1 Unmanaged	Level 2 Partly managed	Level 3 Defined	Level 4 Managed	Level 5 Strategic
No systematic development towards openness	Partial policies and tools	Processess have started	Collective, well-managed development	Proactive, systematic actions

Results from the strategic guidance part

- There is a lack of strategies targeting open science and the intent is not sufficiently brought up
- Openness in the strategies is usually a value, not an overall theme
- Strategic guidance has shortages in acknowledging the openness of the whole research cycle
- There is wide engagement in carrying out the measures needed for open science and research
- Consideration of the persevering development of the strategic work, in many cases the inclusion of openness in the strategic work is only in the beginning



Metrics and indicators

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PUBLICATIONS

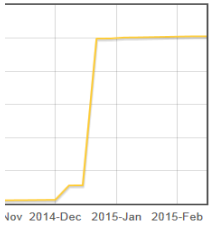
Publications in universities parallel copy archives 2011–2013 (data form 2014)

yliopisto	2010	2011	2012	2013	2014
HY	309	240	265	302	278
JY	77	141	147	223	439
TaY	93	169	189	130	102
Hanken	25	13	36	17	23

CHALLENGES
- Comprenhensive metrics not easy to get
- APC information difficult to get

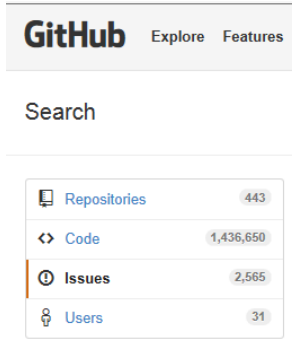
DATA

Datasets in Etsin: 1336 datasets, 0 shared by CC0



CHALLENGES
- Metadata generation and gathering
- Poor lisencing hinders further usage
- Data availability

METHODS (CODE)



Challenges
- Comprehensive information on skills and contributions missing

Shared responsibilities in national and international collaboration (1)

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- Science policy-makers
  - Strategies
  - Information gathering of openness describing material
  - Incentives, merits, rewards
- Research funders
  - Openness as a requirement in research applications
  - Support for openness costs
  - Evaluation and measurement of openness
  - Support utilization the opportunities of openness
- Trade and commerce
  - Competence in strategic and practical implementation of openess
  - Utilization of open data and methods, strategically opening up companies' data

Shared responsibilities in national and international collaboration (2)

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- Research organizations
  - Openness in strategies and clear policies and principles
  - Strengthening and maintaining openness-related expertise
  - Systems for quality control
  - Fostering interoperability and repeatability
  - Utilising services supporting openness
- Researchers
  - Management of quality and life cycle of open results (data, methods and publications)
  - Allocation of resources also for publication and re-use of research data
  - Licencing authors, ownership and outcome
  - Taking care of citations and information on sources
  - Producing comprehensive and flawless metadata

Building the expertise

For Open Science and Open Innovation: ICT skills are essential

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Digital research and innovation environments demand strong capabilities and skills.

The needs include:

- ICT specialists, who understand the need for better results
- Advanced users, who can utilize ICT-tools to get better results
- Basic users, who embrace the digital way of working

Interdisciplinarity

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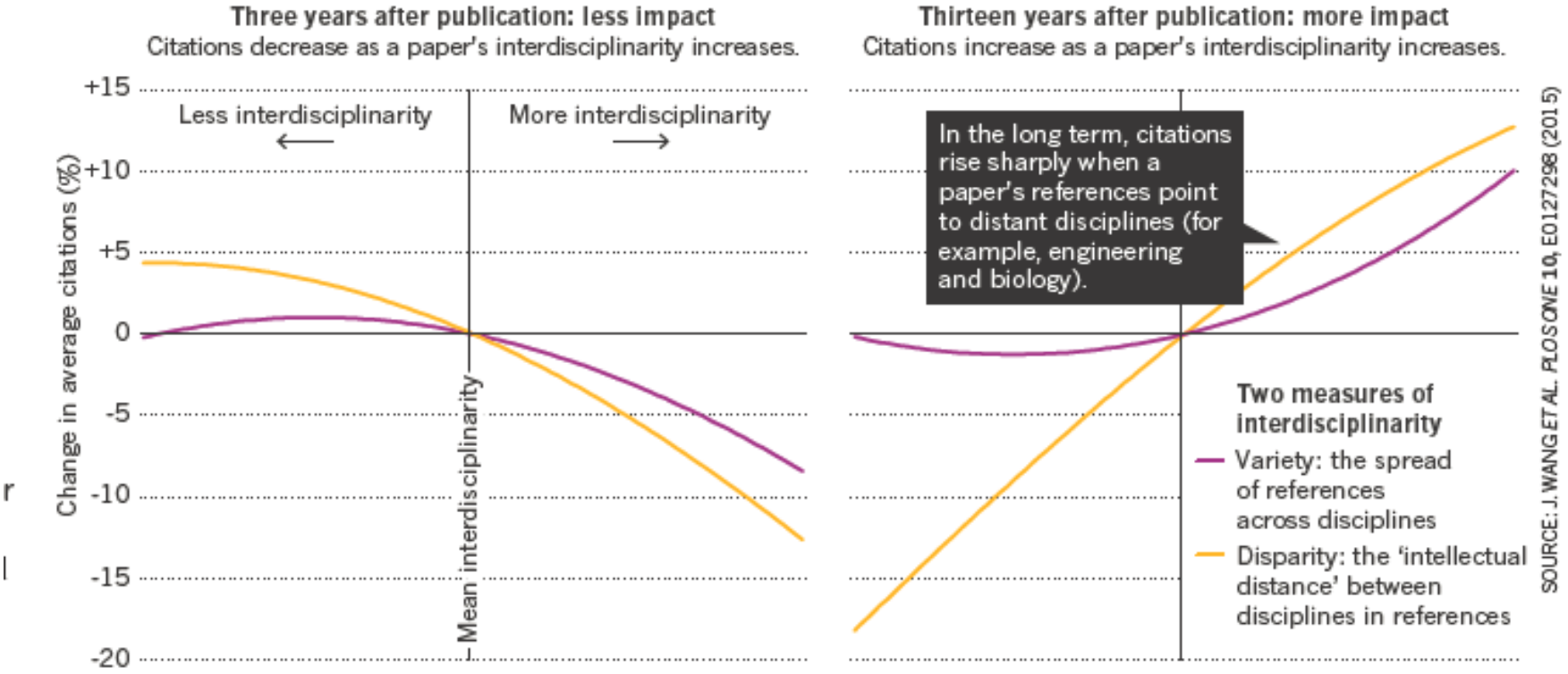
3 Some fields are more interdisciplinary than others ...

Impact and interdisciplinarity



Strenghtening the skills

- Open Science and Research Manual produced via open dialogue
- Open Science education
  - Reports on educational needs and level of knowledge
  - Identification of various target groups and tools
  - Designing educational packages for Open Science
  - Maste course in Open Science
  - Certificate development for Open Science

Thank you!