

Developing a Data steward curriculum : the Danish experience

Lorna Wildgaard, PhD

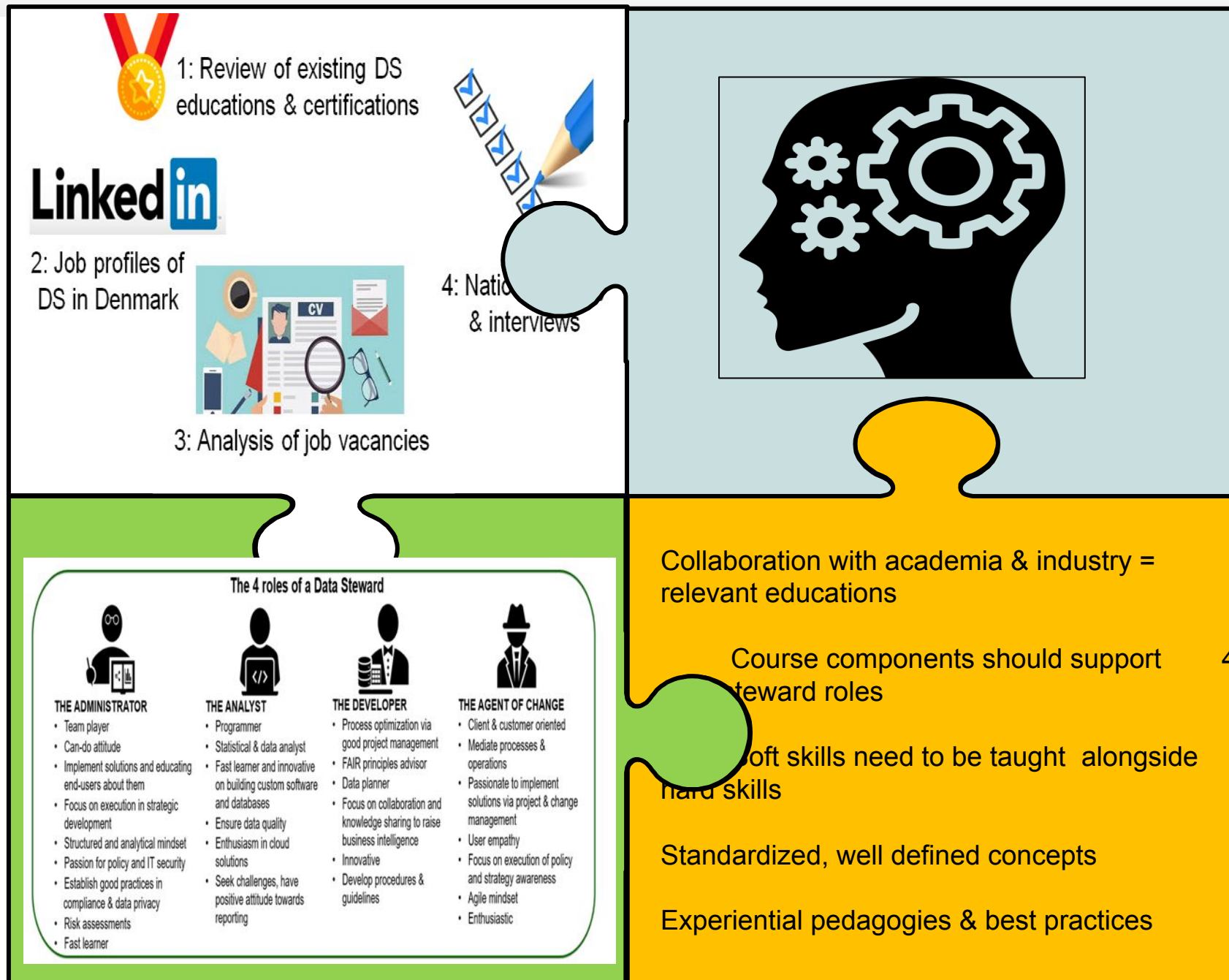
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Data Steward Education (UCPH), 1Y Master, 60 ECTS



Autumn		Spring	
Block 1	Block 2	Block 3	Block 4
Introduction to Data Science	Data modelling, management & security	Data analysis & processes	Elective
Data Gov.	Elective	Project (15 ECTS)	

Prequalification accepted
Focus group interviews
Recruit students
Develop curricula
Implement master
(September 2022 enrollment)

Process

- Developed by a cross-university work group
- Document analysis (background), Informal hearing with Danish E-Infrastructure Consortium, dialog with advisory boards (major players in the private and public sector)
- Major input from report "National Coordination of Data Steward Education in Denmark"
- The proposed curriculum is now being evaluated by the Ministry of Higher Education and Science expected approval by the end November 2021

Relevance

- Increase the number of people with specialized skills in IT and data -> there is currently a lack of data scientist, ML, IA, computer scientists, software developers
- The increased societal focus on digitalization demands knowledge about how to manage and activate stored data -> support for business and process development
- Data stewardship is currently undertaken by professionals from related disciplines i.e. data scientist to law
- Data stewardship combine digital expertise with domain specific knowledge

Number of data stewards needed

- UCPH estimates a need of at least 50 masters in data stewardship yearly – reports have estimated a need for at least 20.000 skilled staff before 2030
- Advisory board members representing 5 private and public sector organizations (medical industry, industrial production and dairy sector) estimated a need for 150-200 data stewards during the next 5 years alone
- 115 questionnaire respondents from private and public sector did express a need for data stewards in their organizations
- We estimate a yearly need for 100 – 200 with a master in data stewardship

Structure

	Autumn		Spring	
	Bloc 1	Bloc 2	Bloc 3	Bloc 4
Year 1	Python for data science	Data modelling, management and security	Data analysis & processes	Elective course : methodologies
	Data governance	Elective course : Domaine specific	Project (15 ECTS)	

Elective course : domain specific

Health data
Sequence & bio informatics
Social data
Organisation & cultural data

Elective course :
methodologies

Machine learning & AI
Open data & FAIR
Project management / change management
Citizen science

Background reports – needs analysis

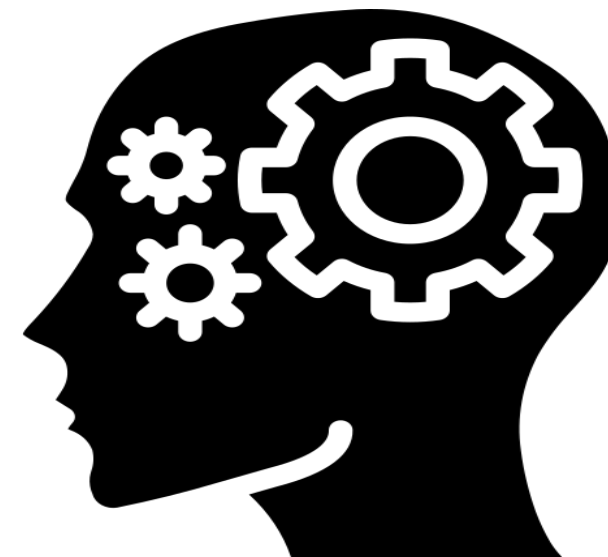
- Background reports:
 - Iris Group and HBS Economics, 'Mismatch in the Danish labor market for IT graduates in 2030', HBS Economics, Jun. 2021.
<https://hbseconomics.com/publications/mismatch-in-the-danish-labor-market-for-it-graduates-in-2030/>
 - McKinsey & Company and Innovationsfonden, 'An AI Nation? Harnessing the opportunity of artificial intelligence in Denmark', 2019. [Online]. Available:
<https://innovationsfonden.dk/sites/default/files/2019-09/an-ai-nation-harnessing-theopportunity-of-ai-in-denmark.pdf>
 - L. Wildgaard, E. Vlachos, L. Nondal, A. V. Larsen, and M. Svendsen, 'National Coordination of Data Steward Education in Denmark: Final report to the National Forum for Research Data Management (DM Forum)', Zenodo, Jan. 2020. doi:10.5281/zenodo.3609516.
 - + a number of reports in danish

Reference Slides



DATA STEWARDS

competition
or
coordination?



Coordination of Data Stewardship Education in Denmark

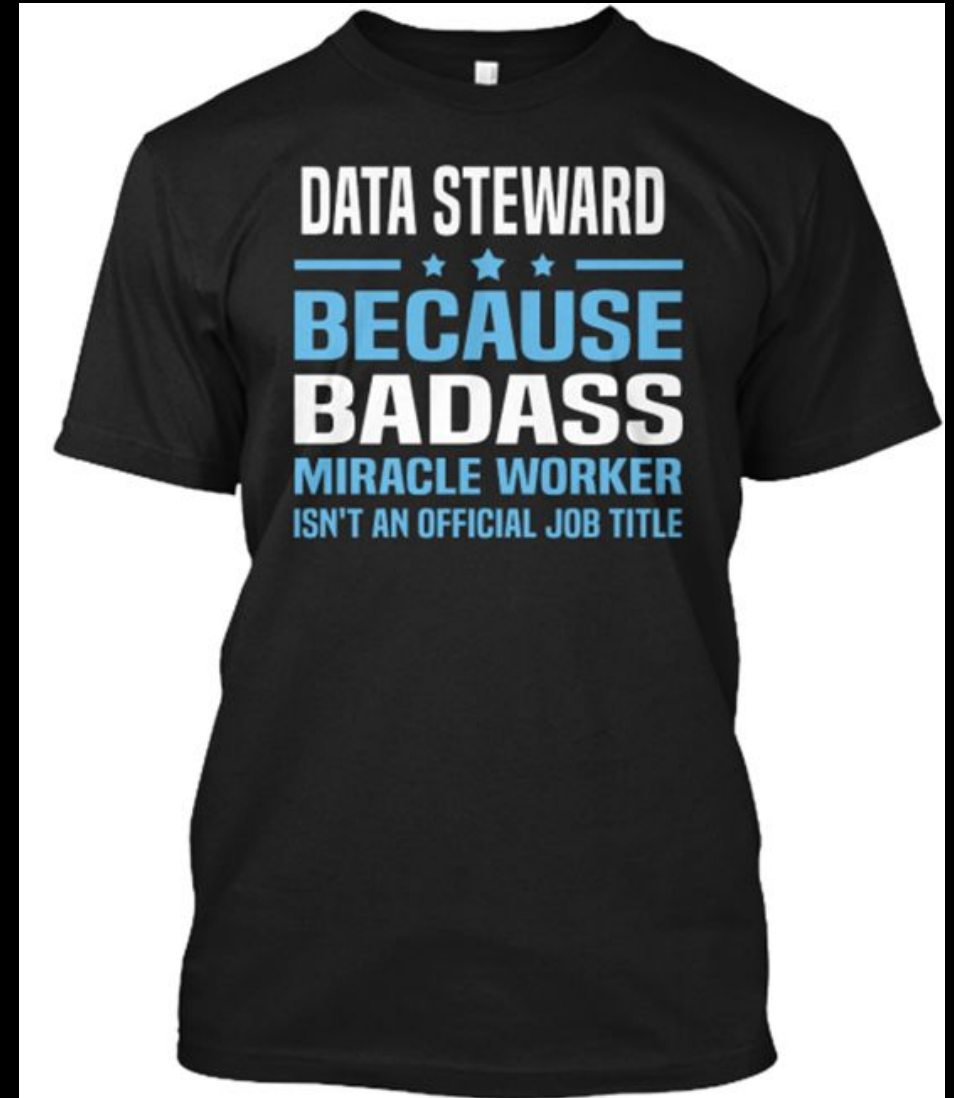
April 16 - 2020 | NPOS, Project F | NL
Michael Svendsen, Head of Research Support, Copenhagen
University Library, Royal Danish Library

[@tullemich](https://twitter.com/tullemich)

<https://bit.ly/2ToEnga>

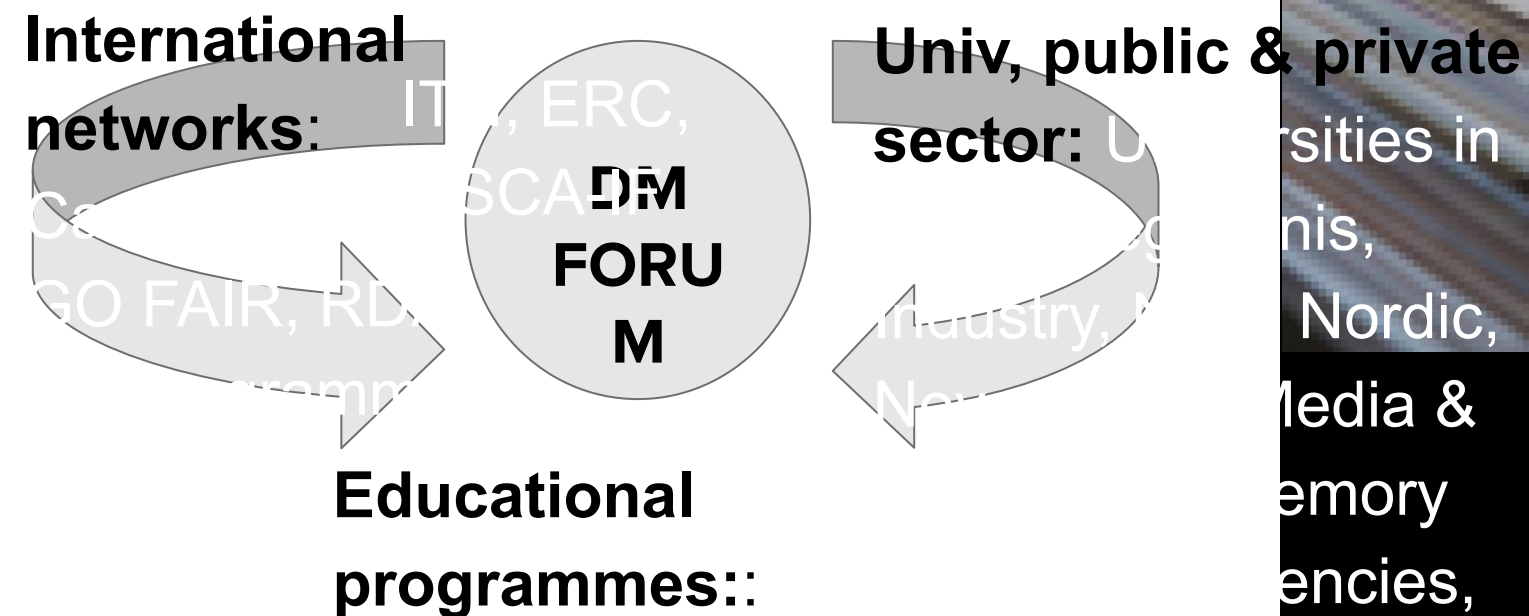


- The DS project in brief: commissioned study
- Outcome: level of demand and key competencies
- Prequalification work: new master programme in Data Stewardship
- Future focus: Network and training activities



A National Data Management Forum (DeiC) funded project

Researchers:



Participating Institution

AAU - Aalborg University

AUL/KB - Aarhus University Library

CBS - Copenhagen Business School

ITU - IT University (*observer*)

KP - University College Copenhagen (*observer*)

KUB - Copenhagen University Library (*project lead*)

SA - The National Archives

RUC - Roskilde University

SDU - University of Southern Denmark

Project period
(2019):

1. Is a national Data Steward education a feasible solution?
2. Is there a rationale in terms of benefits for a national coordinated effort?
3. Should the development of Data Steward education in Denmark be in collaboration or competition between universities and businesses?
4. How to ensure recommendations in the study address the demand side both in the private and public sector?

DATA STEWARDS

competition
or
coordination?

Methods & Data



1: Review of existing DS educations & certifications



2: Job profiles of DS in Denmark



3: Analysis of job vacancies



4: National survey & interviews

GROUP 1, the Administrator

Job Vacancies	LinkedIn Hard Skills	LinkedIn Soft Skills
business	data	project
management	system	communication
global	sap	innovative
team	business	team
develop	customer	professional
information	marketing	solutions
organization	data steward	positive
reporting	user	player
system	sales	business
security	product	colleagues
support	analysis	performance
solutions	implementation	importance
implementation	reporting	analytical
compliance	data quality	developing
relevant	database	making
customer	sql	great
risk	architecture	extra
requirements	information	data
financial	management	execution

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Topic modeling of text corpus
from the LinkedIn and job
vacancies vocabulary

→ to discover hidden thematic
structures of our text corpora

GROUP 1, the Administrator

<i>Job Vacancies</i>	<i>LinkedIn Hard Skills</i>	<i>LinkedIn Soft Skills</i>
business	data	project
management	system	communication
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develop	customer	professional
information	marketing	solutions
organization	data steward	positive
reporting	user	player
system	sales	business
security	product	colleagues
support	analysis	performance
solutions	implementation	importance
implementation	reporting	analytical
compliance	data quality	developing
relevant	database	making
customer	sql	great
risk	architecture	extra
requirements	information	data
financial	management	execution

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GROUP 2, the Analyst

<i>Job Vacancies</i>	<i>LinkedIn Hard Skills</i>	<i>LinkedIn Soft Skills</i>
data	processes	communication
data quality	sap	management
business	management	training
team	customer	customer
support	develop	structured
customer	business	tool
data steward	marketing	important
description	masterdata	collaboration
system	product	outgoing
knowledge	reporting	solutions
international	data quality	professional
monitoring	user	simple
analytical	maintenance	various
reporting	governance	tasks
ensuring	architecture	focus
projects	change	understanding
finance	ensuring	procedures
tools	reports	extra
activities	tableau	user
compliance	microsoft	innovative

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GROUP 3, the Developer

Job Vacancies	LinkedIn Hard Skills	LinkedIn Soft Skills
data	data	project
business	develop	team
data quality	system	tasks
team	masterdata	management
customer	management	important
data steward	super (user)	close
requirements	processes	structured
quality	customer	training
management	data steward	player
support	sales	procedures
information	support	life
system	project	time
standards	manager	performance
develop	product	human
data_management	implementation	challenge
processes	analysis	games
issues	global	create
knowledge	data management	seek
analysis	data quality	knowledge

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Method:

August 2019, survey validated & sent to universities, libraries, companies and NGOs.

Snowballing approach.

Software: SurveyXact

Survey closed: September 19th

Respondents:

329 opened survey

62 partial answers

84 complete answers

86% from public organisations

14% private organisations

56% from employed at universities





Employed VS. non-employed at University

SURVEY

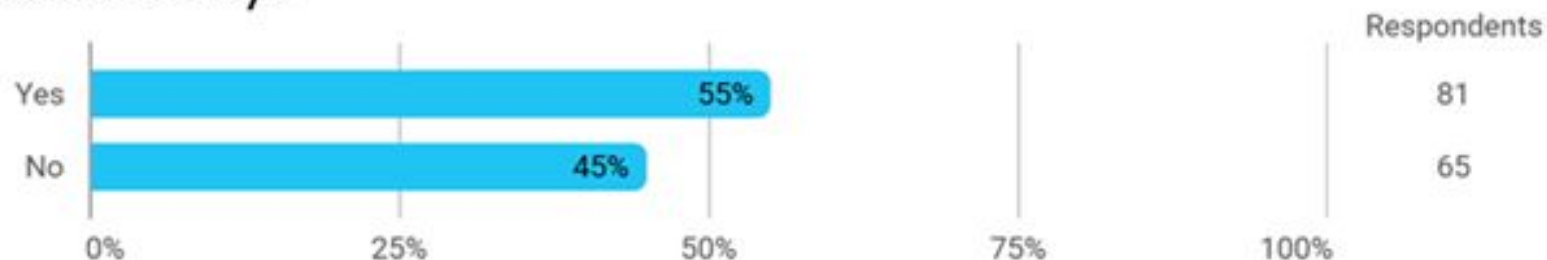
for developing a
Data Stewardship
education in Denmark

DeiC

DM FORUM

Danish National Forum for
Research Data Management

Are you employed at a university?



Not employed
at a University

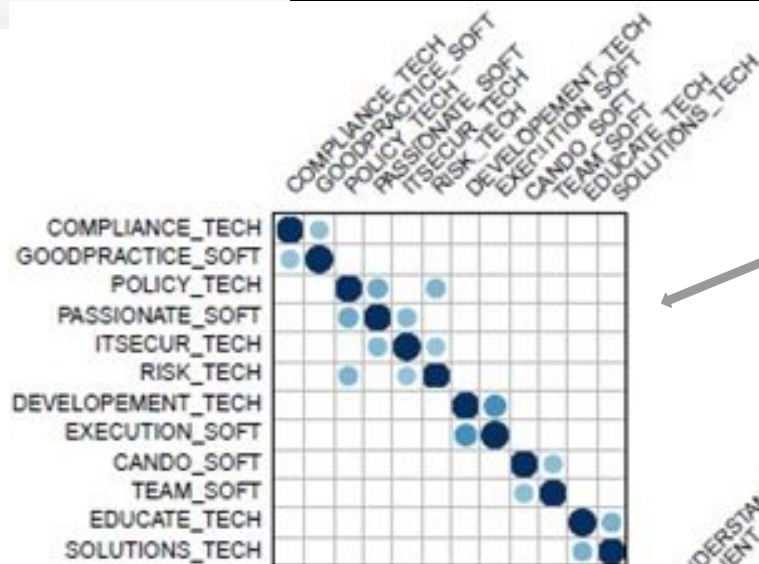
3 confirmed roles + 1
new identified to
survey questionnaire
and interviews

Agent of
Change?
*Client oriented
and*

*understanding
of processes
and operations*

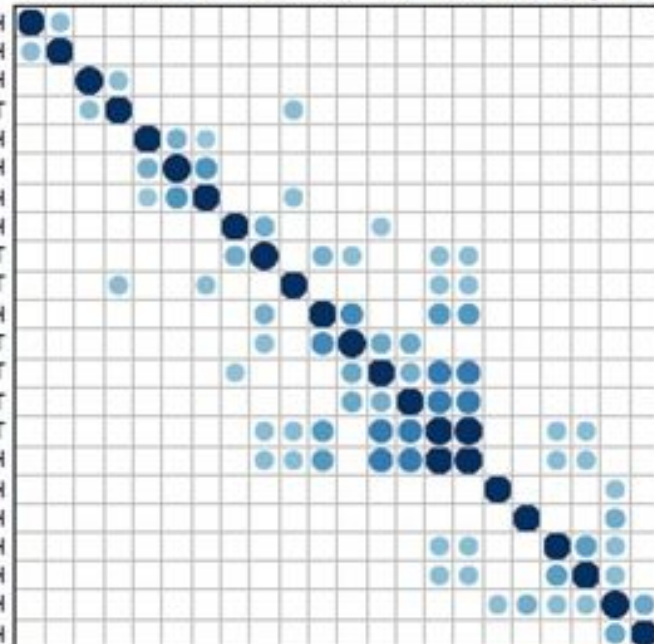
Combination of **Analyst** and
Developer

*Fast learner, innovative who Builds
custom SW, seeks Challenges with*



UNDERSTANDING_Tech
CLIENT_SOFT

DP_Tech
FAIR_Tech
BI_Tech
COLLAB_SOFT
PROCEDURES_Tech
OPTIMIZATION_Tech
PM_Tech
CLOUD_Tech
ENTHUSIAST_SOFT
MULTITASK_SOFT
REPORT_Tech
POSITIVE_SOFT
CHALLENGE_SOFT
INNOVATIVE_SOFT
FAST_SOFT
SW_Tech
DQ_Tech
DB_Tech
DS_Tech
PROGRAM_Tech
ANALYSIS_Tech
STATISTICS_Tech



Administrator:
*Execution of strategic
development,
passionate about
policy w. strategy
awareness & risk
assessments*

Analys
t?

Develop
r?

Administrat
or?

Agent of
Change?

Employed at
a University

0 standard deviation (no
correlation):

Expertise and
Business Intelligence

NAT-SCI
TECH
HEALTH

Employed at a University

0 standard deviation (no correlation):

Project Management,
Strategic Development,
Optimization of Processes,
Change Management,
SW development

HUMANITIES
SOC-SCI

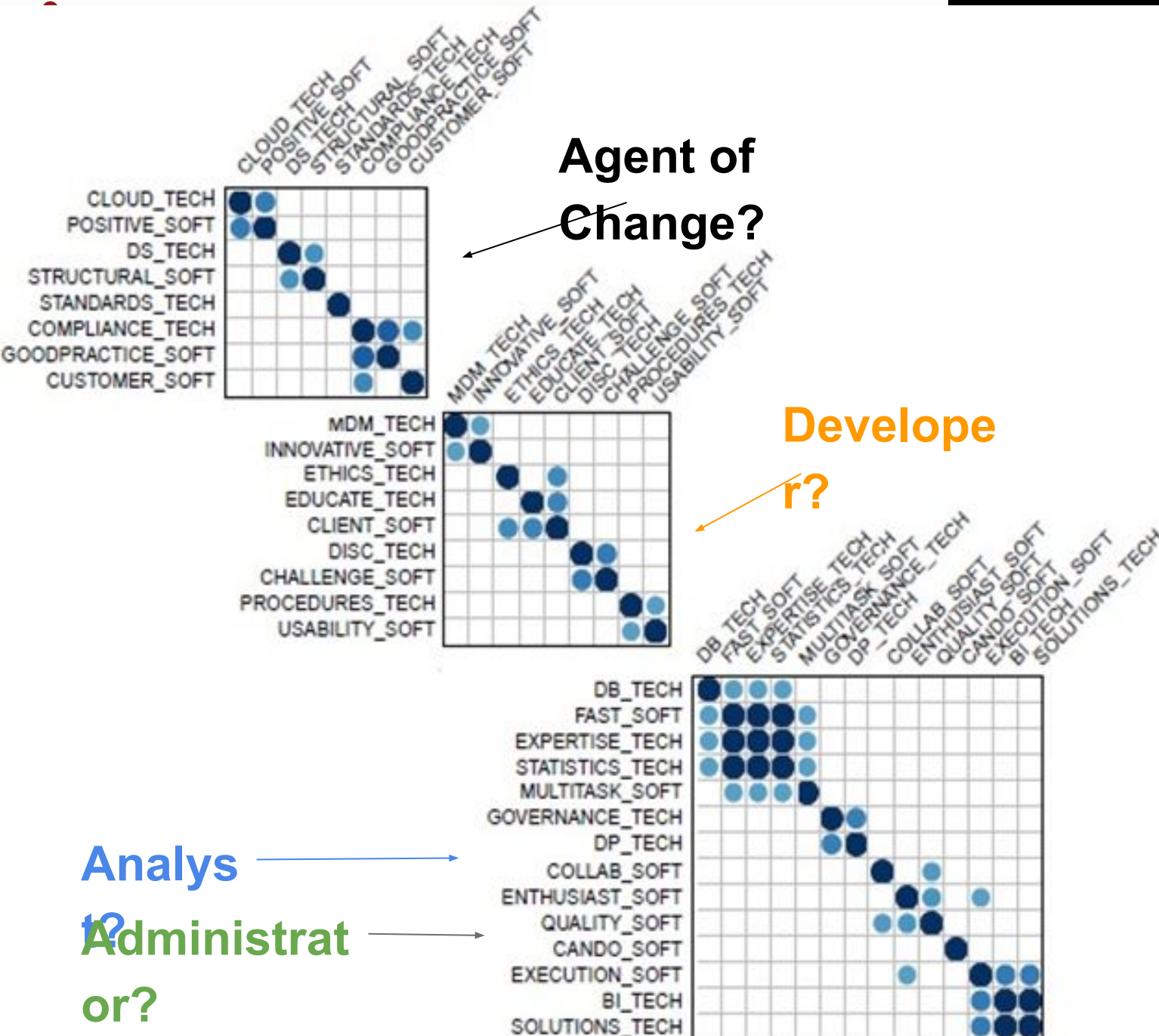
Agent of
Change?

Develope

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Analys

Administrat
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Ethics expert?

ETHICS_TECH
CANDO_SOFT

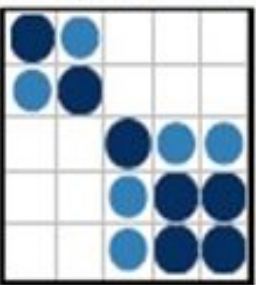


ETHICS TECH
CANDO_SOFT

CHALLENGE_SOFT
AGILE_SOFT
INNOVATIVE_SOFT
OPTIMIZATION_TECH
PASSIONATE_SOFT

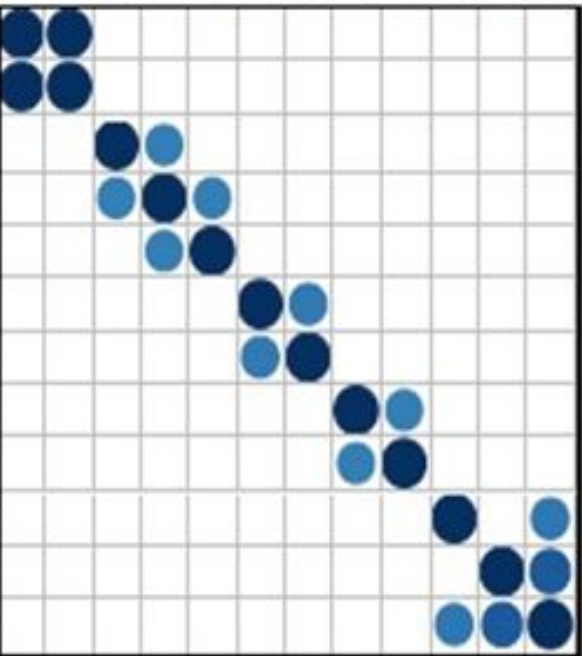
Administrat
or?

CLOUD_TECH
RISK_TECH
UNDERSTANDING_TECH
FAST_SOFT
CHALLENGE_SOFT



OPTIMIZATION_TECH
PASSIONATE_SOFT
CHANGE_TECH
PROGRAM_TECH
MDM_TECH
ANALYSIS_TECH
DS_TECH
DM_TECH
GDPR_TECH
GOODPRACTICE_SOFT
COMPLIANCE_TECH
TEAM_SOFT

OPTIMIZATION_TECH
PASSIONATE_SOFT
CHANGE_TECH
PROGRAM_TECH
MDM_TECH
ANALYSIS_TECH
DS_TECH
DM_TECH
GDPR_TECH
GOODPRACTICE_SOFT
COMPLIANCE_TECH
TEAM_SOFT



Analys

Develop
r?

Employed at a University

0 standard deviation (no correlation):

Focus on Execution, Project Management, Strategic Development, Statistics, Multitasking, Enthusiasm, Positive Attitude, Reporting, Implementing Solutions, SW development

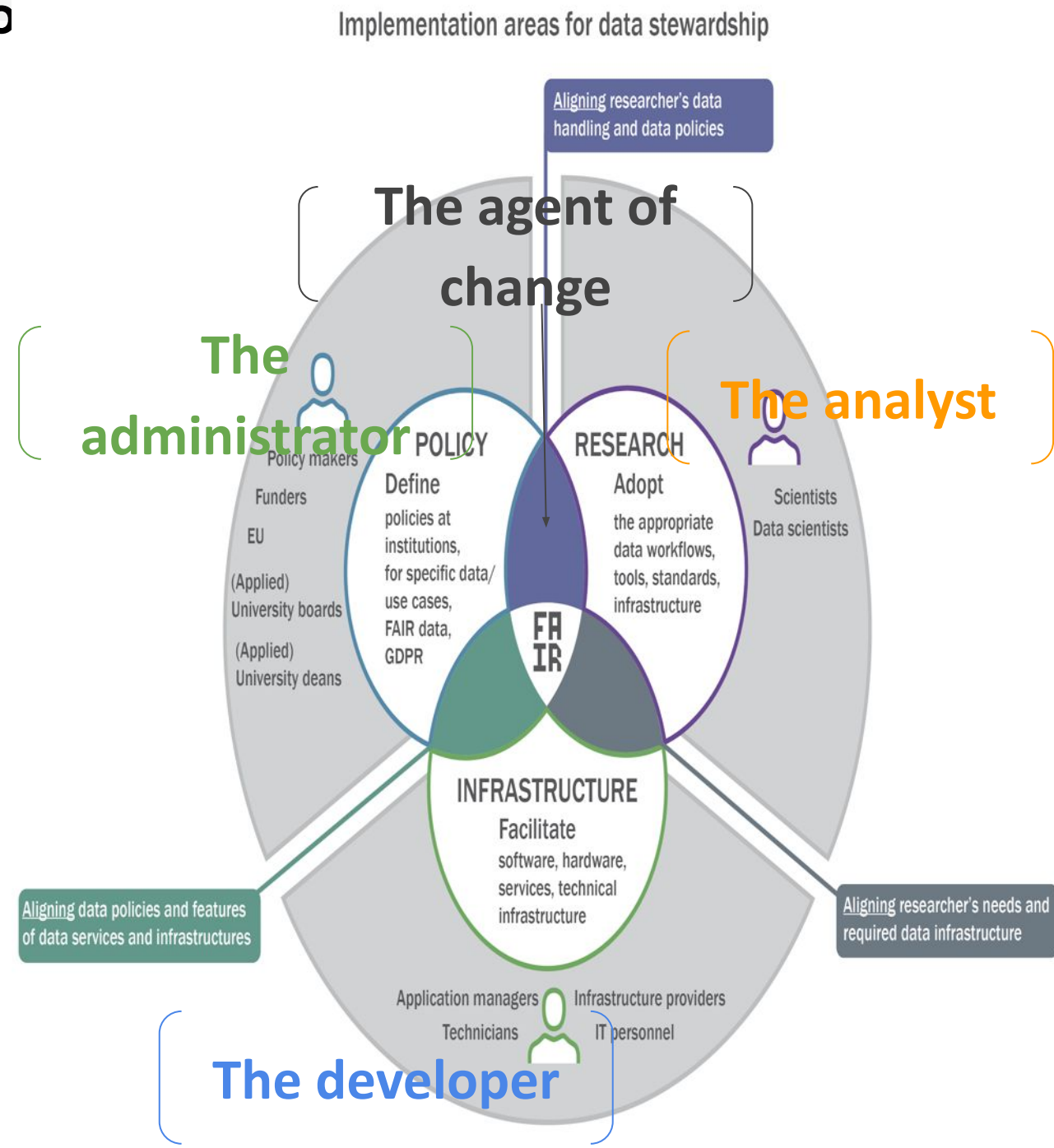
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4 competency groups identified in job profiles
LinkedIn (hard+soft skills) + job vacancies combined

The administrator, focused on business intelligence solutions and data-service support, providing management with KPI's

The analyst, focused on data quality, customer support and crunching data for the industry or doing research for the university.

The developer, project oriented, emphasizing on data management, procedures and testing with technical and analytical skills

The agent of change, client, customer oriented, process & operations mediator, implementation of solutions via project + change management, execution of policy and strategy



The 4 roles of a Data Steward

The 4 roles of a Data Steward



THE ADMINISTRATOR

- Team player
- Can-do attitude
- Implement solutions and educating end-users about them
- Focus on execution in strategic development
- Structured and analytical mindset
- Passion for policy and IT security
- Establish good practices in compliance & data privacy
- Risk assessments
- Fast learner



THE ANALYST

- Programmer
- Statistical & data analyst
- Fast learner and innovative on building custom software and databases
- Ensure data quality
- Enthusiasm in cloud solutions
- Seek challenges, have positive attitude towards reporting



THE DEVELOPER

- Process optimization via good project management
- FAIR principles advisor
- Data planner
- Focus on collaboration and knowledge sharing to raise business intelligence
- Innovative
- Develop procedures & guidelines



THE AGENT OF CHANGE

- Client & customer oriented
- Mediate processes & operations
- Passionate to implement solutions via project & change management
- User empathy
- Focus on execution of policy and strategy awareness
- Agile mindset
- Enthusiastic

47% know term Data Steward
52% unfamiliar

“so many of the terms are still completely interchangeable or incomprehensible to me.

I actually think this might be your biggest challenge to get this project flying....Finding a common language.”

“We use the term 'Data Steward' to refer to the lead of University academics responsible for generating the research data.”
DM FORUM, Project Lead, First Supervisor in the case of PhD students.”

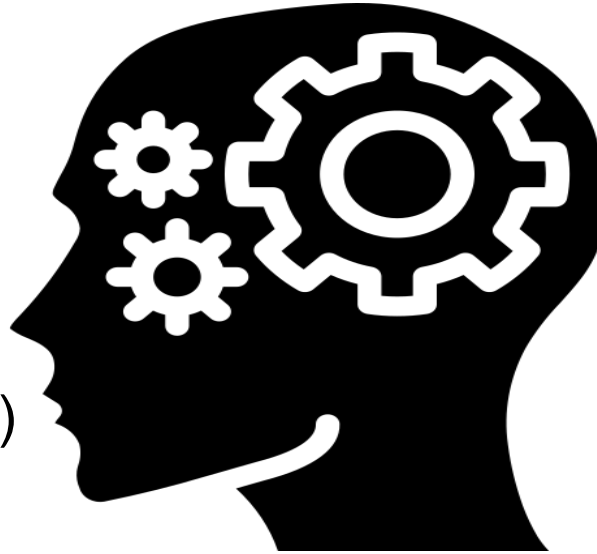
SO, WHAT IS A DATA ST

Preferred term	n
Don't know	37
Data manager	29
DPO	13
Data Steward	10
Data librarian	6
Information Management Specialist	4
Arkivar / Digitaliseringskonsulent	3
Data scientist	2
Dataansvarlig	2
IT specialists	2
Records manager	2
Consultant	2
Colleague	2
Administrative medarbejdere - IT	2
Project managers/ dept. coordinators	2
Business intelligence analyst	1
Data Engineers	1
Data handler	1
Data koordinator (coordinator)	1
Data specialists	1
Data/system owners	1
Datadisciple	1
IT Risk Management	1
IT-koordinator	1
Systemansvarlig or digitaliseringskonsulent	1
Projektmedarbejder	1
Research Data Officer	1
Research supporter	1

Most frequent DS concepts and skills

University

Don't know (28%)
Data Manager (25%)
Data Steward (10%)
Not a position, teamwork (10%)
Data Protection Officer (6%)



Tech skills: DM, GDPR, FAIR

Soft skills: Usability, user oriented, good practices

Not University

DPO (20%)
Don't know (15%)
Data Manager (14%)
IT, Administrative (13%)
Librarian/information spec (10%)

Tech skills: DM, GDPR, Compliance & privacy

Soft skills: Good practices, Quality, Customer/user support



DATA STEWARDS

competition
or
coordination?

1. Collaboration between academia and industry result in relevant educations and improve the student's employability.

2. Course design should support the competencies of a DS as an:

Administrator, Analyst and/or Developer, Agent of Change?

3. Data Stewards work in a multitude of positions, therefore:

- skills and competencies must not be limited to technical proficiency and hard skills alone
- must be supported with “soft skills” like the ability to assess:

the value of DS to communicate, teach, have disciplinary knowledge and the ability to teamwork and project manage are requirements for curricula development.



DATA STEWARDS

competition
or
coordination?

4. Education & competence development support 4 DS roles:

Administrator, Analyst, Developer, Agent of Change

including the Dutch recommendations highlighting focus areas of: **Policy, research & infrastructure** with functions of Data Stewards as: **Embedded, Generic, Policy**

5. Clearly defined concepts

6. Develop experiential pedagogies: New and innovative educational structures in collaboration with local/national stakeholders

7. Align a common national approach to University education

8. Form a national Data steward network – in order to coordinate DS training & knowledge sharing

Recommendations for DS education prequalification

The 3 models for Data Stewardship Education

Students with BACHELOR degree

Directed corporate employment

- *One-year master programme*
For students who fulfill requirements to basic programming skills, study skills, subject knowledge and academic language level.
- *Two year master programme*
For students who do not meet the requirement for programming and study skills follow a *pre-master's year before the master's* and then continue with the one-year master.
- *Two-year candidatus*
Traditional university candidatus combining theory, methods and internships. A dissertation in the area of DS is required.

Students with a PH.D. or equivalent

Directed corporate or academic employment

For PhDs from any field at university faculties or part of research teams in industry. Educational programmes are a collaborative endeavor between faculties, library or knowledge centers, Centers for Information Security, Data Steward Community, Research coordinators, Project PI's, System Developers, Communication and Teaching teams, the Graduate School (for PhD training) & Human Research Ethics Committees.

- *Requirements:* Short courses, workshops, mentorships, online modules, summer school programmes & MOOCs, that immerse the student in the DS Community.

VET-students (Vocational Education & Training)

Directed corporate or academic employment

Flexible master programme

- For students who have professional experience and wish to improve their DS skills but keep working full-time, or already have a master's degree in any field.
- The programme is a part-time vocational education with a prescribed period of study, that the student individually plans, and a total of 60 ECTS-points.
- The student combines elements from established programmes, thus it is a requirement that DS courses, such as the one year master and two year candidatus, are available through the Open University.

Made-up personas: illustration of potential candidates

Zander V. Carlsen*

"Conversations around data stewardship are happening at my workplace, but must be given more urgency."

Age: 40.

Family: Father of 3, married.

Private: Enjoys building robots in his garage with his three sons. Volunteers at the local library at a programming club for children aged 7-14.

Education: Bachelor degree as Biomedical equipment technician from his home country of England in 2001.

Personality: Curious - Extrovert - A natural teacher.

DS roles Zander already can fill:

Analyst	✓	Developer	✓
Administrator	✗	Agent of Change	✗

Frustrations: Zander's expertise is in instrument and equipment making. In his current position he produces one-off, bespoke equipment for medical research. In his job as a Lab Technician, Zander assists researchers in developing innovative equipment using his knowledge and experience of instrumentation developments. He feels he can optimize research workflows in his organisation by combining his ability as a teacher with his software and innovation skills. However, he admits he doesn't know enough about policies and the administrative side of data management to confidently act in an advisory position for researchers or mediate position between researchers and the organisation.

Goals:

- Change culture in data management.
- Ensure compliance.
- Provide a single point of contact.
- Share knowledge and experience.

Ambition: As a busy family man with financial responsibilities, he only has the economic freedom to take a short-term education. He is looking for an education that fits with his family and work-life and is tempted by the **one year master programme in data stewardship** offering a deeper knowledge on management of data and policy compliance. His employer has agreed to give him up to one years study leave and he is eligible for benefits from his A-Kasse.

Jesper L. Andersen*

"I read an article that all the major companies in Greater Copenhagen have a need for data stewards."

Age: 21.

Family: Single.

Private: Plays handball in a local team and has run his first Nordic Race (obstacle course racing).

Education: Attending his fourth semester at a bachelor (BSc) in data science at IT University of Copenhagen.

Personality: Structured - Outgoing - Keeps things simple - Fast learner.

DS roles Jesper already can fill:

Analyst	✗	Developer	✗
Administrator	✗	Agent of Change	✗

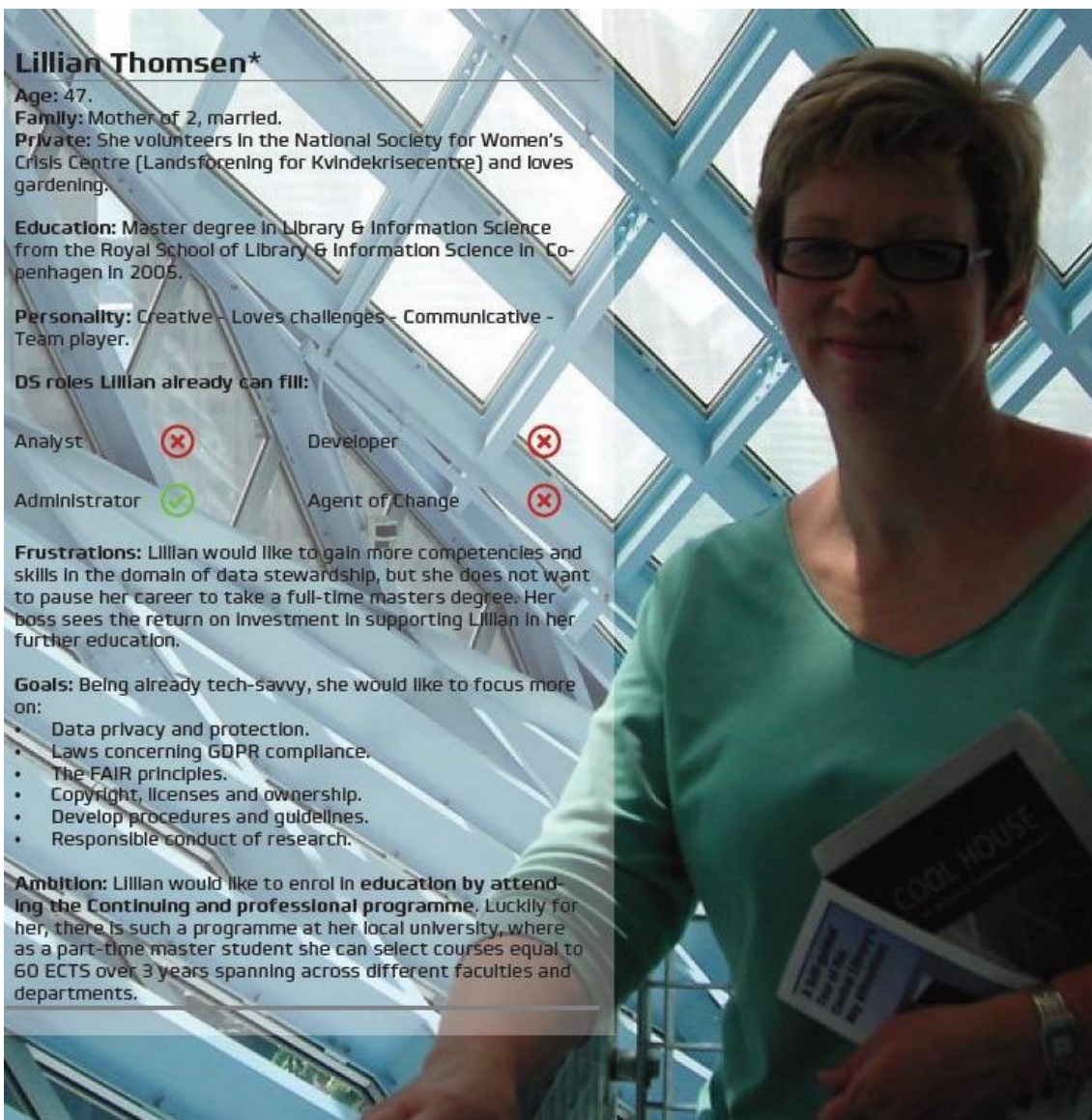
Frustrations: Even though Jesper's degree equips him with skills and knowledge that are in high demand across both the private and the public sector, the competition is increasing dramatically. Jesper wants to differentiate his profile and focus exclusively on business intelligence in the financial sector.

Goals:

- Be able to ensure data quality.
- Become skilled on building custom software and databases.
- Enhance his programming skills in statistical and data analysis.

Ambition: Jesper wants to be able to assess the quality of shared enterprise datasets, ensure accurate and consistent data across the enterprise and understand the business value of data. He would like to grab that chance and become a DS himself, so he is already considering to build on top of his bachelor with a **two year full-time master degree in data stewardship (Candidatus)**. Currently, he is trying to get a data stewardship internship at one of these companies that would assist him greatly in clarifying his future steps.

Made-up personas: illustration of potential candidates



Lillian Thomsen*

Age: 47.
Family: Mother of 2, married.
Private: She volunteers in the National Society for Women's Crisis Centre (Landsforening for Kvindekrisecentre) and loves gardening.

Education: Master degree in Library & Information Science from the Royal School of Library & Information Science in Copenhagen in 2005.

Personality: Creative - Loves challenges - Communicative - Team player.

DS roles Lillian already can fill:

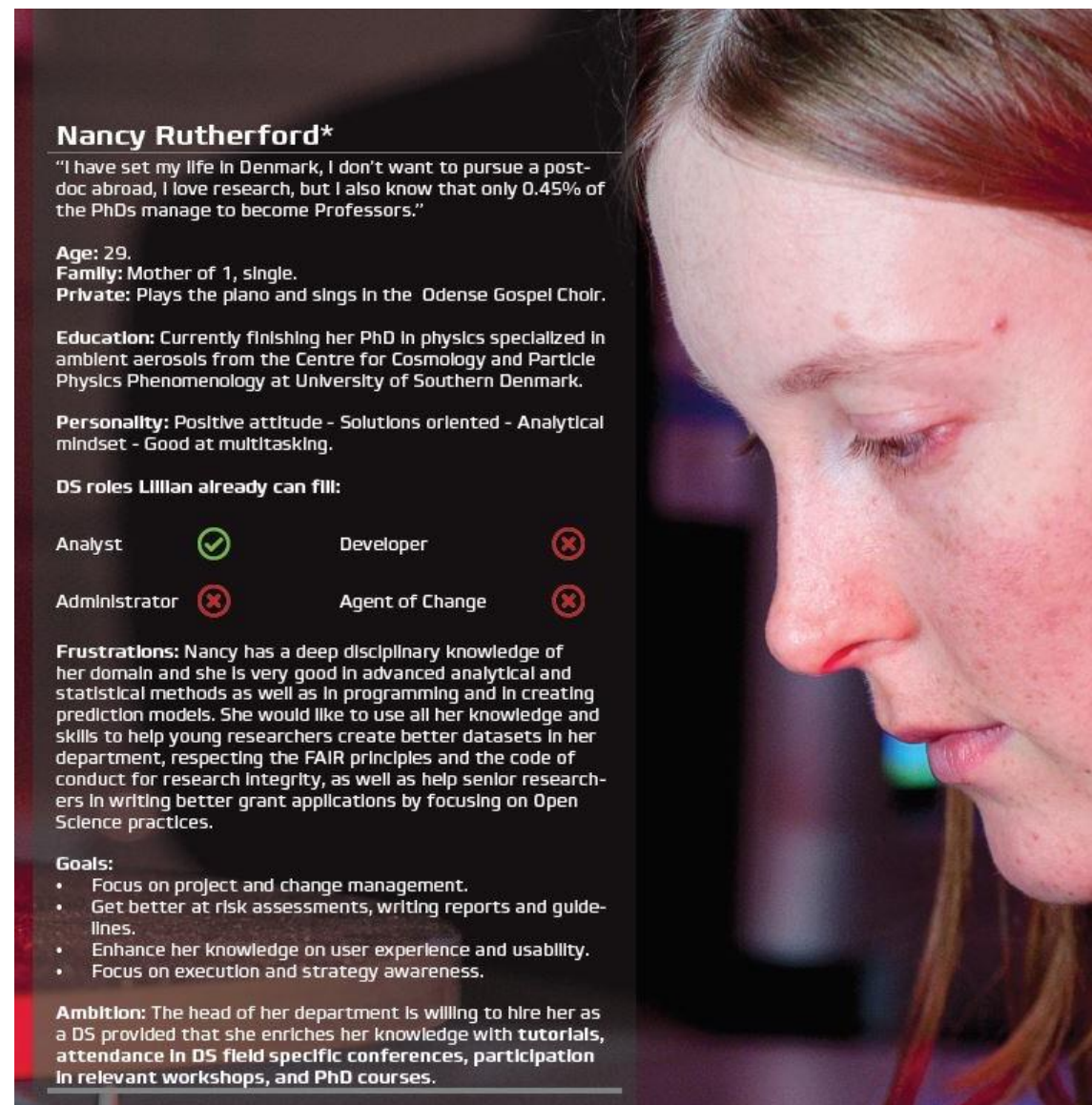
Analyst	✗	Developer	✗
Administrator	✓	Agent of Change	✗

Frustrations: Lillian would like to gain more competencies and skills in the domain of data stewardship, but she does not want to pause her career to take a full-time masters degree. Her boss sees the return on investment in supporting Lillian in her further education.

Goals: Being already tech-savvy, she would like to focus more on:

- Data privacy and protection.
- Laws concerning GDPR compliance.
- The FAIR principles.
- Copyright, licenses and ownership.
- Develop procedures and guidelines.
- Responsible conduct of research.

Ambition: Lillian would like to enrol in education by attending the Continuing and professional programme. Luckily for her, there is such a programme at her local university, where as a part-time master student she can select courses equal to 60 ECTS over 3 years spanning across different faculties and departments.



Nancy Rutherford*

"I have set my life in Denmark, I don't want to pursue a post-doc abroad, I love research, but I also know that only 0.45% of the PhDs manage to become Professors."

Age: 29.
Family: Mother of 1, single.
Private: Plays the piano and sings in the Odense Gospel Choir.

Education: Currently finishing her PhD in physics specialized in ambient aerosols from the Centre for Cosmology and Particle Physics Phenomenology at University of Southern Denmark.

Personality: Positive attitude - Solutions oriented - Analytical mindset - Good at multitasking.

DS roles Lillian already can fill:

Analyst	✓	Developer	✗
Administrator	✗	Agent of Change	✗

Frustrations: Nancy has a deep disciplinary knowledge of her domain and she is very good in advanced analytical and statistical methods as well as in programming and in creating prediction models. She would like to use all her knowledge and skills to help young researchers create better datasets in her department, respecting the FAIR principles and the code of conduct for research integrity, as well as help senior researchers in writing better grant applications by focusing on Open Science practices.

Goals:

- Focus on project and change management.
- Get better at risk assessments, writing reports and guidelines.
- Enhance her knowledge on user experience and usability.
- Focus on execution and strategy awareness.

Ambition: The head of her department is willing to hire her as a DS provided that she enriches her knowledge with tutorials, attendance in DS field specific conferences, participation in relevant workshops, and PhD courses.

- Collaboration between academia and industry result in relevant educations that have a stronger recognition in stakeholder communities, including potential employers, thus improving the student's employability.
- Course design based on experiential learning creates motivation and presents the student with real-life requirements to data stewardship.
- DS work in a multitude of contexts, primarily functioning as bridge between different stakeholders.
- Skills and competencies must not be limited to technical proficiency alone. Hard skills such as coding, software and system knowledge must be supported with Soft skills like the ability to communicate, teach, and assess the value of DS.
- Disciplinary knowledge, teamwork and project management are requirements for curricula.
- Certification should be renewed regularly and further education should be offered to ensure skill maintenance.

DATA STEWARDS

competition
or
coordination?



Royal Danish Library have joined **working group at UCPH**: Planning & designing a Data Steward Education - through pre-qualifiaction (launch Autumn 2021)

Drafting a **library specific training module** in the DS programme: 7,5 ECTS

Continuation of the project:

Carpentries involvement (2020-); Participation in GO-FAIR IN: DSCC; RDA WG + IG; EOSC WG: Training & Skills; EOSC Nordic (H2020), DelC/NeIC nordic collaboration + networking and training events and exploration of potential exchange programmes (European level)



Projects, training & networking activities

Data Steward Education (UCPH), 1Y Master, 60 ECTS

Suggested distribution

- Data modeling and management inc. HPC, metadata, archiving etc (2-3 courses)
7,5 - 15 ECTS
- Legal and ethical issues with DM, FAIR, GDPR & Research Integrity (2-3 courses)
7,5 - 15 ECTS
- Characteristics of domain specific data (1-2 courses)
7,5 - 15 ECTS
- Final project
15 ECTS



Prequalification in cross
faculty working group
organised by the
Department of
Computer Science

<https://di.ku.dk/english/>

Data Science Training for Librarians (DST4L)

3-day workshops (2015-2016)

Bash, Shell (command line operations)

OpenRefine (cleaning of data)

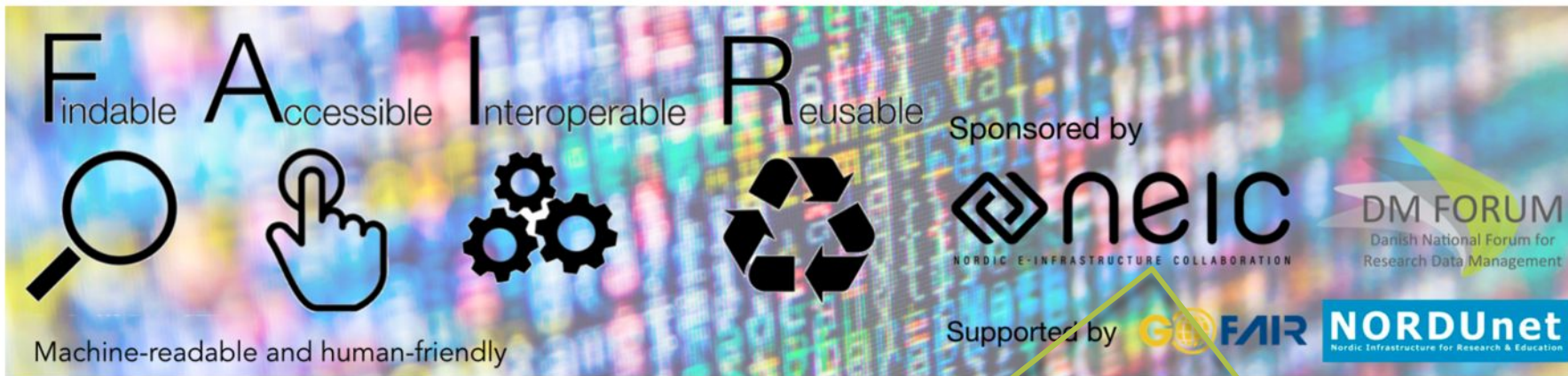
Git, Github (versioning control, collaboration)

R & Python, Jupyter Notebooks (simple coding and Markdown)

Tableau, Plotly (DataViz)

Networking and learning together (community building)





FAIR data stewardship: Supporting FAIR data interoperability

Welcome to the second Nordic course on "FAIR data stewardship". This course is organised and subsidised jointly by the Danish National Forum for Research Data Management and NeIC.

This is a fully fledged 5-day training event which will provide the much needed foundational skills for competent data stewards and data managers in the Nordic countries with knowledge of the FAIR principles and their application. The course will be held by two trainers from FAIR and provides a broad but fairly technical introduction to data stewardship. Go [HERE](#) for more info about the course content. Registration will be limited to max 35 persons and the course is subsidised by NeIC and DM-Forum for Nordic + EE participants. Early registrations (until 1 Oct) are priced NOK 6750,-, while standard registration is NOK 8500,- (only for Nordic+Estonian participants). Non-Nordic participants are not subsidised and pay NOK 6750,-.

Registration form

First Name *

Last name *

TRAINING

[View entries](#)

Prices

- Early registration - NOK 6 750,00
- Standard registration - NOK 8 500,00

Schedule

Start date: 18.11.2019 09:00
End date: 22.11.2019 17:00
Register by: 09.11.2019 00:00
[Add to calendar](#)

Place

Nordunet as
Kastruplundgade 22
D-2770
Kastrup

Contact person for the event

Andreas O Jaunsen
+47 99598800

<https://www.deic.dk/da/fair-data-stewardship-kursus>





CODE REFINERY

Training and e-Infrastructure for Research Software Development [↗](#)

We are working with students, researchers, Research Software Engineers from all disciplines and national e-infrastructure partners to advance FAIRness of Software management and development practices so that research groups can collaboratively develop, review, discuss, test, share and reuse their codes.

Check out our [upcoming events and workshops](#)



Training opportunities

We offer training opportunities to researchers from Nordic research groups and projects to learn basic-to-advanced research computing skills and become confident in using state-of-the-art tools and practices from modern collaborative software engineering.

[More >](#)



Lesson materials

We develop and maintain training material on software best practices for researchers that already write code. Our material addresses all academic disciplines and tries to be as programming language-independent as possible.

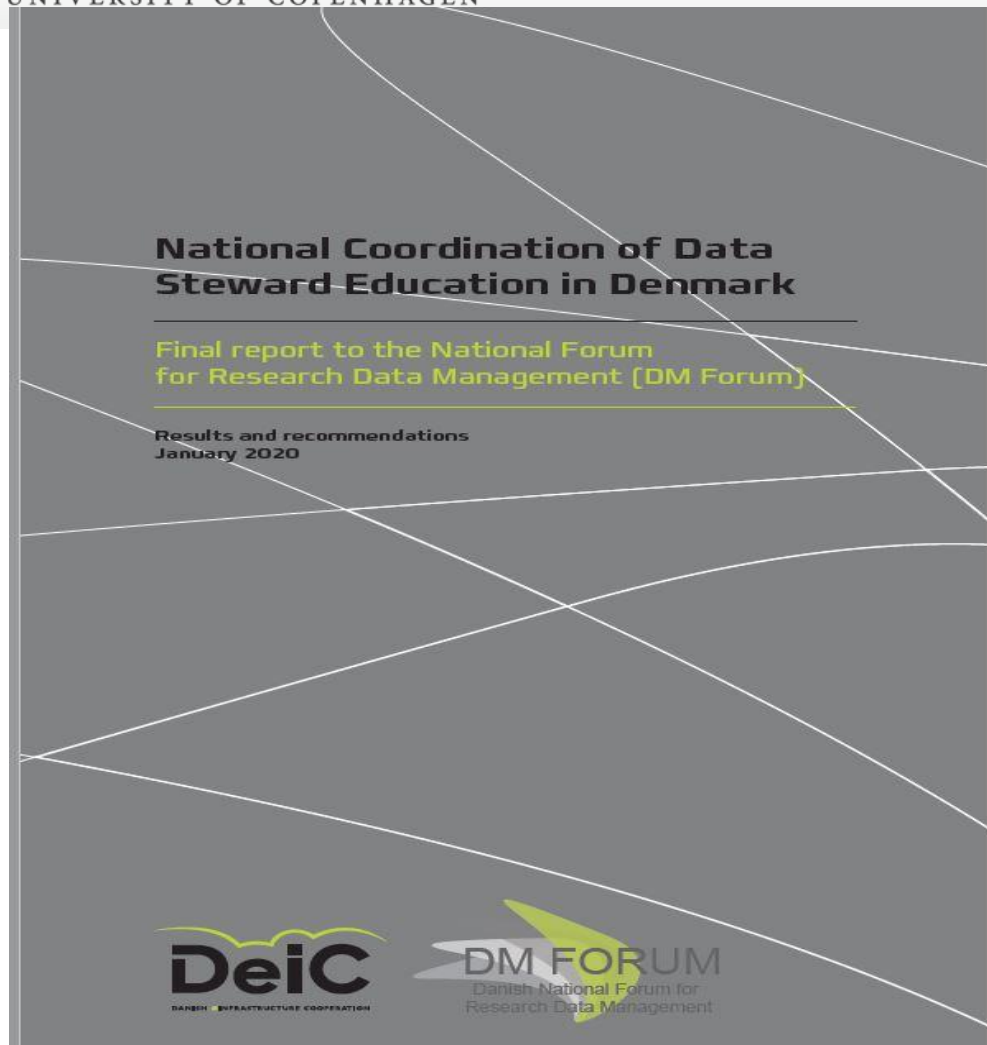
[More >](#)



Code Repository Hosting

Our code repository hosting service is open and free for all researchers based in Nordic universities and research institutes. Please contact us if you would like to use these services.

[More >](#)



<https://www.zenodo.org/communities/ds-edu-dk>

Wildgaard, LE, Vlachos, E, Nondal, L, Larsen, AV & Svendsen, M 2020, National Coordination of Data Steward Education in Denmark: Final report to the National Forum for Research Data Management (DM Forum). 1 udg, Danish e-Infrastructure Cooperation.
<https://doi.org/10.5281/zenodo.3609516>





Data Steward Education: Coordination or competition?

Data Stewards to the rescue, please!

A data what? Preliminary investigations into the role and qualifications of Data Stewards



National Coordination of Data Steward Education in Denmark



<https://doi.org/10.5281/zenodo.3629191>