WELCOME

SESSION 3

SPONSORED BY

FAIR DATA STEWARDSHIP AWARENESS COURSE

FAIR DATASTEWARDSHIP: A NEW PROFESSION

PHORTOS CONSULTANTS

GO FAIR foundation

THE EMERGING DEMAND FOR HIGH QUALITY FAIR SERVICES

FAIR DATA STEWARD: A NEW PROFESSION

THE DATA PROBLEM IN RESEARCH AND INNOVATION

- Most data do not TALK to each other
- Data are lost and/or hard to find
- Constrains scaling of effective knowledge discovery
- Limits the delivery of a fully effective discovery and R&D

- 20% links to supplementary data ‘rot away’ (annually)
- 80% of data is lost forever
- 60% of what is literature can not be found by machines
- Only 12% of NIH funded datasets are deposited in recognized repositories
- Approximately 50% of funded research not reproducible

CAPACITY CHALLENGE FAIR DATA STEWARDS

- Ever growing Big Data Tsunami requires skill sets beyond today's computer science education

- Need for education programs for professional Data Stewards

  - EC: 1.7M scientists and 70-100M professionals in S&T need 500,000 linked data stewards (based on conservatively assuming 10M data-producers and 1 data-steward per 20 data 'generators').

  - USA: "The United States of America faces a shortage of 140,000 to 190,000 with analytical expertise and 1.5M managers and analysts with the skills to understand and make decisions based on the analysis of Big Data" (Source McKinsey Global Institute, 2011)

JUST AN IMPRESSION OF HOW BIG THIS MARKET IS

- €2B for initial phase EOSC
- Total EU plus USA 86,5 B for Data Stewardship (DS) annually
- EU (28 member states)
  - GDP 52,000 B
  - 2.4 % of GDP to R&D = 1,248 B
  - @ 5% = 62 B for DS
- The Netherlands
  - GDP 818 B
  - 1,973% of GDP to R&D = 16B
  - @ 5% = 800M for DS

(Source OECD)

EXAMPLES OF ORGANIZATIONS IN THE PROCESS OF GOING FAIR

- Many organizations (20+) have participated in FAIR BYODs and trainings
- Several academic institutions and funders have started or are considering GO FAIR Readiness programs
- Several companies have started or are considering the GO FAIR Readiness program

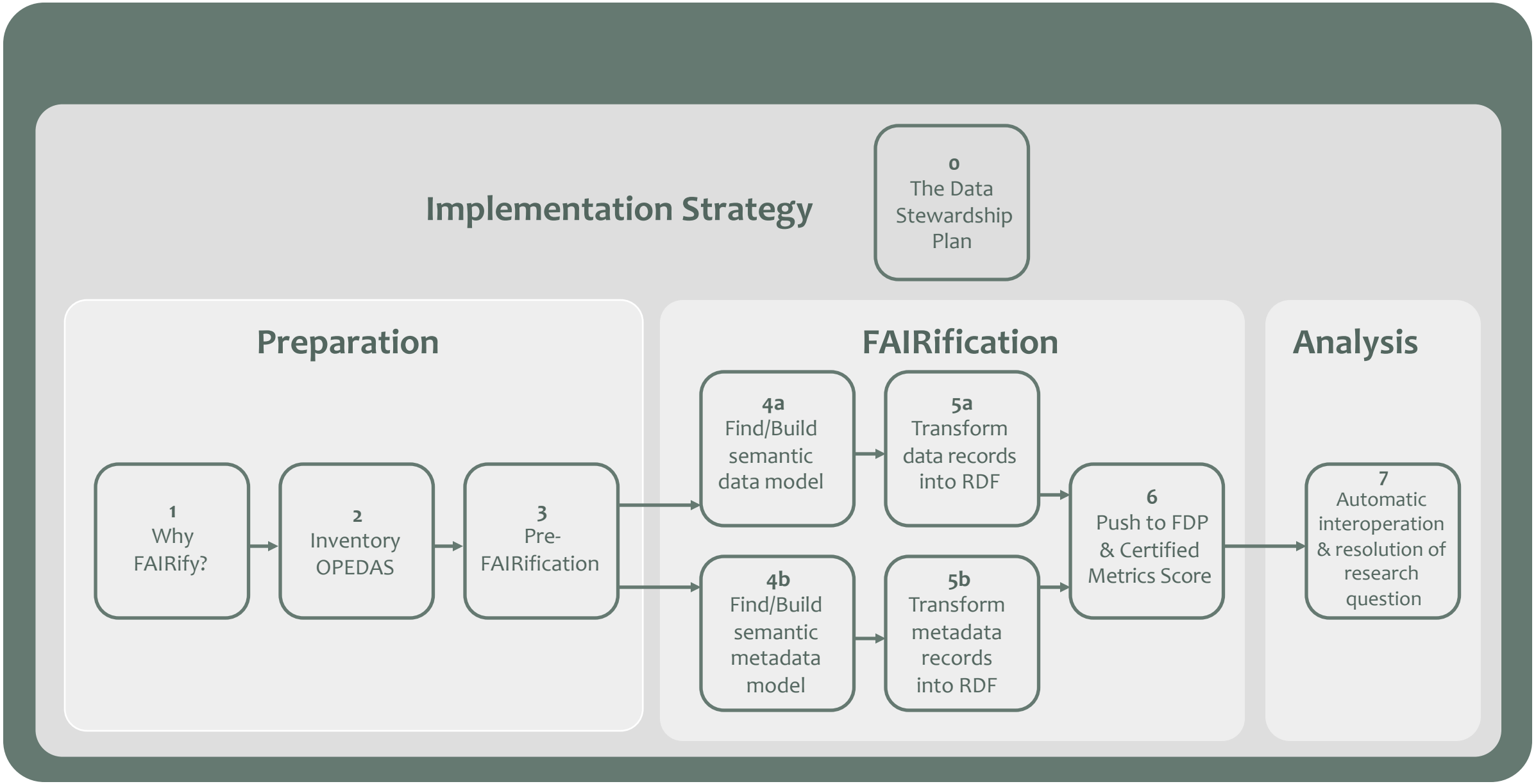
FAIR DATA STEWARDSHIP: NO LONGER WHY BUT HOW

THE CAPACITY CHALLENGE

CAPACITY CHALLENGE FAIR DATA STEWARDS

- Only a few *small size companies/institutions* (globally) with sufficient knowledge to:
  - Train FAIR Data Stewards
  - Make data FAIR
  - Create FAIR tooling
  - Assist with FAIR Data Stewardship Plans
  - Assist organizations/companies to GO FAIR
- This means an *enormous* economic activity and *lots* of new jobs

THE 7 CANONICAL STEPS OF FAIRIFICATION



FAIR DATA SUITE OF TOOLS

Plan → Create → Publish → Find → Measure

PROBLEM (WITH ALL DUE RESPECT)
ALL TOOLS ARE CURRENTLY *PROFESSORWARE*

THE FAIR SERVICE PROVIDER CONSORTIUM

FROM PROFESSORWARE TO PROFESSIONAL WARE

THE GO FAIR FOUNDATION

- **Founded** February 2018
- **Goal:** Legal entity to support the GO FAIR Initiative towards implementation
- **Image:** Advisory, non-competitive, non-profit
- **Focus:** Broker function for early market initiatives: Grant proposals, Pilots, Training, Hackathons, etc.
  - **Certification:**
    - Professional FAIR Data Stewards
    - Datasets
    - Tooling
    - Service Providers
    - Organisations/companies

THE INITIATIVE

- The GO FAIR Foundation in collaboration with Phortos Consultants, a DTL partner, has taken the initiative to approach candidates for the GO FAIR Service Provider Consortium

GO FAIR SERVICE PROVIDER PARTNERS CONSORTIUM: covering the full spectrum of FAIR Data and Services

Purple Polar Bears

Software development

micelio

DTL partner

Data Quality

EURETOS

FAIRification and Analysis

PHORTOS CONSULTANTS

DTL partner

Consulting and training

mobiquity

Digital Engagement

GO FAIR foundation

Certification and Coordination

thehyve

DTL partner

Software development and consulting

castor

DTL partner

FAIR data at the source

AND GROWING

ELSEVIER

FAIR data publishing

GO FAIR SERVICE PROVIDER PARTNERS CONSORTIUM ADHERE TO

- The GO FAIR Rules of Engagement
- The GO FAIR Vision
- The GO FAIR Readiness Program approach (interim)
- The GO FAIR Certification rules (soon to come)
  - The GO FAIR Implementation choices
  - The GO FAIR FAIR Data Stewardship approach
  - The GO FAIR training and tooling approach

SPEAKING WITH ONE VOICE

THE GO FAIR SERVICES PROVIDER CONSORTIUM'S OFFERINGS

FAIR Data Consulting and Services

- FAIR Readiness Requirements studies
- FAIR Data Stewardship Planning
- FAIRification services
- Semantic and Ontology Modeling
- Analytics based upon integration of FAIR public and proprietary data
- FAIR Readiness training courses (off-site or on-site)
- FAIR Metrics Evaluation

AND MORE

FAIR Value Events

- Demonstrates Value by answering driving research question making one of your datasets FAIR
- 6 weekly conference calls (one hour) in prep
- 2-day on site event: Bring Your Own Data (BYOD) and FAIR Metrics evaluation

FAIR Readiness Implementation and Vision Plan of Approach

- An introduction to GOing FAIR for organizations
- A 3 to 6-month implementation process including training and use cases

THE GO FAIR SERVICES PROVIDER CONSORTIUM'S TRAININGS OFFERING

FAIR TRAINING COURSES (on-site or off-site)

- FAIR Awareness (one day)
- FAIR Data Stewardship (4 days; prerequisite Level 1)
- FAIR Ontology and Data modeling (4 days; prerequisite Level 1)
- FAIR Data & Services (4 days; prerequisite Level 1)
  - Operators: FAIR data processing
  - Engineers: FAIR tooling and apps

THE GO FAIR READINESS IMPLEMENTATION PROGRAM

A 6 month project to make an organization GO FAIR Ready

- Blueprint plan of approach including business case and design of the organization
- Project initiation: clear roadmap for implementation
- Project execution: Set up governance; set up structures for frontrunners working on (3) use cases
- Involve relevant stakeholder from the beginning to show value
- National and international engagement and collaboration

Stakeholder driven implementation and safeguarding knowledge

THE 'PRODUCT' DEVELOPMENT PROCESS

Modelathon	Toolathon	Datathon
Existing/ New model	Existing/ New tools	Legacy data De Novo data
Review	Review	Review
(Re) model	(Re) build	(meta) data model
Simulate / apply	Use case / apply	FAIRify
Use for analysis	Test with users	Use for analysis
Freeze & Deposit	Freeze & Deposit	Publish as FDP

FACILITATING REPOSITORY

MODELS

- Ontology models
- Semantic
  - metadata models
  - data models

TOOLS

DSW Data Stewardship Wizard

FAIRIFIER

FAIR DATA POINT

FAIR DATA

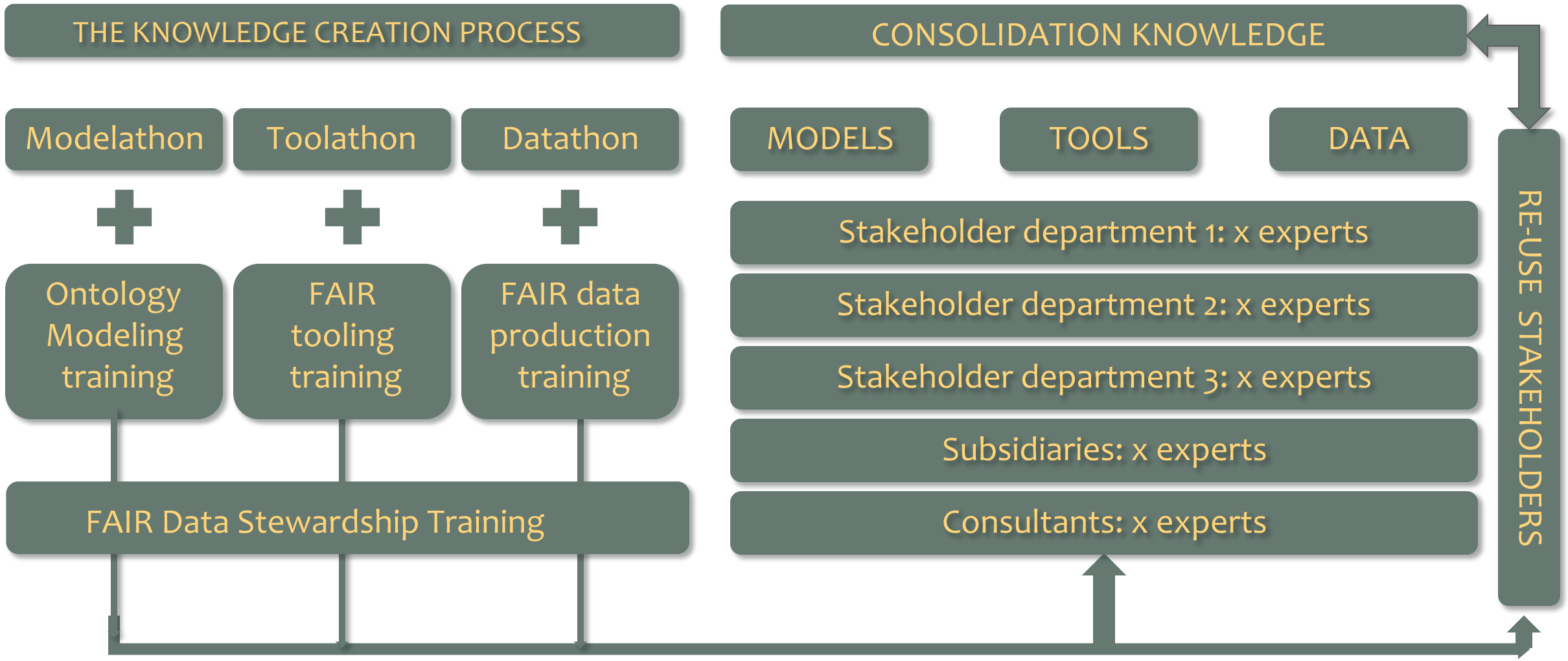
FAIR Metrics Evaluator
Quantitative | Reproducible | Objective

DATA

AVAILABLE AS ONLINE PROFESSIONAL SERVICES

RE-USE OTHER STAKEHOLRDERS

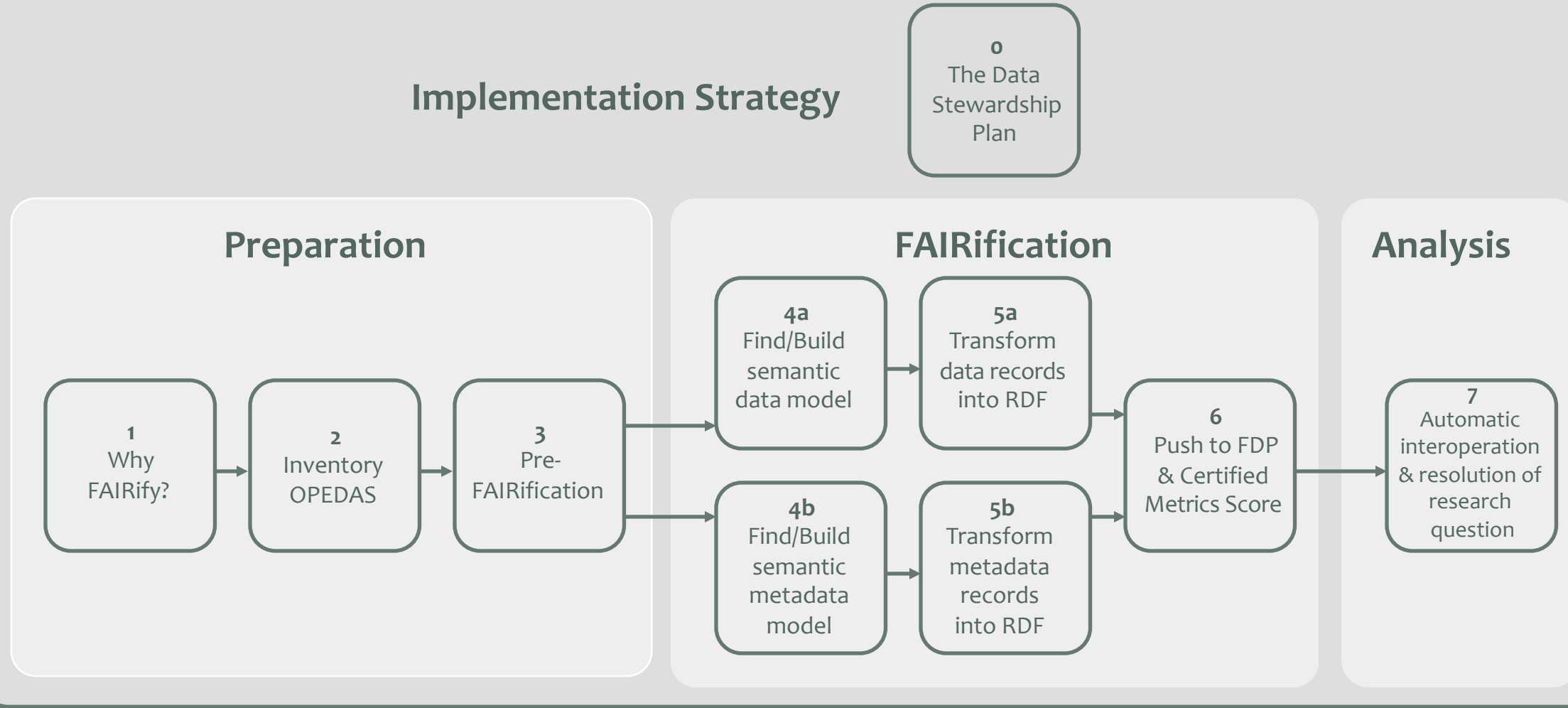
SAFEGUARDING KNOWLEDGE



FAIR DATA STEWARDSHIP: SUPPORTING FAIR DATA INTEROPERABILITY

FAIR DATASTEWARDSHIP: SUPPORTING FAIR DATA INTEROPERABILITY

THE 7 CANONICAL STEPS OF FAIRIFICATION



FAIR DATA STEWARDSHIP: SUPPORTING FAIR DATA INTEROPERABILITY

DAY 1

Trainers

GO FAIR: an introduction

- ✓ Introduction and purpose of course
- ✓ The need for FAIR data
- ✓ The history of the FAIR initiative
- ✓ The internet of FAIR Data and Services

An introduction to FAIR Data Stewardship

- ✓ What is FAIR Data Stewardship
- ✓ The purpose and goals
- ✓ The FAIR Principles and Metrics

Erik Schultes
Albert Mons

Lunch

FAIR Data Stewardship: a new profession

- ✓ The need for high quality FAIR services
- ✓ Elements of a FAIR Data Stewardship Department
- ✓ Roles in a FAIR Data Stewardship Department
- ✓ A FAIR Readiness Implementation Program

Practicing FAIR Data

- ✓ The FAIR Principles explained
- ✓ The FAIR Metrics applied
- ✓ The FAIR Community Challenges discussed
- ✓ Resources for FAIR Data Stewards

Erik Schultes
Albert Mons

FAIR DATA STEWARDSHIP: SUPPORTING FAIR DATA INTEROPERABILITY

DAY 2

Trainer

Introduction to Semantic Data Modeling and Ontologies

- ✓ What is semantic interoperability
- ✓ How can it improve the current data situation
- ✓ Ontological principles
- ✓ Ontologies are computer-actionable artefacts

Luiz Bonino

Lunch

Introduction to Semantic Web and Linked Data

- ✓ The Semantic Web
- ✓ Linked Data
- ✓ Unique Identifiers
- ✓ The FAIR principles explained
- ✓ For each Principle what are the required actions

Luiz Bonino

FAIR DATA STEWARDSHIP: SUPPORTING FAIR DATA INTEROPERABILITY

DAY 3

Trainers

FAIRification Process - DATA

- ✓ Where will the data "live" (repository)? Considerations for GUPIDs for the FAIR data
- ✓ Consider semantic models for the sample dataset
- ✓ Consider "core" ontological frameworks (e.g. SIO, DCAT)
- ✓ Apply semantic model to data elements
- ✓ Custom scripts to achieve data record transformation to FAIR Data
- ✓ "Push" into the selected repository for data and metadata) = machine-readable knowledge graph

Mark Wilkinson/ Luiz Bonino

Lunch

FAIRification process

- ✓ Open Refine FAIRifier tool
- ✓ Sculpting and cleaning data
- ✓ Export data without custom scripting

Mark Wilkinson/ Luiz Bonino

FAIR DATA STEWARDSHIP: SUPPORTING FAIR DATA INTEROPERABILITY

DAY 4

Trainers

FAIRification process - METADATA

- ✓ The purpose of metadata
- ✓ What should be included to be FAIR
- ✓ Meta data structures (FAIR Accessors and LDP containers)
- ✓ Introduction to the FDP
- ✓ Create a FAIR metadata record by scripting
- ✓ Push into a FAIR metadata repository

Mark Wilkinson/ Luiz Bonino

Lunch

The FDP in practice

- ✓ Create FDP record for the data set published on Day 3
- ✓ Explore the FDP (interface and SPARQL)
- ✓ Are we FAIR yet: discuss measuring FAIRness
- ✓ The FAIR metrics
- ✓ Metric Evaluator (prototype)
- ✓ Evaluate published data / metadata

Mark Wilkinson/ Luiz Bonino

FAIR DATA STEWARDSHIP: SUPPORTING FAIR DATA INTEROPERABILITY

DAY 5

Trainers

Answering driving questions: the real power of FAIR data

- ✓ Query federation
- ✓ More SPARQL if needed
- ✓ Through a search or analysis demonstrate value
- ✓ Discussion: what did we achieve?
- ✓ Professional Analytics Tool: an example
  - ✓ The Euretos AI Platform

Mark Wilkinson/ Albert Mons

Lunch

Practical Application and next steps

- ✓ Scenarios and Plan of Action for follow up
- ✓ Institutional FAIR Data Stewardship
- ✓ Plans for Train-the-trainers

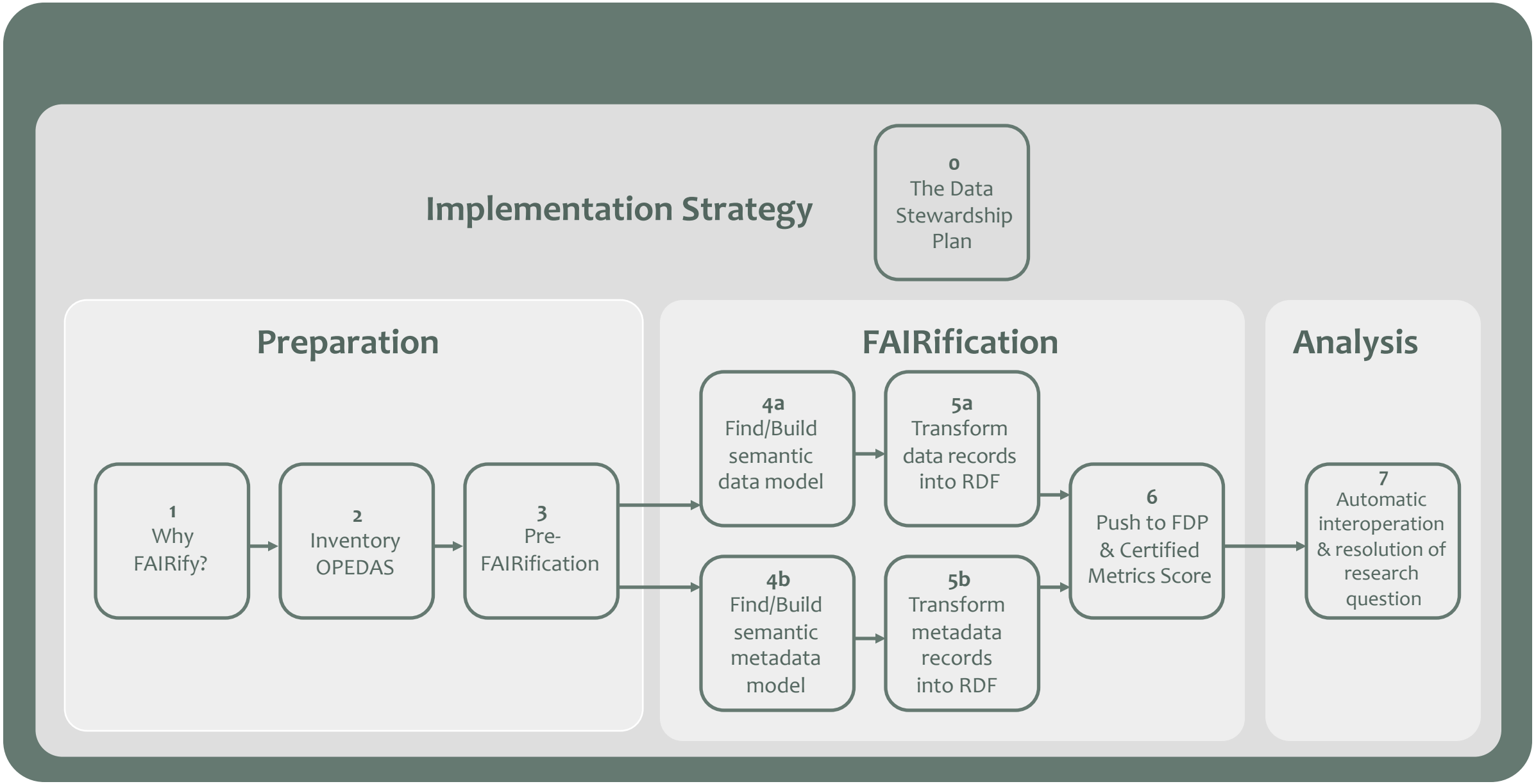
Erik Schultes Albert Mons

AN ONTOLOGY-DRIVEN APPROACH FOR FAIR DATA INTEROPERABILITY

PHORTOS
CONSULTANTS

GO FAIR foundation

THE 7 CANONICAL STEPS OF FAIRIFICATION



AN ONTOLOGY-DRIVEN APPROACH FOR FAIR DATA INTEROPERABILITY **DAY 1**

Trainers

Introduction to FAIR Data and GO FAIR

Albert Mons

- ✓ Introduction and purpose of course
- ✓ The need for FAIR data
- ✓ The history of the FAIR initiative
- ✓ The internet of FAIR Data and Services
- ✓ Data stewardship

Lunch

Introduction to ontology-driven conceptual modeling – I

Giancarlo Guizzardi

✓ The relation between Conceptualization, Language, (Meta)Models and Ontology

Introduction to ontology-driven conceptual modeling – II

✓ The criteria for an Ontologically Well-Founded Conceptual Modeling Language

AN ONTOLOGY-DRIVEN APPROACH FOR FAIR DATA INTEROPERABILITY **DAY 2**

Trainer

Types and taxonomic structures

✓Object Type Categories and Taxonomic Structures
✓A typology of Categories of Object Types: Philosophical and Psychological

Giancarlo Guizzardi

Lunch

Types and taxonomic structures

Continued

✓Object Type Categories and Taxonomic Structures
✓Ontology Patterns for Modeling of Taxonomic Structures

Giancarlo Guizzardi

AN ONTOLOGY-DRIVEN APPROACH FOR FAIR DATA INTEROPERABILITY **DAY 3**

Trainer

Relationships and events

Giancarlo Guizzardi

- ✓ Ontological Analysis and Modeling of Relations
- ✓ A Typology of Relations
- ✓ Relationship Reification and Truthmaking Patterns
- ✓ An Ontology of Events with Applications

Lunch

From the Conceptual to the Operational Level

Giancarlo Guizzardi

- ✓ Modeling session
- ✓ Validation and Anti-Pattern Detection
- ✓ Aspects of mapping to implementation environments
- ✓ Wrap up of ontology-driven conceptual modeling

AN ONTOLOGY-DRIVEN APPROACH FOR FAIR DATA INTEROPERABILITY **DAY 4**

Trainer

Conceptual models through ontologies on the semantic webs

- ✓ Introduction to the Semantic Web
- ✓ Introduction to Linked Data

Luiz Bonino

Lunch

Conceptual models through ontologies on the semantic web

- ✓ Practical data modeling and data manipulation using the Semantic Web
- ✓ Relating linked data using ontologies

Luiz Bonino

AN ONTOLOGY-DRIVEN APPROACH FOR FAIR DATA INTEROPERABILITY **DAY 5**

Trainer

Linkable Metadata modeling

Luiz Bonino

- ✓ Hands-on:
  - ✓ Defining required metadata elements
  - ✓ Select existing vocabularies for the concepts of the metadata content
  - ✓ Create metadata records based on the defined templates

Lunch

FAIR Data Points

Luiz Bonino

- ✓ FAIR Data Point and metadata layers
- ✓ Deploying FAIR Data Point
- ✓ Populate FDP with metadata
- ✓ Link FDP metadata to the data

FAIR DATA STEWARDSHIP REQUIRES INSTITUTIONAL CHANGE

IMPLEMENTING FAIR DATA STEWARDSHIP

- Board level decision to GO FAIR
- Formulate a institution wide Data stewardship policy
- Set goals for how to become more FAIR
- Formulate an implementation program
- Determine and approve adequate budgets

FAIR DATA STEWARDSHIP FOR ORGANIZATIONS

- Implementing FAIR Data Stewardship organization-wide
- Elements of a Department of Data Stewardship
- Roles in a Department of Data Stewardship
- The FAIR Service Provider Consortium Partners
- Examples of FAIR Consortium Partners services

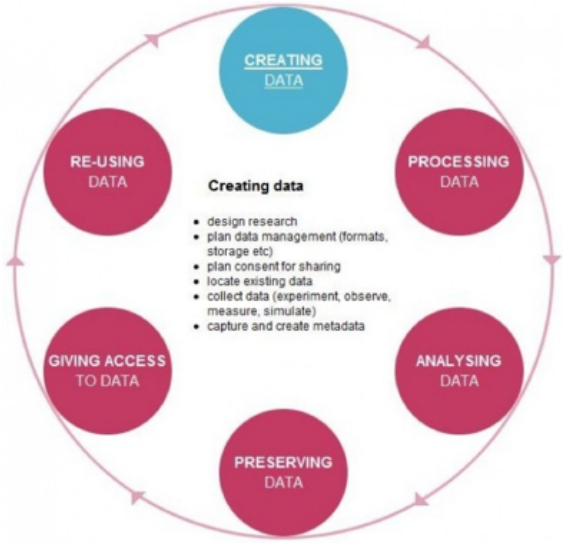
ELEMENTS OF A DEPARTMENT OF DATA STEWARDSHIP (1)

- Well embedded (thus findable and trusted) in its organization
- Well run and organized at a supra-department level (hub and spokes model).
- Formulate an institution wide Data stewardship polic,
- Overseeing all vital Data Stewardship resources
- The place to go to find Data Stewardship Experts who can support

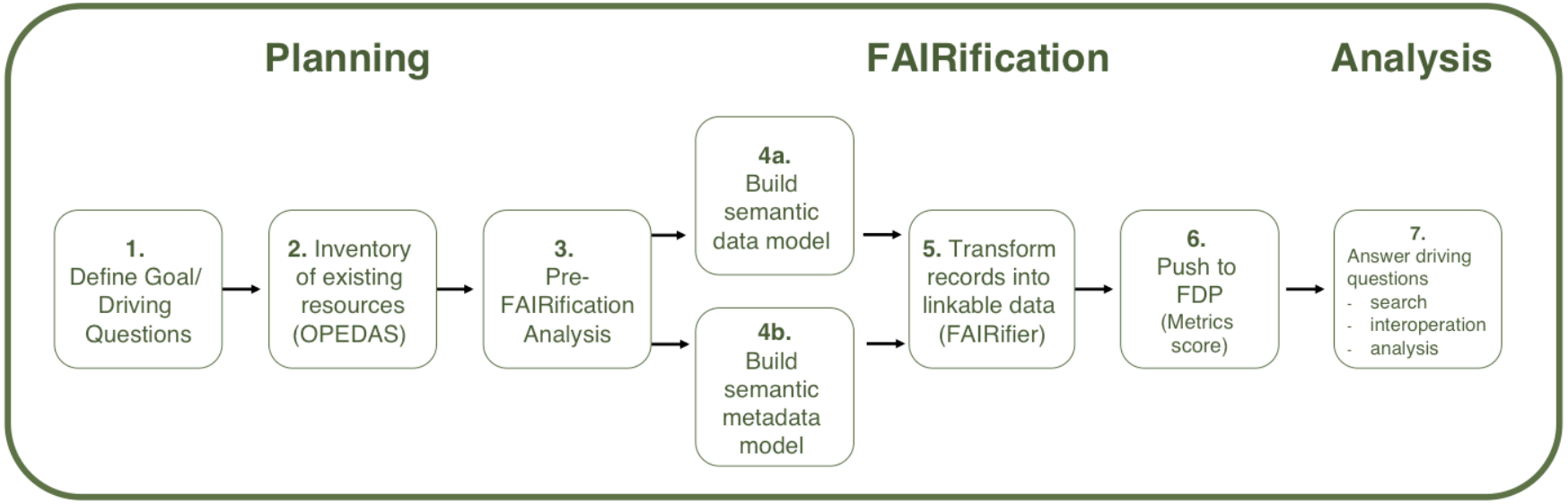
ELEMENTS OF A DEPARTMENT OF DATA STEWARDSHIP (2)

Regard Data Stewards as:

- Highly respected colleagues
  - with dedicated career tracks
- Real partners of the scientists
  - not ‘just data crunchers’.
- Involved
  - in the design of the research project
  - throughout the full research cycle.



ROLES IN A DEPARTMENT OF DATA STEWARDSHIP



- **The FAIR Program manager**
  - Oversees the end-to-end FAIR Readiness program
- **The FAIR Data Steward**
  - Oversees data `life cycles and use cases/projects
- **The FAIR Data & Services Operator/ Engineer**
  - Operates tooling and actively makes data FAIR
  - Develops tooling & apps

USE CASES

ZORGINSTITUUT NEDERLAND PILOT

(HEALTH CARE INSTITUTE OF THE NETHERLANDS)

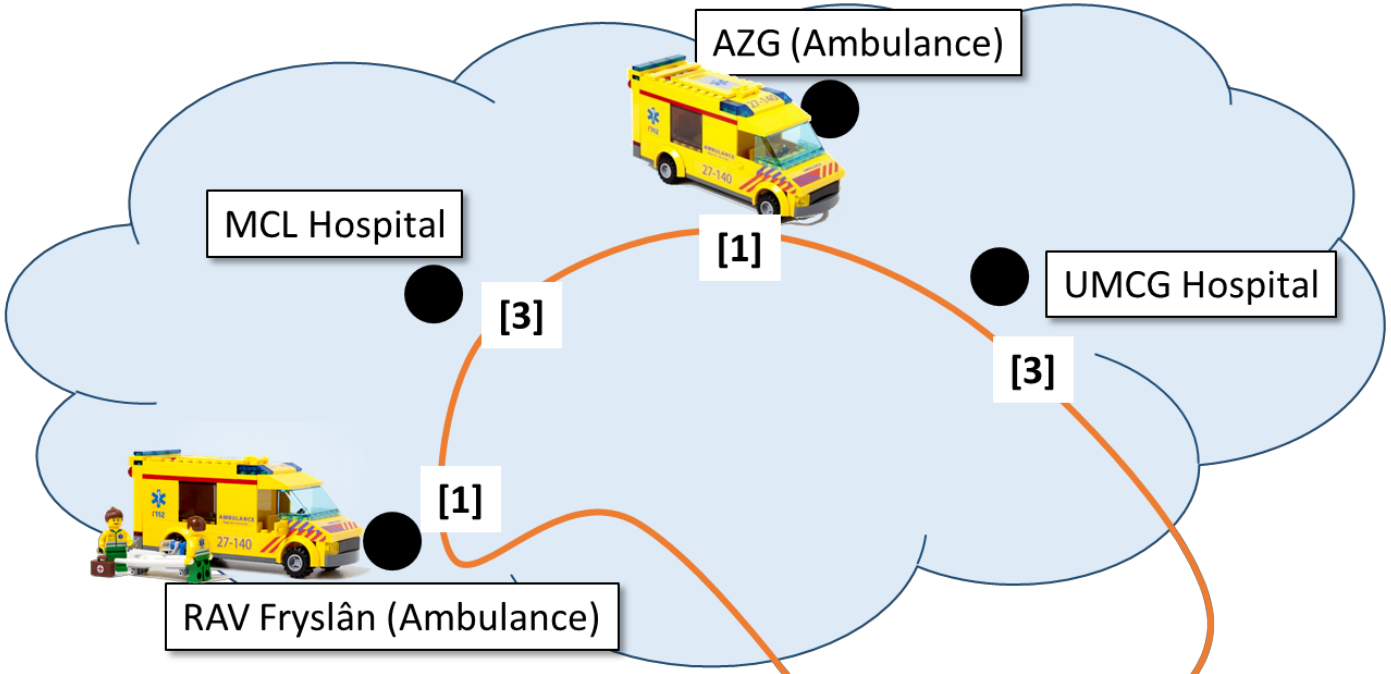
ZORG INSTITUUT NEDERLAND PILOT (HEALTH CARE INSTITUTE OF THE NETHERLANDS

Implement three use cases with the Personal Health Train.

- *Intra Arterial Trombectomy*
- Wet langdurige zorg (law on long term health care)
- FAIRification on non-structured data

INTRA ARTERIAL TROMBECTOMY PILOT

INTRA ARTERIAL TROMBECTOMY PILOT



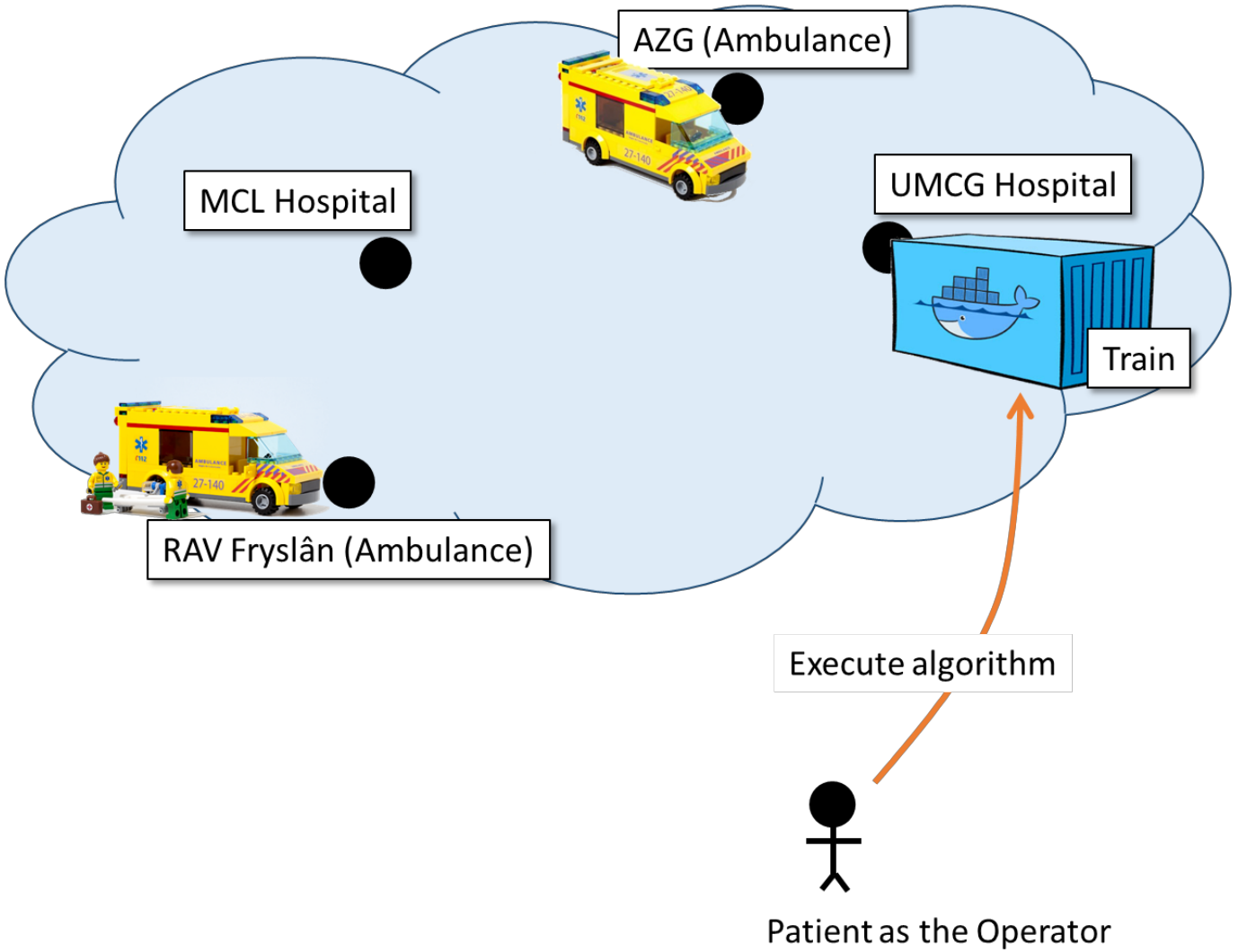
● = Data Station

Trains to ride on the railway:

1. Narrow-gauge (RESTful)
2. Standard-gauge (SPARQL)
3. Broad-gauge (Docker)

Patient as the Operator

INTRA ARTERIAL TROMBECTOMY PILOT



EXAMPLES OF FAIR CONSORTIUM PARTNERS SERVICES

EXAMPLES OF FAIR CONSORTIUM PARTNERS SERVICES

FAIR GUIDELINES ASSOCIATED SERVICES

Which services do we offer around FAIR guidelines?

We are fully aware that most data is not either FAIR or not, but can exhibit several degrees of FAIRness. At The Hyve, we try to support you in taking the right measures to reach the highest level of FAIRness.

Services primarily aimed at data owner of exisiting data

- Assessment of the FAIRness of your data.
- Identification of ways to quickly and efficiently improve the FAIRness of your data!

Services primarily aimed at researchers that plan projects

- Creation of a data management plan compliant to FAIR guidelines.
- Assistance in grant proposal preparations.

Purple Polar Bear

EXAMPLES OF FAIR CONSORTIUM PARTNERS SERVICES

THE FAIR DATA EVALUATOR FOR DIGITAL RESOURCES

PROTOTYPE IN TESTING

FAIR Metrics Evaluator

Quantitative | Reproducible | Objective

Ready to Use

Run the manual or semi-automated FAIR Metrics & discover how FAIR your data currently is.

Improve!

Improve the FAIRness of your dataset and run the Evaluator again. View the progress made.

Up to Date

New tools and Services will be available here. We are committed to helping you to become FAIR compliant.

Our mission

Our mission is to help making your data FAIR: Findable, Accessible, Interoperable & Reusable.

Your first step is to evaluate how FAIR your data set is

Find out how FAIR your dataset is here!

RUN EVALUATOR!

THE FAIR DATA EVALUATOR FOR DIGITAL RESOURCES

My metrics / Manual check / New metric

Manual check

Would you like more information first? Please click here.

Select an earlier saved dataset evaluation or evaluate a new dataset

Create new dataset

Specify the name of your dataset evaluation:

Name your dataset here

Findable

F1 Q0: What is the URL of the resource to be evaluated?

F1 Q1: Do you have a URL to a registered scheme that defines the globally-unique structure of the identifier(s) for your digital resource? Yes No

F1 Q2: Do you have a URL to a document that defines the persistence policy of your identifier(s)? Yes No

F2 Q3: Do you have a URL to a document that contains machine-readable metadata for the digital resource? Yes No

F2 Q4: Do you have a URL for the file format of this metadata? Yes No

THE FAIR DATA EVALUATOR FOR DIGITAL RESOURCES

Dataset: Test set 1

Fair metrics per run & the progression

Date run	Evaluator	Findable	Accessible	Interoperable	Reusable	Score
2018-05-16	Manual check	62%	16%	66%	66%	53%

Run evaluator again

Questions answers of your last evaluation

Q0: What is the URL of the resource to be evaluated?	
Q1: Do you have a URL to a registered scheme that defines the globally-unique structure of the identifier(s) for your digital resource?	X
Q2: Do you have a URL to a document that defines the persistence policy of your identifier(s)?	V
Q3: Do you have a URL to a document that contains machine-readable metadata for the digital resource?	V
Q4: Do you have a URL for the file format of this metadata?	X
Q5: Do you have a URL to the metadata document that contains the globally unique and persistent identifier for the digital resource?	V
Q6: Do you have a URL to the data described by in that metadata document?	V
Q7: Is there a URL to a search engine that can find your data?	X

THE FAIR DATA EVALUATOR FOR DIGITAL RESOURCES

Metrics / My metrics

Your FAIR score

Average Score

Findable
62%

Accessible
16%

Interoperable
66%

Reusable
66%

Go to overview

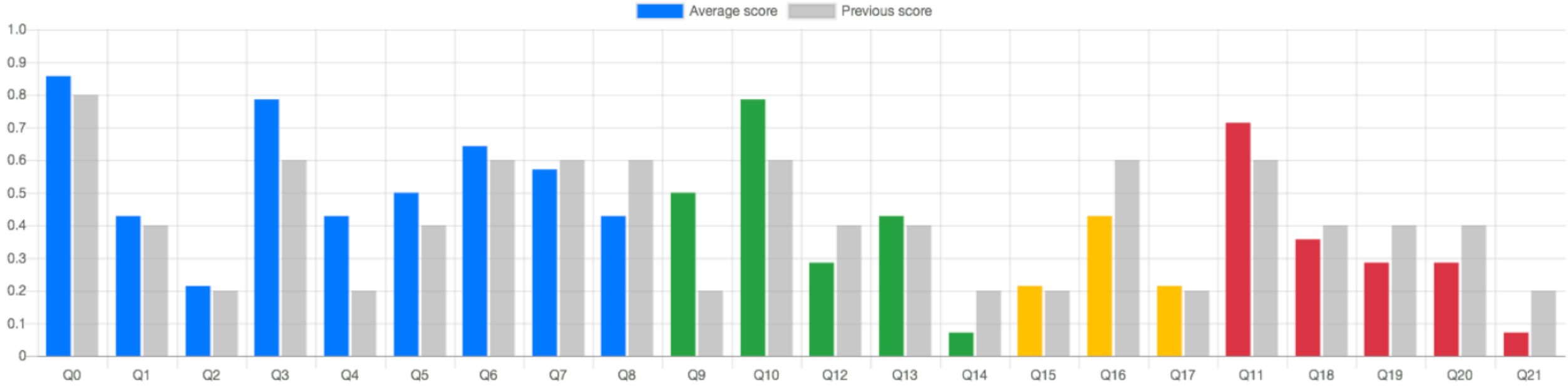
THE FAIR DATA EVALUATOR FOR DIGITAL RESOURCES

Admin / Metric performances / Manual check / 2018-05-16 06:01

Metric evaluator: Manual check

Performance run at: 2018-05-16 06:01

Select comparison



EURETOS

EXAMPLES OF FAIR CONSORTIUM PARTNERS SERVICES

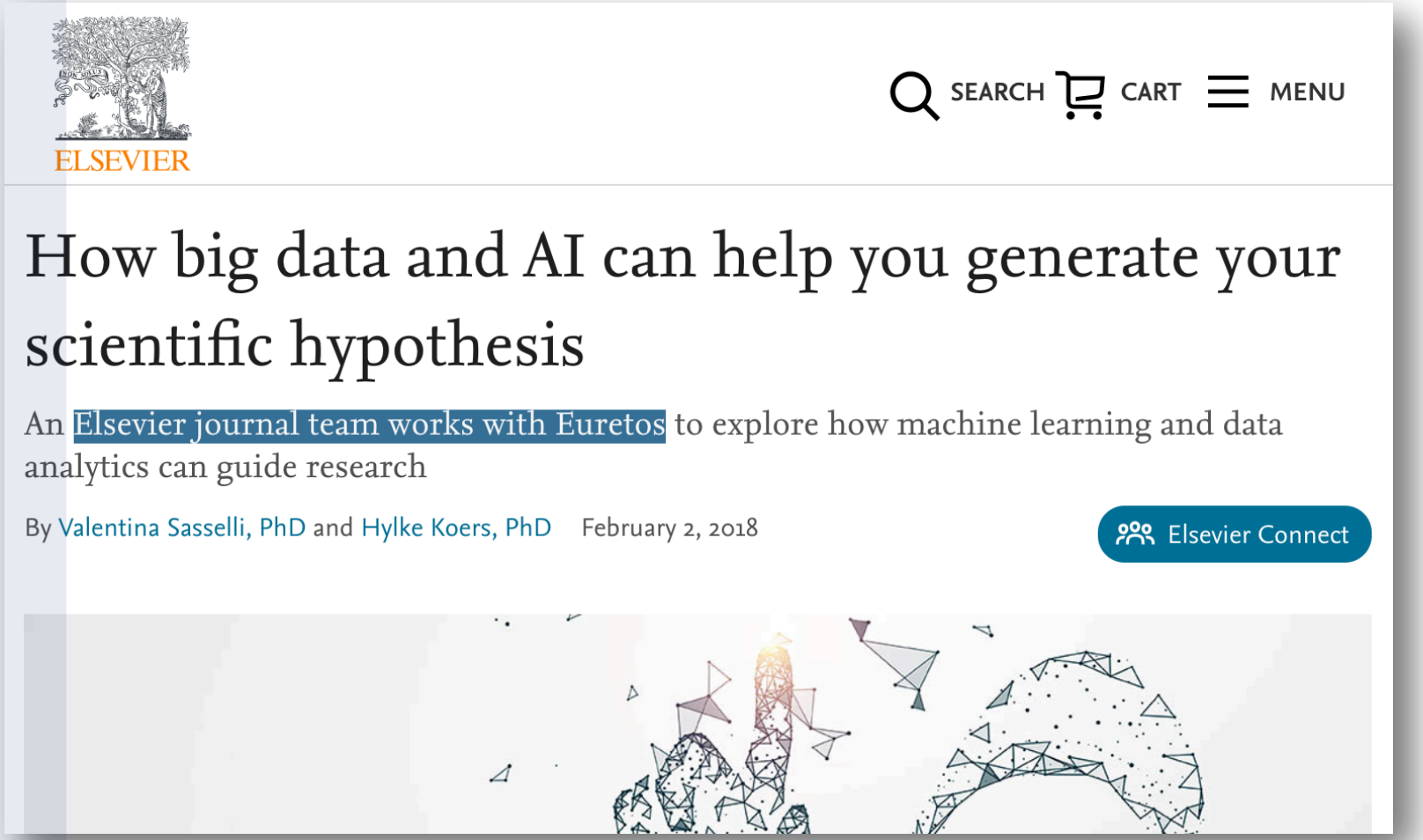
ELSEVIER CASE EXAMPLE – AI GENERATED HYPOTHESES

Joint pilot to enrich scientific publications with hypotheses that are generated using the Euretos AI Platform.

Focusing on an open question in an article's discussion section, a hypothesis is created and discussed in a Mendeley group.

The aim of the pilot is to assess whether these AI derived hypotheses can provide a catalyst for further scholarly discussion

EURETOS



Link to Euretos AI generated hypothesis:
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3098734

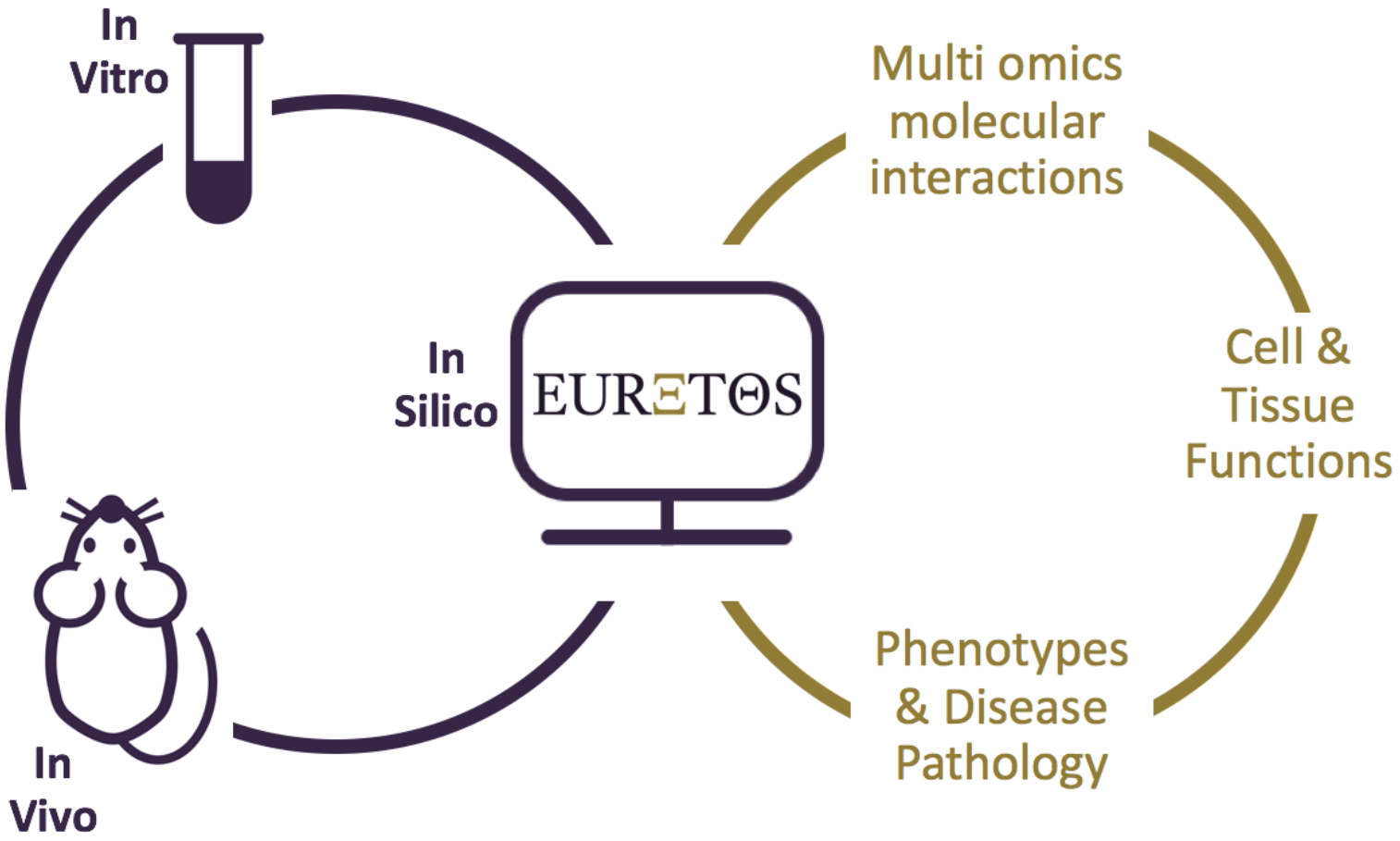
AI DRIVEN SYSTEMS BIOLOGY APPROACH

Euretos puts the power of AI technology and big data analytics in the hands of the researcher via an easy-to-use front end.

By integrating all relevant multi-omics data as systems biology approach to biomarker and target research is enabled.

Researchers discover and evaluate how molecular mechanisms influence cell and tissue functions, and in turn mediate phenotypes and disease pathology.

EURETOS

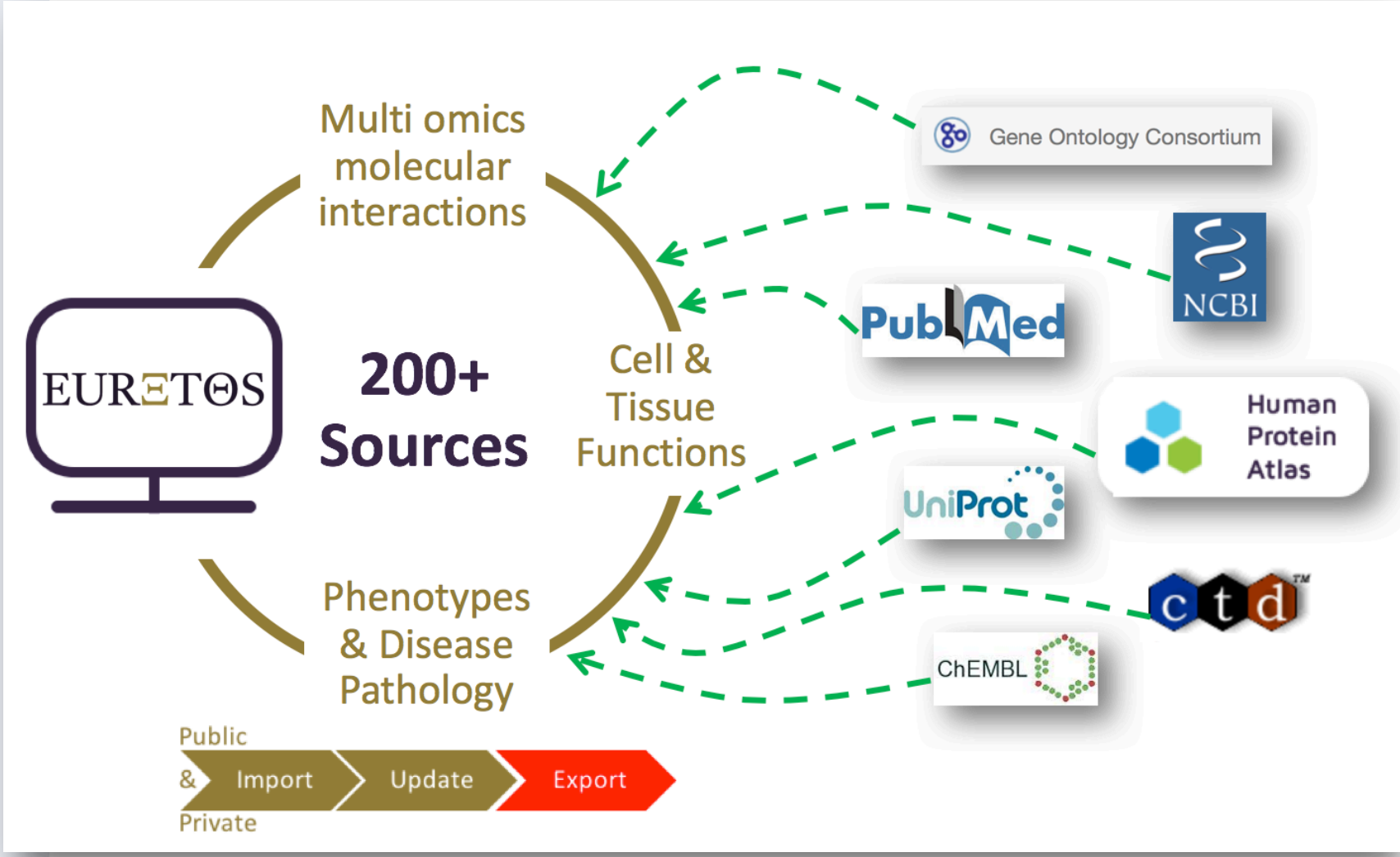


EURETOS AI PLATFORM – EXAMPLE OF INTEGRATED DATA APPROACH

By integrating ***over 200 public data sources****, the platform provides the* ***largest*** *single environment with literature, experimental and clinical evidence*

The ***multi omics data includes:*** *genetic, genomic and proteomic annotations, expression profiles, experimental and animal models, diseases, phenotypes, pathways, small molecules - covering metabolites, food ingredients, as well as therapeutic agents (antibodies and peptides).*

EURETOS



TYPES OF INTEGRATED DATA

***Three** types of data are loaded:*

1. *Ontologies & vocabularies*
2. *Structured data (multi-omics)*
3. *Unstructured data*

All data can also **be exported** into a **FAIR format** where each individual data elements is ontologically resolvable enabling the data to be:

- Findable
- Accessible
- Interoperable
- Re-usable

1. **Ontologies & vocabularies –** GO, PO, HPhO, MPhO, VTO, CMO, EFO, UMLS, MeSH, SNOMED etc.
2. **Multi-omics Databases (structured data) -** Genomics & Genetic variation, Model organisms, Transcription regulation & expression, PTMs, Protein abundance, Protein Interactions, Enzymatic reactions, Metabolic interactions, Pathways, Experimental data
3. **Unstructured data –** Literature, Clinical Trials, Patents & RWD

EURETOS

TYPES OF ANALYTICS PROJECTS BASED ON INTEGRATED DATA

World leading pharma, biotech and academic institutions use the Euretos AI Platform to accelerate multi omics research in all major disease areas.

***In addition to providing access to the AI platform, Euretos has undertaken over 50 projects** in biomarker discovery, target identification, indication expansion, target validation and drug response & resistance.*

EURETOS

- **Biomarker Discovery** for all marker types: mechanistic, outcome, pharmacogenomic, toxicity biomarkers and diagnostic
- **Target Identification** for complex diseases, including upstream analysis of dysregulated transcripts and downstream impact
- **Indication Expansion** for known therapeutic agents for same tissue based pathologies as well as in non-related tissues and cell types
- **Target Validation** for specific phenotypes and pathologies including the comparison to similar targets, druggability and safety concerns
- **Drug Response & Resistance** analysis of molecular mechanism including the identification of adjuvant therapeutic interventions

Over **50 projects** in **all disease areas** including:

Pancreatic cancer, lung cancer, colorectal cancer, hematological tumors, complex cardiometabolic diseases, endometriosis, skin disorders, NASH, rheumatoid arthritis, inflammatory respiratory disease, pulmonary fibrosis, neuropathic pain.

WHAT'S IN IT FOR ME?

THE VALUE PROPOSITION

BENEFITS OF FAIR DATA STEWARDSHIP IF YOU ARE A FUNDER/POLICY MAKER

- ***Better organized*** stakeholder community
- ***Less resources lost*** on slack and overhead
- ***Increased 'Return on Investment'*** of public funding
- ***Automated*** FAIR Data Stewardship planning and FAIRness Evaluation
- ***Participate in international developments***, e.g. European Open Science Cloud
- ***Improved societal impact:***
  - increased involvement of citizen/patient (digital control of own data
  - Increased economic benefits in health care sector including prevention

BENEFITS OF FAIR DATA STEWARDSHIP IF YOU ARE AN INSTITUTION

- ***No more silo-ed*** data 'solutions'
- ***Less time lost*** on data crunching***; more time*** for research
- ***No more short term point solutions*** over and over again
- ***Compliance by design*** to technical, ELSI and scientific standards
- ***Easier & safer*** (inter)national exchange
- ***More efficient*** business operations

BENEFITS OF FAIR DATA STEWARDSHIP IF YOU ARE A CITIZEN

- Better opportunities for ***active participation***
- ***Active recommendations*** *for prevention*
- With better prevention ***lower insurance premiums***
- ***Better privacy:*** you are in control of your own data!
- ***More benefit*** from tax and charity money spent
- ***Faster development of*** new preventive, diagnostic and therapeutic solutions

BENEFITS OF FAIR DATA STEWARDSHIP IF YOU ARE A COMPANY OR ENTREPENEUR

- Have your researchers **do research rather than data wrangling**
- **Offer** your researchers ***better analytics, applications and services***
- **ALL** your (proprietary) data
  - ***Integrated so you 'know what you know'***
  - ***Compliant and interoperable*** with FAIR public domain data and EOSC procedures
  - **Easier compliance** with **Medical Device Regulation** and **FDA Regulatory Procedures**
  - **Easier Post Implementation surveillance**
  - ***Improved*** data analytics and knowledge predictions
  - **Enabling** more ***effective discovery process***
  - ***Leading*** to ***decreasing Time-to-Market***
  - ***Effecting*** *your bottom line*
- ***PR value:*** *FAIR* ***compliance*** *and Open Science* ***association***
- ***Save*** cost and ***increase*** revenue

BENEFITS OF FAIR DATA STEWARDSHIP IF YOU ARE A PI/RESEARCHER

- ***Eligible for funding*** for FAIR Data Stewardship (the '5%')
- ***Assistance*** from dedicated professional FAIR Data Stewards
- ***More time*** for actual research!
- Your data ***interoperate with other data***
- ***Increased scientific impact*** (citations; also of datasets!)
- Increased rate of hypotheses testing: ***Discovery and Innovation***