
WP2:
Stormwater management in small catchments
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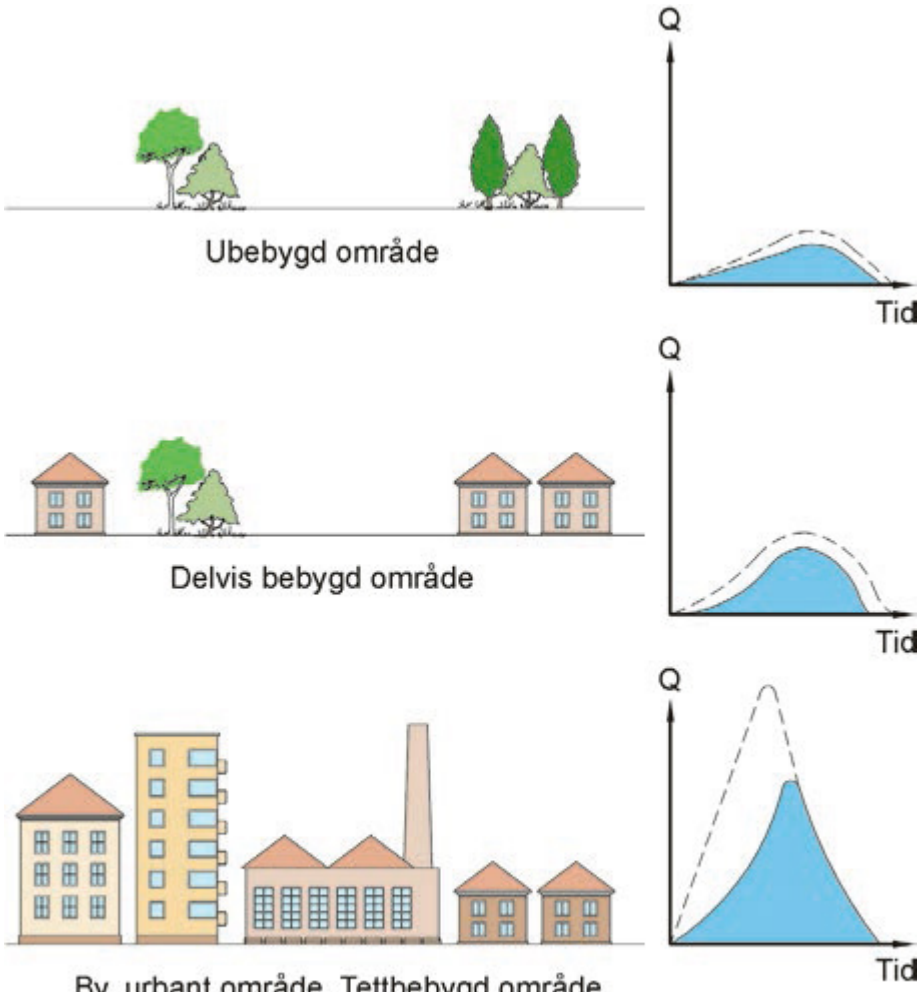
KLIMA2050

WP2.1: Analysis of inventory databases including flooding damage data

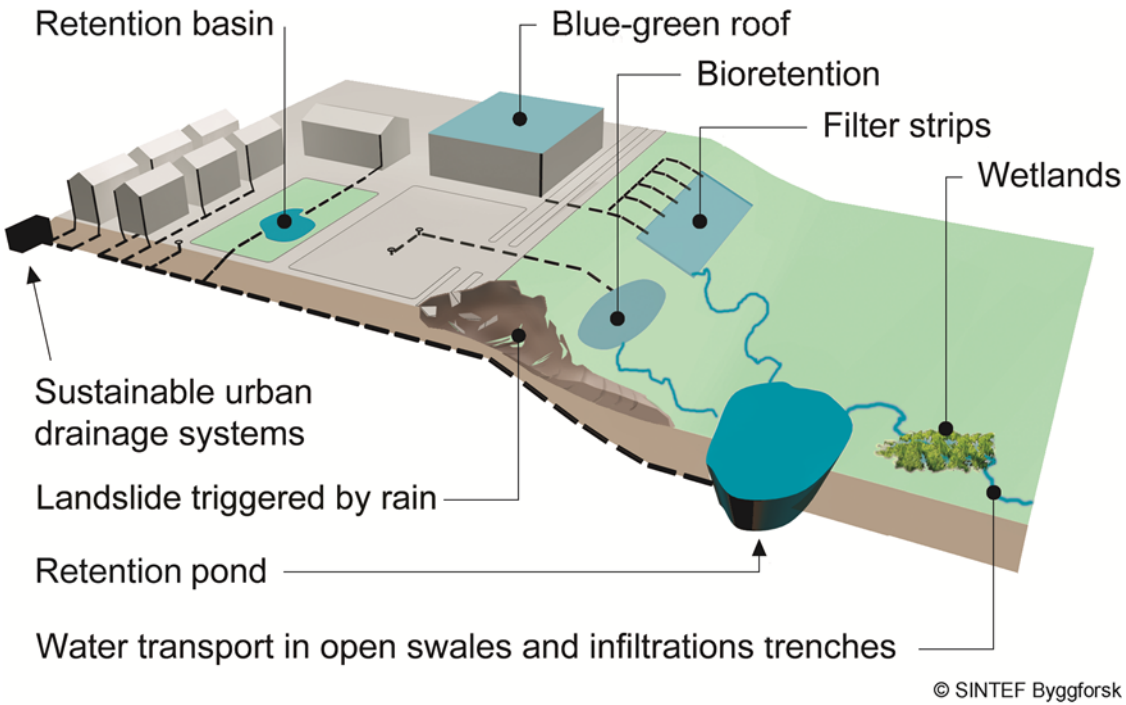
- Contexts: Urban flooding
- Contexts: Data and its use
- Where is the data?
- Challenges
- Solutions / Further work

Contexts: Urban flooding

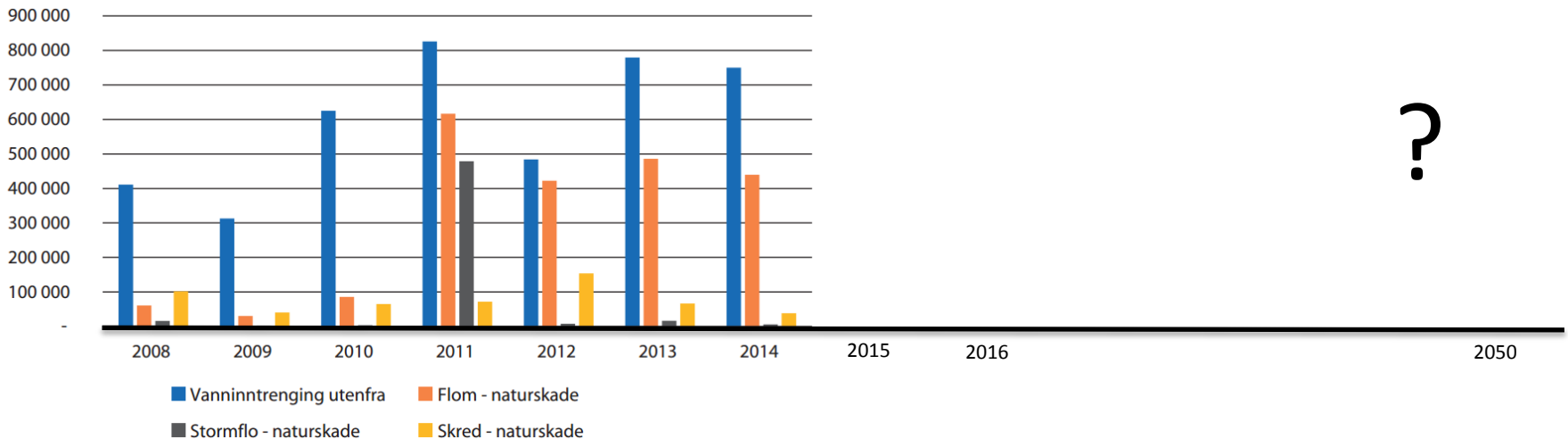
New York City after Hurricane Sandy, 2012



Byggforskserien 311.015



Urban flooding = lack of drainage in an **urban** area



Figur 3.9 Erstatning etter vanninntrenging utenfra sammenliknet med naturskadeerstatning (1000 kroner, KPI-justert)

Kilde: Finans Norge, utarbeidet på oppdrag av utvalget.

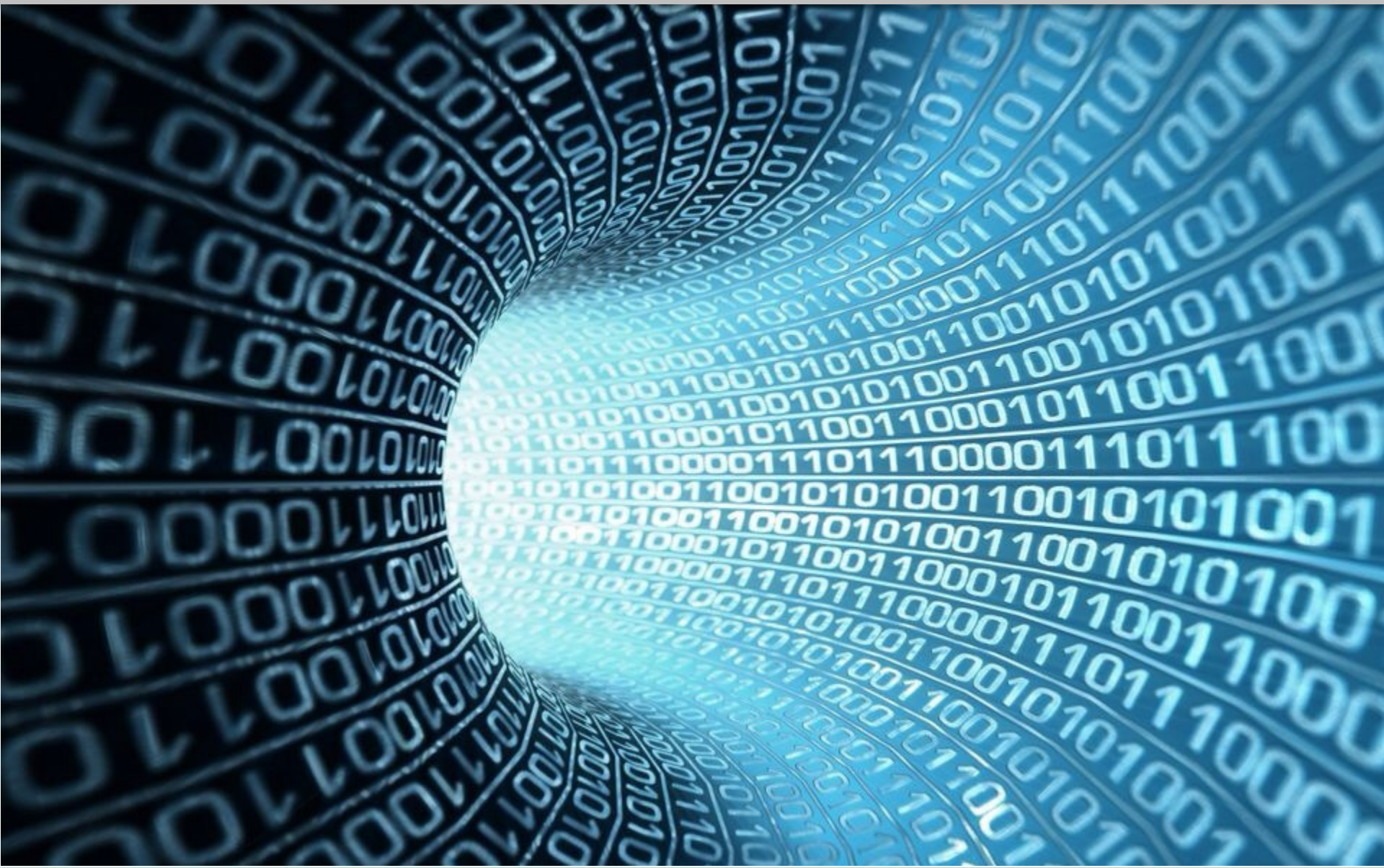
NOU 2015: 16
Overvann i byer og tettsteder

More urban

More intense

More frequent

Contexts: Data and its use



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What for?

Prevention and protection

Preparedness

Response

Recovery and review

Whom for?

National

Local

Individuals

Policy makers

Emergency planners

Insurance companies
Private firms
You & me

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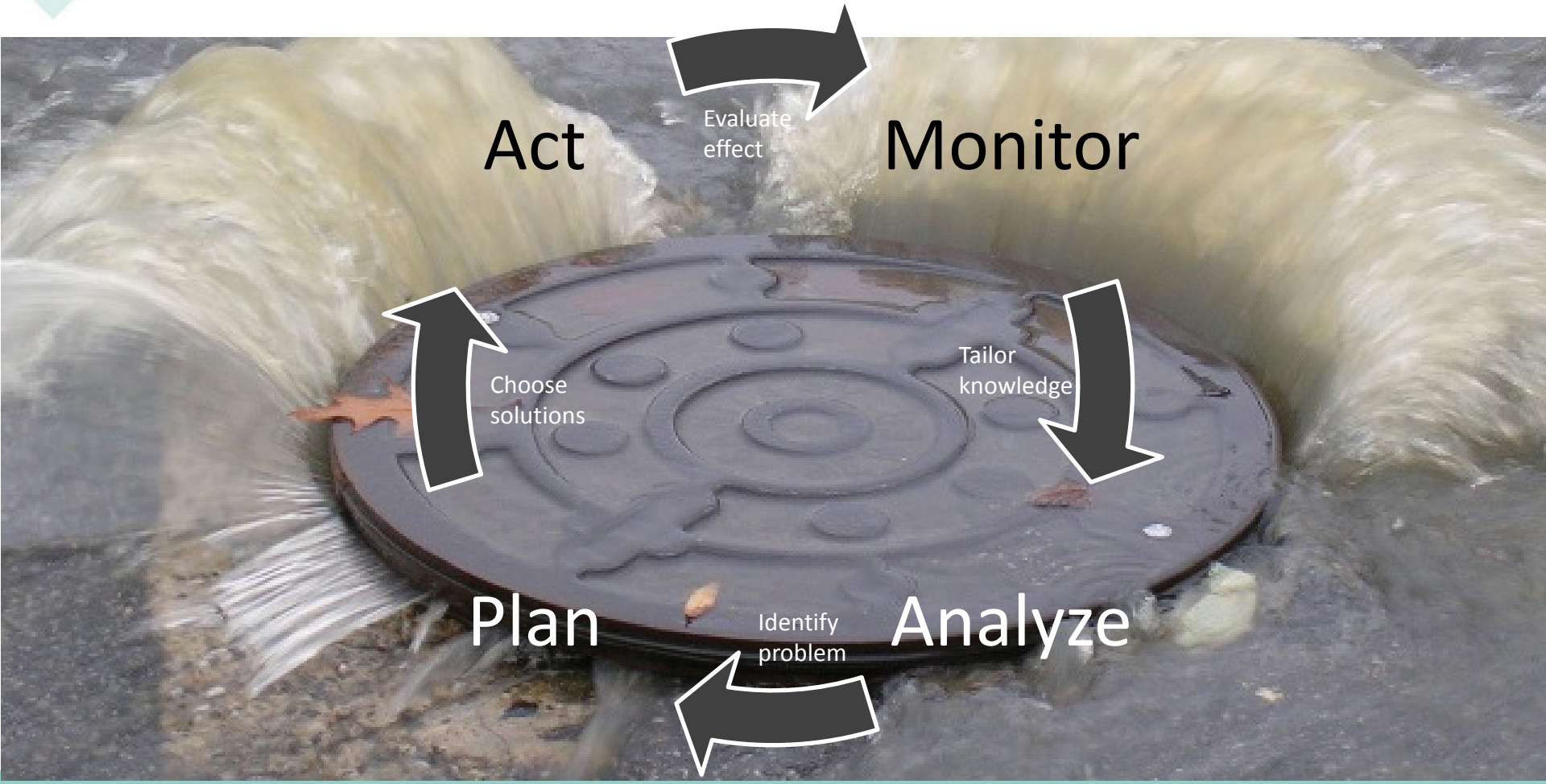
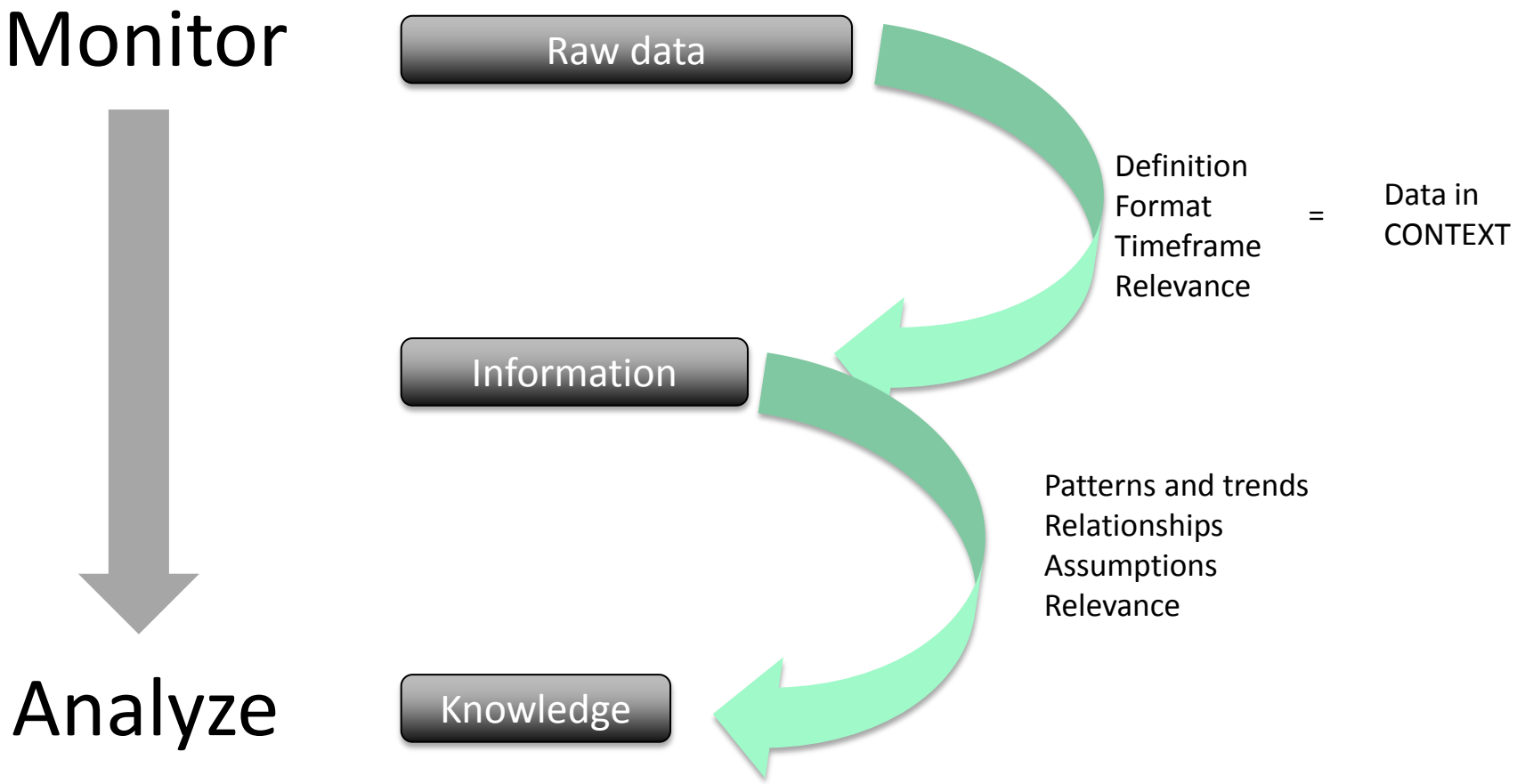
Data to support decision-making process



Tailoring knowledge



Important questions

What type of raw data is available?

Who is implementing it?

Who has access to it?

Who is providing analyses?

Who is using results?

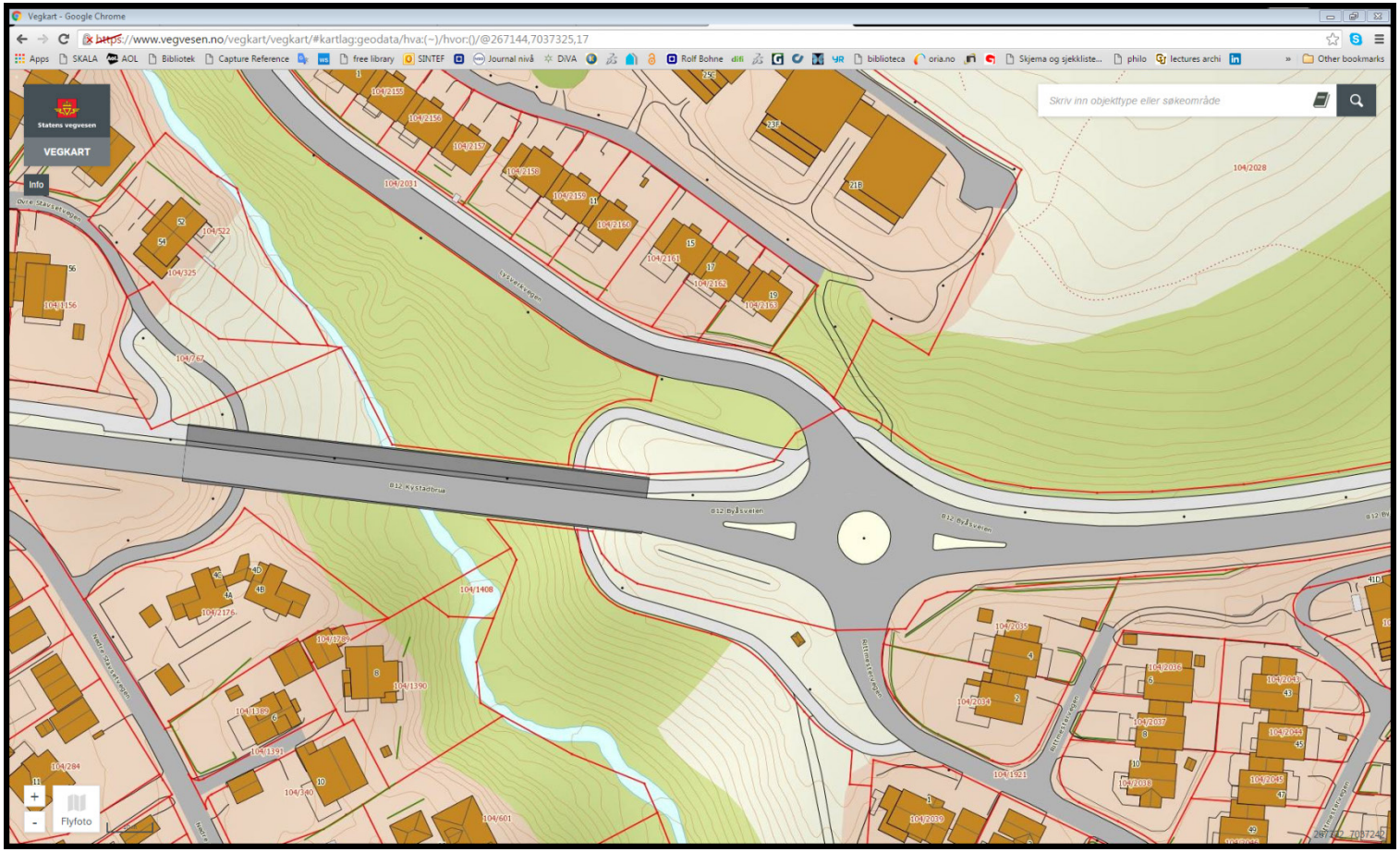
What for?

Where is the data?

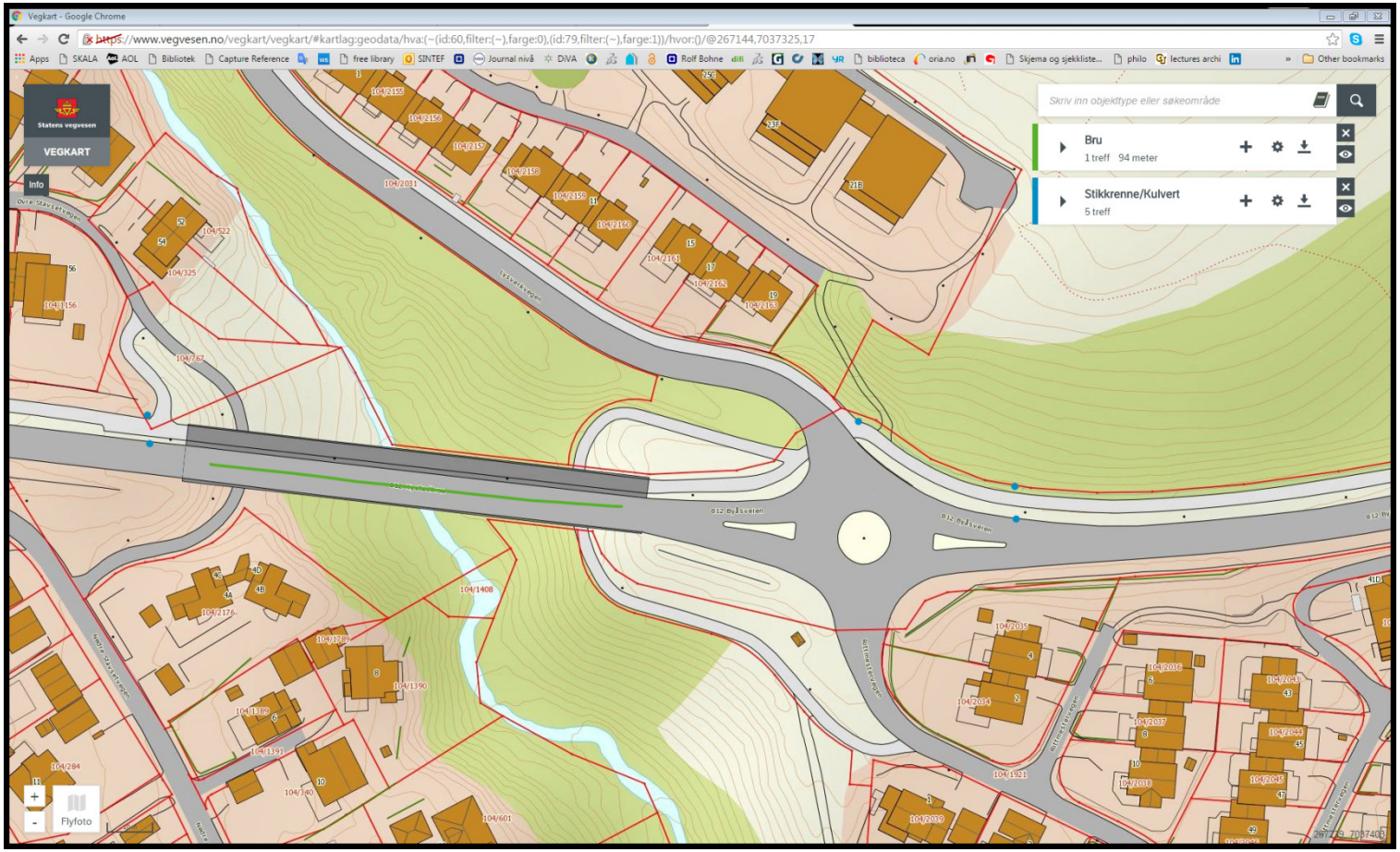
Oslo, Karl Johan gåte, 2013

Object-based databases **vs.** **Event-based databases**

Object-based database: National Road Database / Statens Vegvesen



Object-based database: National Road Database / Statens Vegvesen



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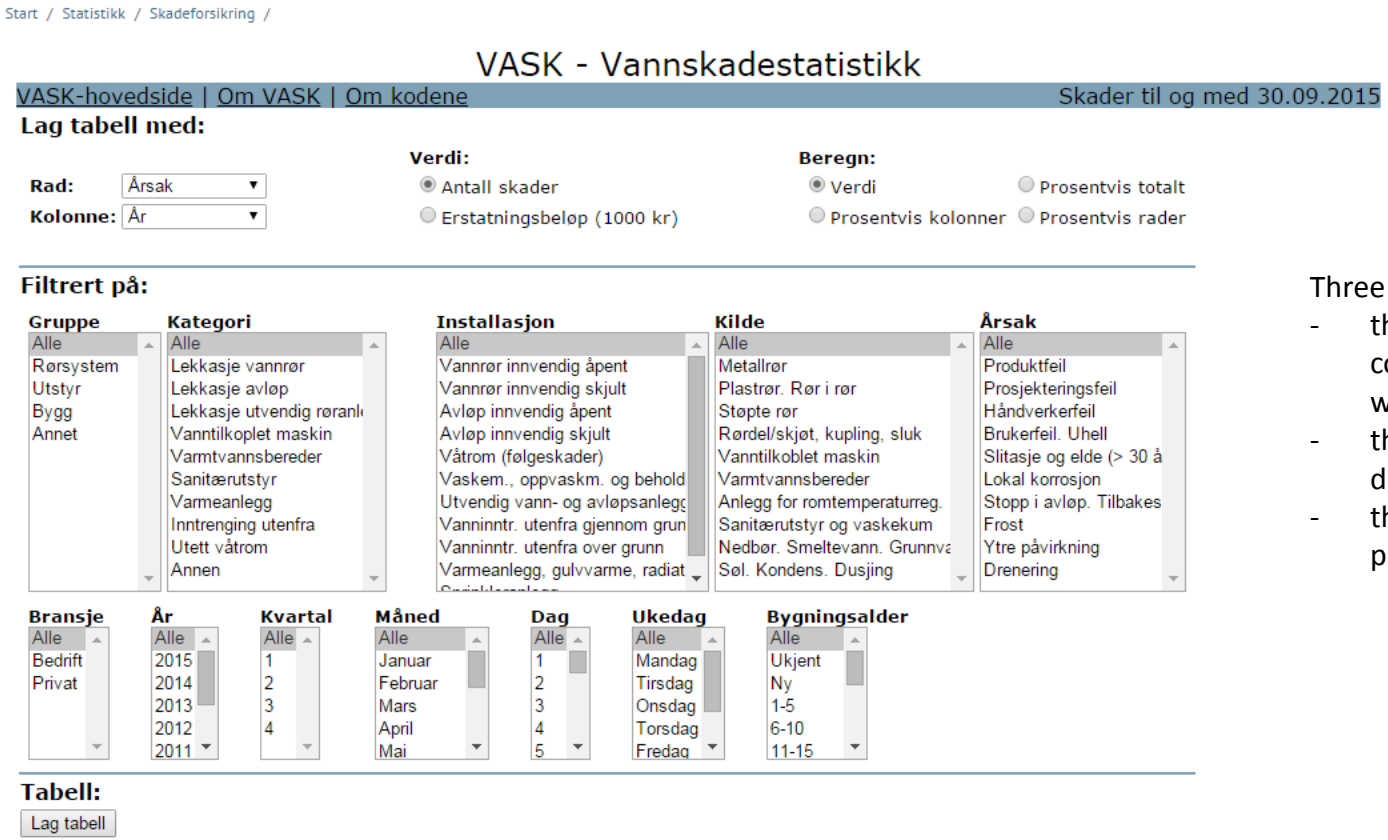
Object-based database: National Road Database / Statens Vegvesen

	Sist modifisert	Status	Vegnummer	Fra meter	Diameter,	Eier	Geometri, punkt	Lengde	Materialty	Tilknyttet	Tverrsnitt	Tykkelse overfylling	Type innløp	Type utløp
2	2014-11-19 12:01:16	V	812	5148	200	Fylkeskommune	POINT (267216.884744425 7037310.75705719)	8	Betong	Ja	Sirkulær	1.9	Kum over stikkrenne	Kum
3	2014-11-19 12:01:16	V	812	5339	200	Fylkeskommune	POINT (267017.818582502 7037328.06772431)		Betong	Ja	Sirkulær	2.5	Kum over stikkrenne	Kum
4	2014-11-19 15:16:40	G	812	5166	200	Fylkeskommune	POINT (267216.593774205 7037318.23113037)	12	Betong	Ja	Sirkulær	2.4	Kum over stikkrenne	Kum
5	2014-11-19 15:16:40	G	812	5206	200	Fylkeskommune	POINT (267180.657776098 7037333.14789724)	7	Betong	Ja	Sirkulær	2	Kum over stikkrenne	Kum
6	2014-11-19 15:16:40	G	812	5375	200	Fylkeskommune	POINT (267017.294212139 7037334.62727162)	10	Betong	Ja	Sirkulær	2.2	Kum over stikkrenne	Kum

Sist modifisert	Status	Vegnummer	Fra meter	Til meter	Byggverkstype	Lengde	Navn	Nummer	Vedlikeholdsansvarlig
2012-09-11 13:10:23	V	812	5231	5325	Bjelkebru (3)	96	Kystadbru	1508	Vegvesenet/Fylkeskommune

Event-based database: VASK (Vannskadestatistikk)



Three main levels:

- the affected installation (which corresponds to a rough location for where the damage occurred)
- the source (which corresponds to a description of what was damaged)
- the cause (which corresponds to the primary cause of the damage)

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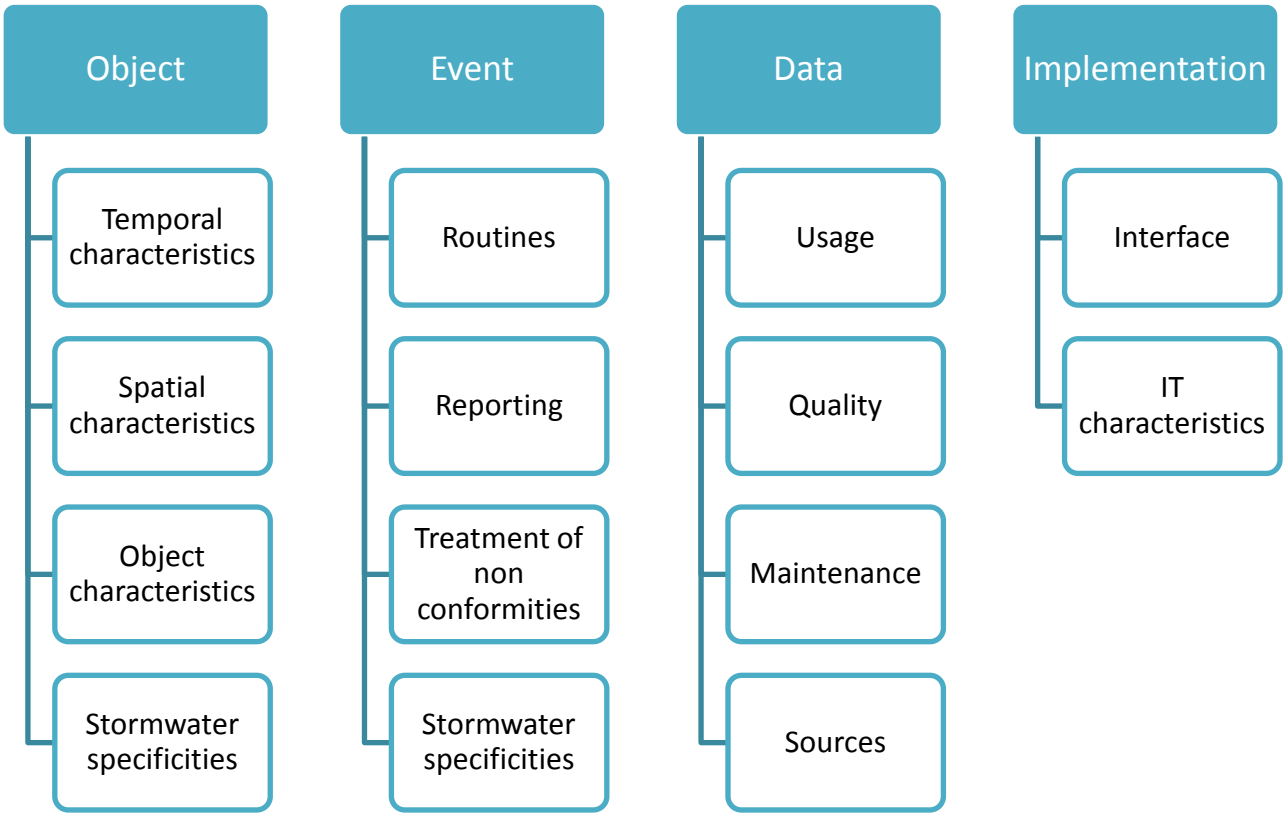
Event-based database: VASK (Vannskadestatistikk)

VASK genererer krysstabeller som den som er vist nedenfor.

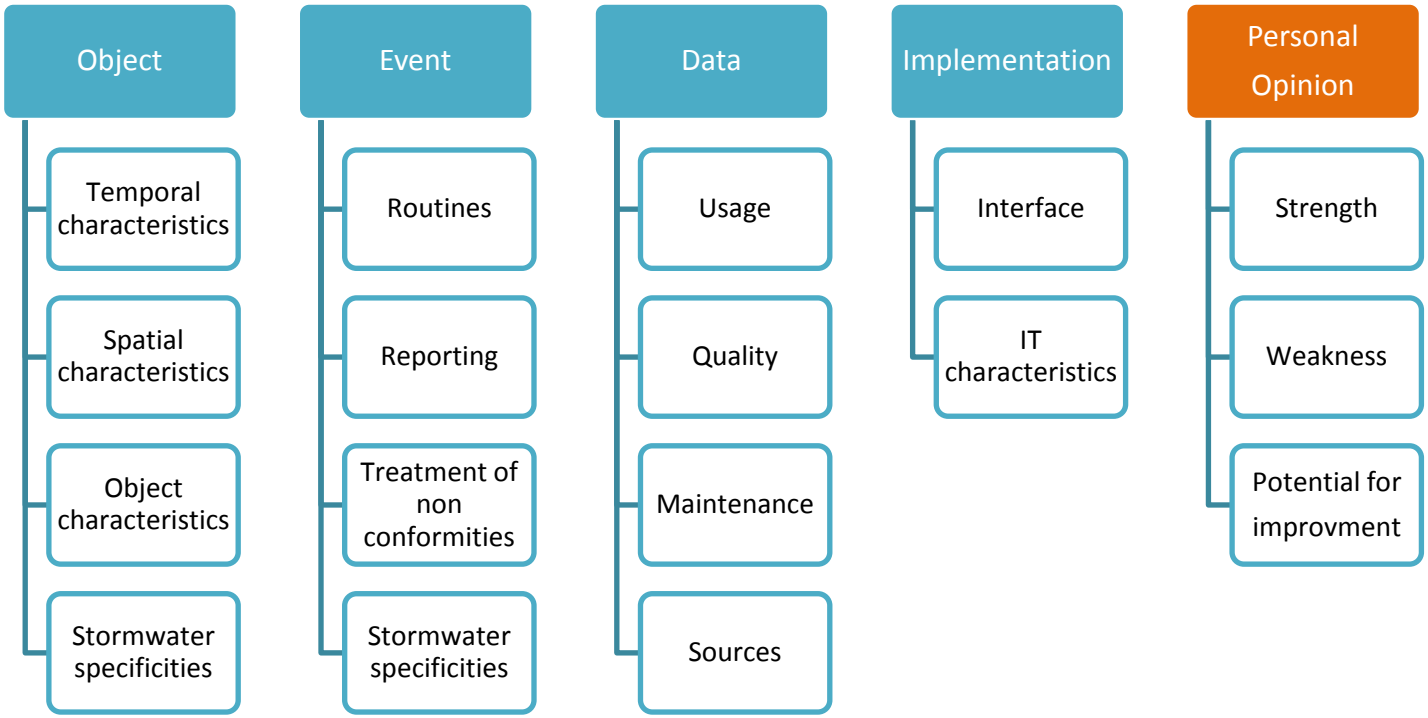
Årsak	Ledningssystem	Utstyr	Bygg	Annet	SUM
Produktfeil	2594	681	130	601	4006
Prosjekteringsfeil	357	58	155	158	728
Håndverkerfeil	1956	248	912	583	3699
Brukerfeil. Uhell	1967	1154	244	975	4340
Slitasje og elde	16779	4123	3070	3316	27288
Lokal korrosjon	4741	1141	147	937	6966
Stopp i avløp. Tilbakeslag	4192	436	547	1877	7052
Frost	1313	176	93	129	1711
Ytre påvirkning	2638	755	5492	1620	10505
Drenering	46	21	1782	162	2011
SUM	36583	8793	12572	10358	68306

Member companies (about 85% of the market) submit accounting data directly to FinansNorge.

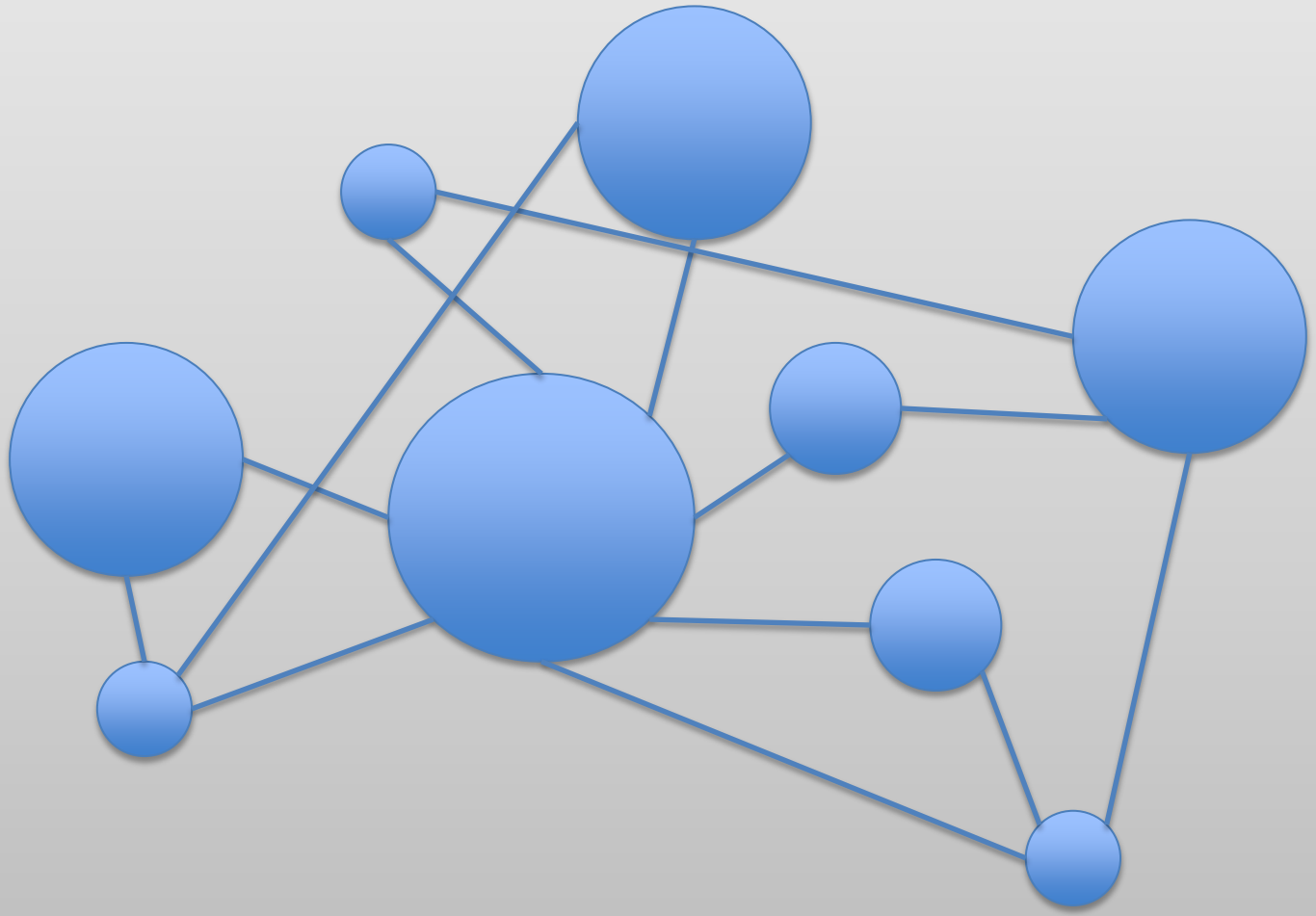
How to describe a database?



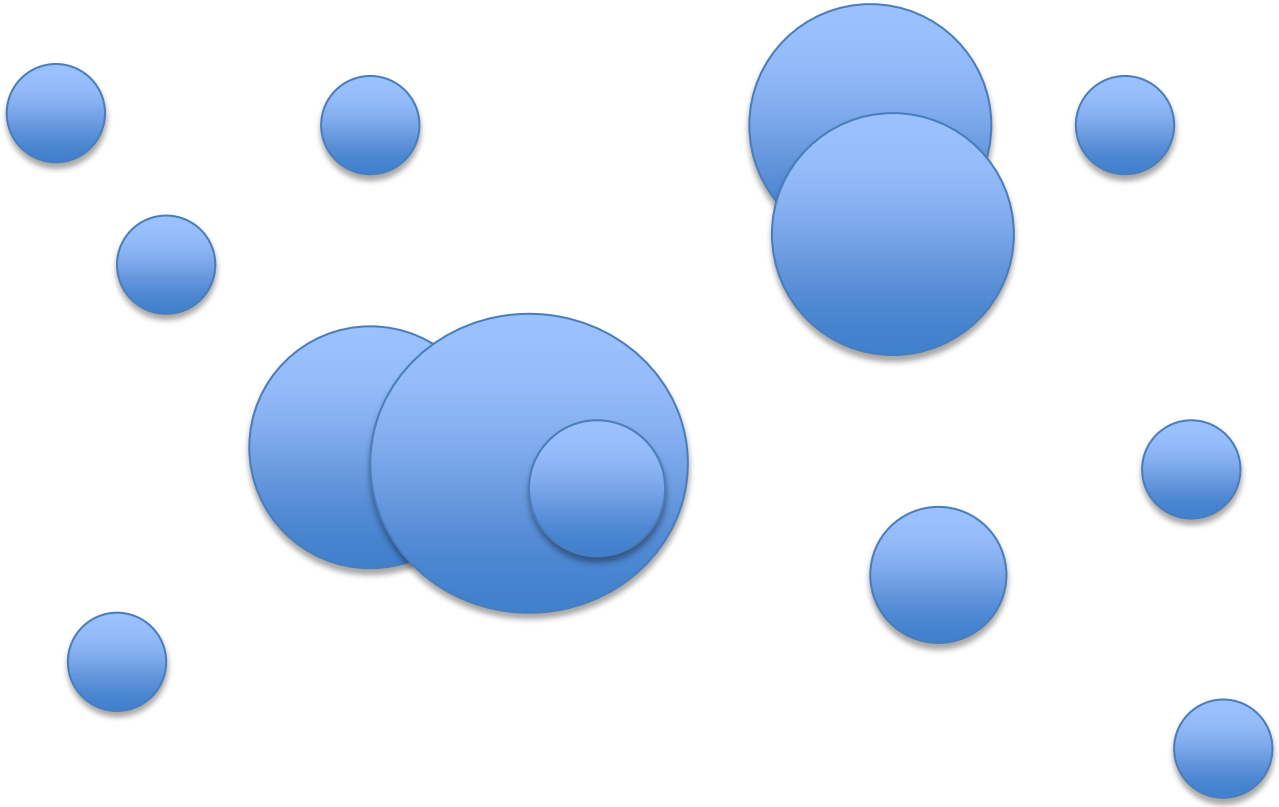
Our interview



Challenges

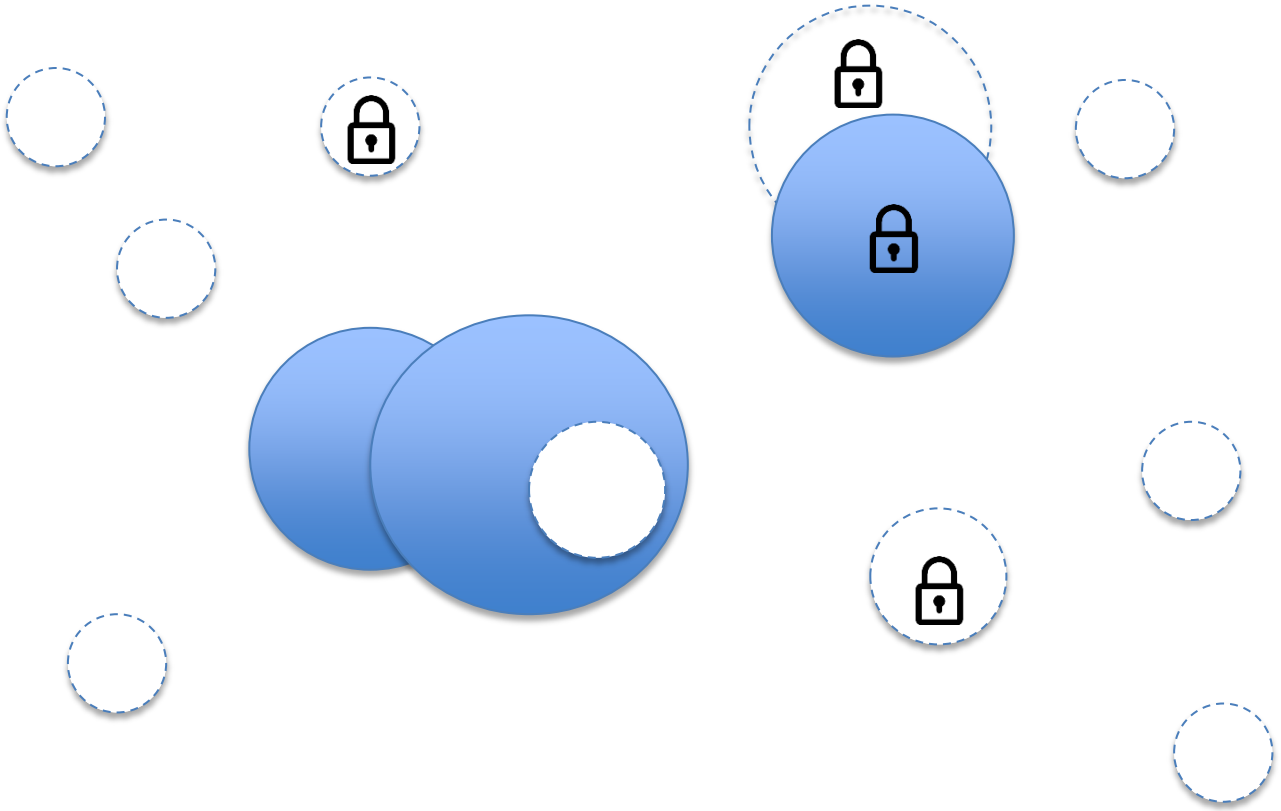


Disparity



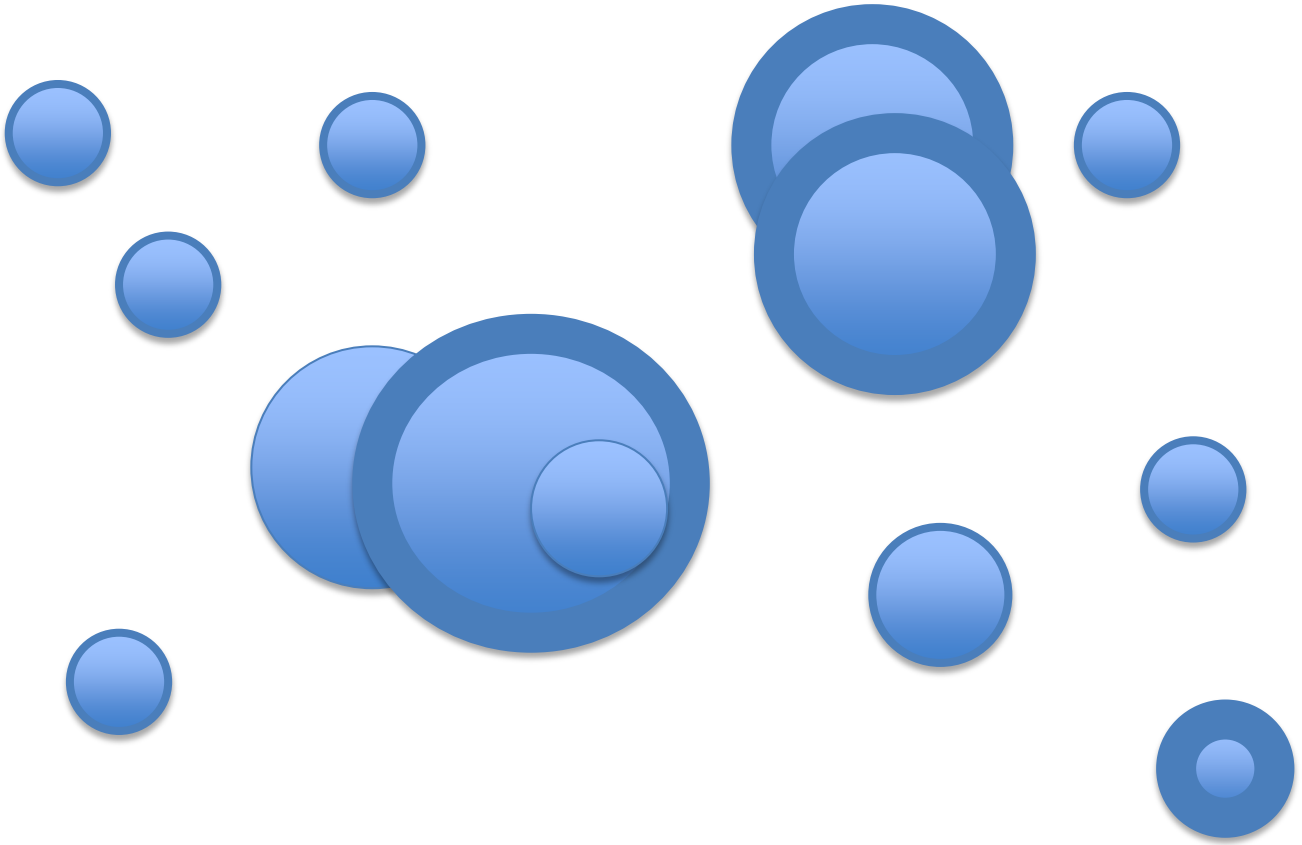
Different motivations / stakeholders / times / purposes

Availability



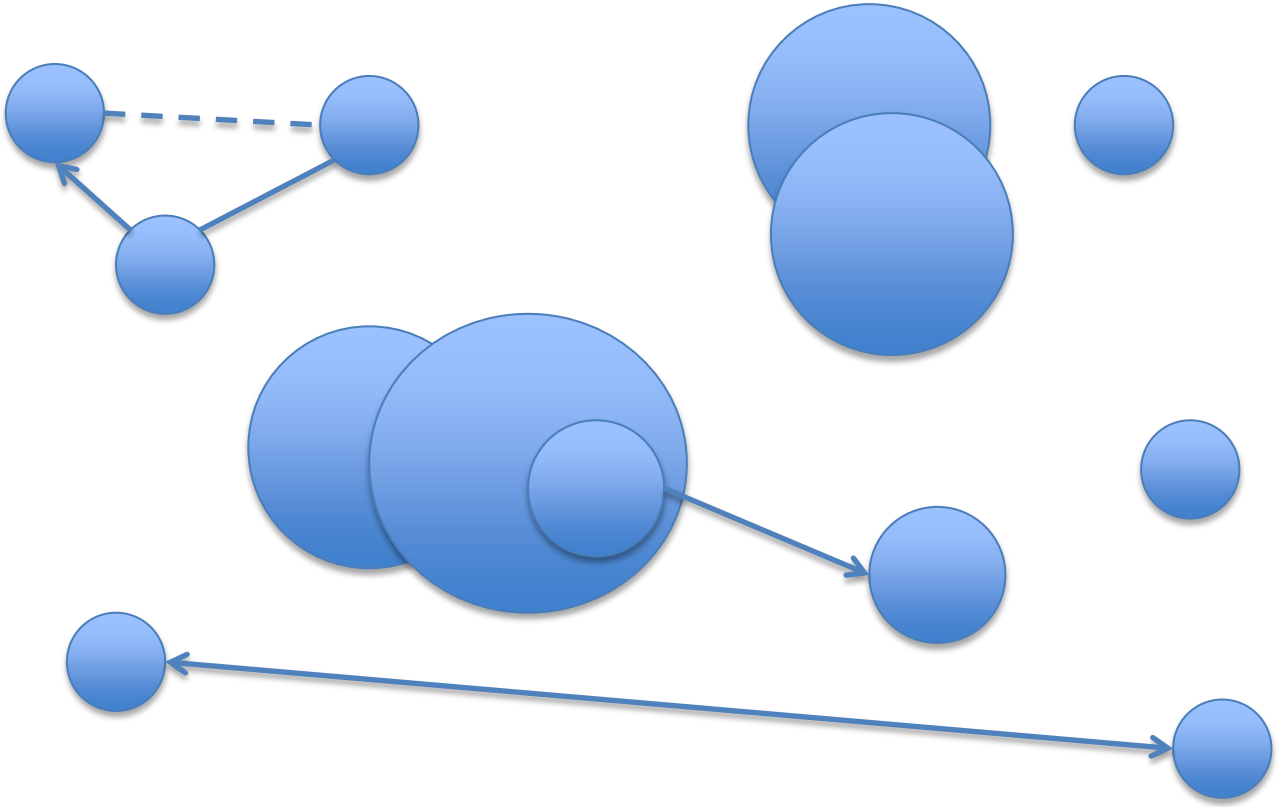
Many low-impact events / few high impact events / not always open-data

Accuracy



Direct vs. Indirect damages / cause uncertainties

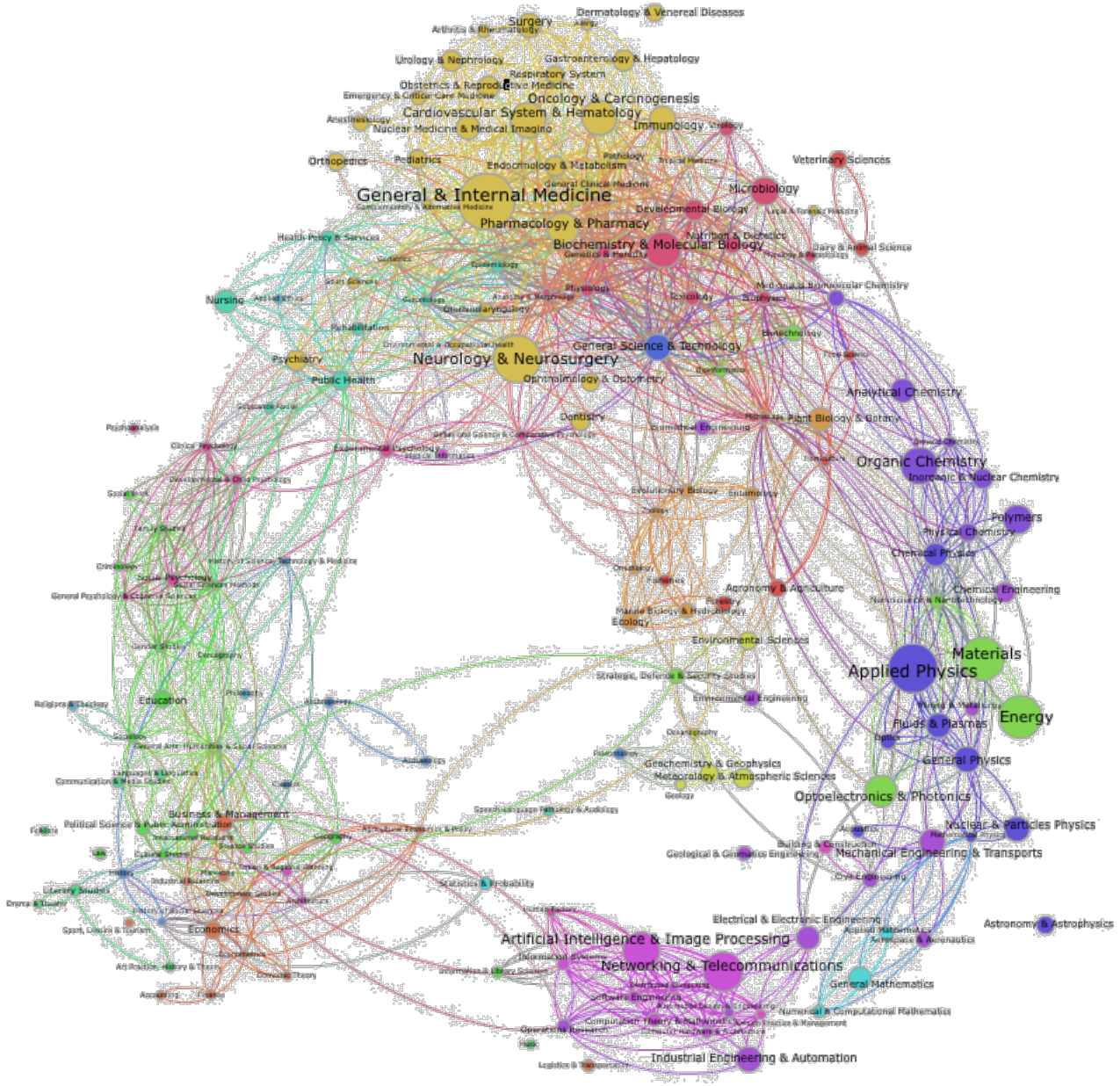
Consistency

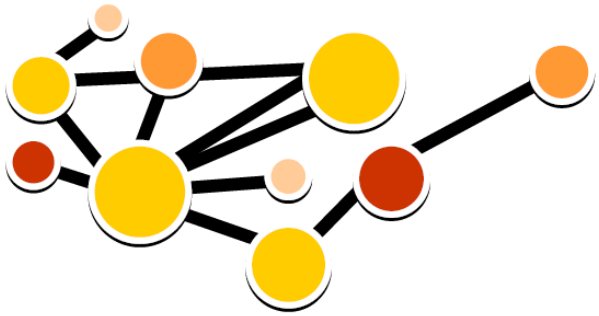


Different designations / changes over time

Solutions / Further work

Ontology

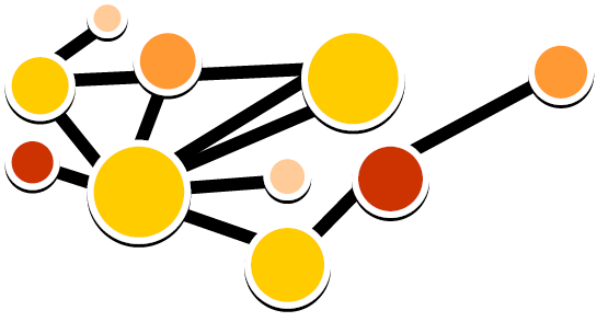

Dermatology & Venereal Diseases
Surgery
Urology & Nephrology
Gastroenterology & Hepatology
Respiratory System
Oncology & Carcinogenesis
Cardiovascular System & Hematology
Immunology
Orthopedics
Pediatrics
Endocrinology & Metabolism
Veterinary Sciences
General & Internal Medicine
Microbiology
Pharmacology & Pharmacy
Biochemistry & Molecular Biology
Nursing
Psychiatry
Neurology & Neurosurgery
General Science & Technology
Public Health
Ophthalmology & Optometry
Analytical Chemistry
Dentistry
Organic Chemistry
Inorganic & Nuclear Chemistry
Polymers
Physical Chemistry
Chemical Physics
Agronomy & Agriculture
Chemical Engineering
Ecology
Environmental Sciences
Materials
Applied Physics
Energy
Education
Fluids & Plasmas
General Physics
Geochemistry & Geophysics
Meteorology & Atmospheric Sciences
Optoelectronics & Photonics
Business & Management
Nuclear & Particles Physics
Mechanical Engineering & Transports
Economics
Electrical & Electronic Engineering
Astronomy & Astrophysics
Artificial Intelligence & Image Processing
Networking & Telecommunications
General Mathematics
Industrial Engineering & Automation

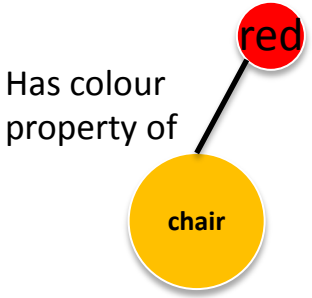


An ontology is a controlled, logically structured representation of reality that is both human and machine readable

clearly-defined ‘classes’ for each entity
(may have one or more labels)

defined relationships between classes





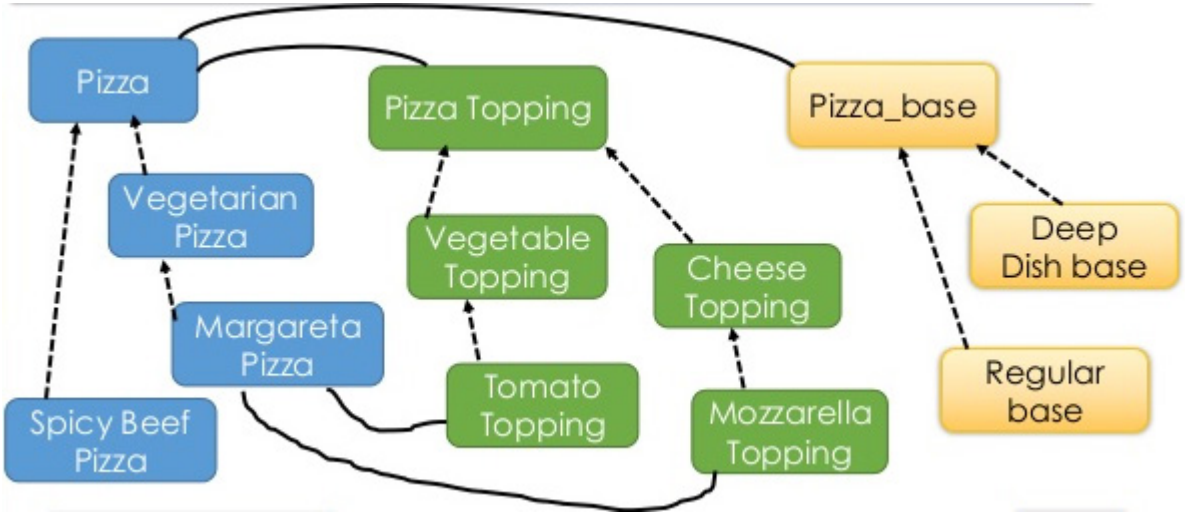
Main hierarchy formed by subclass relations:

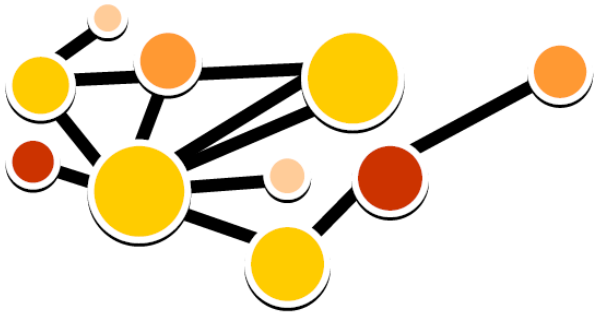
A B is an A which Cs

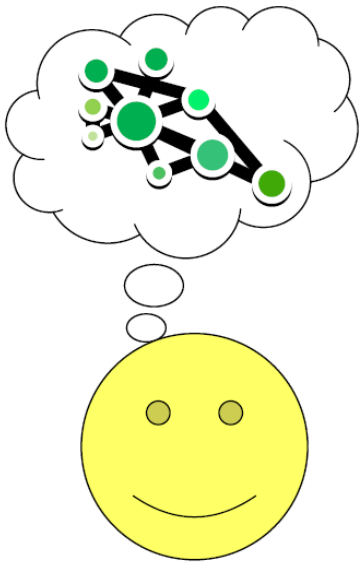
genus differentia

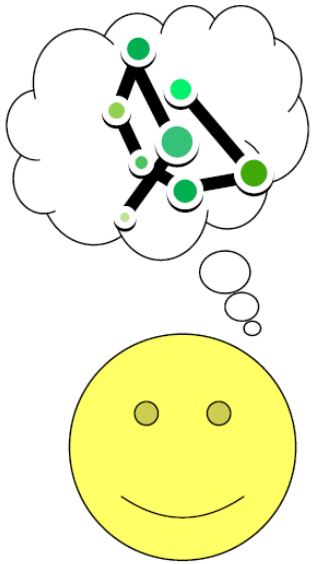
A red chair is a chair which has a red quality

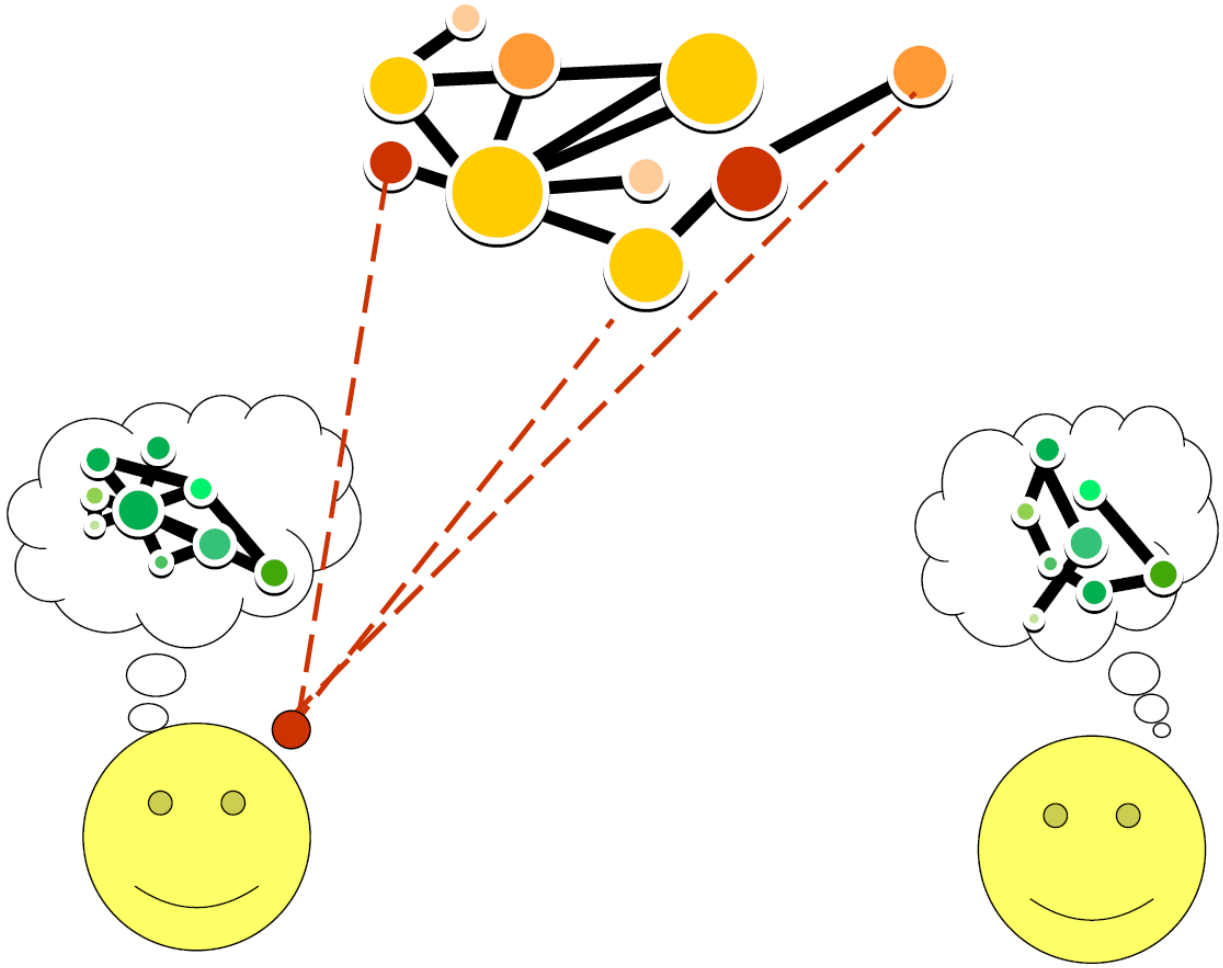

pizza
PIZZA PIZZA

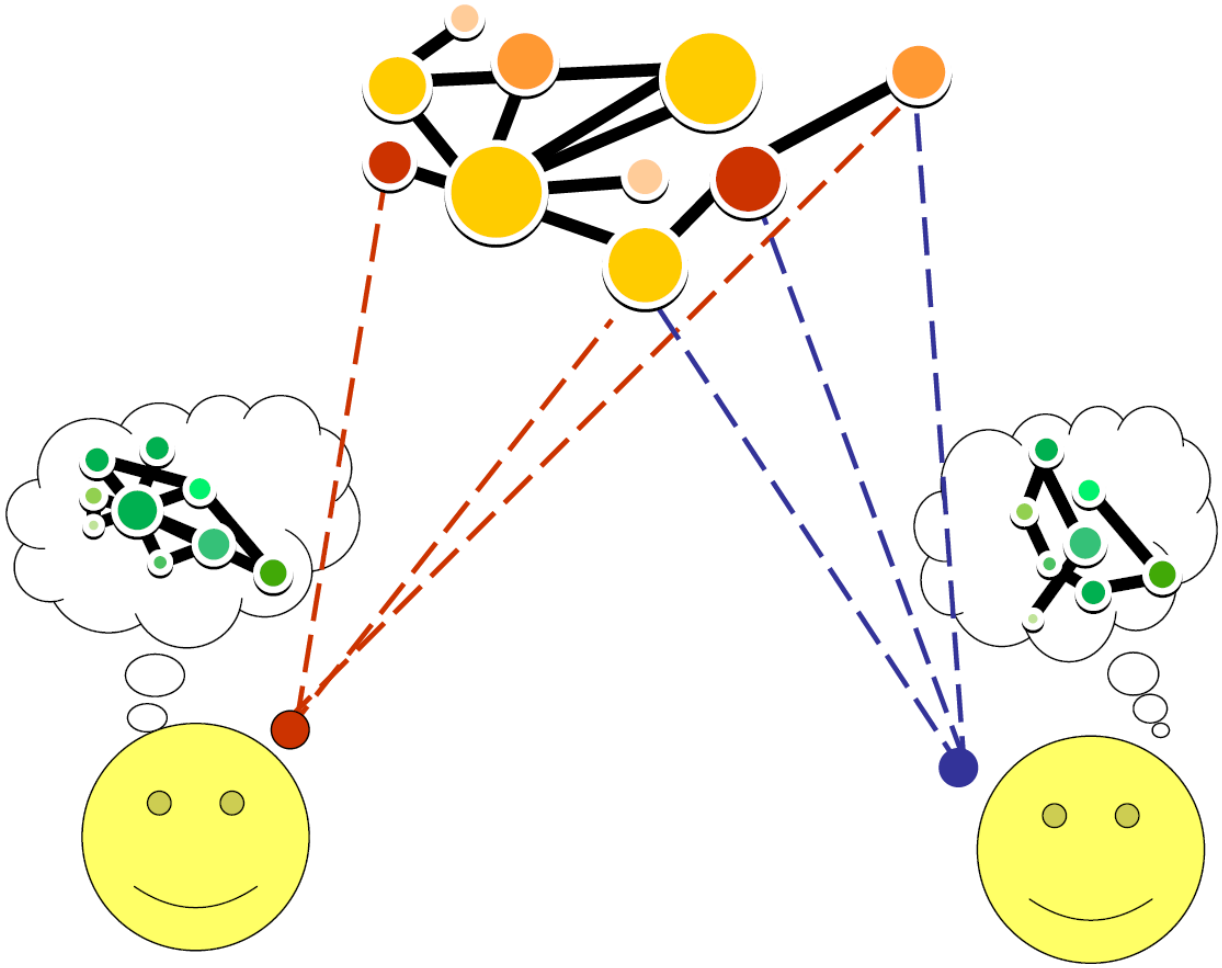

Pizza
Pizza Topping
Pizza_base
Vegetarian Pizza
Vegetable Topping
Cheese Topping
Deep Dish base
Margareta Pizza
Tomato Topping
Mozzarella Topping
Regular base
Spicy Beef Pizza

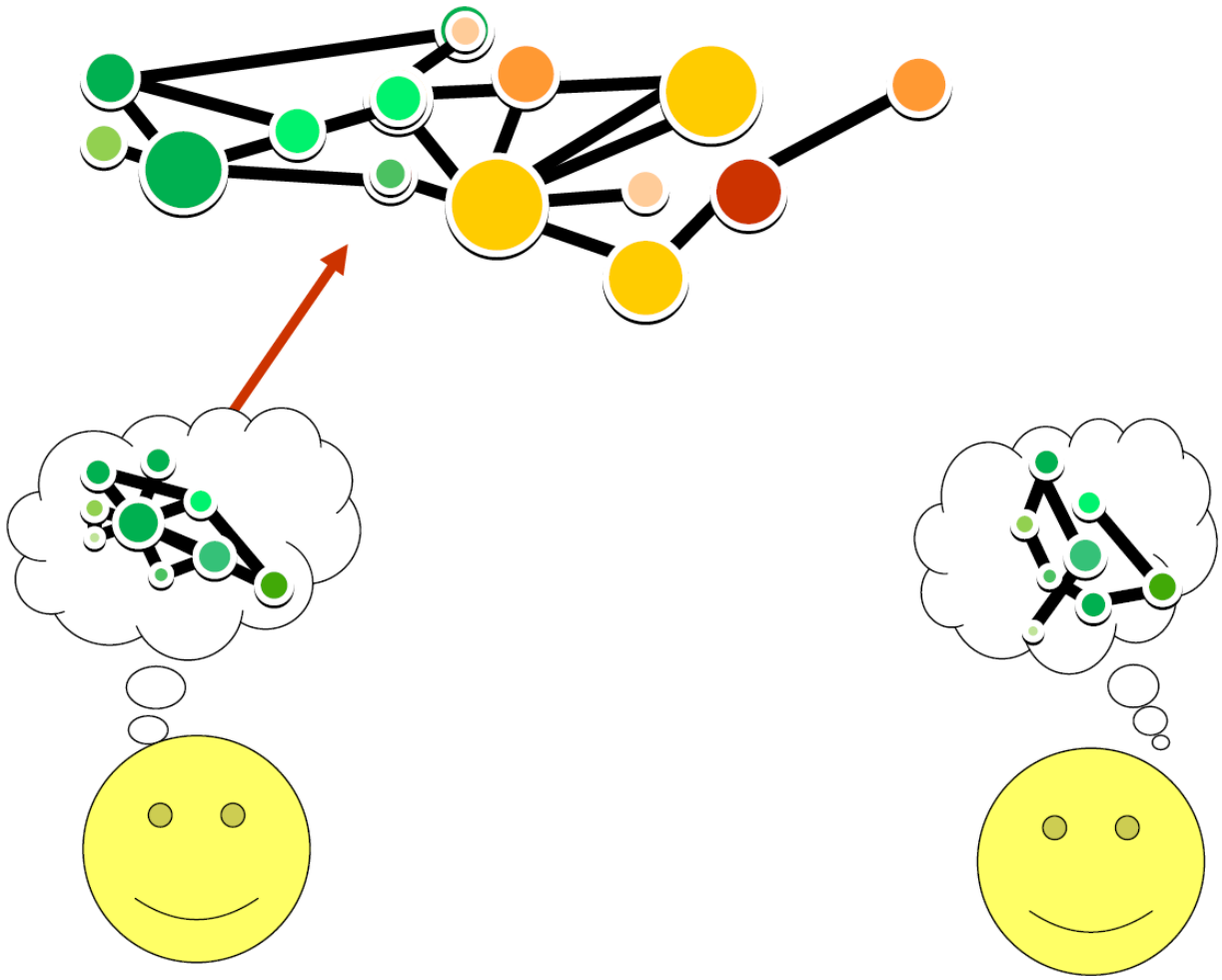


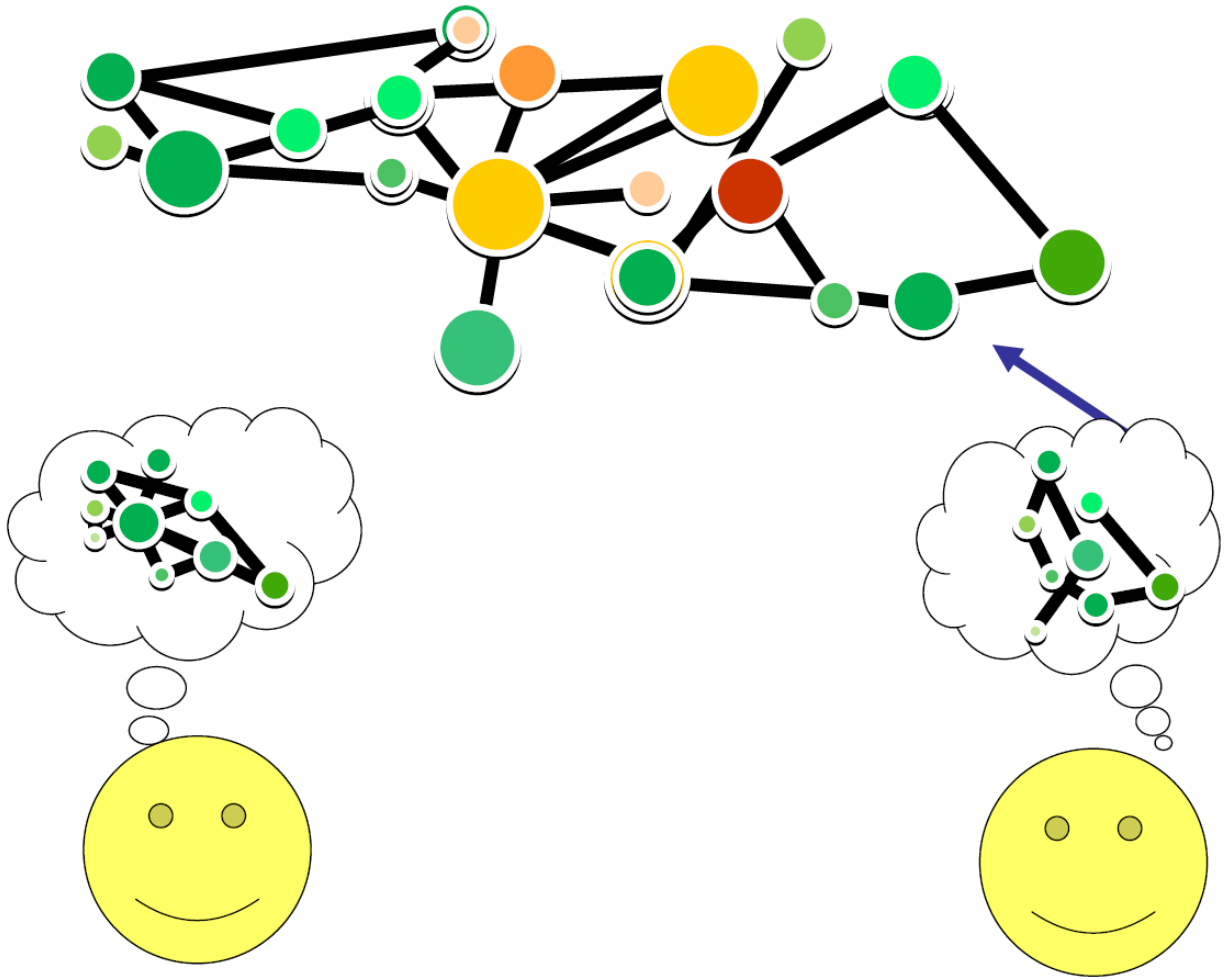


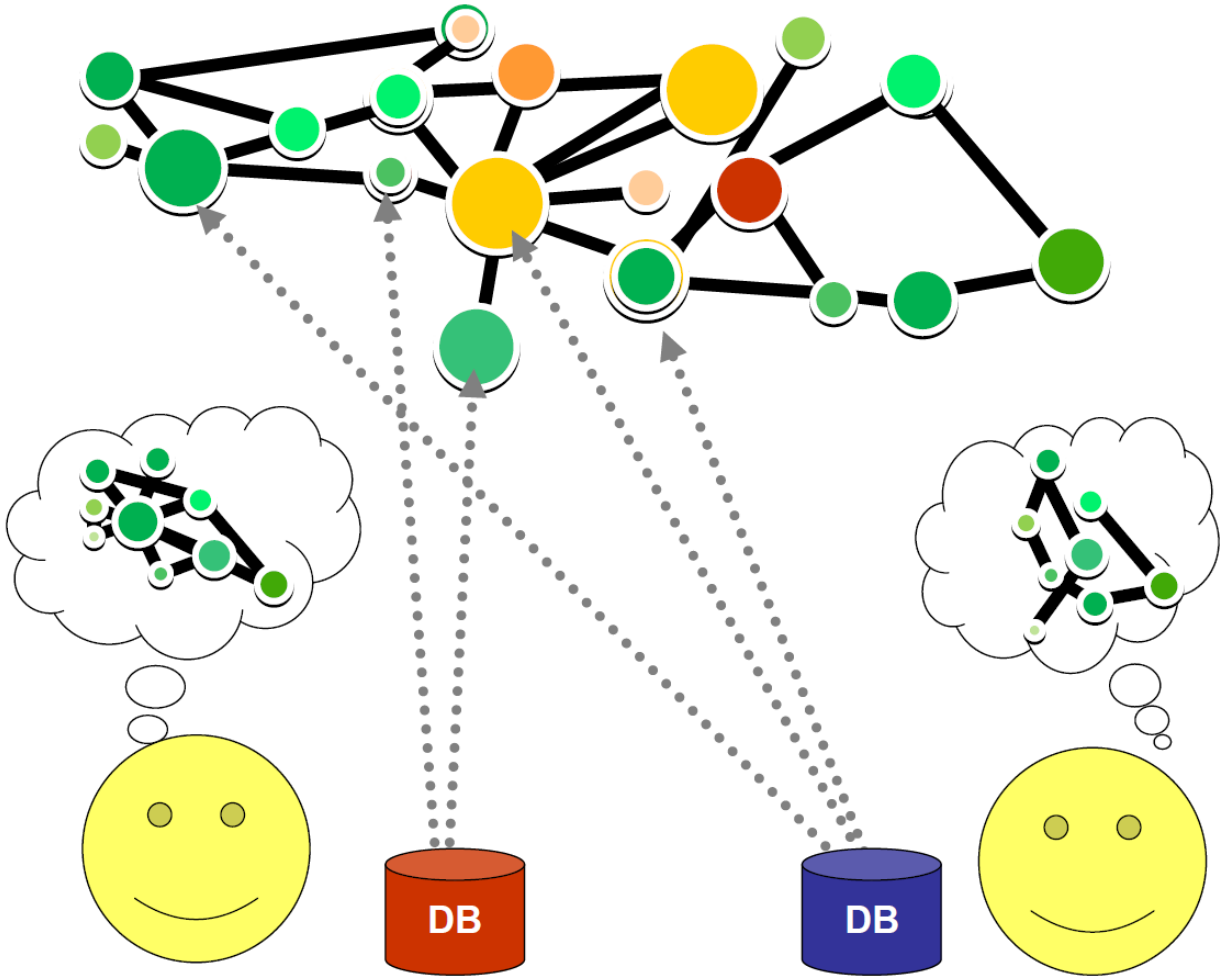


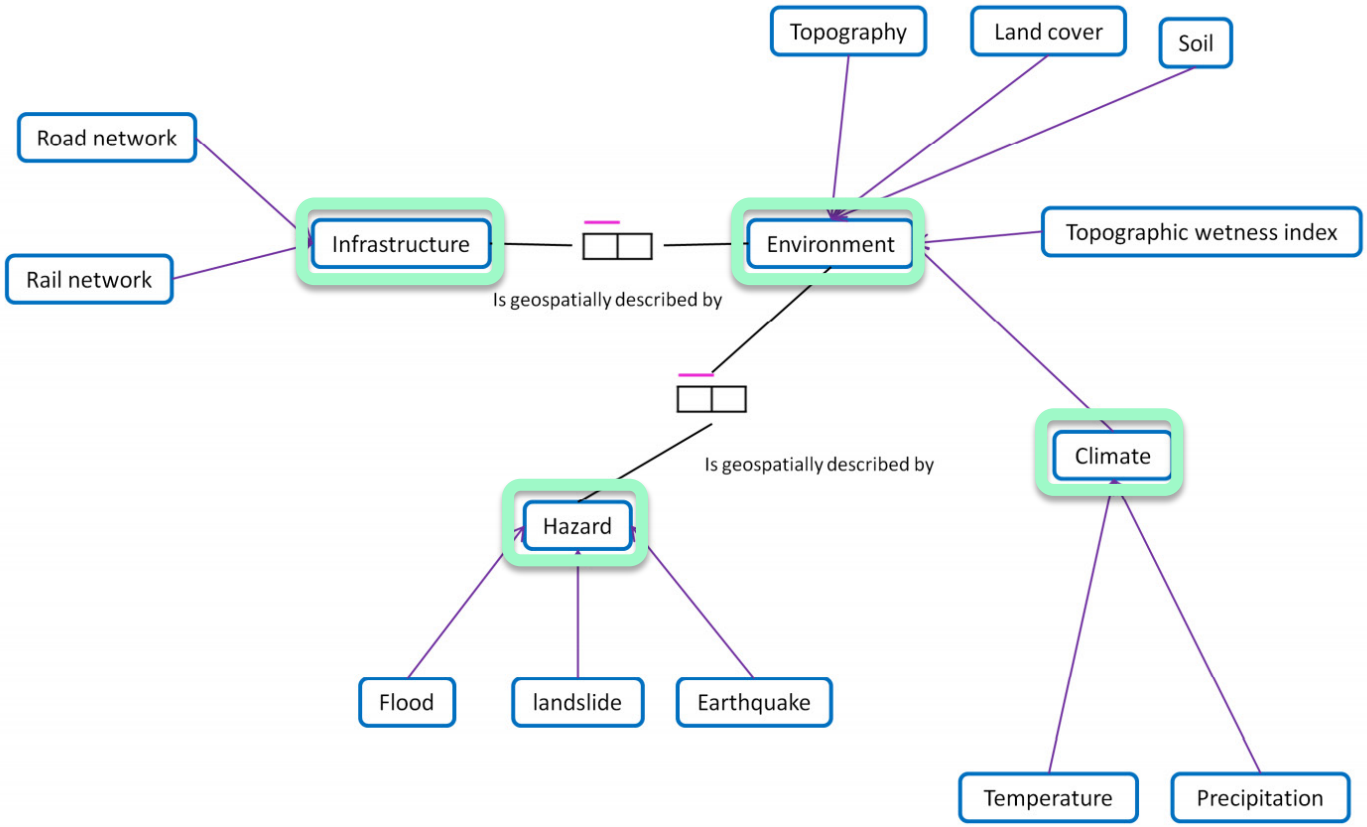


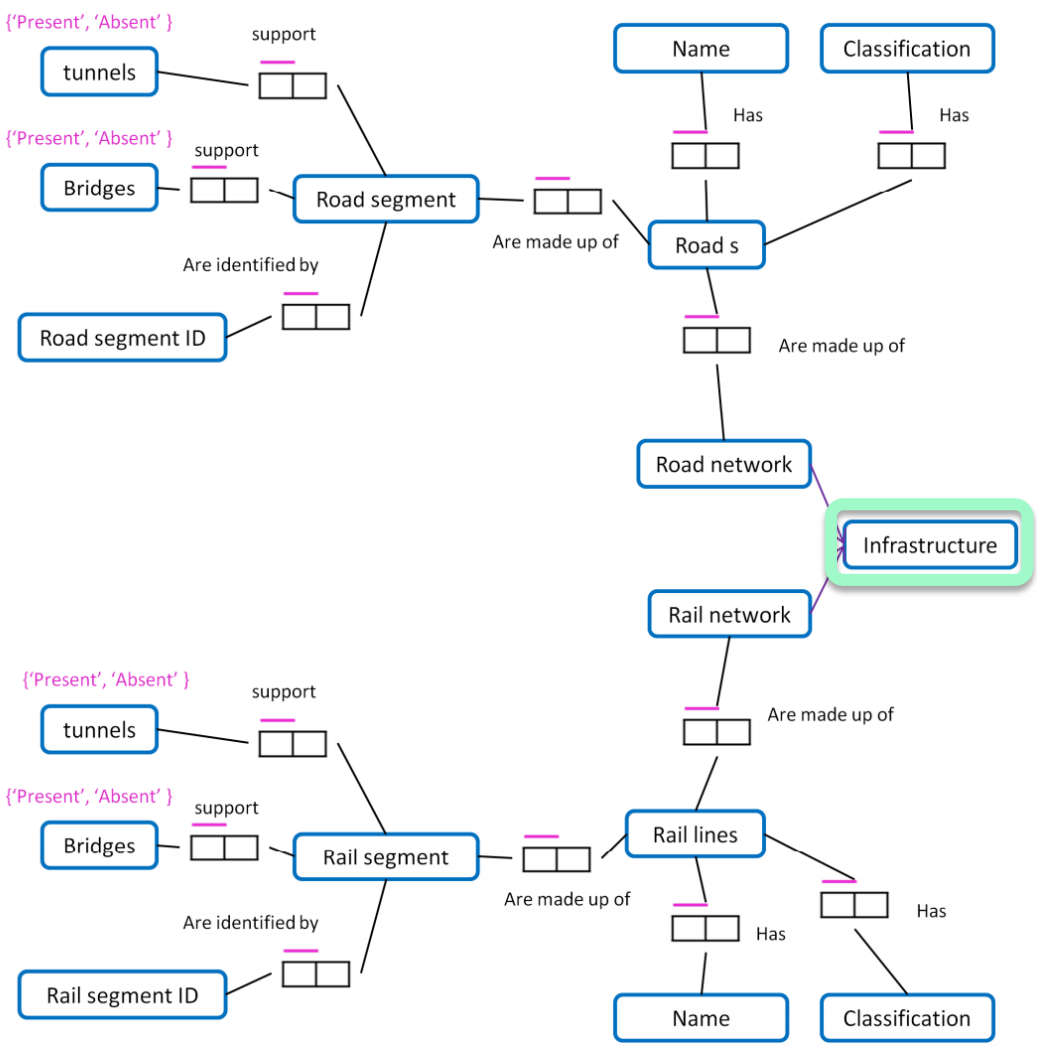


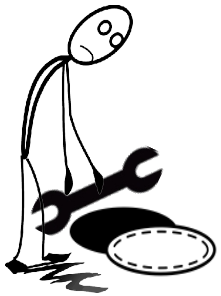


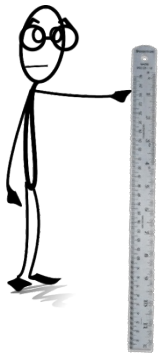


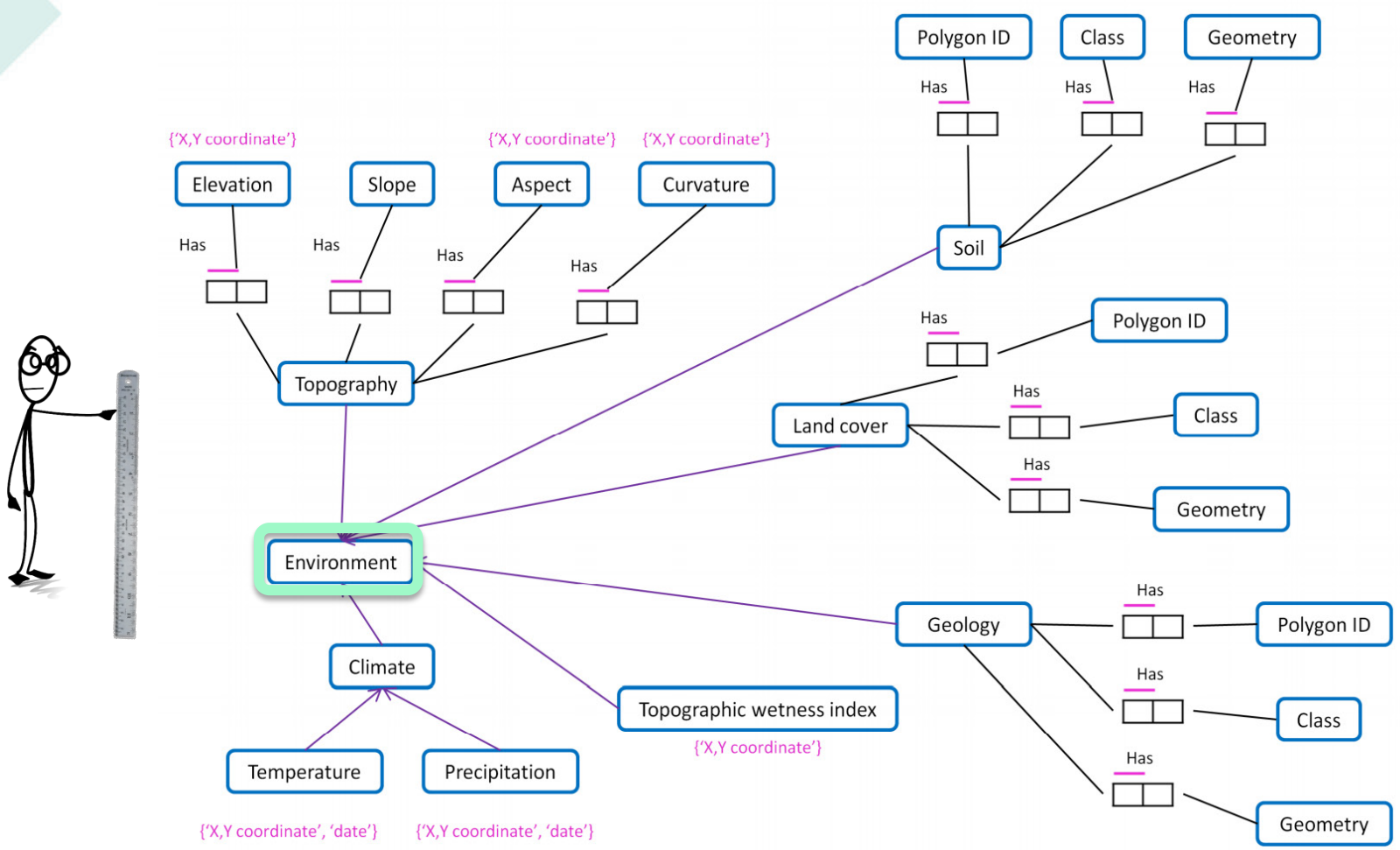


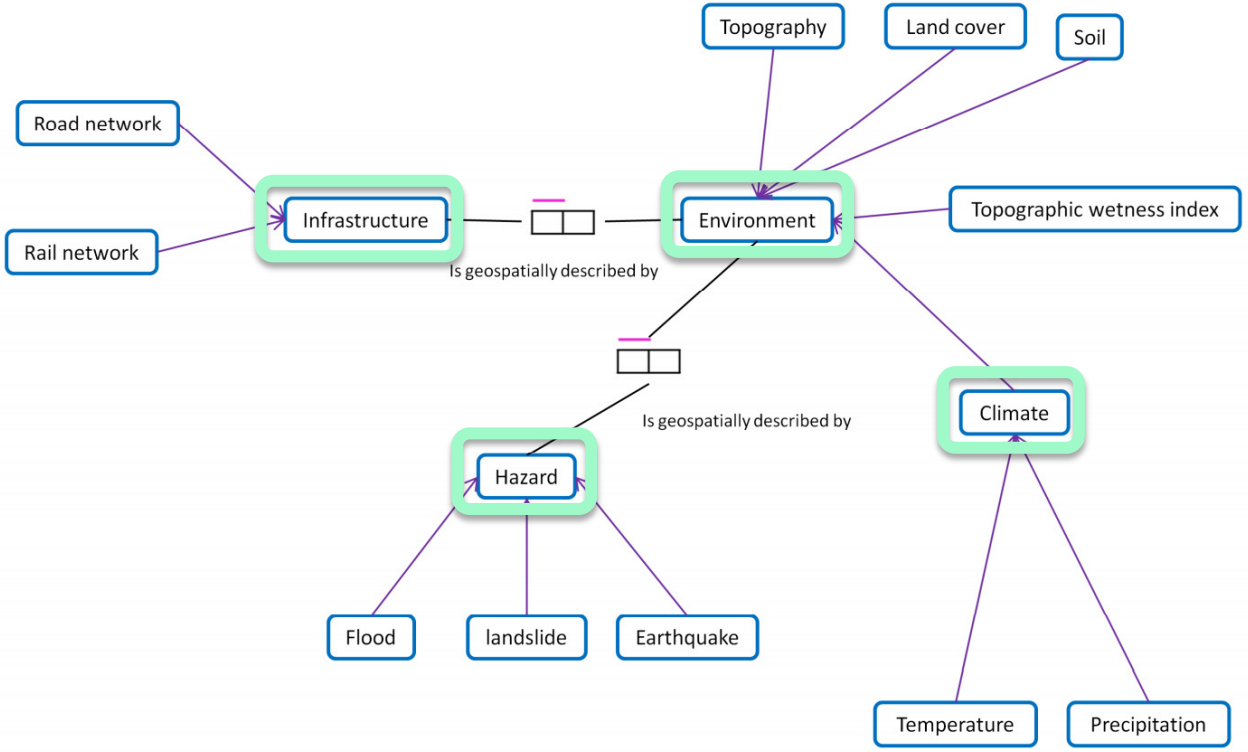


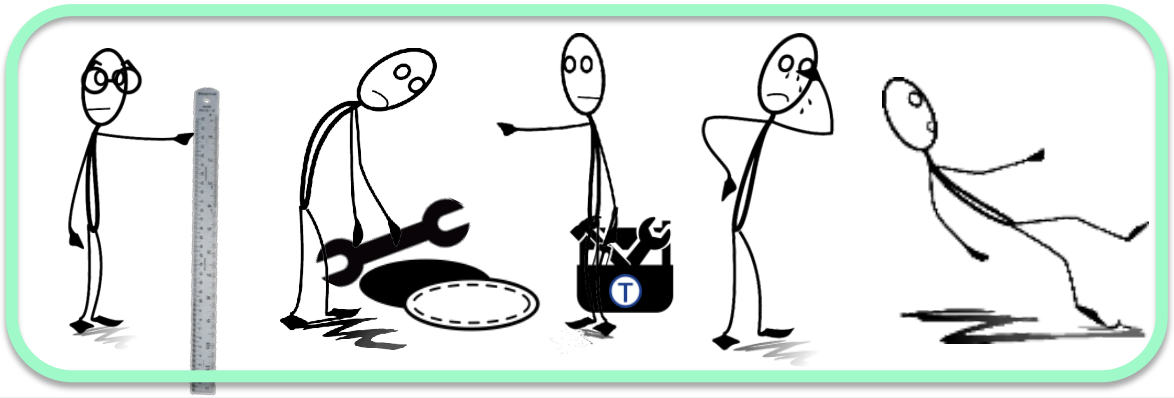




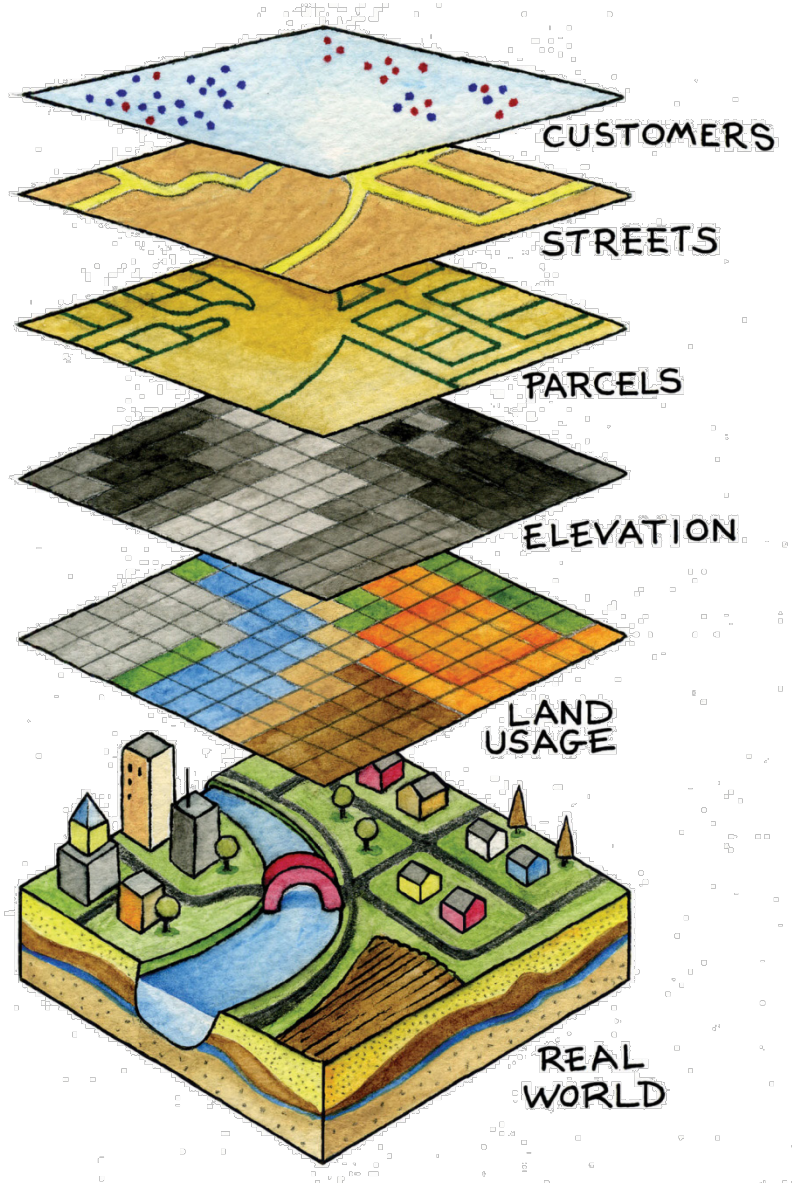


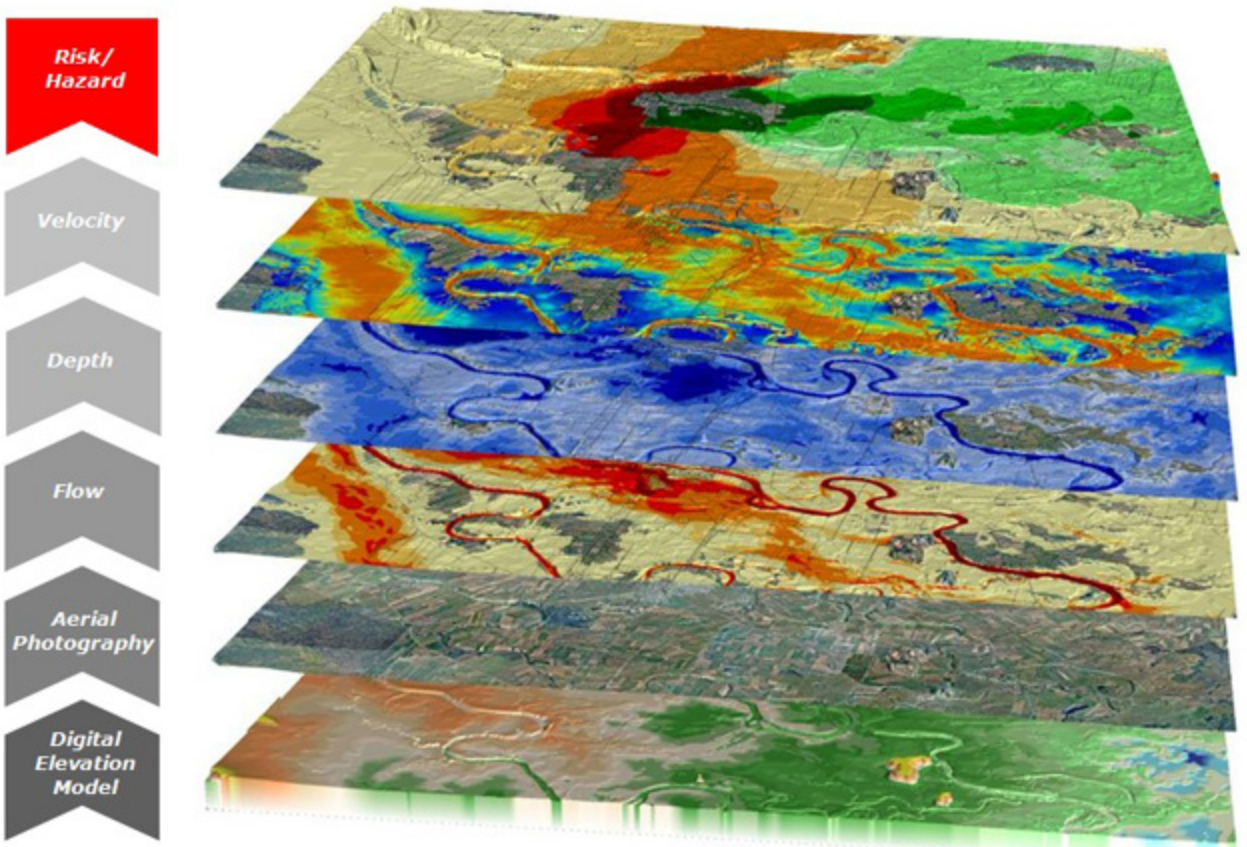


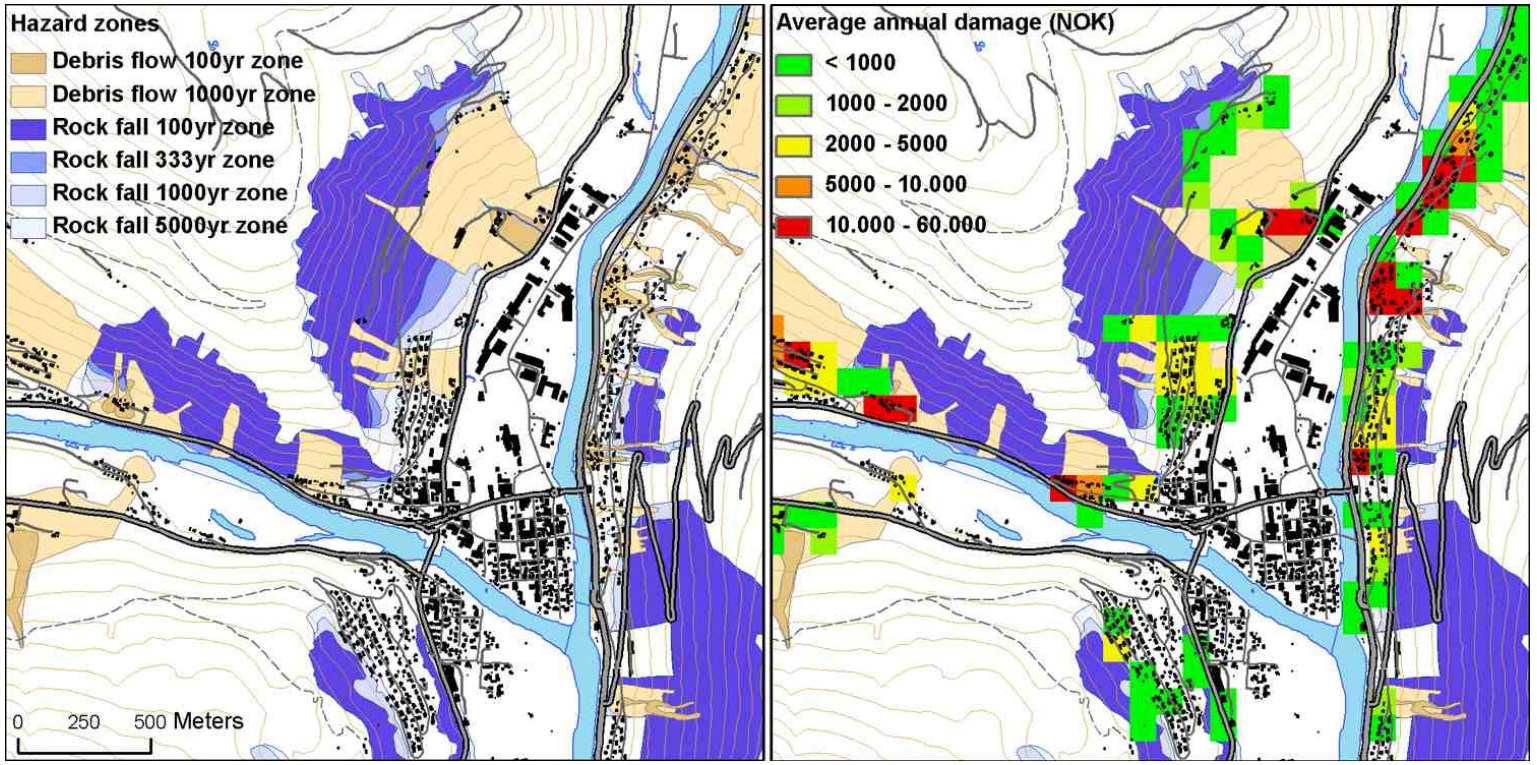




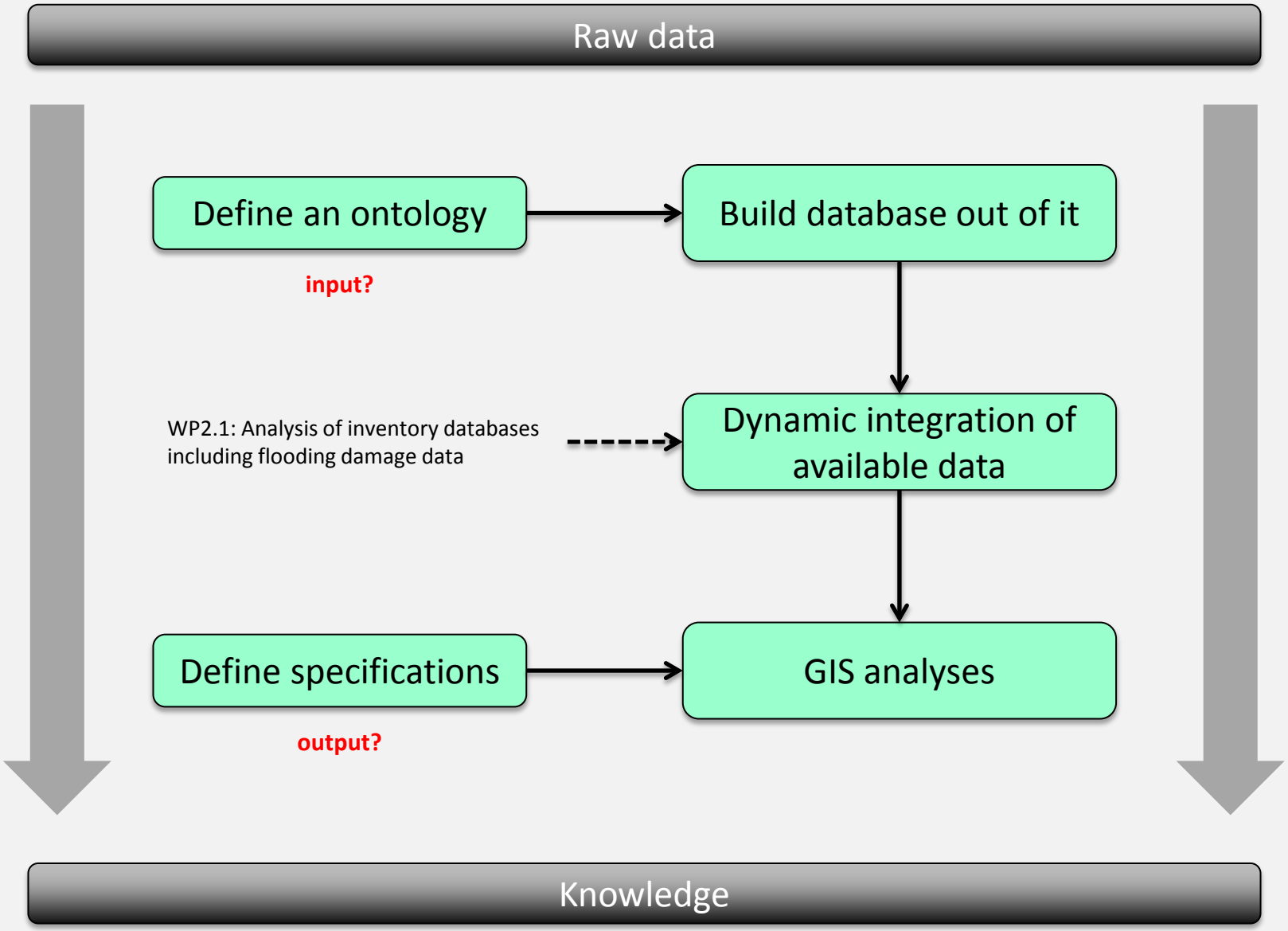
Geographic Information Systems (GIS)







Summary


Raw data
Define an ontology
Build database out of it
input?
WP2.1: Analysis of inventory databases including flooding damage data
Dynamic integration of available data
Define specifications
GIS analyses
output?
Knowledge

Summary

input

output

WP2.1: Analysis of inventory databases including flooding damage data

(what?)

(why?)