

DELIVERABLE REPORT

WP2 – D2.3 - Summer School
Training Material

ABSTRACT This document, as part of WP2 (Capacity Building) consists of presentations and hands-on material for the execution of the Summer school derived from D2.1.

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Delft University of
Technology



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Draft v0.2	11/09/2020	Bastiaan van Loenen (TU Delft)	Updated version with ppts of Summer school participants
Draft v0.3	14/09/2020	Anneke Zuiderwijk (TU Delft), Frederika Welle Donker (TU Delft)	Review
Draft v0.4	27/09/2020	Bastiaan van Loenen (TU Delft)	Final draft review and editing
Draft v0.9	30/09/2020	Ana Kuveždić Divjak (GEOD)	Final review

STAKEHOLDERS INCLUDED: Delft University of Technology (TUDELFT)

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OUTPUT DOCUMENTS/MATERIALS: Other

Approved by:

Date of approval:

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Executive Summary

This deliverable provides the presentations and hands-on material for the execution of the Summer School derived from D2.1 and D2.2. It also includes the result of the work of the Summer School participants. The Summer School, held over five days as a combined online/offline event, focused on the research roadmap development identifying the interdisciplinary and multi-domain research challenges as well as single disciplinary and multidisciplinary open data challenges. The outcomes of the Summer School resulted in the definition of interdisciplinary research challenges dealing with one or multiple stages of the open data life cycle. Main outcomes of the Summer School were:

1. An improved common understanding of open data (ecosystems and infrastructures)
2. An improved common understanding of interdisciplinary research
3. The sharing the research proposals of Early Stage Researcher (ESR) open data projects with the wider TODO community aiming at developing an interdisciplinary view
4. A first draft of interdisciplinary supervision teams for the ESR projects
5. The Interdisciplinary Open Data Assessment Framework 2.0
6. An initial TODO interdisciplinary multi-domain research approach

1 Introduction

As part of the WP2 Capacity Building, the Summer School objective is to transfer open data knowledge and experiences from Delft University of Technology (TUDELFT) and University of the Aegean (UAEGEAN) to the partners of the University of Zagreb (UNIZG).

The Summer School should have been organized in Croatia in July 2020. Due to external circumstances beyond the control of the TODO partners (COVID-19), the Summer School was held from September 7- September 11, 2020. National and international COVID-19 measures prevented partners from TUDELFT and UAEGEAN to travel to Croatia. Therefore, the Summer School was organised in a mixed form: online and offline (for UNIZG partners).

The five-day Summer School focused on the research roadmap development identifying the interdisciplinary and multi-domain research challenges as well as single disciplinary and multidisciplinary open data challenges. The outcomes of the Summer School resulted in the definition of interdisciplinary research challenges dealing with one or multiple stages of the open data life cycle.

The Summer School encompassed a recap of the main concepts of the online training program (day 1), including the open data ecosystem and the open data life cycle concepts, as well as an overview of the current state of the art of the Croatian open data ecosystem. The second day of the workshop focused on the open data research challenges and research methodologies and techniques. On Day 3, the single disciplinary open data approaches on the open data life cycle of all partner university were shared and discussed in the context of the development of an initial interdisciplinary multi-domain research approach. The afternoon of Day 3 was dedicated to the next iteration of the TODO Open Data Interdisciplinary Assessment Framework. On Day 4, we discussed interdisciplinary research approaches and applied the outcomes of our discussions to 10 Early Stage Researcher (ESR) open data projects. On the final day, we discussed interdisciplinary open data challenges that will be further discussed in the TODO seminar I.

Main outcomes of the Summer School are:

1. An improved common understanding of open data (ecosystems and infrastructures)
2. An improved common understanding of interdisciplinary research
3. The sharing the research proposals of Early Stage Researcher (ESR) open data projects with the wider TODO community aiming at developing an interdisciplinary view
4. A first draft of interdisciplinary supervision teams for the ESR projects
5. The Interdisciplinary Open Data Assessment Framework 2.0
6. An initial TODO interdisciplinary multi-domain research approach

This document provides all the lecture material (lectures, assignments), as well as the presentations of the work by the summer school participants.

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2 Summer school impressions

The Summer school was organized in a mixed format: offline and online. For the online Summer school we used the BigBlueButton (BBB) platform (see figures 1 and 2).

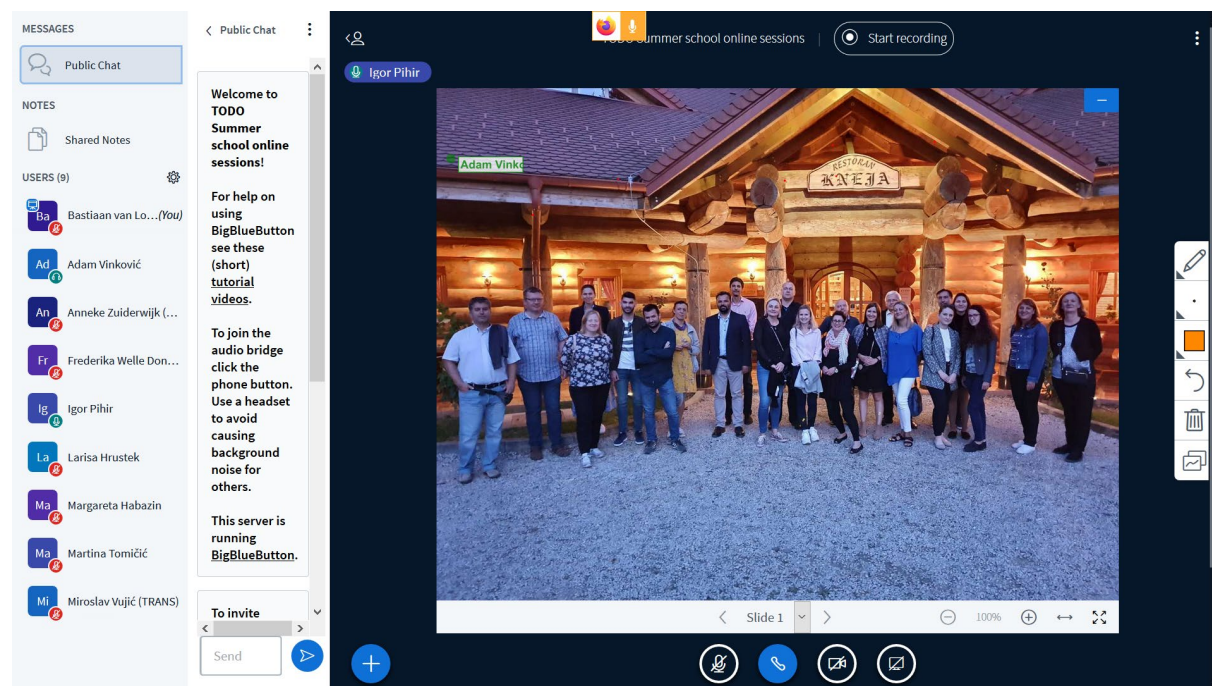


Figure 1: TODO summer school mixed mode: online and offline

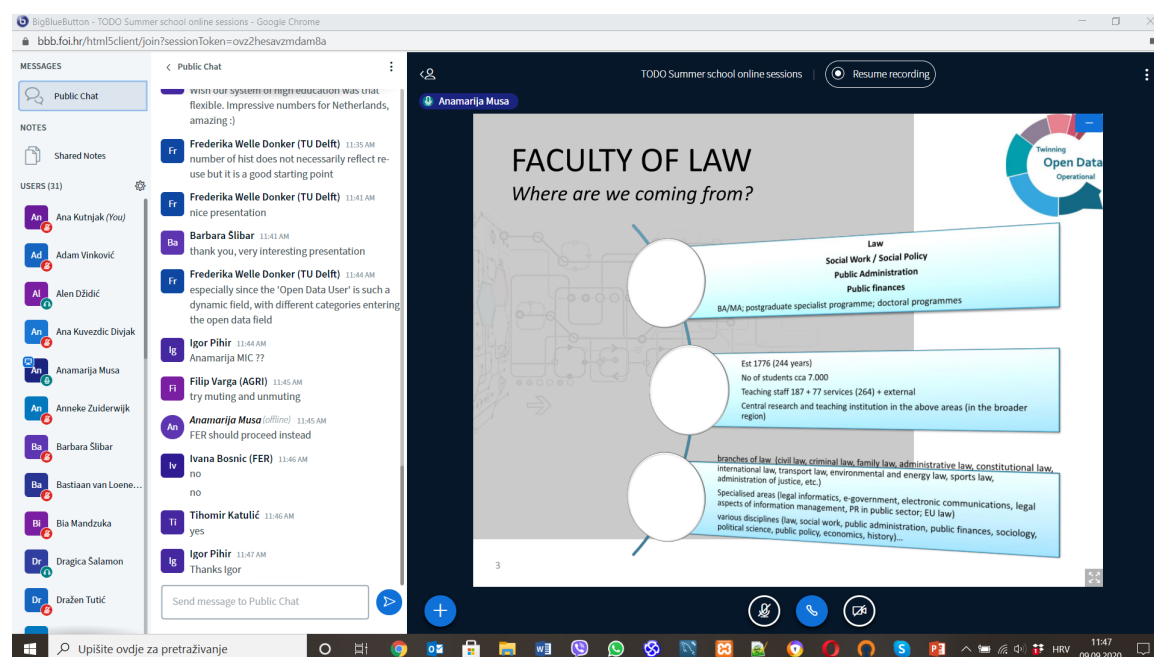


Figure 2: TODO summer school online

On Thursday and Friday, we organized offline in person sessions in Varaždin, which were livestreamed through BBB (see figures 3-5).



Figure 3: online and offline Summer school in Varaždin (1)

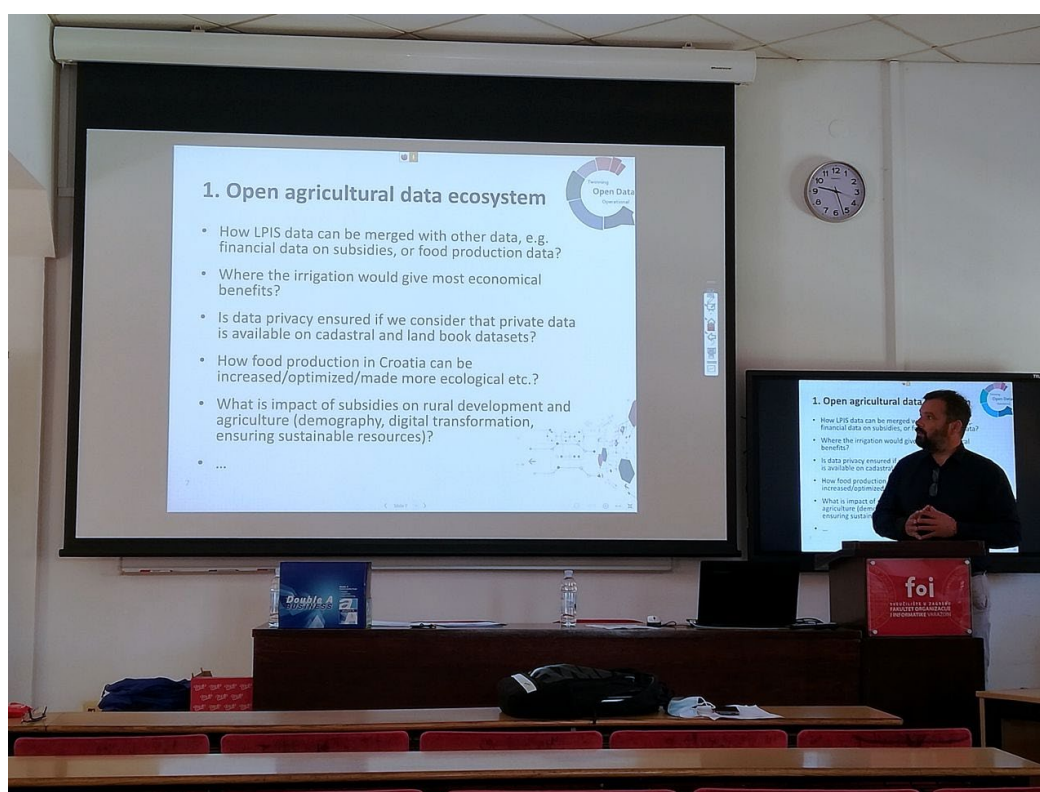


Figure 4: offline Summer school in Varaždin (2)



Figure 5: offline Summer school in Varaždin (3)

3 TODO Summer School Participants

TODO SUMMER SCHOOL T2.2 PARTICIPANTS (7/9-11/9/2020)					
Nr.	Name and Surname	Email address	online / in person	Institution	ESR
1.	Adam Vinković	avinkovic@geof.hr	online	GEOD	YES
2.	Agung Indrajit	a.indrajit@tudelft.nl	online	TU DELFT	
3.	Alen Dzidic	adzidic@agr.hr	in person	AGRI	
4.	Ana Kutnjak	akutnjak@foi.unizg.hr	in person	FOI	
5.	Ana Kuveždić Divjak	akuvezdic@geof.hr	in person	GEOD	
6.	Anamarija Musa	amusa@pravo.hr	in person	LAW	
7.	Anneke Zuiderwijk	A.M.G.Zuiderwijk-vanEijk@tudelft.nl	online	TU DELFT	
8.	Barbara Šlibar	bslibar@foi.hr	in person	FOI	
9.	Bastiaan van Loenen	b.vanloenen@tudelft.nl	online	TU DELFT	
10.	Bia Mandžuka	bia.mandzuka@fpz.unizg.hr	online	TRANS	YES
11.	Dragica Šalomon	dsalomon@agr.hr	in person	AGRI	
12.	Dražen Tutić	dtutic@geof.hr	in person	GEOD	
13.	Emanuel Guberovic	emanuel.guberovic@fer.hr	in person	FER	YES
14.	Euripidis Loukis	eloukis@aegean.gr	online	AEGEAN	
15.	Filip Varga	fvarga@agr.hr	in person	AGRI	YES
16.	Frederika Welle Donker	f.m.welldonker@tudelft.nl	online	TU DELFT	
17.	Harris Alexopoulos	alexop@aegean.gr	online	AEGEAN	
18.	Igor Čavrak	igor.cavrak@fer.hr	in person	FER	
19.	Igor Pihir	ipihir@foi.hr	in person	FOI	
20.	Ivana Bosnic	ivana.bosnic@fer.hr	in person	FER	
21.	Jura Kapustić	jkapustic@foi.hr	in person	FOI	YES
22.	Karlo Kević	kkevic@geof.hr	in person	GEOD	YES
23.	Larisa Hrustek	lhrustek@foi.unizg.hr	in person	FOI	YES
24.	Margareta Habazin	mhabazin1@gmail.com	in person	APIS IT, LAW	YES
25.	Martin Gregurić	mgreguric@fpz.hr	online	TRANS	
26.	Martina Tomićić Furjan	mtomicic@foi.hr	in person	FOI	
27.	Miroslav Vujic	miroslav.vujic@fpz.hr	online	TRANS	
28.	Neven Vrček	nvrcek@foi.hr	in person	FOI	
29.	Nikolina Žajdela Hrustek	nzejdela@foi.hr	in person	FOI	
30.	Petra Đurman	petra.durman@pravo.hr	in person	LAW	
31.	Renata Mekovec	renata.mekovec@foi.hr	in person	FOI	
32.	Tihomir Katulić	tkatulic@gmail.com	in person	LAW	
33.	Vaggelis Pikis	vaggelis.pikis@yahoo.com	online	AEGEAN	YES
34.	Vesna Poslončec-Petrić	vesna.posloncec@geof.hr	in person	GEOD	
35.	Warakan Supinajaroen	w.supinajaroen@tudelft.nl	online	TU DELFT	YES
36.	Željko Bačić	zbacic@geof.hr	in person	GEOD	

4 TODO Summer School Program

Day 1: Introduction and recap

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Welcome, introduction to the Summer school	Martina Tomičić Furjan Igor Pihir	Live + PPT BBB TODO Summer School
10:30-11:00	Introduction of participants	All participants	Live BBB TODO Summer School
11:00-11:30	Recap of the OTP Module 1 & 2	Bastiaan van Loenen Charalampos Alexopoulos	Live + PPT BBB TODO Summer School
11:30-12:00	Status of open data in Croatia	Anamarija Musa	Live + PPT BBB TODO Summer School
12:00-13:00	BREAK		
13:00-15:00	Presentation of TODO PhD research (plans) (UNIZG, TUDELFT, UAEGEAN)		Offline + PPT + forum
15:00-17:00	Presentation of TODO PhD research (plans)	Frederika Welle Donker ESRs, All participants	Live + PPT BBB TODO Summer School

Day 2: Research methodologies and challenges in open data life cycle

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Wrap up of the previous day	Frederika Welle Donker ESRs (1-3)	Live + PPT BBB TODO Summer School
10:30-11:00	The open data research challenges and Assignment 1	Charalampos Alexopoulos	Live + PPT BBB TODO Summer School
11:00-11:30	Advanced Research Methodologies for open data	Euripidis Loukis	Live + PPT BBB TODO Summer School
11:30-12:00	Advanced Research Techniques for open data	Euripidis Loukis	Live + PPT BBB TODO Summer School
12:00-13:00	BREAK		
13:00-15:00	The open data research challenges		Offline + PPT + notes
15:00-17:00	Advanced Research Methodologies for open data		Offline + PPT + notes

Day 3:

Understanding disciplinary research methodologies

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Wrap up of the previous day	Frederika Welle Donker ESRs (4-6)	Live + PPT BBB TODO Summer School
10:30-11:00	Looking ahead to day 3... from disciplinary to Interdisciplinary research	Frederika Welle Donker	Live + PPT BBB TODO Summer School
11:00-12:00	Disciplinary research methodologies: Practices from FOI, TUDELFT, LAW, FER	All participants	Live + PPT BBB TODO Summer School
12:00-12:30	BREAK		
12:30-13:30	Disciplinary research methodologies: Practices from UAEGEAN, GEOD, AGRI, TRANS	All participants	Live + PPT BBB TODO Summer School
13:30-15:00	Interdisciplinary research		Offline + PPT + notes
15:00-17:00	Interdisciplinary assessment framework (IAF) of TODO 2.0	Bastiaan van Loenen	Live + PPT

Day 4:
Towards an interdisciplinary research agenda

Time	Program		Moderator / teacher		Mode
10:00-10:30	Meeting with faculty management and staff at FOI		Martina Tomičić Furjan Igor Pihir		In person + Live + PPT BBB TODO Summer School
10:30-10:45	Wrap up of the previous day		Frederika Welle Donker ESRs (7-9)		In person + Live + PPT BBB TODO Summer School
10:45-11:45	Assignment 2: exploring interdisciplinary approaches in using COVID-19 data		Anneke Zuiderwijk		In person + Live + PPT BBB TODO Summer School
11:45-12:15	BREAK				
12:15-12:30	Introduction to assignment 3: making ESR research more interdisciplinary		Frederika Welle Donker		In person + Live + PPT BBB TODO Summer School
12:30-13:30	ESR discussion session A	Project activities - next steps discussion	TUDELFT UAEGEAN ESRs	Other participants	In person + Live + PPT BBB TODO Summer School
13:30-15:00	LUNCH BREAK				
15:00-16:00	ESR discussion session B	Project activities - next steps discussion	TUDELFT UAEGEAN ESRs	Other participants	In person + Live + PPT BBB TODO Summer School
16:00-17:00	Wrap up of the day: ESRs briefly present their findings and plenary discussion		All participants		In person + Live + PPT BBB TODO Summer School
19:00	Social event				

Day 5:
Applying the interdisciplinary perspective to the open data ecosystem

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Open data research challenges: presentation of cases from the TODO partners	Dražen Tutić	In person + Live + PPT BBB TODO Summer School
10:30-11:30	Assignment 4: Applying the IAF to cases 1, 2 and 3 (parallel sessions)	All participants	In person + Live + PPT BBB TODO Summer School
11:30-12:00	BREAK		
12:00-13:30	Reporting of the findings of assignment 4 (plenary session)	All participants	In person + Live + PPT BBB TODO Summer School
13:30-15:00	LUNCH BREAK		
15:00-17:00	Wrap up of the week and next steps (site visits)	Dražen Tutić All participants	In person + Live + PPT BBB TODO Summer School

4.1 Day 1: Introduction and recap

The Summer School encompassed a recap of the main concepts of the online training program (day 1), including the open data ecosystem and the open data life cycle concepts (recap of Online Training Program Module 1 and 2), as well as an overview of the current state of the art of the Croatian open data ecosystem. Also the ESR's presented their research ideas and topics.

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Welcome, introduction to the Summer school	Martina Tomičić Furjan Igor Pihir	Live + PPT BBB TODO Summer School
10:30-11:00	Introduction of participants	All participants	Live BBB TODO Summer School
11:00-11:30	Recap of the OTP Module 1 & 2	Bastiaan van Loenen Charalampos Alexopoulos	Live + PPT BBB TODO Summer School
11:30-12:00	Status of open data in Croatia	Anamarija Musa	Live + PPT BBB TODO Summer School
12:00-13:00	BREAK		
13:00-15:00	Presentation of TODO PhD research (plans) (UNIZG, TUDELFT, UAEGEAN)		Offline + PPT + forum
15:00-17:00	Presentation of TODO PhD research (plans)	Frederika Welle Donker ESRs, All participants	Live + PPT BBB TODO Summer School



TODO

Summer school

Day 1



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



⇒ Summer school – Introduction and welcome

7-11. September 2020.

Martina Tomičić Furjan, FOI

Igor Pihir, FOI



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda

A

About TODO



B

About the Summer school



C

Program overview



D

Online days - instructions



E

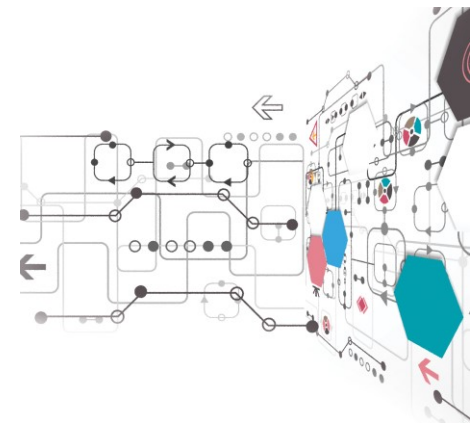
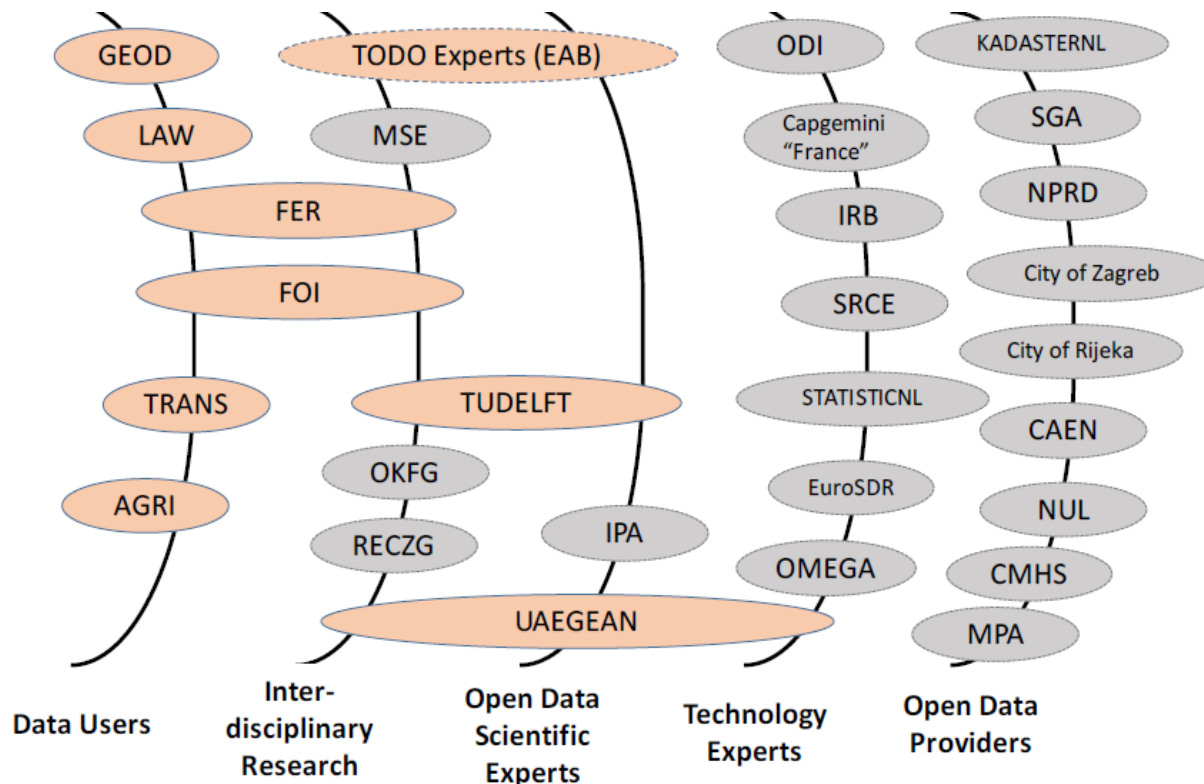
In person days - instructions



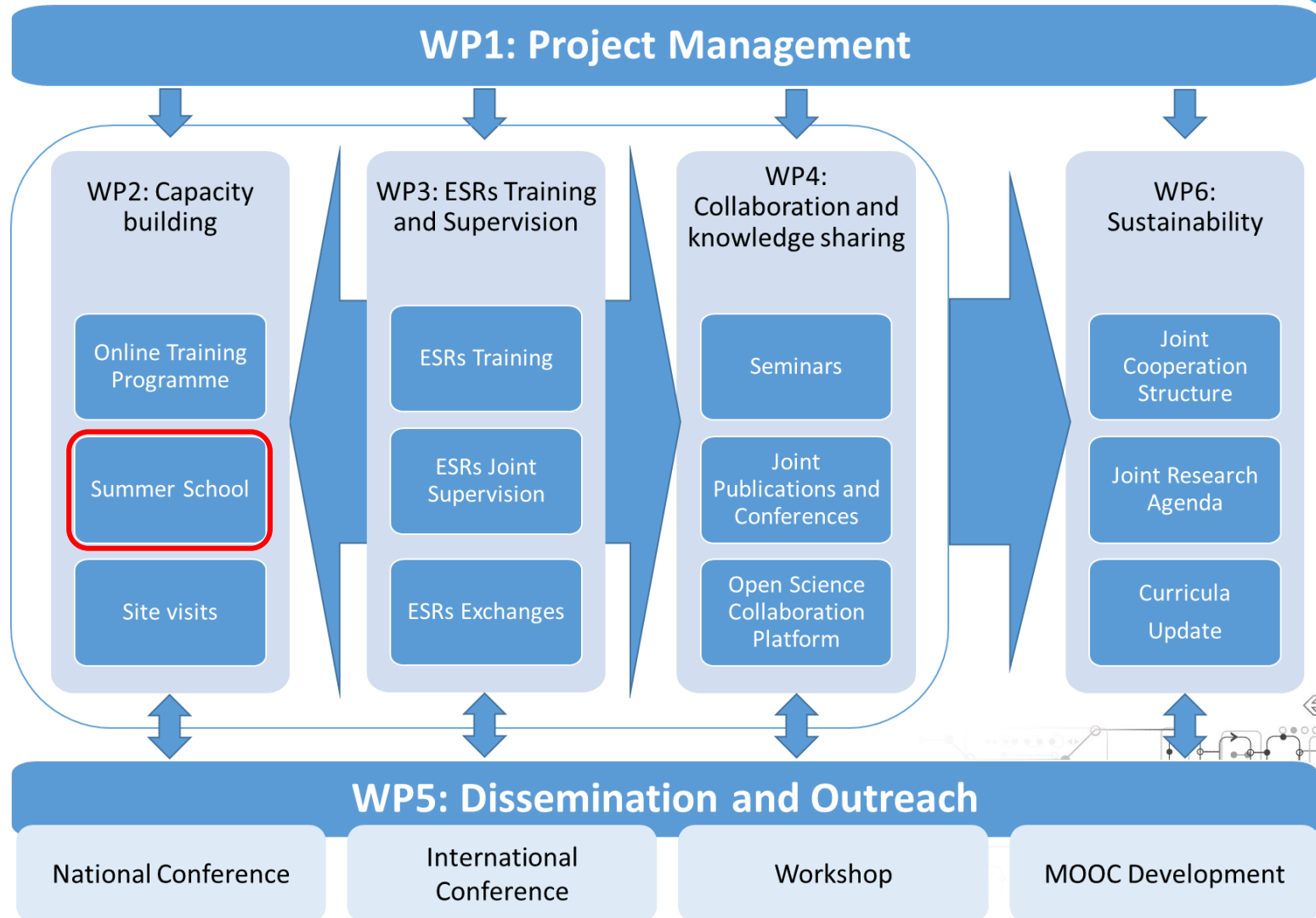
About TODO



- The project "Twinning Open Data Operational" (TODO) aims to leverage the interdisciplinary scientific excellence and innovation capacity of the University of Zagreb (UNIZG) in the field of open data to boost the supply and use of open government data in Croatia and beyond



TODO WPs



TODO towards...



After TODO

Institutional component
(Open Data Labs at each faculty linked into University Center of Excellence)

Established in 1st year along with building common open data language

Technological component
(new open collaboration online platform for research and external collaboration)

Established in 1st year supporting capacity building actions

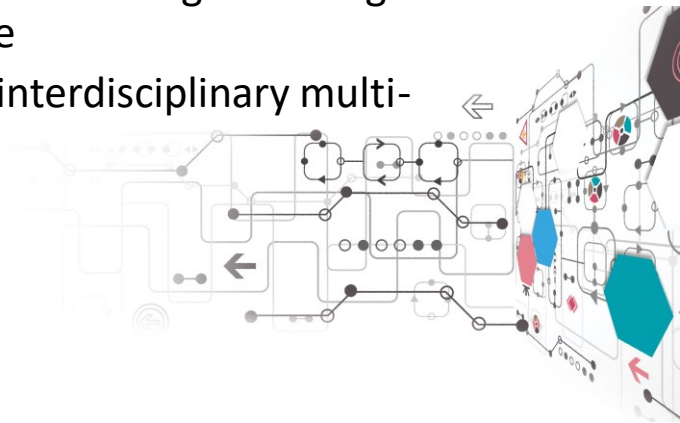
Transfer of knowledge component
(engaging interdisciplinary and multidomain research in collaboration with key open data stakeholders)

Established in 2nd year during joint research on specific use cases

About the Summer school - goals



- Part of WP 2: Capacity building – goal is to significantly enhance the overall scientific R&I capacity of the UNIZG in the field of open data
- Goal of the Summer school is to enhance know-how of concepts, approaches and theories related to the different phases of the open data life cycle and different domains of open data through a summer school
 - single disciplinary open data approaches on the open data life cycle will be shared and discussed in the context of the development of an initial interdisciplinary multi-domain research approach
 - this will lead to a common understanding of the different disciplinary approaches and perspectives and will be used as the starting point for identifying interdisciplinary and multi-domain research challenges dealing with one or multiple stages of the open data life cycle
 - the Summer school should result in an agreed initial interdisciplinary multi-domain research approach



About the Summer school - participants



- **All project researchers** will set ground for interdisciplinary research based on open data
- The involvement of **ESRs (Early Stage Researchers)** and their research by educating and training ESRs in the domain of open data is promoted
- The Summers school is also open to **other UNIZG faculties and departments** and interested public

Program overview – all days



Introduction
and recap **01**

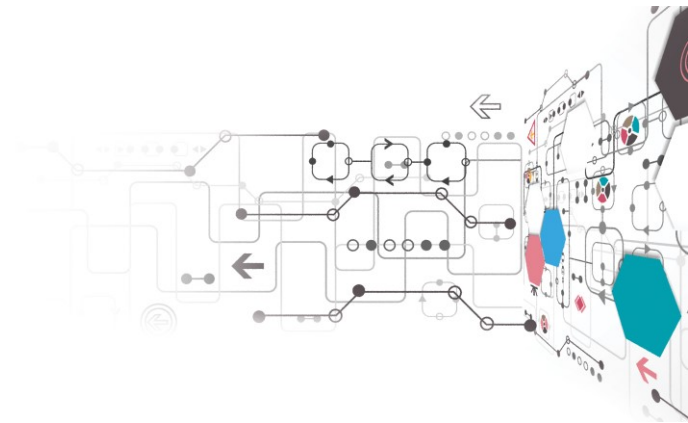
Research
methodologies
and challenges in
open data life
cycle **02**

Understanding
disciplinary
research
methodologies **03**



04 Towards an
interdisciplinary
research agenda

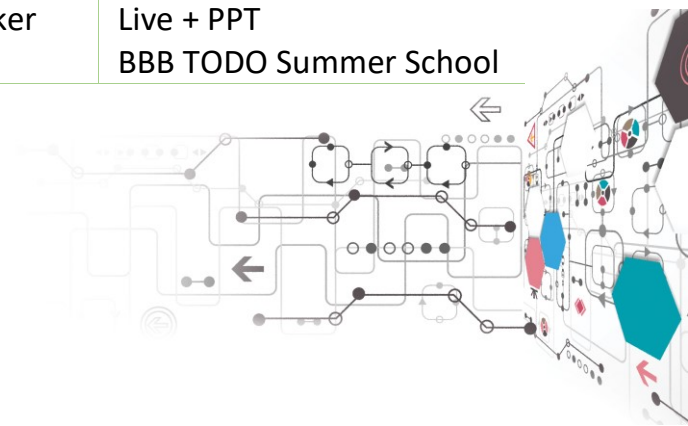
05 Applying the
interdisciplinary
perspective to
the open data
ecosystem.



Program overview – Day 1

Day 1: Introduction and recap

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Welcome, introduction to the Summer school	Martina Tomičić Furjan Igor Pihir	Live + PPT BBB TODO Summer School
10:30-11:00	Introduction of participants	All participants	Live BBB TODO Summer School
11:00-11.30	Recap of the OTP Module 1 & 2	Bastiaan van Loenen Charalampos Alexopoulos	Live + PPT BBB TODO Summer School
11:30-12:00	Status of open data in Croatia	Anamarija Musa	Live + PPT BBB TODO Summer School
12:00-13:00	BREAK		
13:00-15:00	Presentation of TODO PhD research (plans) (UNIZG, TUDELFT, UAEGEAN)		Offline + PPT + forum
15:00-17:00	Presentation of TODO PhD research (plans)	Frederika Welle Donker ESRs, All participants	Live + PPT BBB TODO Summer School

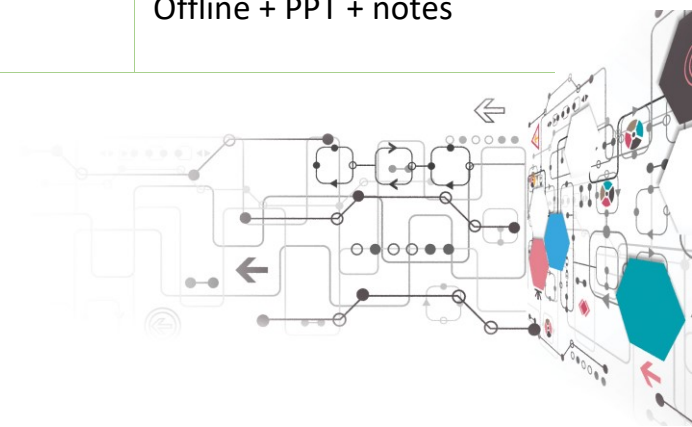


Program overview – Day 2

Day 2:

Research methodologies and challenges in open data life cycle

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Wrap up of the previous day	Frederika Welle Donker ESRs (1-3)	Live + PPT BBB TODO Summer School
10:30-11:00	The open data research challenges and Assignment 1	Charalampos Alexopoulos	Live + PPT BBB TODO Summer School
11:00-11:30	Advanced Research Methodologies for open data	Euripidis Loukis	Live + PPT BBB TODO Summer School
11:30-12:00	Advanced Research Techniques for open data	Euripidis Loukis	Live + PPT BBB TODO Summer School
12:00-13:00	BREAK		
13:00-15:00	The open data research challenges		Offline + PPT + notes
15:00-17:00	Advanced Research Methodologies for open data		Offline + PPT + notes

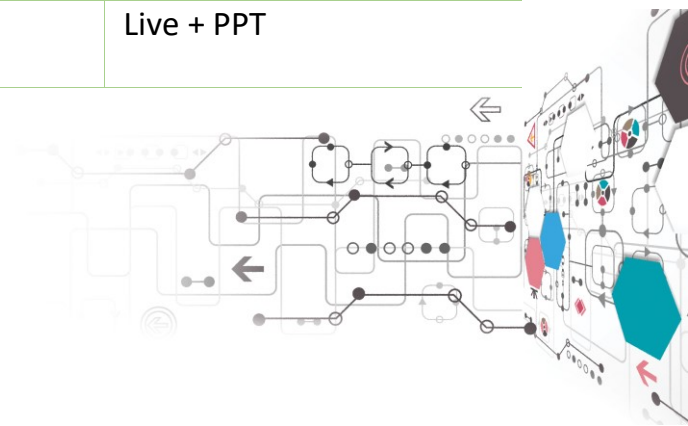


Program overview – Day 3

Day 3:

Understanding disciplinary research methodologies

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Wrap up of the previous day	Frederika Welle Donker ESRs (4-6)	Live + PPT BBB TODO Summer School
10:30-11:00	Looking ahead to day 3... from disciplinary to Interdisciplinary research	Frederika Welle Donker	Live + PPT BBB TODO Summer School
11:00-12:00	Disciplinary research methodologies: Practices from FOI, TUDELFT, LAW, FER	All participants	Live + PPT BBB TODO Summer School
12:00-12:30	BREAK		
12:30-13:30	Disciplinary research methodologies: Practices from UAEGEAN, GEOD, AGRI, TRANS	All participants	Live + PPT BBB TODO Summer School
13:30-15:00	Interdisciplinary research		Offline + PPT + notes
15:00-17:00	Interdisciplinary assessment framework (IAF) of TODO 2.0	Bastiaan van Loenen	Live + PPT



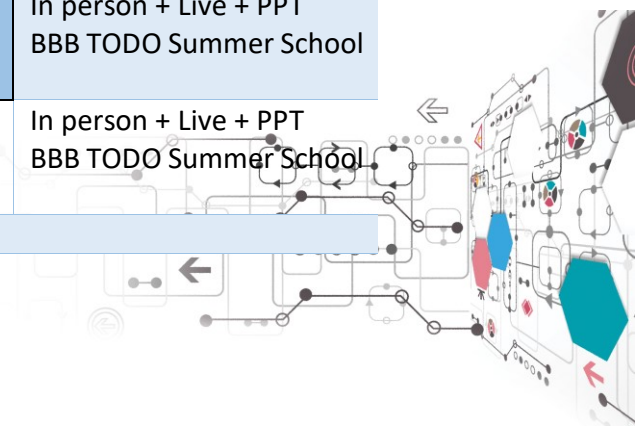


Program overview – Day 4

Day 4:

Towards an interdisciplinary research agenda

Time	Program		Moderator / teacher		Mode
10:00-10:30	Meeting with faculty management and staff at FOI		Martina Tomičić Furjan Igor Pihir		In person + Live + PPT BBB TODO Summer School
10:30-10:45	Wrap up of the previous day		Frederika Welle Donker ESRs (7-9)		In person + Live + PPT BBB TODO Summer School
10:45-11:45	Assignment 2: exploring interdisciplinary approaches in using COVID-19 data		Anneke Zuiderwijk		In person + Live + PPT BBB TODO Summer School
11:45-12:15	BREAK				
12:15-12:30	Introduction to assignment 3: making ESR research more interdisciplinary		Frederika Welle Donker		In person + Live + PPT BBB TODO Summer School
12:30-13:30	ESR discussion session A	Project activities - next steps discussion	TUDELFT UAEGEAN ESRs	Other participants	In person + Live + PPT BBB TODO Summer School
13:30-15:00	LUNCH BREAK				
15:00-16:00	ESR discussion session B	Project activities - next steps discussion	TUDELFT UAEGEAN ESRs	Other participants	In person + Live + PPT BBB TODO Summer School
16:00-17:00	Wrap up of the day: ESRs briefly present their findings and plenary discussion		All participants		In person + Live + PPT BBB TODO Summer School
19:00	Social event				

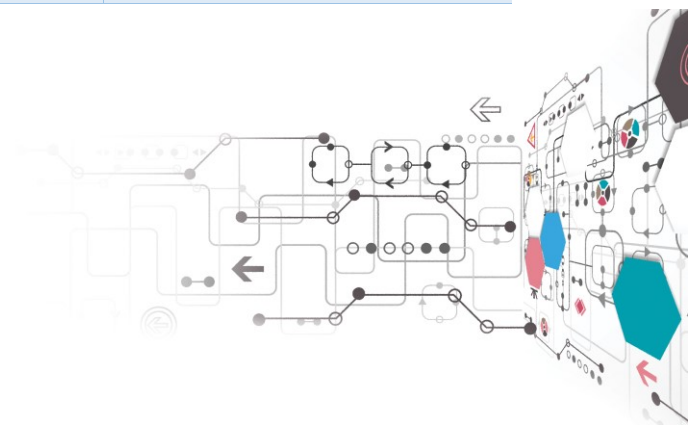


Program overview – Day 5

Day 5:

Applying the interdisciplinary perspective to the open data ecosystem

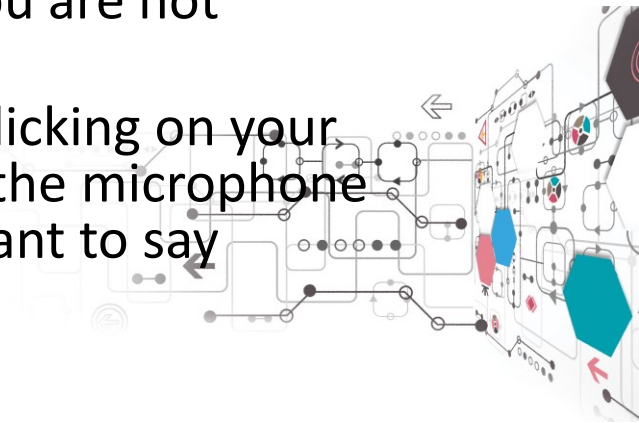
<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Open data research challenges: presentation of cases from the TODO partners	Dražen Tutić	In person + Live + PPT BBB TODO Summer School
10:30-11:30	Assignment 4: Applying the IAF to cases 1, 2 and 3 (parallel sessions)	All participants	In person + Live + PPT BBB TODO Summer School
11:30-12:00	BREAK		
12:00-13:30	Reporting of the findings of assignment 4 (plenary session)	All participants	In person + Live + PPT BBB TODO Summer School
13:30-15:00	LUNCH BREAK		
15:00-17:00	Wrap up of the week and next steps (site visits)	Dražen Tutić All participants	In person + Live + PPT BBB TODO Summer School



Online days 1,2 and 3 – instructions



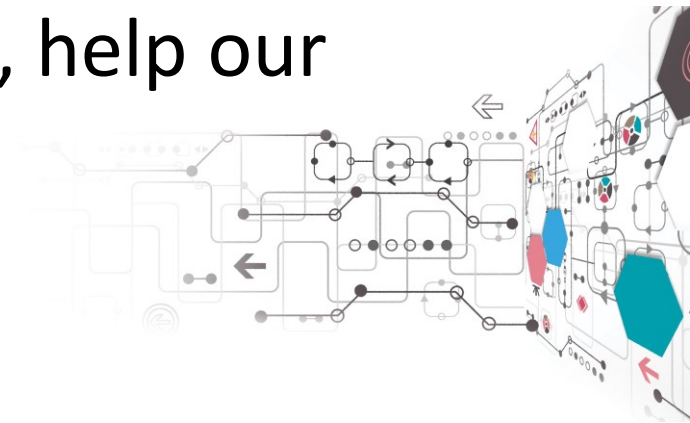
- Live part + offline part (please follow the detailed program)
- Live part will be held through a Virtual room on the BigBlueBatton platform, available on <https://bbb.foi.hr/b/mar-yjb-pg1>
- When online sessions are active:
 - each presenter will be given moderator rights when it is time to present
 - connect with your full name, microphone and speaker
 - be muted and without camera on when you are not presenting
 - if you want to speak, raise your hand (by clicking on your name you will get this option, or just turn the microphone on, and the moderator will see that you want to say something)



Online days 1,2 and 3 – instructions



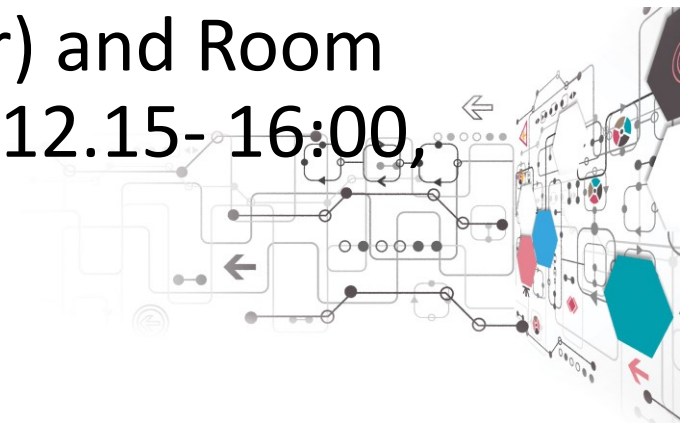
- Please be present in all sessions, since participation will be monitored and documented in all sessions!!!
- ESR presentations are already available in moodle (since Friday), as well as a forum for discussion added to each research presentation, please be active, help our ESRs!!!



In person days 4 and 5 – instructions



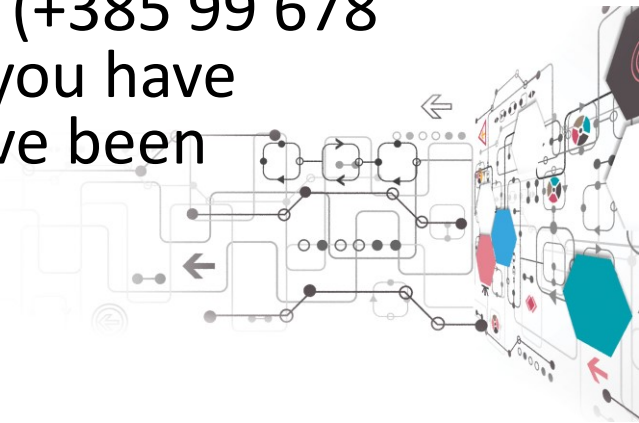
- In person + live part (please follow the detailed program)
- Live part will be held through a Virtual room on the BigBlueBatton platform, available on <https://bbb.foi.hr/b/mar-yjb-pg1>
- Venue: Faculty of organization and informatics, Pavlinska 2, Varaždin, Room 1 (all sessions, located in the 2nd floor) and Room 10 (parallel session on Thursday 12.15- 16:00 located on the ground floor)



In person days 4 and 5 – instructions



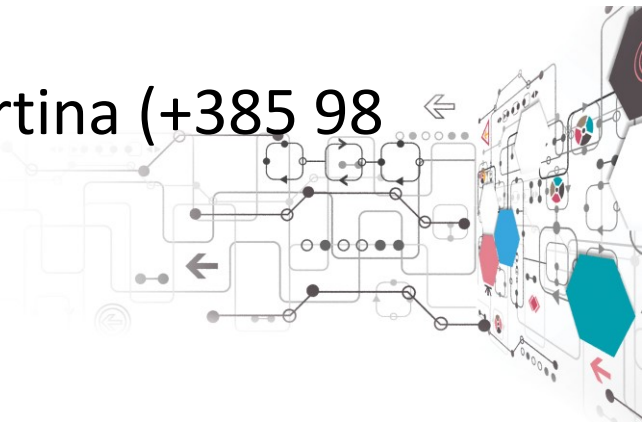
- When you arrive at FOI on **Thursday and Friday**, please:
 - use the **main entrance** (from the main square)
 - **do not come earlier than 9.45**
 - our colleagues **Larisa Hrustek and Ana Kutnjak** will welcome you at the registration desk, will **measure your temperature and document your personal information into an official presence list**
 - **if you arrive later, please call Larisa (+385 99 678 1862)**, and do not enter FOI before you have passed the registration desk and have been documented



In person days 4 and 5 – instructions



- The basic recommendations prescribed by the Croatian Institute of Public Health are also valid on the premises of the Faculty:
 - the rooms where we will stay will be disinfected several times a day
 - liquids for disinfection will be available at several locations of FOI
 - all participants are required to wear protective masks in the lecture halls and other premises of FOI
- Contact for any further questions - Martina (+385 98 1760 819) or Igor (+385 99 710 3214)



In person days 4 and 5 – instructions



- All coffee breaks are organized in the hotel Park, on the terrace, 2 min walk from FOI
- All lunches are organized in the Student restaurant, on the terrace, 10 min walk from FOI
- The social event is organized in the restaurant Kneja, on the terrace, Mali Mihaljevec, 19 km from Varaždin, near Čakovec





Contacts:

martina.tomicic@foi.hr

igor.pihir@foi.hr

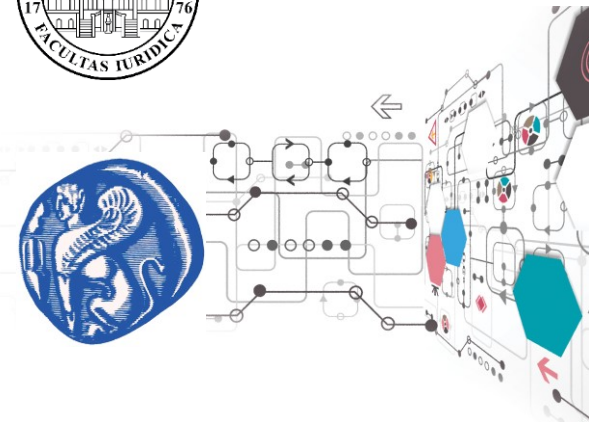
Enjoy and good luck to us all!!!



foi



TU Delft





⇒ Summer school – Introduction of participants

7-11. September 2020.

Igor Pihir, FOI

Martina Tomičić Furjan, FOI

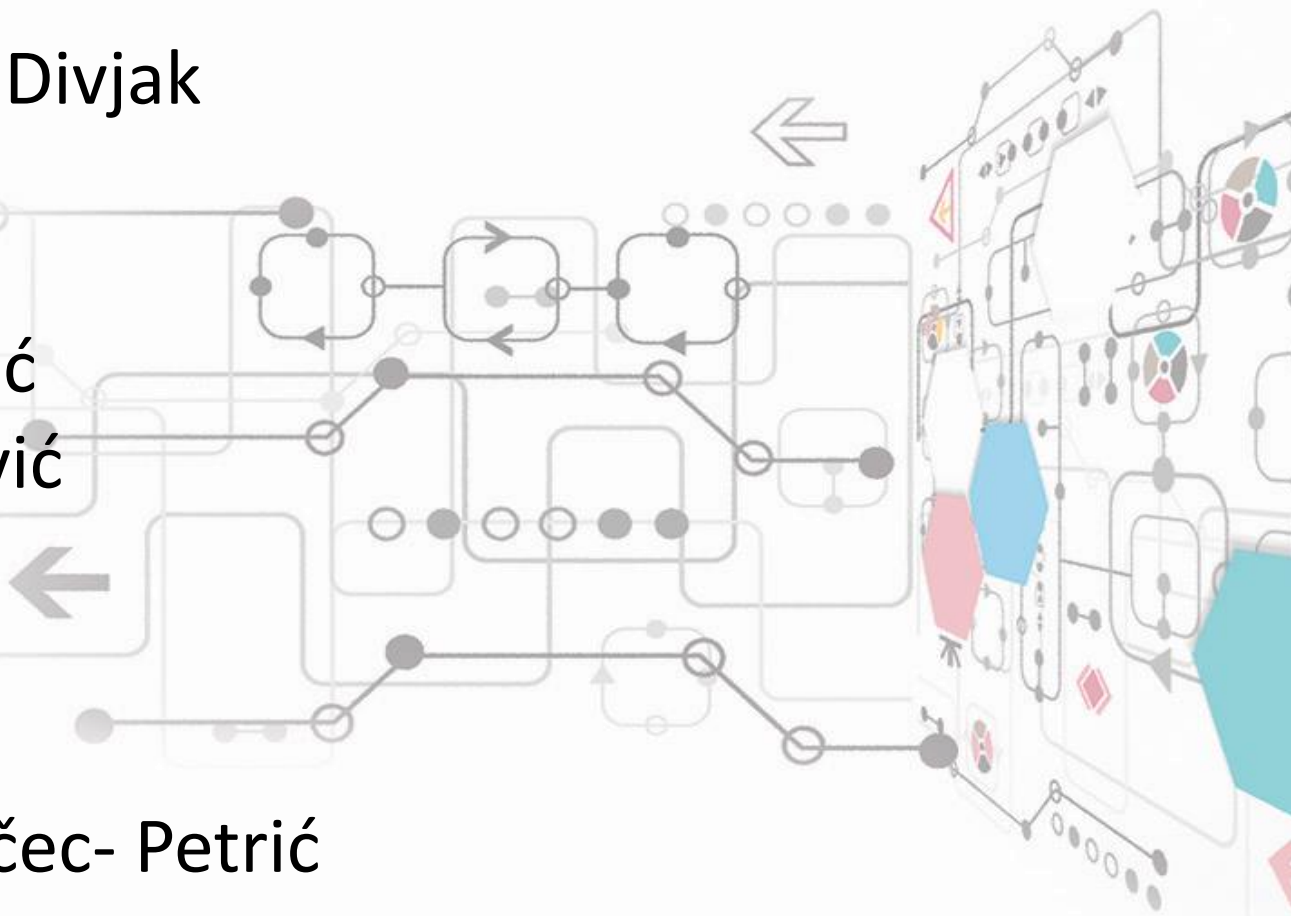


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Partners



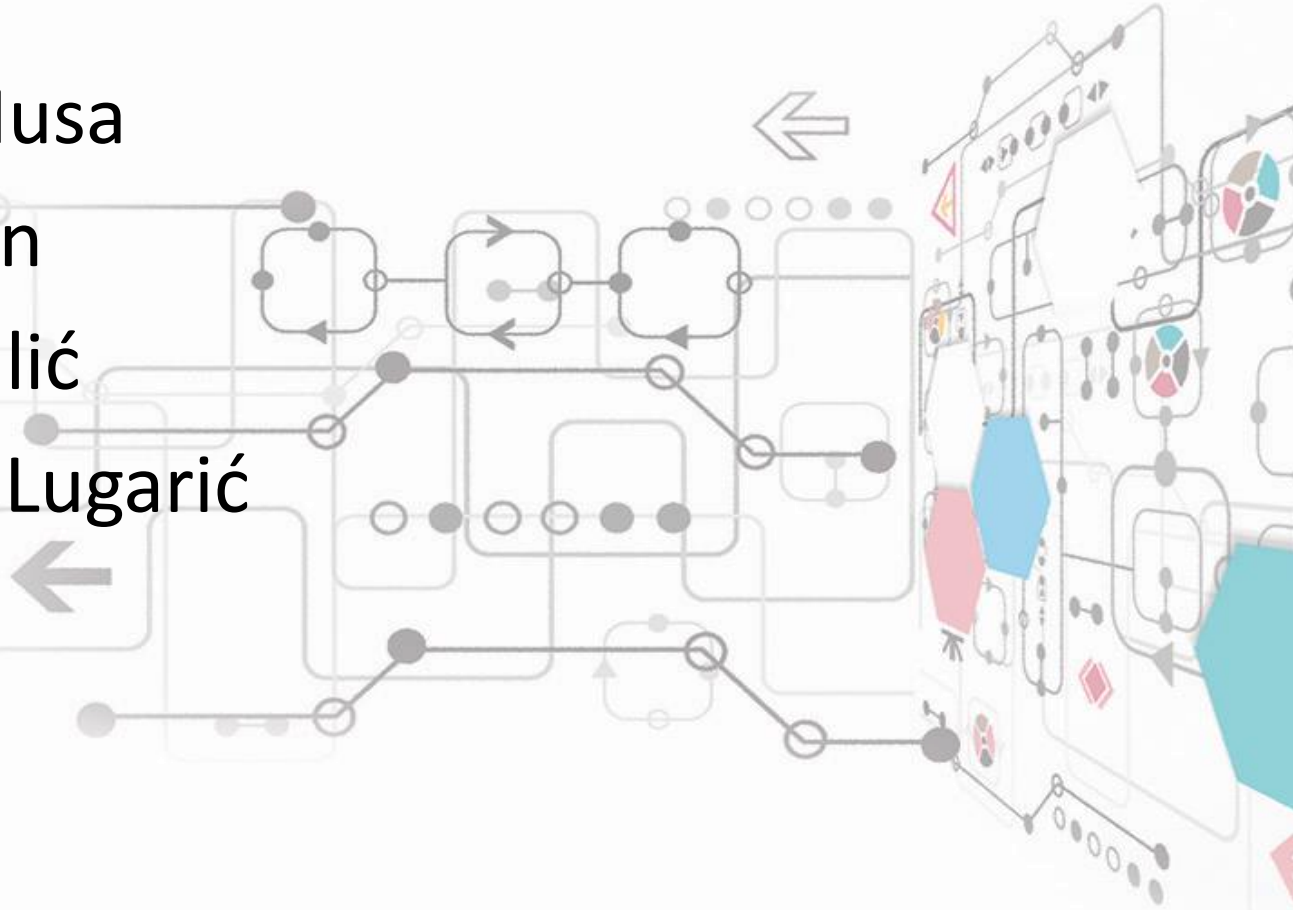
- Ana Kuvedžić Divjak
- Dražen Tutić
- Karlo Kević
- Adam Vinković
- Josip Križanović
- Josip Šiško
- Doris Pivac
- Željko Bačić
- Vesna Poslončec- Petrić



Partners



- Anamarija Musa
- Petra Đurman
- Tihomir Katulić
- Tereza Rogić Lugarić
- Marko Jurić



Partners



- Igor Čavrak
- Ivana Bosnić
- Emanuel Guberović

Partners



- Miroslav Vujić
- Bia Mandžuka
- Martina Gregurić

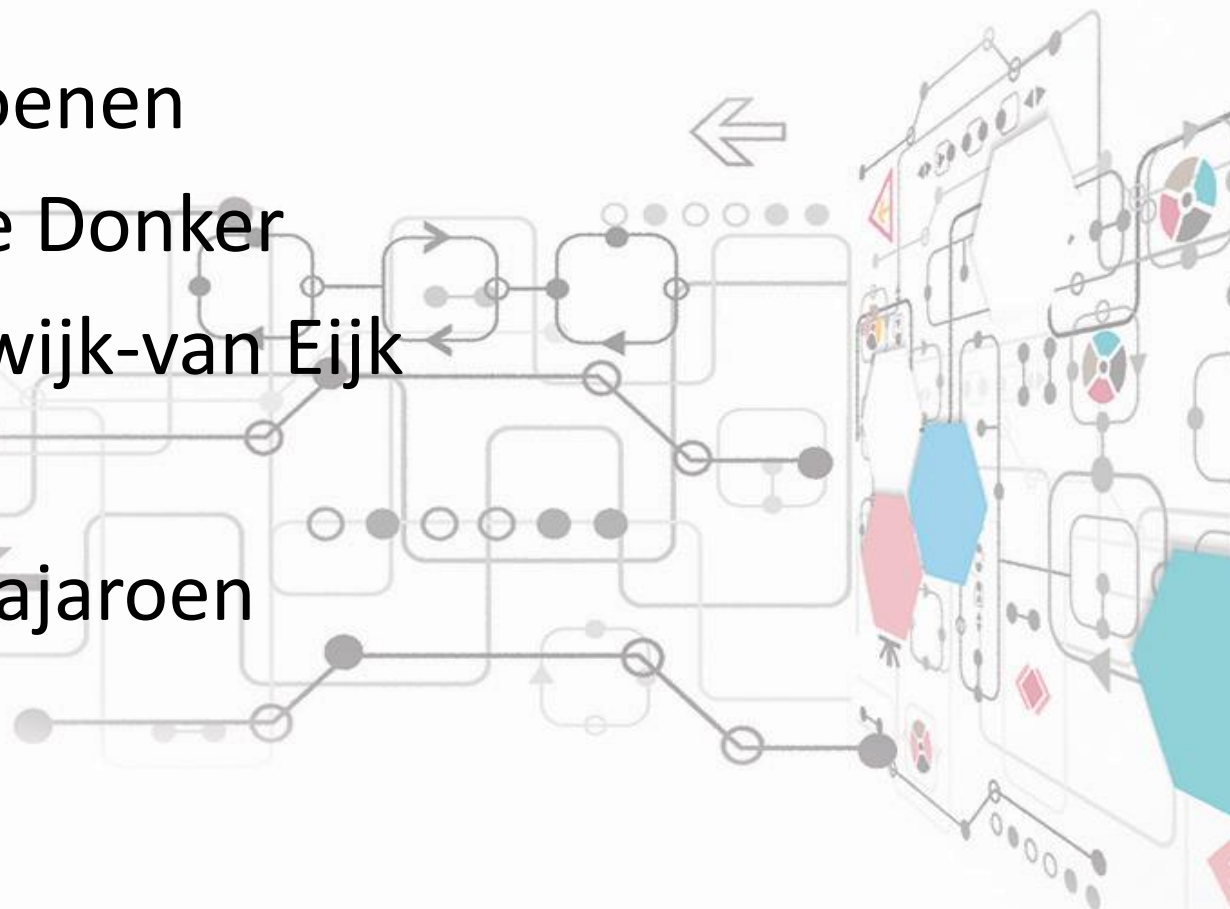
Partners

- Dragica Šalamon
- Alen Džidić
- Filip Varga

Partners



- Bastiaan van Loenen
- Frederika Welle Donker
- Anneke Zuiderwijk-van Eijk
- Agung Indrajit
- Warakan Supinajaroen



Partners



- Charalampos Alexopoulos
- Loukis Euripides
- Vaggelis Pikis

Other participants

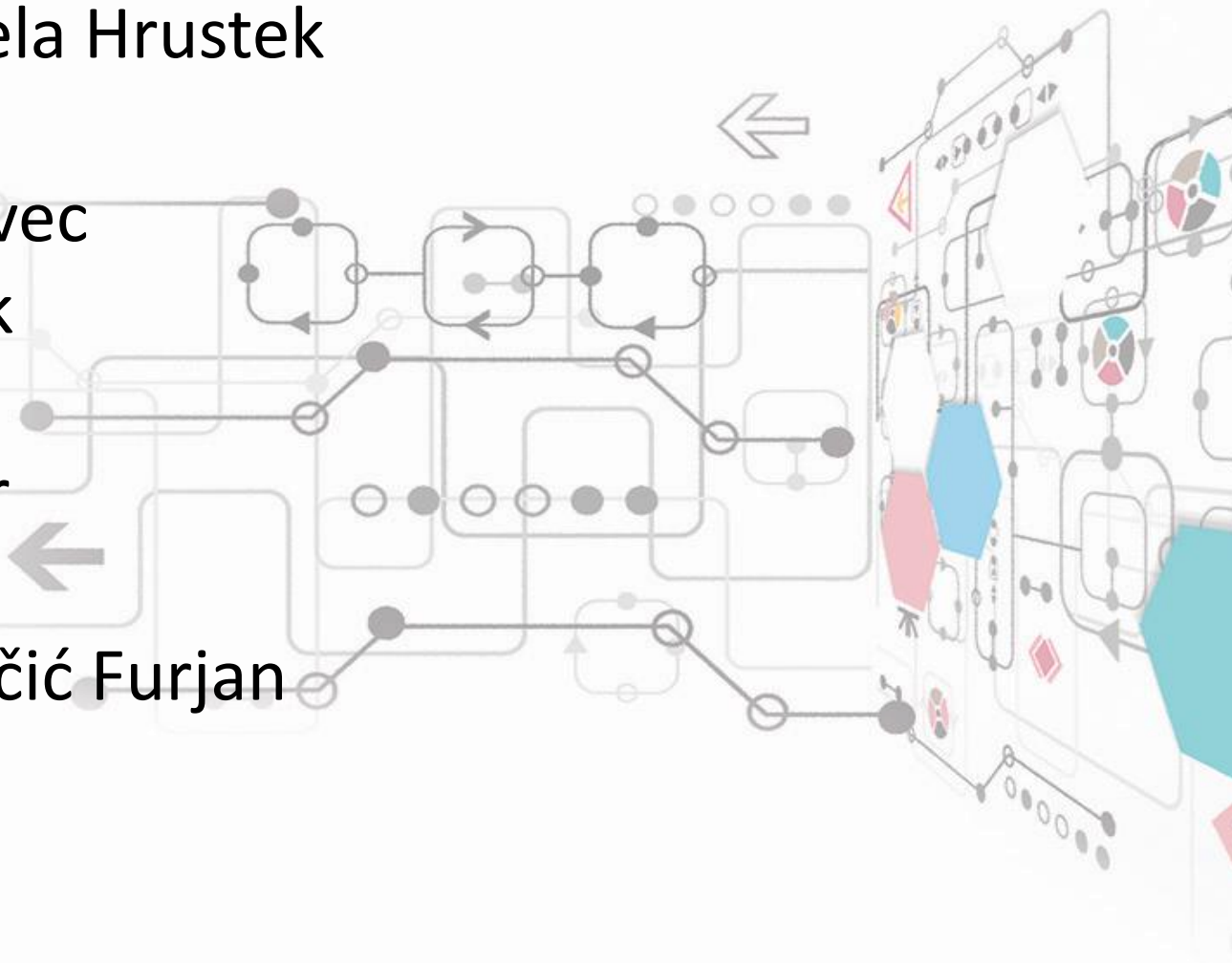


- Margareta Habazin (Apis d.o.o.)
- Jelena Petrović (Ministry of Defence Croatia)

Partners



- Nikolina Žajdela Hrustek
- Neven Vrčec
- Renata Mekovec
- Larisa Hrustek
- Ana Kutnjak
- Barbara Šlibar
- Jura Kapustić
- Martina Tomičić Furjan
- Igor Pihir





Contacts:

igor.pihir@foi.hr

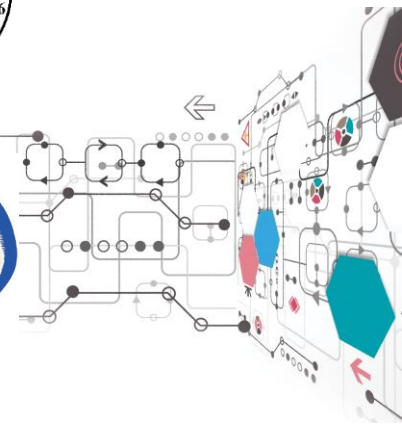
martina.tomicic@foi.hr



foi



TU Delft





Recap of the Online Training Programme Module 1 & 2

Bastiaan van Loenen &
Charalampos Alexopoulos



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



Dashboard

Course: Online Training Program

science.geof.unizg.hr/todo-platform/course/view.php?id=2#section-0

English (en)

OTP

Participants

Badges

Competencies

Grades

General

MODULE 1 Introduction into Open Data

MODULE 2 Assessing Open Data

MODULE 3 Open Data in Croatia

Additional resources

Online Training Program

Home / My courses / OTP

General

Welcome to **Twinning Open Data Operational** Online Training Program!

In this video the set up and goals of the Online Training Program is explained:

Module 2

- Online lectures on open data assessment methodologies
- Creation of a TODO interdisciplinary assessment framework:
 - Interdisciplinary teams of UNIZG staff
- Presentation of the created frameworks to the TODO consortium
- Decision on the framework (e.g., its KPIs) to be applied in Module 3

Course completion status

Status: *In progress*

All criteria below are required:

Required criteria	Status
Course grade	No grade (70.00 required)
Activity completion	4 of 16

[More details](#)
[View course report](#)

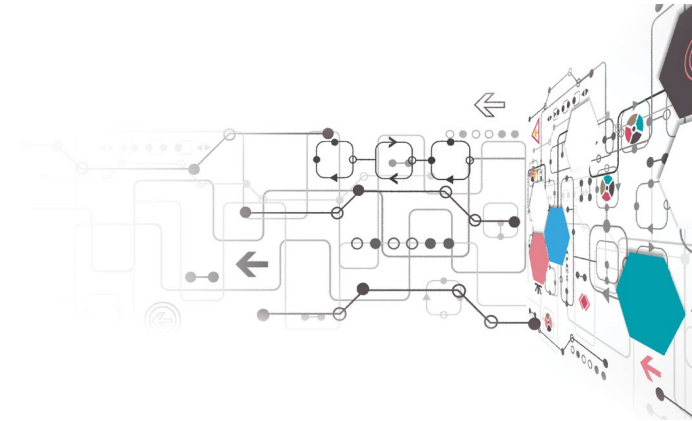
Three modules



MODULE 1 Introduction into Open Data

MODULE 2 Assessing Open Data

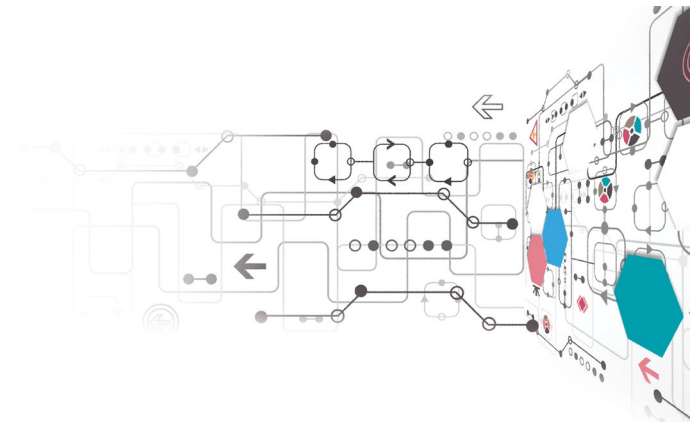
MODULE 3 Open Data in Croatia








Module 1 learning objectives

- To remember, understand and apply the key components and their relations of the open data ecosystem
- To create a common open data vocabulary within the TODO consortium









Lecture series 1 - **Open data ecosystems**

-  Open data concepts and components - Video lectures (9 videos)
-  Open data concepts and components - Literature
-  Open data concepts and components - Quiz (lectures 1-4)
-  Open data concepts and components - Quiz (lectures 5-8)

Lecture series 3 - **Open data technology**




-  Technical aspects of the open data ecosystem - Video lectures (4 videos)
-  Technical aspects of the open data ecosystem - Literature
-  Technical aspects of the open data ecosystem - Quiz
-  Technical aspects of the open data ecosystem - Additional videos and resources (not mandatory)

-  Analysing and handling Data - Video lectures (8 videos)
-  Analysing and handling Data - Literature
-  Analyzing and handling Data - Quiz
-  Analysing and handling Data: Additional videos and resources (not mandatory)






Lecture series 2 - **Open data governance**

-  Open data governance models - Video lectures (4 videos)
-  Open data governance models - Literature
-  Open data governance models - Quiz
-  Legal aspects of open data - Video lectures (4 videos)
-  Legal aspects of open data - Literature
-  Legal aspects of open data - Quiz

Lecture series 4 - **Financial aspects of open data**

-  Economic aspects of open data - Video lectures (3 videos)
-  Economic aspects of open data - Literature
-  Economic aspects of open data - Quiz

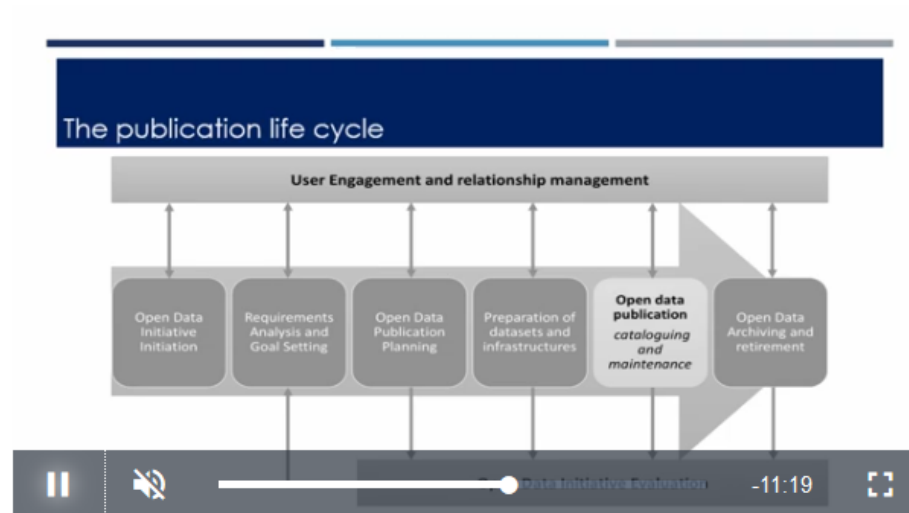
Activity 5 - **Lessons learned and FAQ**

-  Group meeting - Lessons learned and FAQ
-  M1 wrap up meeting: open questions presentation
-  M1: wrap up meeting: most common mistakes
-  M1: wrap up meeting: introduction and definition open data ecosystem
-  M1 wrap up meeting video

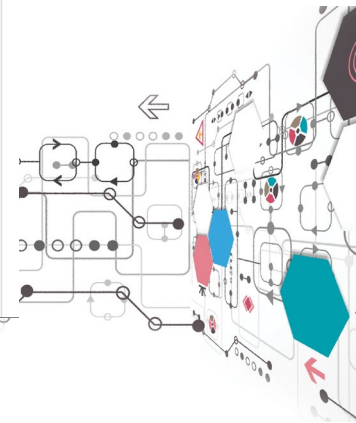




4. Open Data Life Cycle



This lecture focuses on the description of the open data life cycle within the ecosystem approach. Details will be given for various open data life cycles based on different kind or types of open data. It will explain the various streams that formulated the consolidated open data life cycle.



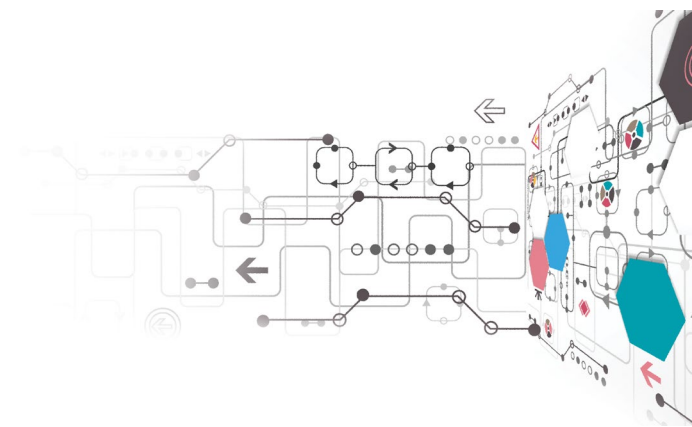


Glossary

A

Access to Information / Freedom of Information

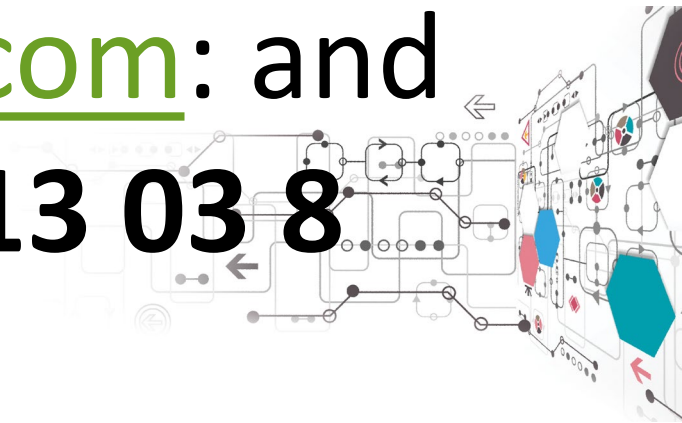
A legal requirement for public bodies to provide data held by them to citizens on request as well as proactively, unless a specific exemption applies, e.g. the data is confidential for the reasons of national security, privacy, market competition or similar. Information obtained under access to information law is not automatically considered open data, unless it is delivered in a machine-readable format and under an open licence. In many of the EU countries the right of access to information (documents) is





What is the difference
between an
Open data ecosystem
and an
Open data infrastructure?

Go to www.menti.com: and
use the code **21 13 03 8**



Difference between open data ecosystem and open data infrastructure is..

Infrastructure enables the existence of an ecosystem.

infrastructure supports the full ecosystem

Infrastructure enables the existence of an ecosystem

od infrastructe is part of ecosystem, it is not the same thing

Infrastructure is part of ecosystem

The open data infrastructure is the basis or foundation on which the open data ecosystem can be built. By it's definition it encompass the widest possible range of uses of the data, while the ecosystems allow for emergence of specialized groups of use

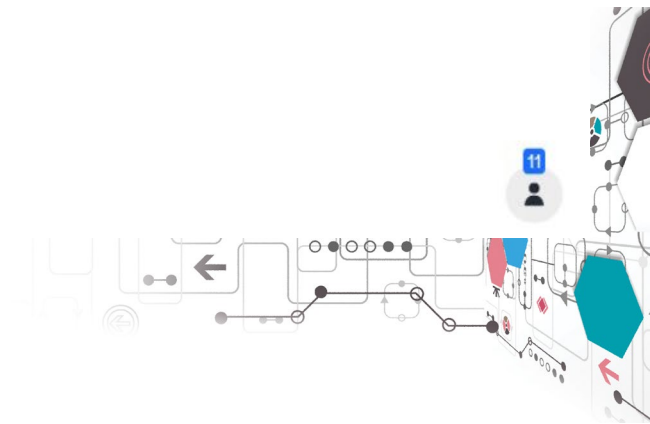
Infrastructure is part of an ecosystem. Infrastructure is means how open data is managed, an ecosystem is a living environment in which all components/subjects are interacting, ie. by defining and designing type of infrastructure to be used.

You should give away virtual candies, or something... :-)

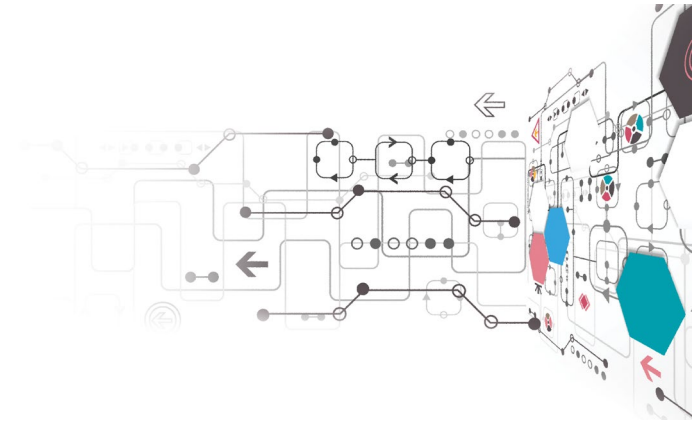
Infrastructure is an element of ecosystem

Infrastructure is included in the ecosystem

infrastructure is the backbone for open data ecosystem



Most common mistakes



Handling Data

1

RDF provides meaning that is readable by machines and humans.

2

The data cube model refers to the analyses of only 3-dimensional databases.

3

Analysis is the process in which researchers look for relevant datasets.

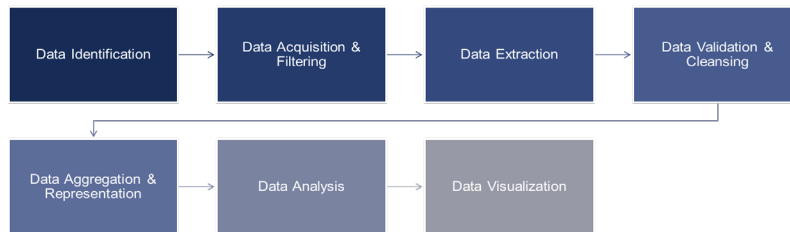
4

Metadata are used to manage research workflows.

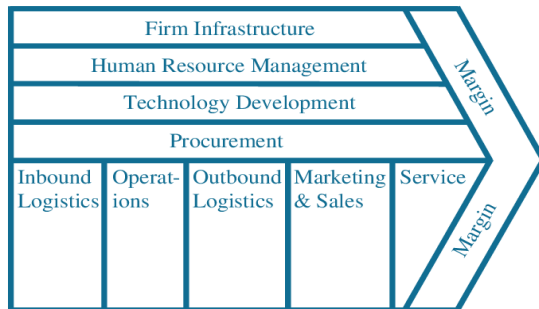
OD Representation models



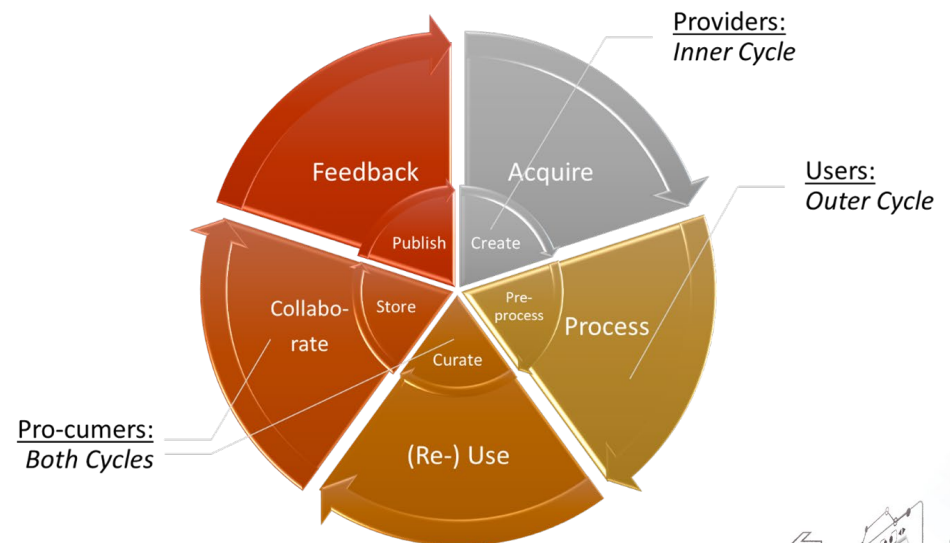
Process Model



Value Chain Model



Life cycle Model



Copyright CC-BY

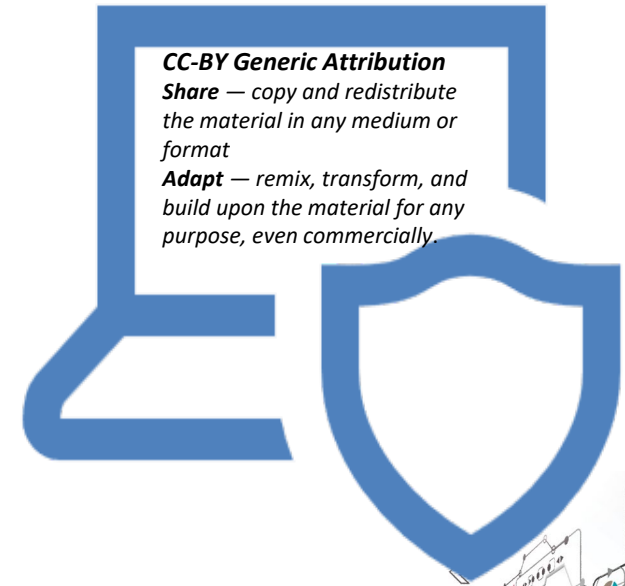
- Read the following terms of use as used on a website:

All data and information on this website is protected by copyright and is the intellectual property of the XYZ Foundation. If you wish to use data from this website for your own purposes, you should refer to the correct page on the website. This can be done as follows: mention that the data is copyright 1999-2020 of the XYZ Foundation, provide a clear and effective link to the correct page on the XYZ Foundation website.

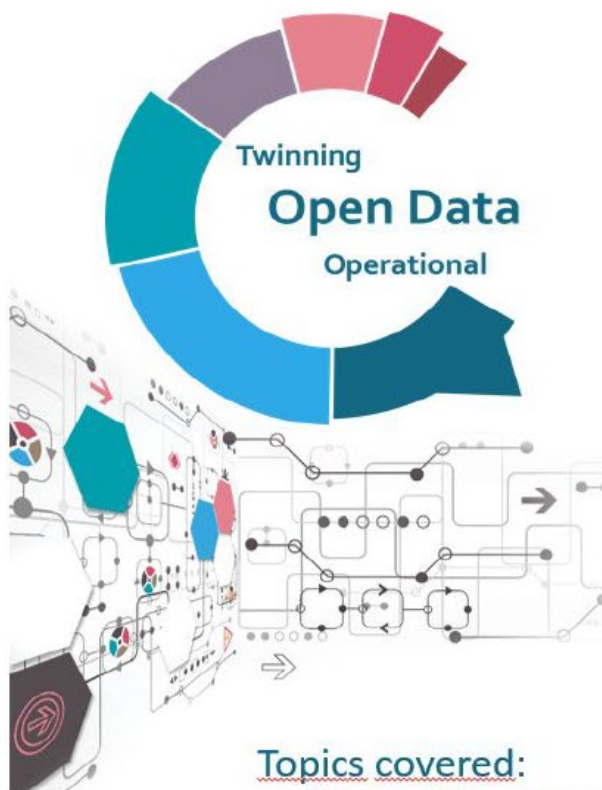
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CC0 → “No Rights Reserved”



CERTIFICATE OF ACHIEVEMENT

awarded to

for completing the

Online Training Program: Module 1 – Introduction into Open Data

in duration of 4 weeks, equivalent to 4.0 Online Continuing Education Units

Date Issued: June 26th, 2020.

Topics covered:

- Open data ecosystems
- Open data governance
- Open data technology
- Financial aspects of open data

On behalf of the Consortium,
The Project Coordinator



Dražen Tutić
University of Zagreb, Croatia



Scientific Coordinator
Bastiaan van Loenen
TU Delft, The Netherlands



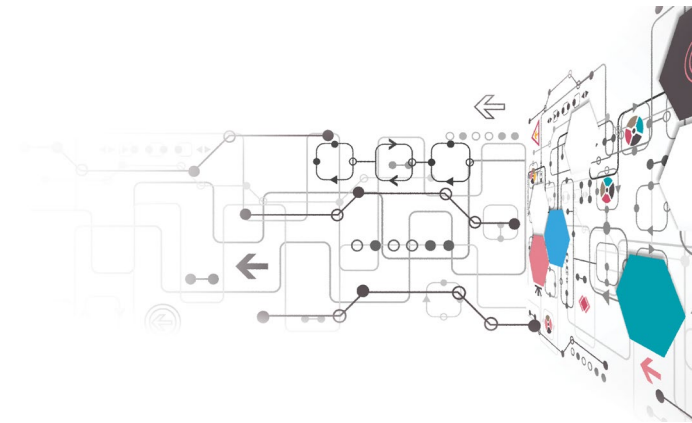
Scientific Manager
Charalampos Alexopoulos
University of the AEGEAN, Greece



Module 2: learning objectives

After this module the participant should be able to:

- Describe various methods to assess open data ecosystems
- Design a new method for open data ecosystem assessment



OD Assessment frameworks



OTP: Assessing Open Data - Literature

science.geof.unizg.hr/todo-platform/mod/page/view.php?id=16

TODO English (en)

Bastiaan van Loenen

Online Training Program

[Home](#) / [My courses](#) / [OTP](#) / [MODULE 2 Assessing Open Data](#) / [Assessing Open Data - Literature](#)

Assessing Open Data - Literature

Below you will find in depth information about Open data assessment in general and open data assessment frameworks that will be the basis for the TODO assessment framework.

Open data assessment literature

1. Vancauwenberghe G. (2018) [Assessing Open Data](#). In: van Loenen B., Vancauwenberghe G., Crompvoets J. (eds) Open Data Exposed. Information Technology and Law Series, vol 30. T.M.C. Asser Press, The Hague
2. Welle Donker, F., & van Loenen, B. (2016). [How to assess the success of the open data ecosystem?](#) International Journal of Digital Earth: a new journal for a new vision, 1-23
3. Susha, I; Zuiderwijk-van Eijk, Anneke; Janssen, Marijn; Grönlund, Åke (2015). [Benchmarks for evaluating the progress of open data adoption usage, limitations, and lessons learned](#)
4. Charalabidis, Y., Zuiderwijk, A., Alexopoulos, C., Janssen, M., Lampoltshammer, T., & Ferro, E. (2018). Open data evaluation models: Theory and practice. In [The World of Open Data](#) (pp. 137-172). Springer, Cham.
5. Anneke Zuiderwijk, Ali Pirannejad and Iryna Susha, Open data evaluation and benchmarking, under review



- OTP
- Participants
- Badges
- Competencies
- Grades
- General
- MODULE 1 Introduction into Open Data
- MODULE 2 Assessing Open Data**
- MODULE 3 Open Data in Croatia
- Additional resources

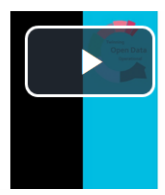
Online Training Program

[Home](#) / [My courses](#) / [OTP](#) / [MODULE 2 Assessing Open Data](#) / [Assessing Open Data - Video lectures \(7 videos\)](#) [Turn editing on](#)

Assessing Open Data - Video lectures (7 videos)

1. Introduction to Module 2

In the introductory video of TODO the set up and content of Module 2 is explained. Further explanation is provided in the Synthesis meeting of Module 1 (18 June 2020, 9-10:30am).



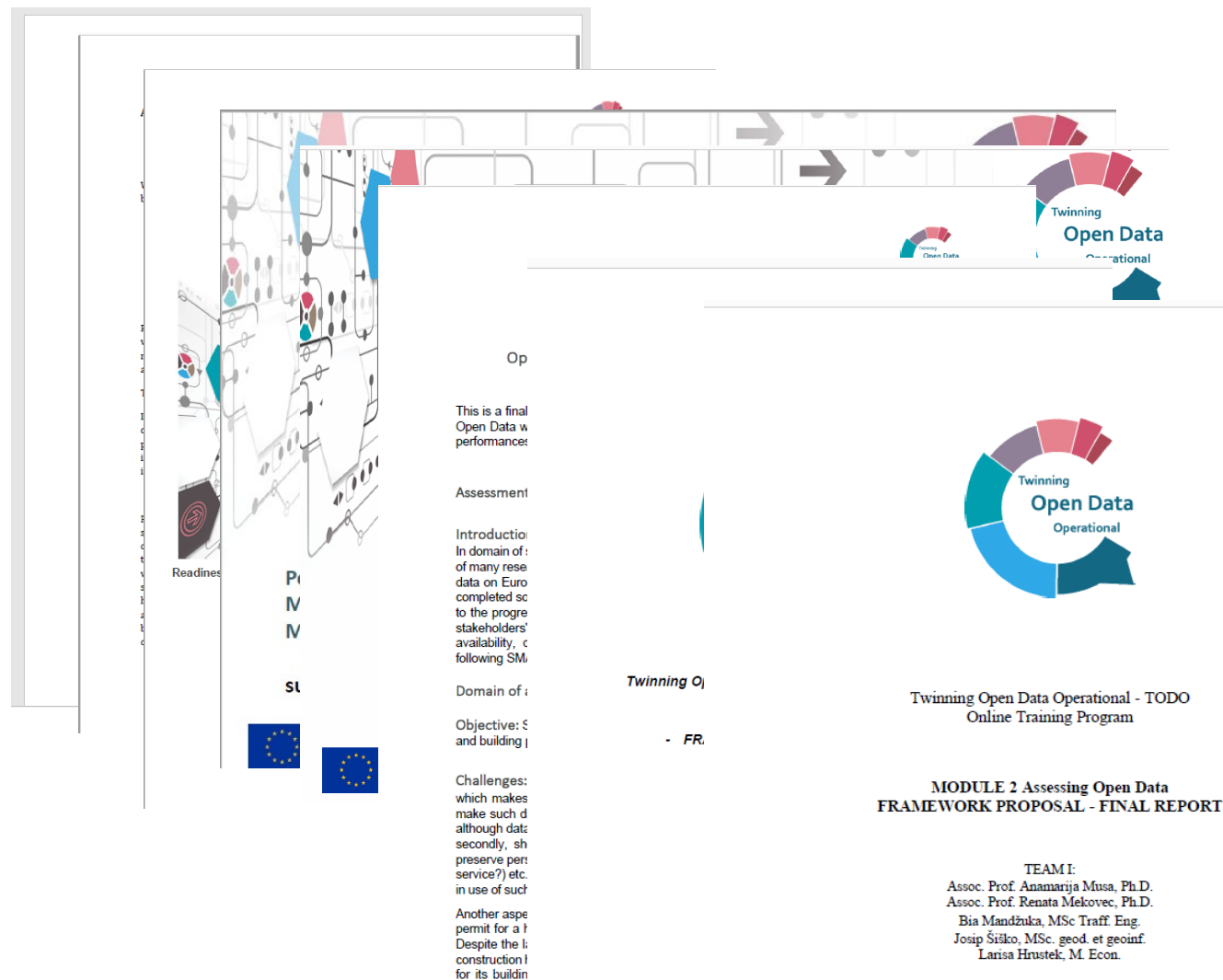
Module 2

- Online lectures on open data assessment methodologies
- Creation of a TODO interdisciplinary assessment framework:
 - Interdisciplinary teams of UNIZG staff

Table of contents

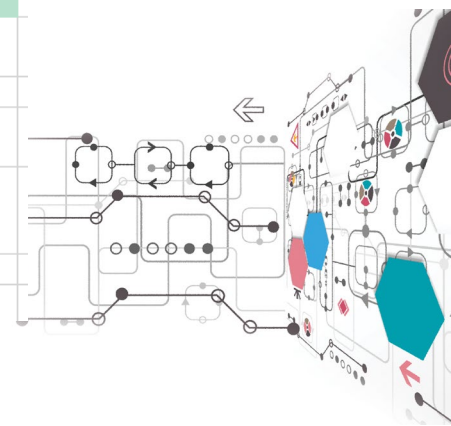
- 1. Introduction to Module 2**
2. Open Data Evaluation Models and Methods
3. Evaluation of open data initiatives I
4. Evaluation of open data initiatives II
5. Evaluation of open data initiatives III: compliancy with the law
6. Critical evaluation of practical open data cases
7. Towards the design of your own evaluation framework

Result of M2





Category	Indicator	A	B	D	E	F	G	I
Readiness	vision on open participation in open data strategy	X						
	open data policy	X		X				X
	OD action plan	X						
	Institutional			X				X
	Legal framework			X	GDPR			X
Dataset level	Number of OD dataset existence	X		X	X			
	search engine: on findability: portal					x	x	
	findability: multi access:	X	X	X			X	
	availability: publicly	X			X	x		X
	availability: free of	X	X	X	X	fair pri	X	X
	Availability: open format & machine readable		X		X	x	X	X
	availability: open data licence		X	X	X	x	X	
	availability: openly licensed	X						X
	availability: access services:							
	download/ API etc	X	X	X			X	X
	data quality	X	X		X	X	X	X
Metadata	metadata available	X	X	x	x	X	X	X
	metadata language (multilingual)		X				X	
	historic versions						X	
	sustainability of data publication				x			
	scope/ coverage of dataset					nat./local/regiona		
Portal specific	Search engine							





Open data ecosystems assessed by TODO

In this questionnaire, we want to assess the Open Data Ecosystem using the Key Performance Indicators (KPIs) identified in Module 2. You can select any Open Data Ecosystem to research, e.g. a national or local government open data portal, a domain-specific portal, e.g. environmental information portal or an institutional open data portal, e.g. a university.

* Required

1. Provide the name and (if available) the URL of the Open Data ecosystem that you will assess *

Open Data Governance:
Policies and strategies

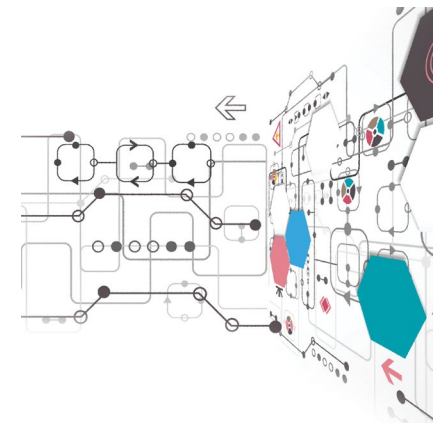
the questions in this section relate to the governance of open data in your country, and if open data policies and strategies are in place.

2. Question G1: is there a formal Open Data (OD) policy covering the open data ecosystem assessed by you? *

This question assesses whether there is a formal open data policy covering the open data ecosystem in your country, domain or organisation. If you assess an Open Data Ecosystem on domain level, you may have to check if there are formal open data policies as a result of international conventions / EU directives, e.g. environmental information, geodata, traffic information. If you assess an Open Data Ecosystem on organisational level, you may have to check if there are open data policies as a result of specific directives of e.g. government ministers or international directives (e.g. open science directives).

Mark only one oval.

- ☐ yes, but the OD policy is only applicable to national government departments / agencies
- ☐ yes, but the OD policy is only applicable to local government organisations
- ☐ yes, and the OD policy is applicable to all levels of government organisations
- ☐ yes, although the OD policy is applicable to all government organisations, a number of (semi) government organisations, e.g. universities, are specifically exempted
- ☐ yes, and the open data policy also applies to non-government organisations, e.g. universities
- ☐ no formal OD policy but there are directives from e.g. ministers to ensure specific datasets are available as open data
- ☐ no formal OD policy but there is a widely accepted informal OD policy
- ☐ no formal or informal OD at all



TODO assessment framework



TODO Open data ecosystem



All changes saved in Drive



Questions

Responses

Section 1 of 5

Open data ecosystems assessed by TODO



Background

Provide the name of the Open Data ecosystem that you will assess

Short answer text

After section 1 Continue to next section

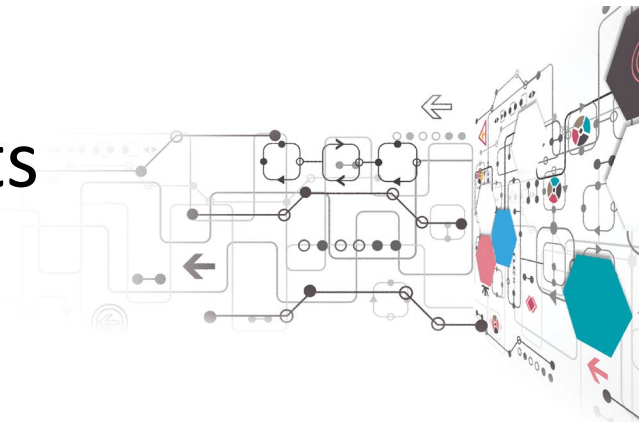
Section 2 of 5



Module 3: learning objectives

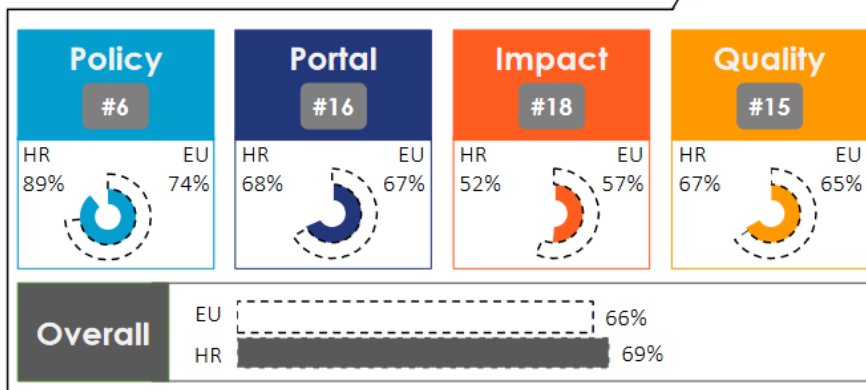
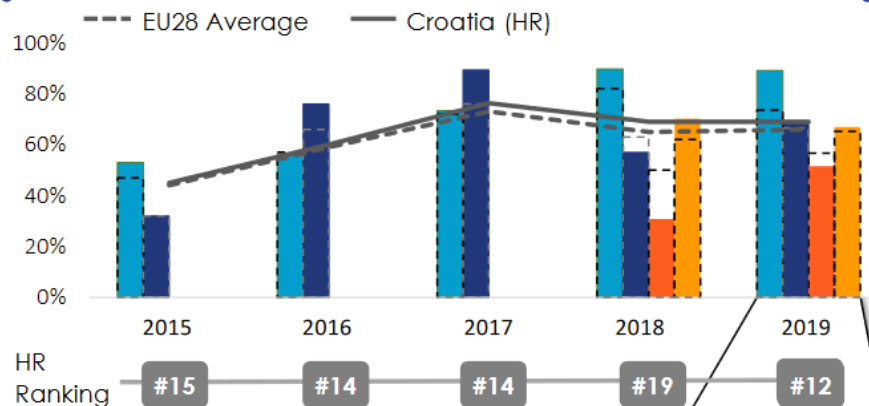
After this module the participant should be able to:

- Apply assessment models to a domain/disciplinary open data ecosystem
- Present the result in an appealing manner (e.g., spider diagram; user experience animation, etc.)
- Reflect on their research results



State-of-Play on open data - 2019

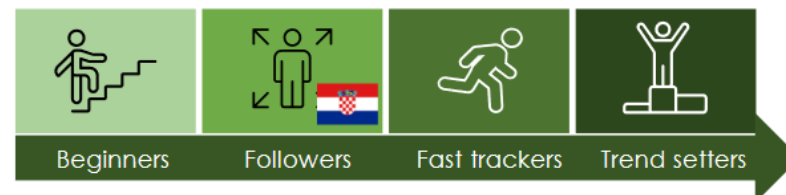
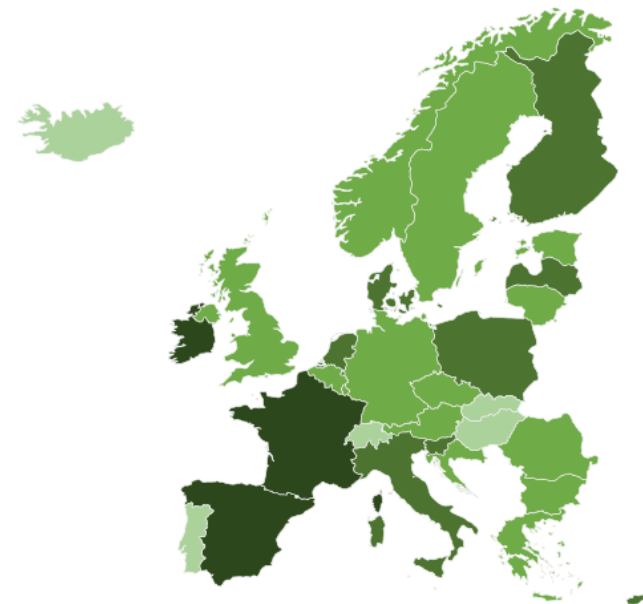
MATURITY LEVEL RATING



Croatia

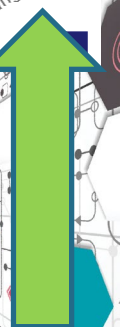
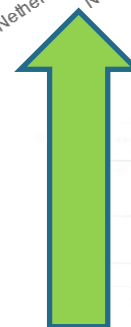
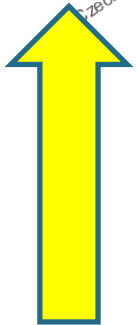
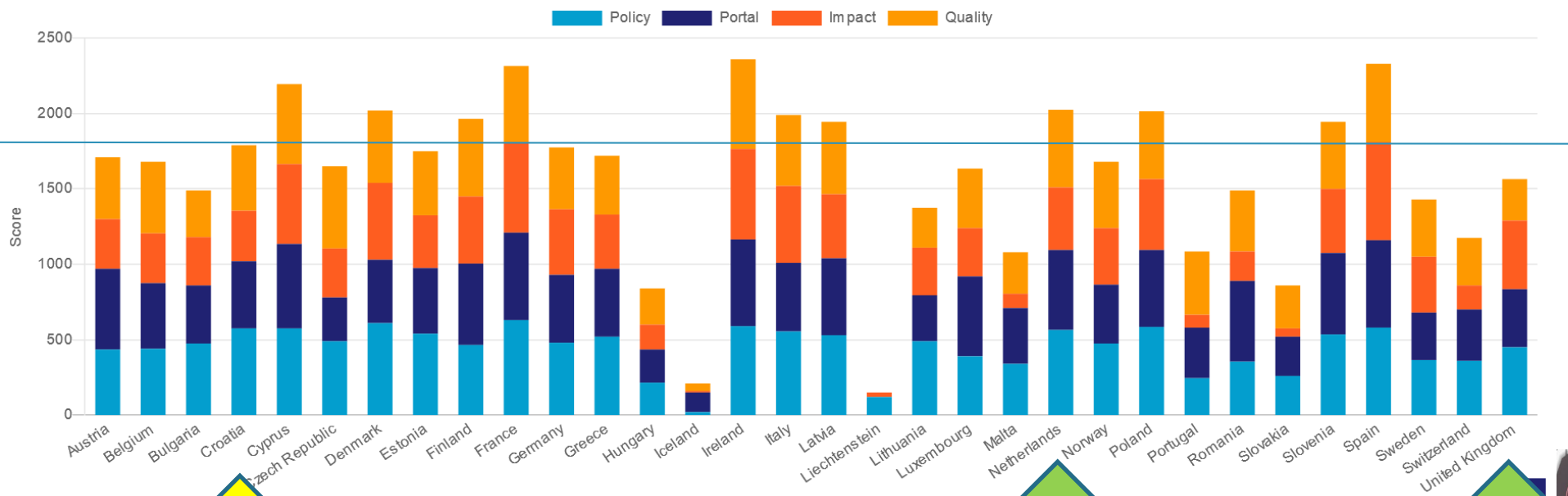


OVERALL MATURITY LEVEL SEGMENTATION





Country overview



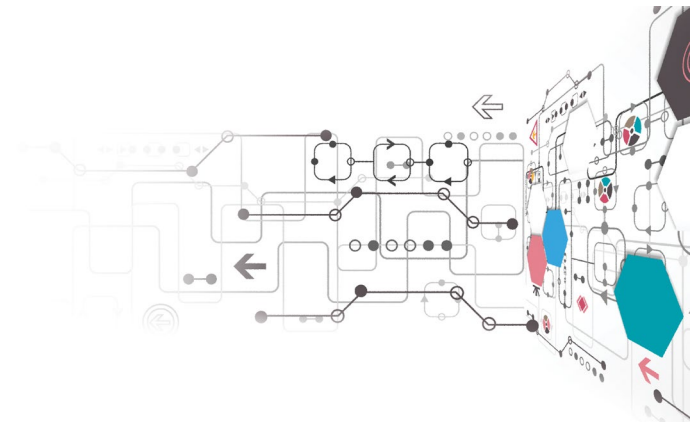
Maturity Identification: Stage Model



		Traditional OGD Infrastructures		Advanced OGD Infrastructures	
	Time	Point Zero	1 st Generation	2 nd Generation	3 rd Generation
General	Open Government level	Initial: Information broadcasting	Data Transparency: processes and performance	Open participation: Data quality, Public feedback, conversation, voting, Interactive communications, Crowd-sourcing	Open Collaboration: Interagency and with the public, Co-creating value-added services
	Value	N/A	Transparency & Accountability	Participation	Efficiency & Innovation
Information	Format	.xls, .pdf	html, .xls, .pdf	+ .csv + URLs	+ Linked data
	Metadata	Metadata Ignorance or Closed flat Metadata	Metadata Ignorance or Closed flat Metadata	Open Metadata for Humans or Open Reusable Metadata + contextual or detailed metadata models	Linked Open Metadata 3-layer metadata model (flat, contextual, detailed)
	RDF-compliance	No	No	Partially yes	Yes



Discussion to be continued in
the disciplinary session
tomorrow!





⇒ OPEN DATA (research) IN CROATIA

Anamarija Musa, Faculty of Law, University of Zagreb

TODO WP2 Summer School 7-11 September 2020



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda



A

Policy and legal framework

A brief overview



B

Stakeholders

Who? What they do?



C

Availability of OD

Open data portals, assessments



D

OD success stories

A few cases of OD usage (non-commercial)



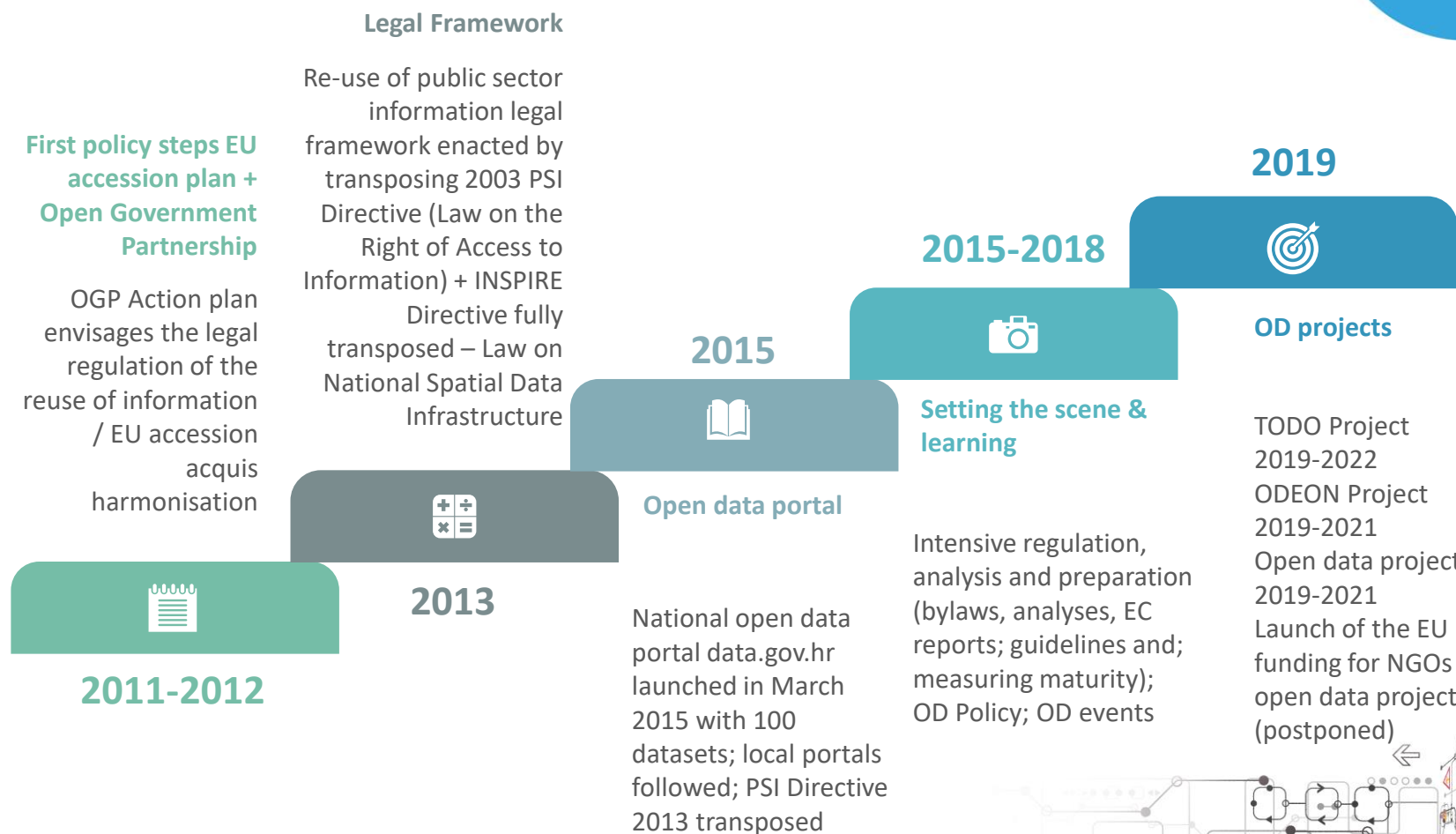
E

Open data research

What we know so far?



Timeline of OD development in Croatia



Policy and legal framework



Laws

Law on the Right of Access to Information (NN 25/13, 85/15) – (publication + request + costs + licences)
June 2021 transposition of the new OD Directive expected

Law on the National Spatial Data Infrastructure
Law on Environmental Protection
By Laws

Regulation on Costs (2018)
Decree on Open Data Licence (2017)
Decree on Exclusive Rights (2016)



Policy

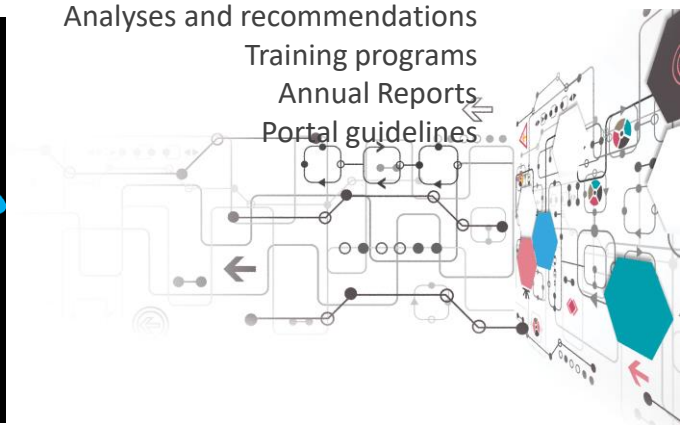
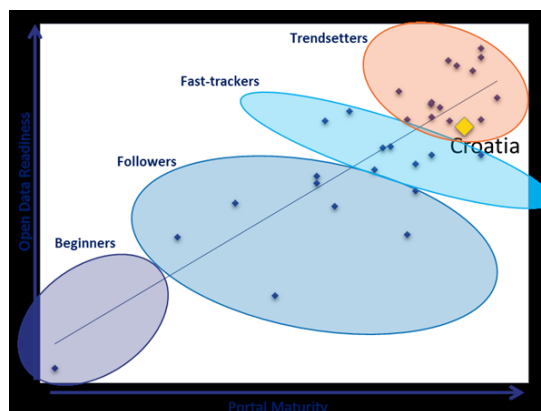
Open Data Policy 2018 (no Action plan)

Open Government Partnership Action Plans (2012-2013; 2014-2016; 2018-2020)

Anti-Corruption Strategy 2015-2020 (Action Plans 2015-2016; 2017-2018; 2019-2020)

Guidelines & Assistance

Information Commissioner's Guidelines and Handbook
Analyses and recommendations
Training programs
Annual Reports
Portal guidelines





Key stakeholders of OD in Croatia

OD PROVIDERS WHO MAKE OD AVAILABLE TO THE USERS

- Almost 6.000 public bodies,
with the obligation to
publish;
- key: designated person
 - Different level of activity
 - Publication and requests
for the reuse

Public bodies

STEERING AND OVERSIGHT TO FOSTER OPEN DATA AVAILABILITY AND REUSE

Ministry of Administration –
portal, policy, bylaws
Central state office for the
development of Digital Society –
from 2017 – portal, projects,
coordination / policy
Information Commissioner –
oversight, reporting, dealing
with requests; guidelines and
training

Coordinating / control institutions

POLITICAL
ENTREPRENEURS?

Users

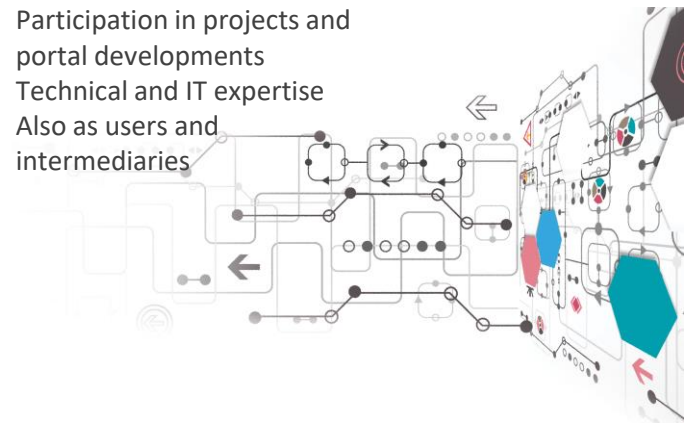
DEMAND SIDE: NEED OPEN DATA TO CREATE NEW VALUE

- Civil society organisations – active
in reusing and organising events
(OD Days, Hackaton)
- Private sector – SMEs and
established companies;
- Academia / experts - participate
in projects; as users

Private sector partners

PARTICIPATING IN OD ACTIVITIES & PROVIDE ASSISTANCE

Participation in projects and
portal developments
Technical and IT expertise
Also as users and
intermediaries





Open data portals

- national and four local open data portals (from 2015); specialised portals (geo information, environment, statistics, ...); datasets turned to application to provide service (public procurement, company register, election data, etc.); websites containing open data
- European open data portal – 1.055 out of more than 1 mil datasets are from Croatia (less than 0,1%)

	Central portal	City of Zagreb	City of Rijeka	City of Virovitica	City of Varaždin
Url	http://data.gov.hr/	http://data.zagreb.hr/	http://data.rijeka.hr/	http://opendata.virovitica.hr/	http://otvoreni.varazdin.hr/
Est.	2015	2015	2016	2017	2020
No of datasets (Sept. 2020) / publishers	809 / 85	70 / 1	131 / 10	6	18 / 1
Type	Various	Various	Various	Institutional	Financial / fiscal data
Formats	Xls, csv, (186 datasets 3 stars)	Xlsx, csv, xls	Xlsx, csv, xls,	Xlsx, xls	Csv, json, rdf
Licences	CC	CC-BY	CC-BY	CC-BY	CC0 (public domain)



Open data portals



- In addition to general portals, there are specialized sectoral portals, such as:
 - Geodata Portal <https://geoportal.dgu.hr/> <http://geoportal.nipp.hr/>
 - Environmental Portal <http://www.haop.hr/hr/baze-i-portali/envi-portal-okolisa>
 - Statistical information <https://www.dzs.hr/>
 - Weather data <https://meteo.hr/index.php>
 - Sea information <http://baltazar.izor.hr/portal/pocetna>

City of Rijeka Portal	Open data portal (National)	City of Varaždin
National Spatial Information Portal (NIPP)	Information system Sea (More)	Nature and Environmental Protection

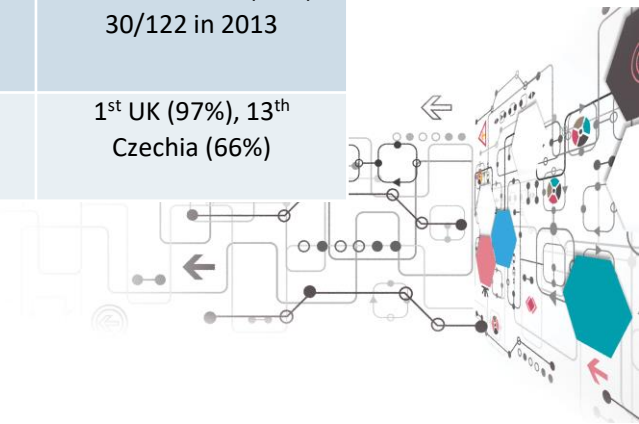
OD assessments

	Croatia				EU
	DESI 2016 value	Rank	DESI 2015 value	rank	DESI 2016 value
5a1 eGovernment Users % individuals returning filled forms, out of Internet users in the last year (aged 16-74)	21% (2015) ↑	22	18% (2014)	24	32% (2015)
5a2 Pre-filled Forms Score (0 to 100)	21 (2015) ↑	22	2 (2014)	28	49 (2015)
5a3 Online Service Completion Score (0 to 100)	61 (2015) ↑	24	54 (2014)	24	81 (2015)
5a4 Open Data Score (0 to 700)	380 (2015) ↑	14	230 (2014)	27	351 (2015)



- Different positions at different assessment instruments – methodological issues; some outdated; uneven development

	OD Maturity (EU)	OD Monitor	Global Open Data Index
web	https://www.europeandataportal.eu/en/imp-act-studies/open-data-maturity	https://www.opendatamonitor.eu/	https://index.okfn.org/
WJO	The EU	EU funded project 2013-2015	Open Knowledge Foundation
Measures what	Comprehensive assessment of the OD maturity (policy, availability, impact, portals, ...)	Catalogue and data finder (supply side); 4 categories (open licences, machine readable, availability, metadata)	Key datasets & quality (statistics, elections, environment, geo and maps, statistics, etc.)
1st appeared	2015-cont	2013-2015	2013-2015
Rank	12 th (2019) out of 32 19 th (2018)	32/32	51/122 in 2014 (41%) 30/122 in 2013
Compare to	UK 21 st ???	Less datasets than significantly smaller (Luxembourg, Malta) or non-EU countries (Kosovo, Serbia, Ukraine, Lichtenstein)	1 st UK (97%), 13 th Czechia (66%)



State-of-Play on open data - 2019

Croatia



Planning
Open Data
Operational



OVERALL MATURITY LEVEL SEGMENTATION

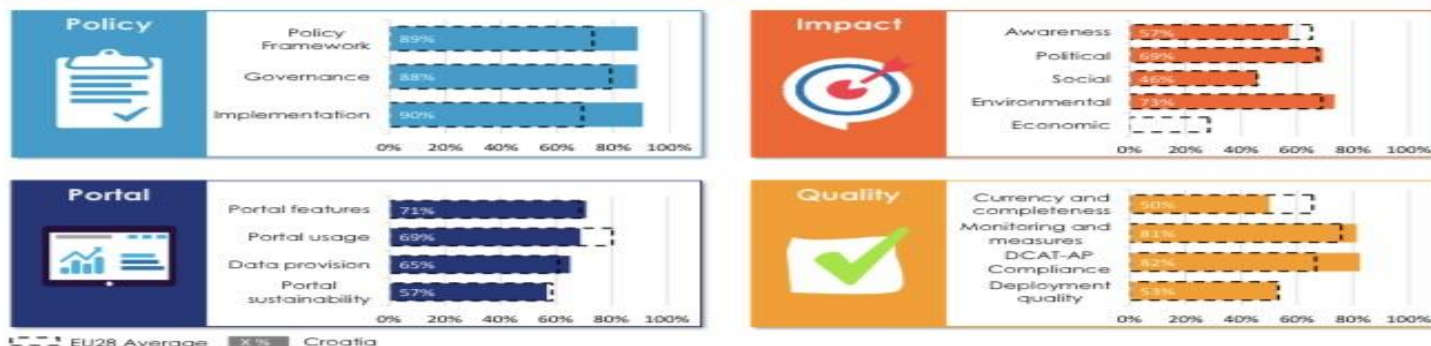


State-of-Play on open data - 2019

Croatia



DIMENSION PERFORMANCE



State-of-Play on open data - 2019

Croatia



ADDRESSING BARRIERS

Financial

The challenge is to ensure that the loss of financial resources of particular public bodies does not endanger the provision of services, including collection and distribution of data. In September 2018 the Croatian government has passed the [Regulation on Costs of the Re-use](#), which lays down the method and criteria for calculating the reimbursement of re-use costs, the justified costs to be taken into account when determining the price list, and the implementation of the revision of the method of calculating the cost reimbursement on an annual basis.

Organisational

Given the lack of capacity of in particular smaller local public bodies, activities are envisaged to provide training and support. Key challenges in this area are strengthening the capacity of the Information Commissioner in terms of resources in order to be fully functional, as well as the training of Information Officers, so that they can properly proceed when receiving a request regarding open data. In 2018, the Information Commissioner published a [handbook on Open data and Re-use information](#).





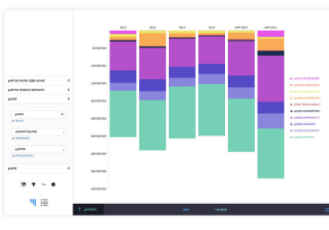

OPEN DATA RE-USE

The public awareness on the availability of open data and the benefits of re-using open data is improving in Croatia. Multiple activities are conducted to boost open data re-use in the country, such as hackathons and conferences. An example is the [Open Data Day - Croatia 2019](#), a conference bringing together experts, representatives of institutions, civil society, and IT activists, to engage in networking and solve challenges with open data.

An example of how open data is re-used in Croatia, is [Mosaic viza](#), a tool that enables investigative journalists, activists, and interested public to explore relationships between politically exposed persons as well as links to other legal and physical persons based on data taken from registries and public body bases. Mosaic link allows users to search, filter, and visualise required data. As part of the Mosaic link, requests for access to information were promoted and open data was advocated by various institutions such as the Ministry of Finance and FNA and the Ministry of Justice.

Another example is [ZET info](#), a mobile application with detailed real-time timetables of trams and buses operating in the City of Zagreb. The app is based on General Transit Feed Specification data which has been published by the local public transport operator.

Success stories

			
<p>Gugalaga – application for kindergarten search and rating</p>	<p>Imamopravoznati.org / Right to know - access to information requests submission portal</p>	<p>Croračun / Local government data comparison (commercial)</p>	<p>Mozaik veza / the database of personal connections of Croatian politicians and businesspeople</p>



Open data research in Croatia

OPEN DATA RESEARCH PUBLICATIONS

OD
RES

Aspects of OD (general development, licences, governance, legal framework)
Crosbi 'Open data' 125 hits (Geo, FER, FOI, LAW, etc.)

OPEN RESEARCH DATA

Ope
n
Res

IRB, Srce – Open Aire; NI4OS; RDA
Hrčak; Crosbi – Open science repositories
Pubmet conference
OD Directive – implementation in 2021

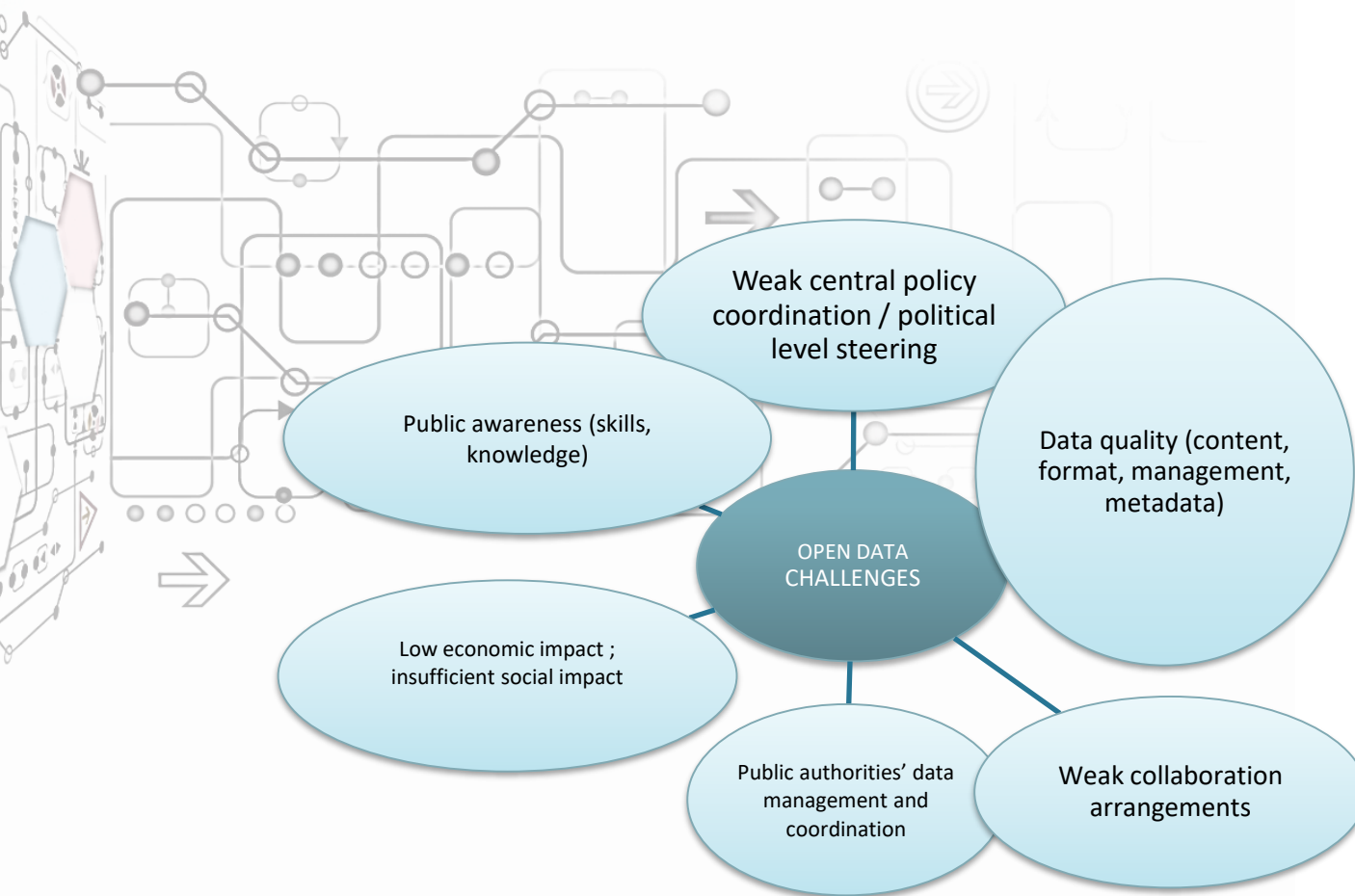
RES
-OD

RESEARCH BASED ON OPEN DATA

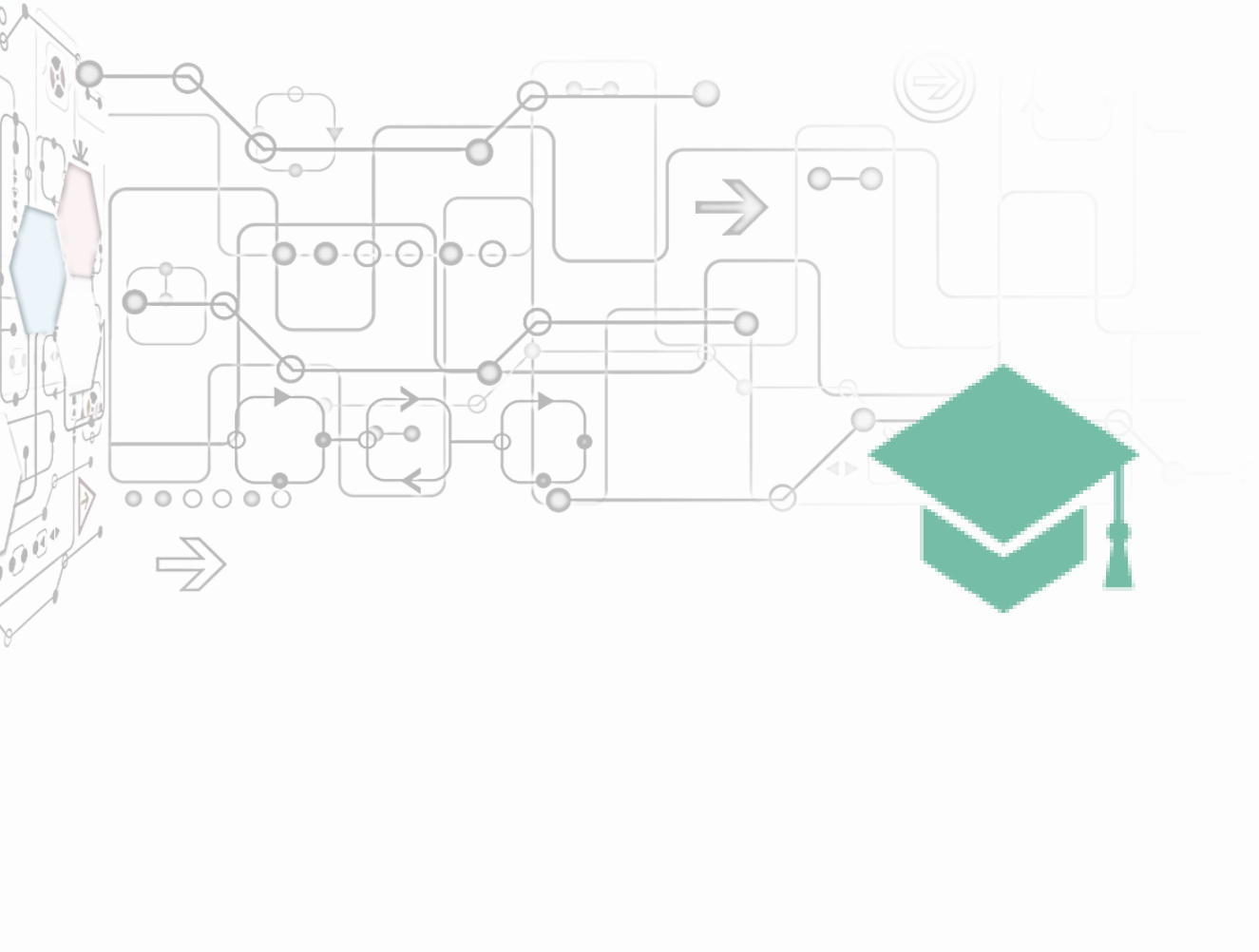
Not easy to track down
D1.1. TODO (for partners) – lists 29 + 23 papers (disc + interdisc)

UNIZG Faculty	Single discipline		Interdisciplinary	
	Open data development	Applications of open data	Open data development	Applications of open data
GEOD	2	9	2	5
FER	2	2	1	8
FOI	0	5	3	2
LAW	1	1	1	1
TRANS	1	2	1	1
AGRI	1	10	0	6

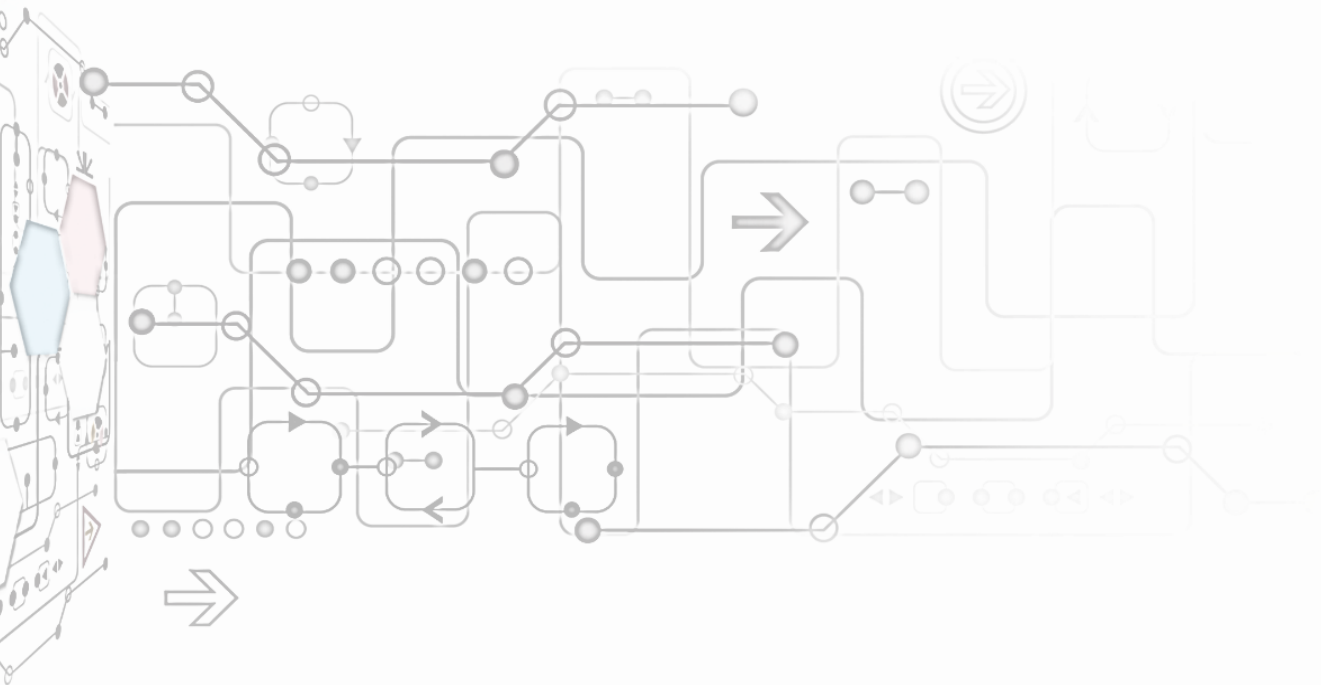
Key challenges of the OD ecosystem in Croatia



Questions & Answers



Thank you for your attention!





Prediction of voter turnout based on statistical data using machine learning methods

Adam Vinković

adam.vinkovic@geof.unizg.hr

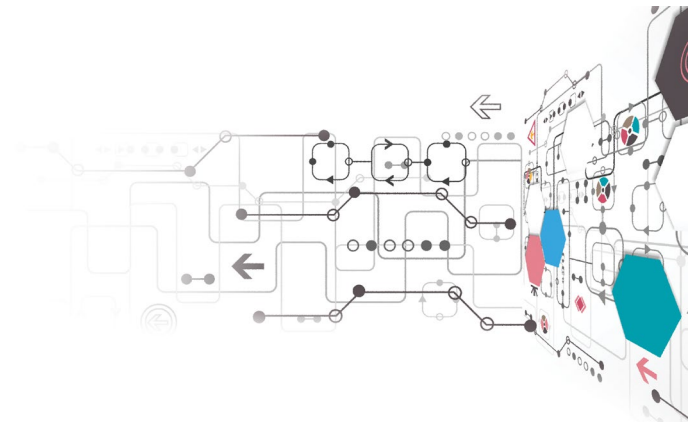


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



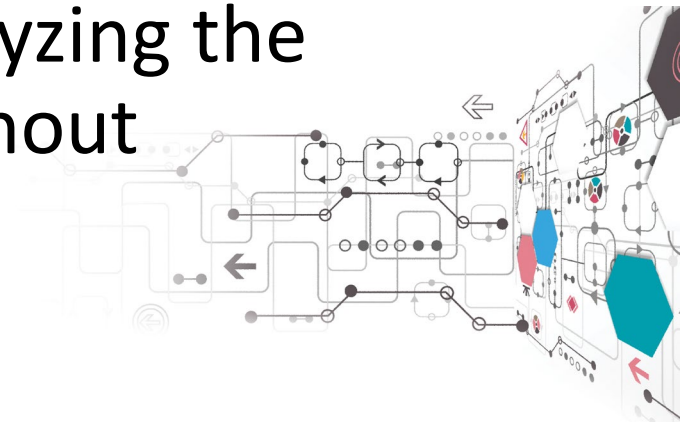
Agenda

- Research domain
- Research challenge
- Contribution to the scientific body of knowledge
- Societal relevance
- Research question(s)/ hypotheses
- Planning
- Status of the research



Research domain

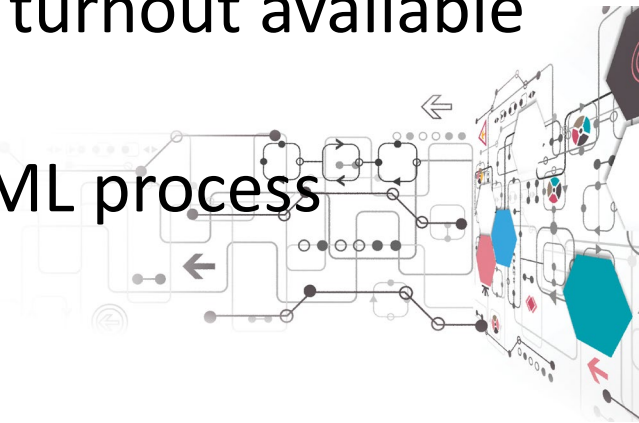
- political sciences → manage a state more efficiently, predict voter turnout (predict election results?), motivate voters, replace surveys
- cartography → visual analysis of statistical (demographic) data in connection with voter turnout
- machine learning (ML) → analyzing the possibility to predict voter turnout





Research challenge

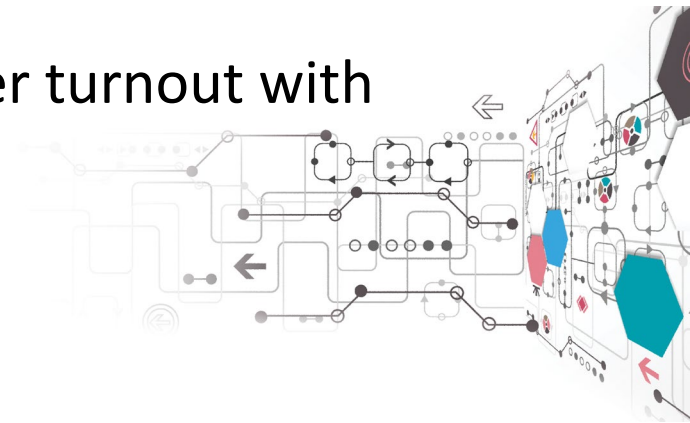
- Technical challenges → vast amount of data for collecting and preprocessing, acquire knowledge of ML algorithms
- availability of OD → limited availability of statistical data, statistical (demographic) data is spatially not coherent with voting data (electoral units), could be limitation factor for the ML training dataset
- unclear electoral units → spatial data for units (e.g. borders) not available, data of voter turnout available only for individual voting places
- selecting demographic data for the ML process



Contribution to the scientific body of knowledge

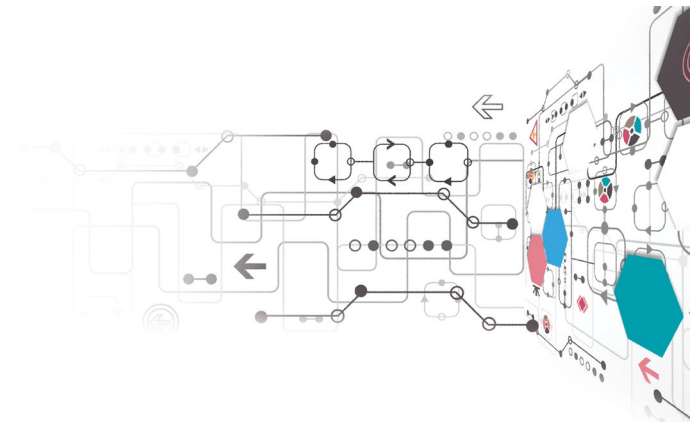


- apply sources of open data, primarily statistical and voting data, in order to improve voter turnout in Croatia
- define spatially borders of electoral units, aggregate data from previous elections, integrate demographic and voting data
- identify demographic aspects that impact voter turnout
- apply ML methods and compare voter turnout with pre-electoral survey data



Societal relevance

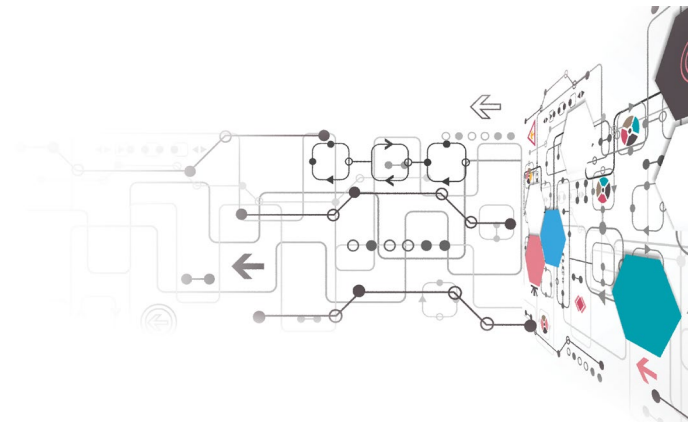
- Is demographic data in Croatia correlated to voter turnout and in what way → determine the most important parameters e.g. income, age, education
- Are pre-election polls regarding turnout replacable by machine learning algorithms?
- How can voter turnout incline?





Research question/ hypotheses

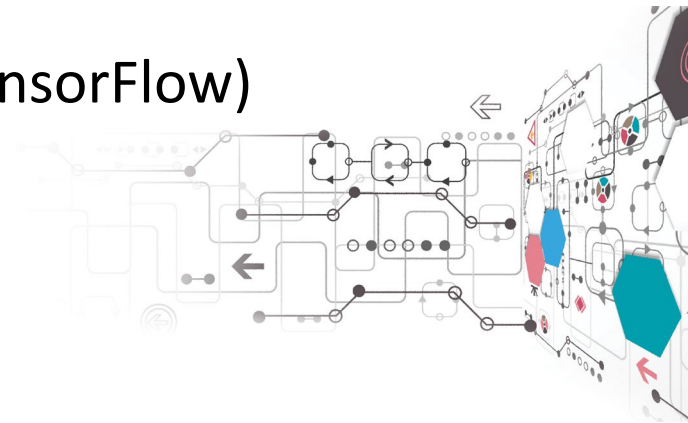
- „Demographics predict voter turnout” (BCStats, 2010 – Who Heads to the Polls?, Exploring the Demographics of Voters in British Columbia) → is this true for Croatia?
- Visual analytics of statistical/demographic data is relevant for the prediction of voter turnout
- ML methods can be used to increase the accuracy of voter turnout prediction





Planning & Status

- Current state:
 - Literature analysis
 - OD data search & wrangling
- Status: initial phase
- Plans (for 2020):
 - complete analysis of all collected OD
 - acquire knowledge in ML (Python, TensorFlow)
 - define hypotheses





Digital transformation of the agricultural sector for increasing adaptability to disruptions

Larisa Hrustek

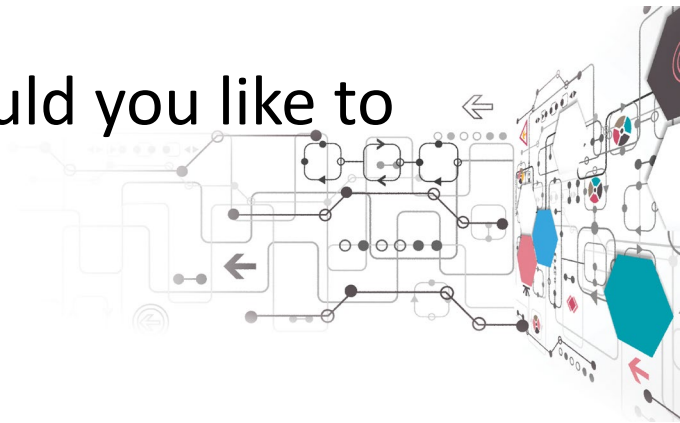
larisa.hrustek@foi.unizg.hr



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

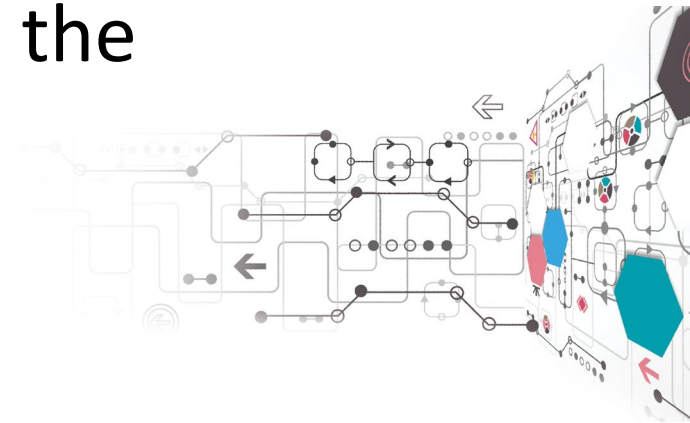
Agenda

- Research domain
- Research challenge
- Contribution to the scientific body of knowledge
- Societal relevance
- Research question(s)/ hypotheses
- Research methodology
- Planning
- Status of the research
- With which other TODO partner would you like to cooperate and why?



Research domain

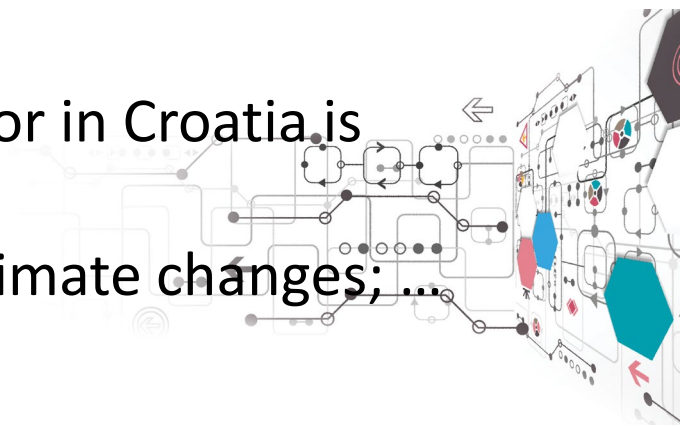
- digital transformation in the private and public sector
- identification of leading trends of digital transformation (business models, technologies...), with improvement potentials in the agricultural sector
- application of digital technologies to improve business processes in the agricultural sector





Research challenge

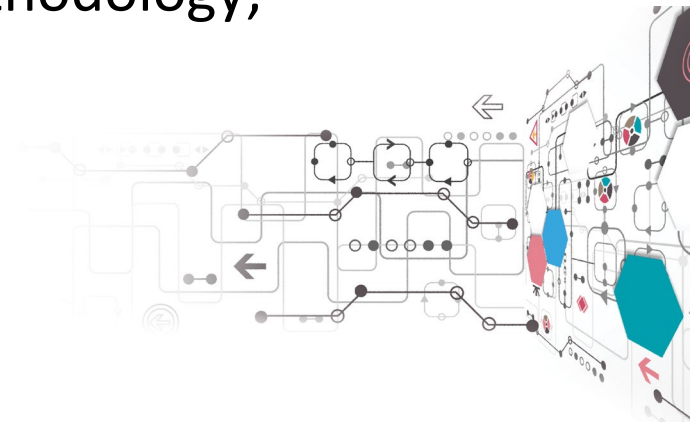
- General:
 - Research complexity (selection of data for analysis; survey methodology, etc.)
 - Appropriate sample of respondents (agriculture business) included in the research
 - Characteristics of agricultural sector (diversity of agricultural activities; size; capacities, etc.)
- Technical challenges → technical capacities of agricultural business: level of equipment
- Challenges for adaptability → transformation of the agricultural sector in Croatia is slow
- Economic challenges → agricultural sector in Croatia is recording a decline in production
- Environmental challenges → weather; climate changes; ...



Contribution to the scientific body of knowledge



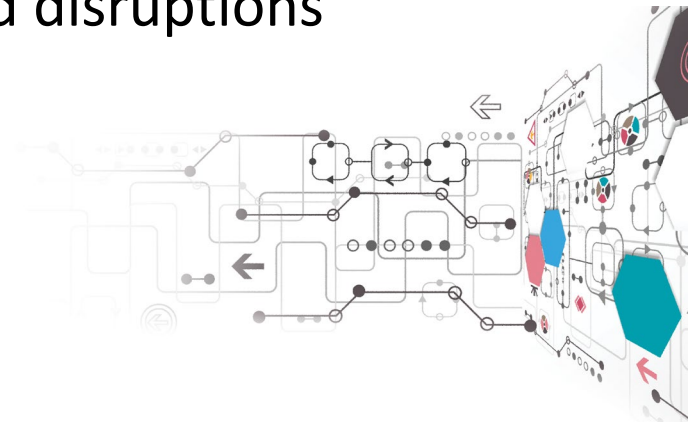
- Information science:
 - identify current state of the application of digital technologies in the agricultural sector
 - find, evaluate and apply sources of open data and other information for the improvement of agricultural business processes (as one of potential trends of digital transformation)
 - apply and integrate information, knowledge and algorithms in the results (model; methodology; framework, platform?)





Societal relevance

- Improvement of business processes of the agricultural sector for increasing productivity and sustainability
- Creation of an ecosystem for farmers' cooperation based on open (and other) data generation and exchange
- Creation and encouragement of a culture directed towards exchanging information and knowledge in the agricultural sector
- Establishment of a stronger agricultural and food sector in the fight against changing conditions and disruptions





Research question/ hypotheses

- Digital transformation enables increasement of adaptability of the agricultural sector, which are constantly influenced by disruptions and global challenges
- The application of open and other relevant data, based on data processing and predictive analytics, enables a system of support for business decisions and operational planning in agricultural production.
- Digital technologies, data processing and predictive analytics play a relevant role in transforming the agricultural and food sector into a smart, precise and strengthened sector, leading the development of global food supply chain sustainability and ensuring economic, social and environmental sustainability.



Research methodology



Literature
review

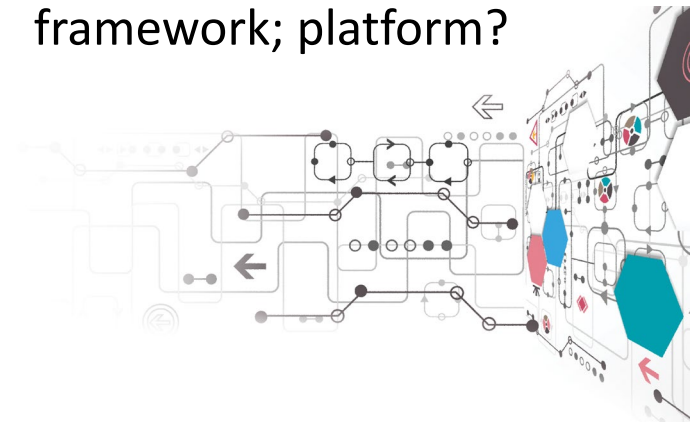
- Scopus;
Wos

Survey

- Sample
- Data
- Analysis

Results

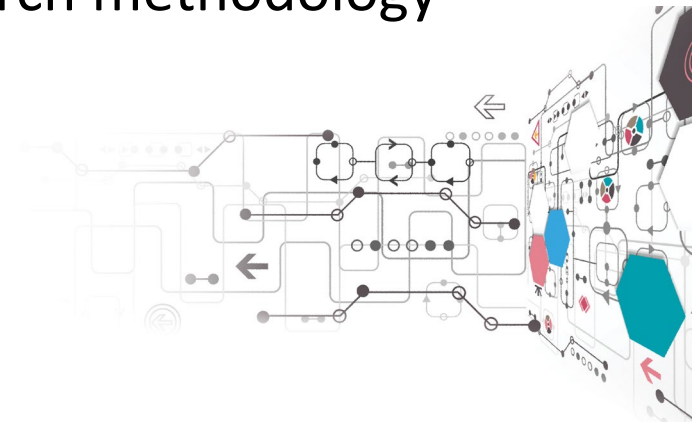
- Model; methodology;
framework; platform?





Planning & Status

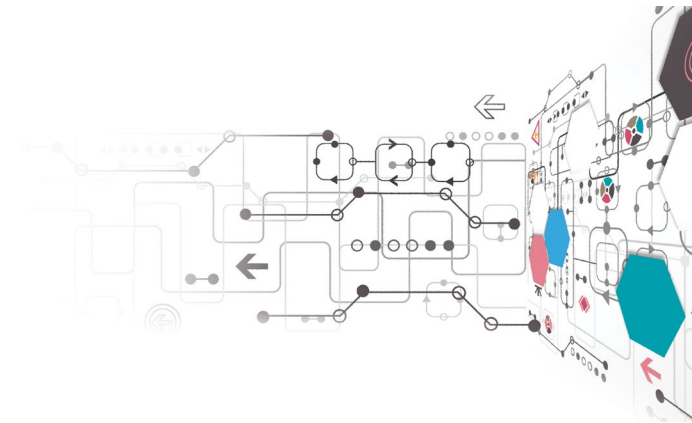
- Current state:
 - analysis of literature
 - Identification of hypotheses
- Status: initial phase
- Plans (by the end of 2020.):
 - complete an analysis of the current state
 - define hypotheses
 - develop the first version of the research methodology



With which other TODO partner would you like to cooperate and why?



- AGRI (research domain)
- ???





⇒ **Data access and National Continuously Operating Reference Station (NCORS)**

Warakan Supinajaroen

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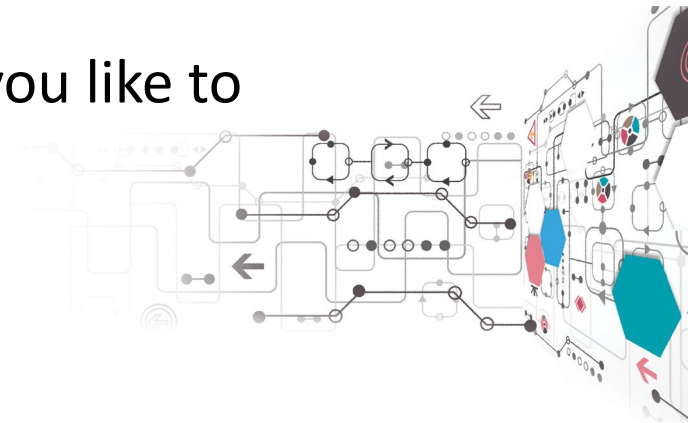


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda

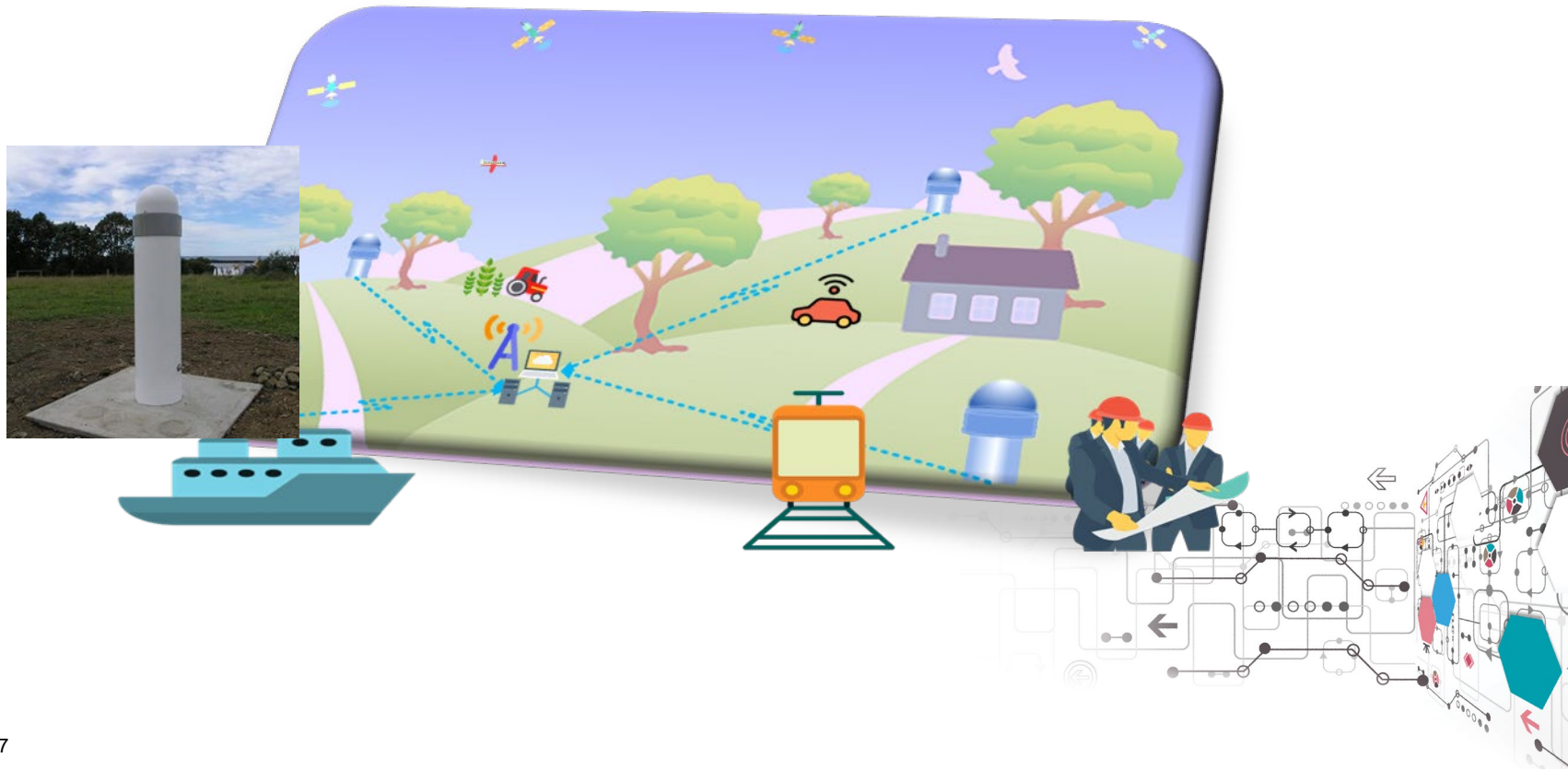


- Research domain
- Research challenge
- Contribution to the scientific body of knowledge
- Societal relevance
- Research question(s)/ hypotheses
- Research methodology
- Planning
- Status of the research
- With which other TODO partner would you like to cooperate and why?



Research domain

- Public data policy
- Spatial Data Infrastructure, data ecosystem
- System Dynamics modelling





Research challenge

- Implementing suitable access data and relevant policies for NCORS is a challenge for many national governments

Data regimes (Open Data, Cost-recovery)

User characteristics

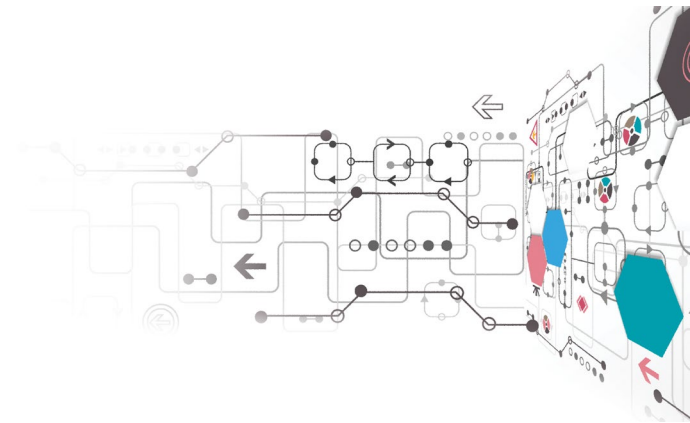
Financial plan

Service overlapping

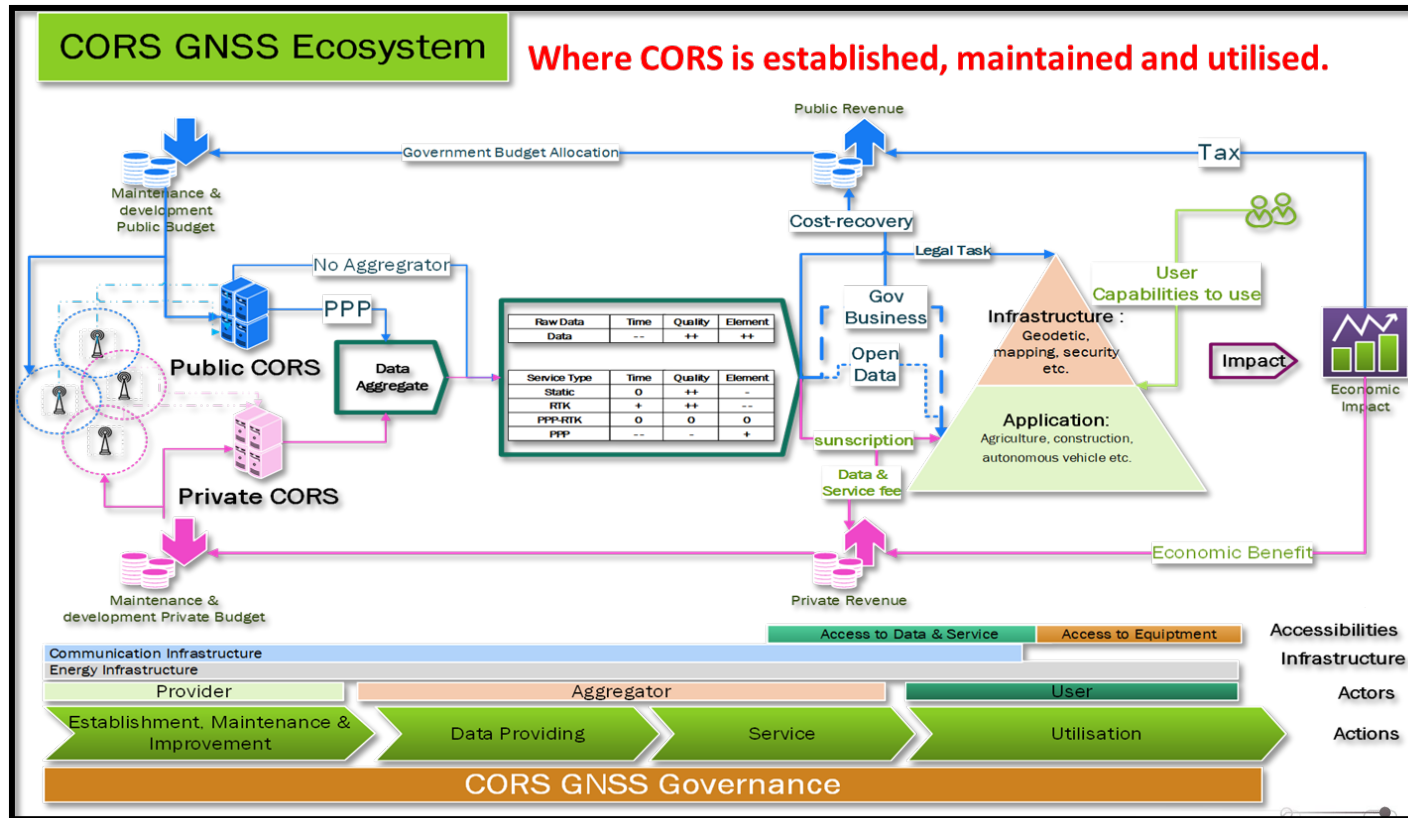
System improvement

Public good vs private business

No single solution fits all...



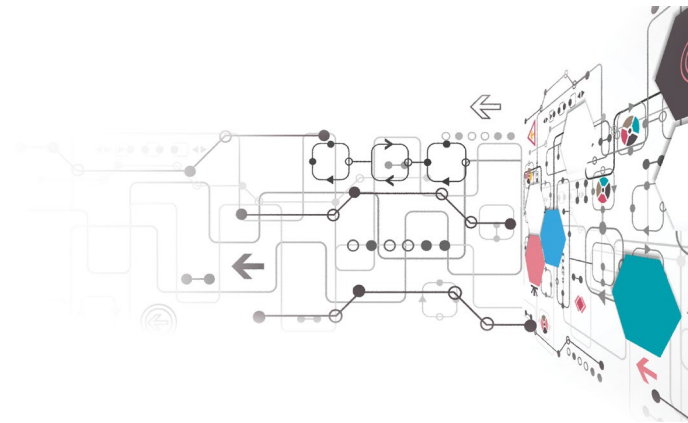
CORS ecosystem



Contribution to the scientific body of knowledge



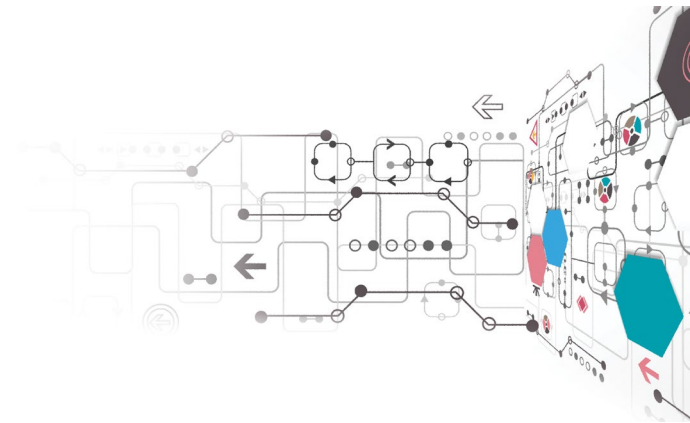
- A Decision Support System for NCORS implementation (and other public datasets)
 - An assessment framework for NCORS data
 - A simulation model
- A framework to identify the impact of public data (NCORS) utilisation





Societal relevance

- NCORS is an infrastructure underlying many scientific and daily life activities.
- The suitable data policy for NCORS leads to the optimal utilisation of NCORS in such activities and societal impact accordingly.



Research question

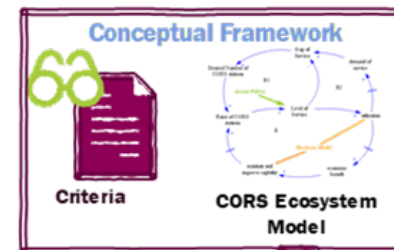


In order to determine a suitable access policy for national CORS in a CORS ecosystem, a Decision Support System is required.

What constitutes a DSS in determining a suitable access policy for CORS in individual context?

Objective 1: To identify a CORS ecosystem conceptual model

What are the elements of a CORS ecosystem?
What are the relations of elements in a CORS ecosystem?
How to validate the CORS ecosystem model?



Objective 2: To construct a Decision Support System for CORS ecosystem
- Assessment Framework
- Simulation Tool

What are the characteristics of DSS for CORS ecosystem?
How to translate the CORS ecosystem model into a DSS?
How to validate the DSS?
How to evaluate the performance of DSS for CORS ecosystem?



Objective 3: To identify the access policy for a case(s) of CORS project

What is the status of CORS ecosystem in the test case(s)?
What access policy should optimize CORS in the context of the test case(s)?

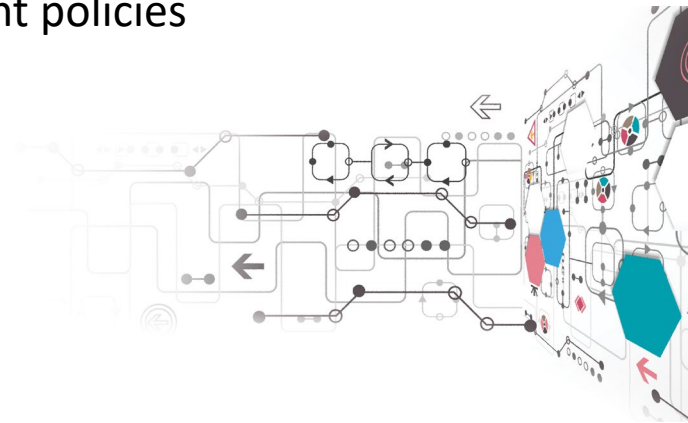




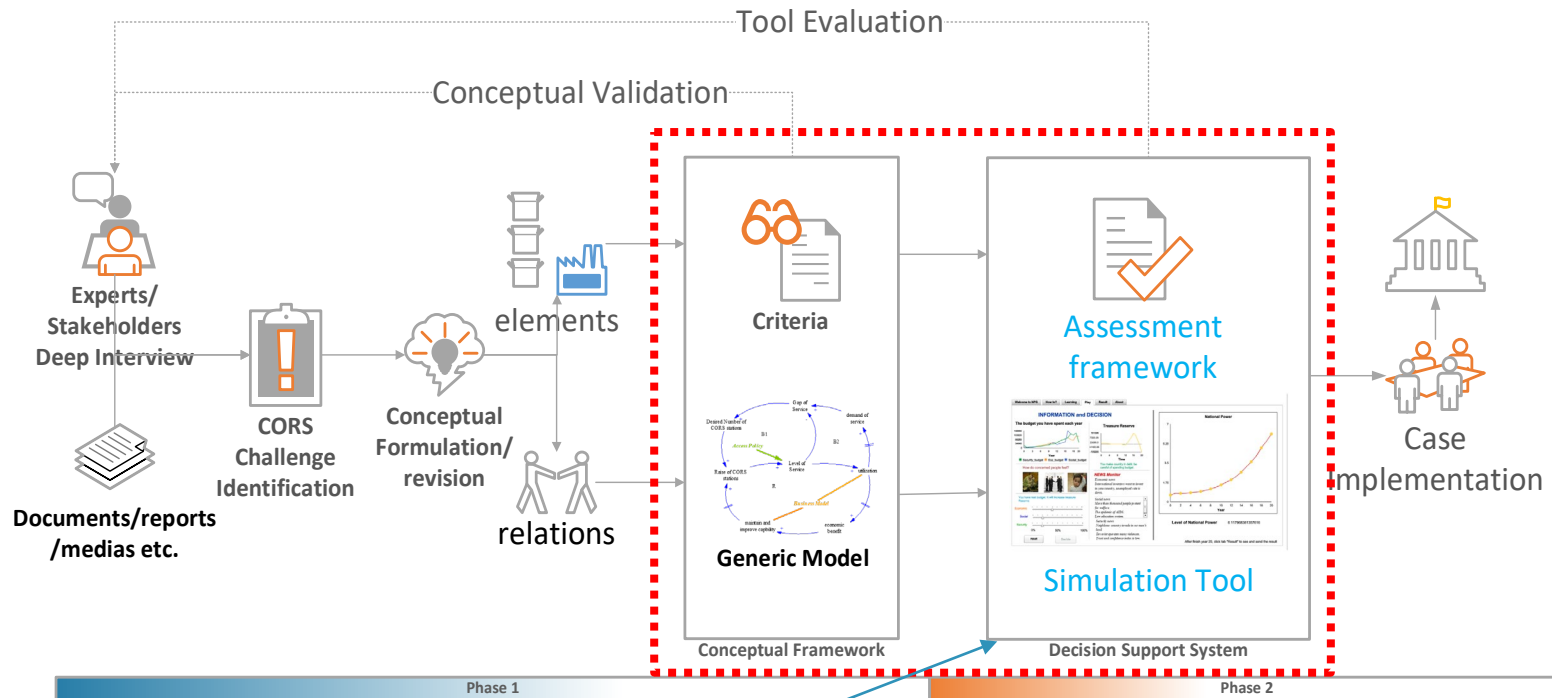
Research methodology

Both qualitative and quantitative methods and combination of primary and secondary sources.

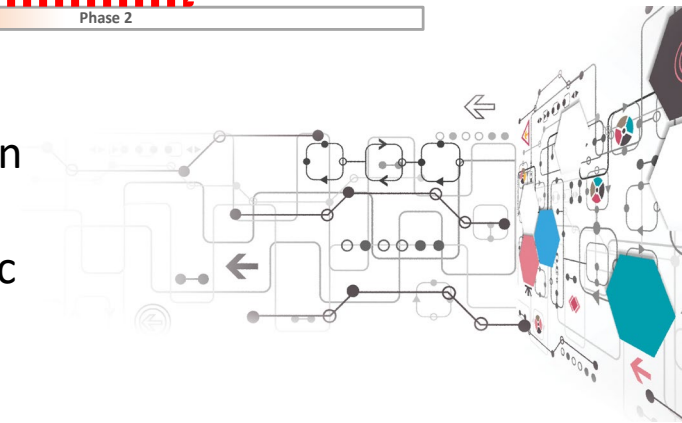
- Preliminary research and gap finding
 - Desk research
 - Literature, reports, documents
 - Expert interview
 - semi-structured and unstructured interviews
- Model formulation and policy simulation
 - System Dynamics methodology
 - to model NCORS ecosystem
 - to validate the model
 - to simulate potential data access and relevant policies
 - User interview
 - Questionnaire

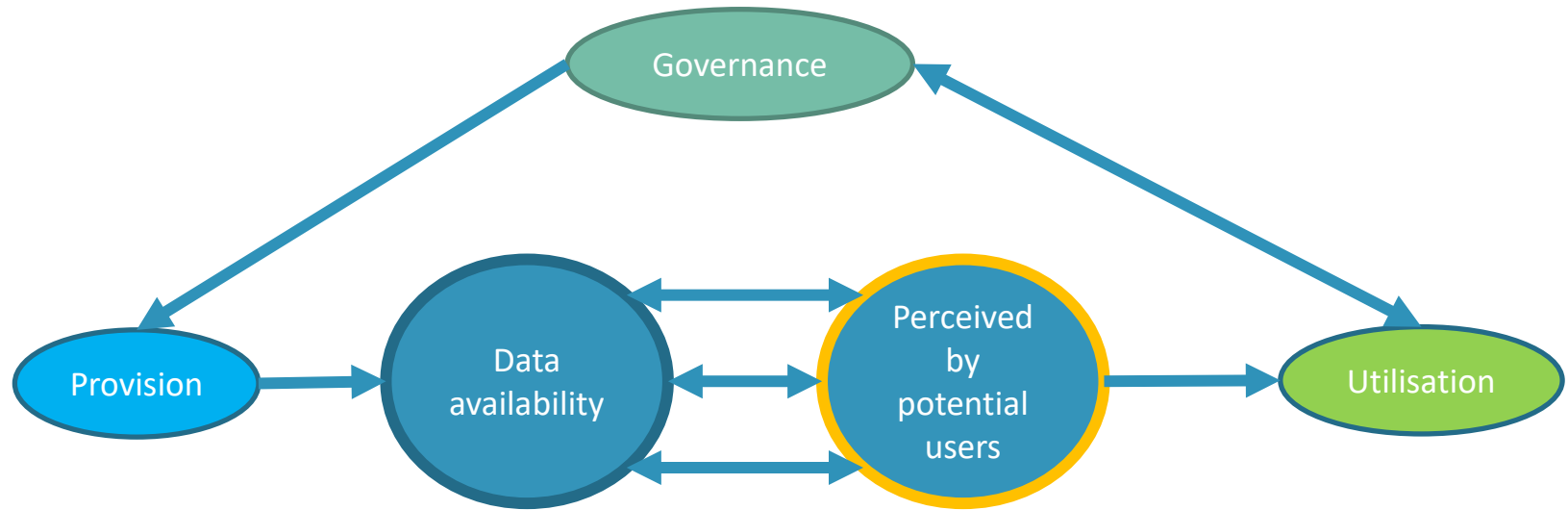


Planning & Status



- Introducing five perceived attributes of the Diffusion of Innovation theory (DOI) to the model
- Acquiring the parameters from the users in geodetic (original use) and agriculture (reuse) domains





Adoption factors

Rationale of use

Relative advantage
Compatibility
observability

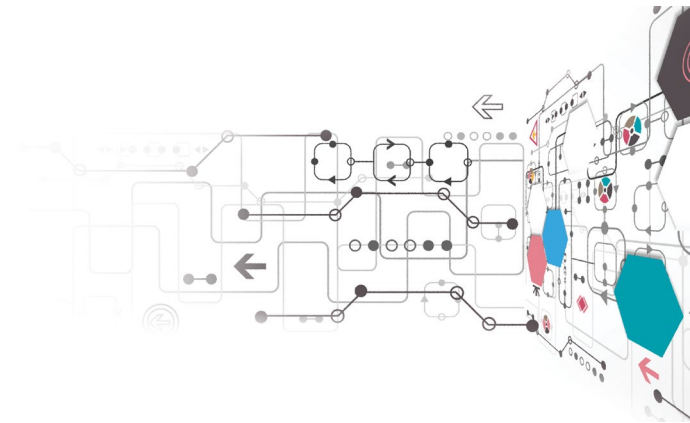
Capability to use

Knowledge
Relevant costs

With which other TODO partner would you like to cooperate and why?



- CORS experts/agencies —to acquire/exchange experiences, opinions and perhaps conducting a case study
- Anyone who is interested in applying
 - System Dynamics modelling,
 - Diffusion theory,
 - market research
- To learn and work together



4D Open Spatial Information Infrastructure Supporting Participatory Urban Planning Monitoring

Ph. D Research Proposal

Agung Indrajit

PhD Candidate

Department of OTB – Faculty of Architecture and Built Environment



OTB
TU Delft

Agung Indrajit, M.Sc



2004-2006, 2009-2016 (Geospatial Information Authority-Bogor)

- Head of Division of Geospatial Data Management in Indonesian Spatial Data Infrastructure
- Head of Division of Fundamental Geospatial Data Standardization
- Senior Engineer at Geospatial Intelligence Unit

2007-2008 (Deutsche Luft Raumfahrt, Oberpfaffenhofen)

- Part Time Database Developer for Satellite Imageries
- Full Time Geospatial Data Mining for Earthquake and Tsunami modelling

2001-2004 (Chevron Texaco-Sumatra)

- GIS Systems Developer

1999-2000 (Institute Technology of Bandung-Bandung)

- Teaching and Research Assistant

Master of Science from Technische Universitaet Muenchen 2008

Post Graduate Courses (UN CSSTEAP-India, UNSW-CSIRO Australia, ICPLST-Taiwan)

Bachelor from Institute Technology of Bandung 2000

Current Affiliation :



PUSAT
INFRASTRUKTUR
DATA SPASIAL
ITB - Bandung



Research and Strategic Issues
IKATAN SURVEYOR INDONESIA
Indonesian Surveyors Association
member of Fédération Internationale des Géomètres (FIG)

Background

- United Nations (2014) report:
 - 3.9 billion people were living the city in 2015.
 - It is expected 80% will live in urban areas in Europe in 2020
 - It is expected 2.7 billion or 54 % will live in urban areas in Asia in 2030
- UN (2015) adopted Target for Sustainable Cities and Communities in Goal 11 of Sustainable Development Goals (SDGs) for city.
- These challenges of the city need spatial techniques and geospatial technologies, in combination with other engineering subjects, social and natural sciences (Gruen, 2013).
- SIIs should have made a great impact as expected in decision making that set the direction of the city; and rarely being integrated with the system that runs Smart City (Roche et al., 2012).
- Williamson (2010) stated that a city needs to be spatially enabled and spatial information is available to governments, citizens, and businesses as a means of organizing their activities and information (Goodchild , 2007).

Background:

Why Participatory Urban Planning Monitoring?

Why 4D Spatial Information? Why Open SII?

Participatory Urban Planning Monitoring



Background:

Why Participatory Urban Planning Monitoring?

Why 4D Spatial Information? Why Open SII?

4D (3D City Model and Spatio-Temporal) Information

CITYLAB

DESIGN / TRANSPORTATION / ENVIRONMENT / EQUITY / LIFE



Office workers cross a street during lunch hour in the central business district in Singapore. // Edgar Su/Reuters

Singapore, City of Sensors

LINDA POON APR 21, 2017

They're on buses, atop buildings, in parks, and inside drains as part of the island's vision to become the world's first "Smart Nation." But what do they mean for privacy?

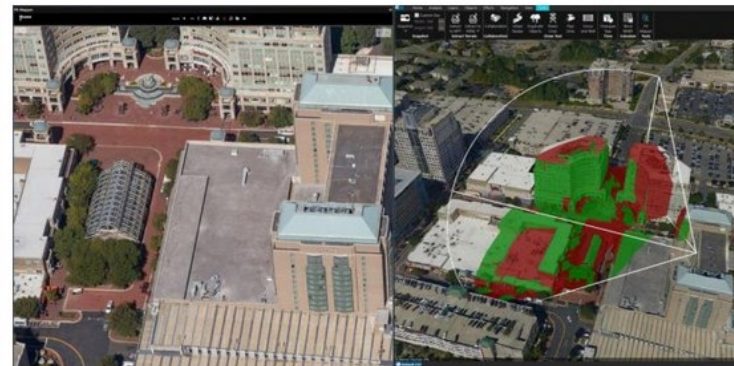
SHARE TWEET

This post is part of a CityLab series on [open secrets](#)—stories about what's hiding in plain sight.

Armed with a deep pool of tech entrepreneurs and startups—not to mention a government that's eager to make the most use out of them—the island-nation of Singapore offers a wealth of urban

Fugro and Skyline team up for 3D city modelling

by Anthony Wallace on 7 June 2017 in Company & Industry, Latest News, Surveying



Normally known for their global hydrographic surveying services, Netherlands company **Fugro** has just announced its intention to begin taking on the lucrative 3D city modelling market. A strategic partnership with United States 3D modelling software developer **Skyline** (also known as Skyline Globe) will deliver realistic, spatially accurate, high-resolution 3D modelling derived from oblique aerial imagery.

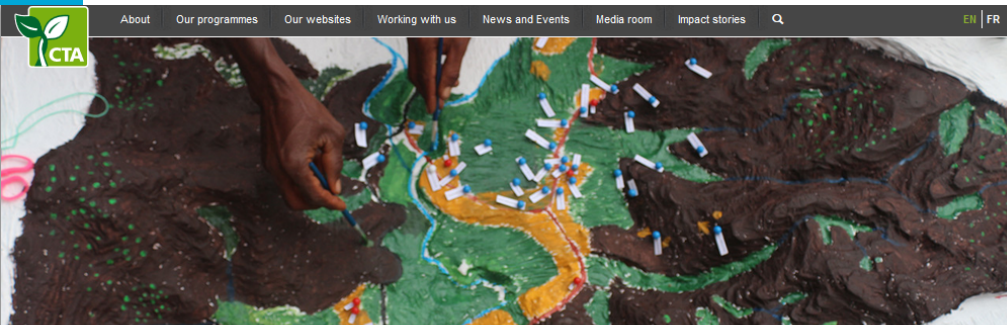
Fugro and Skyline are aiming to release a product that integrates both companies' oblique viewing and 3D modelling software products and Fugro's 360-degree oblique mapping capabilities. The partnership will build upon the components of Skyline's automated 3D modelling technology, as well as its established 3D GIS platform, TerraExplorer, and Fugro's visualisation and analysis tool, PX Mapper.

Background:

Why Participatory Urban Planning Monitoring?

Why 4D Spatial Information? **Why Open SII?**

Open Data and Spatial Information Infrastructure



[Home](#) / [Impact-stories](#) / Participatory 3D modelling as a means of increasing synergy between village projects and contributing to more holistic development



Impact stories

CTA

Participatory 3D modelling as a means of increasing synergy between village projects and contributing to more holistic development

P3DM



Further reading

[March 18, 2017](#)
[Participatory 3D Modelling, a powerful development tool for Madagasy associations](#)

[March 18, 2017](#)
[Light at the end of the tunnel for Malagasy fishermen](#)

[March 18, 2017](#)
[How Participatory 3D Modelling has contributed to women's personal development in Madagascar](#)

Community development in Madagascar is often hampered by a lack of synergy between different local initiatives. Now project managers in areas where the Participatory 3-Dimensional Modelling (P3DM) process has been developed are hoping that this new technique can help harmonise and coordinate different development actions.

"Help! There's too much aid!" This headline on a rural affairs magazine probably stopped development project promoters and readers in the Madagascar capital in their tracks – but it reflects a growing feeling among beneficiaries that poorly coordinated interventions have created chaos rather than harmonious development. "Things would be so much better if partners gave the matter just a little concerted thought" sighed a farmer's leader in Anjafotsy (Betsfo District). The negative effects of the situation are all too clear in this rural commune of Andranomafana, where local development is confused, chaotic and hampered by resistance to change, inability to commit to projects and problems preparing development plans ...

Lack of coordination

Unbalanced development is one of the first signs of a lack of coordination that has left some communities in certain areas inundated with projects while their neighbours have none. The commune of Andranomafana is a case in point, as there are five projects in the north of this small community (48 km²) and none in the south. One woman thinks this is because "people the south are less educated as they're a long way from the highway," but deputy mayor Sololo Marc Rakotondrarafa blames it on lack of coordination, arguing that intervening agencies are disorganised and choose their intervention areas and themes without consulting other actors. Rajoroana Razafimahatratra, a technician with the Liaison Office for Rural Training Institutions (BIMTT) reckons that "Everyone's out for

KOMISI INFORMASI PUSAT
Republik Indonesia

Veranda Profile Report KI Province Publication Regulation Cooperation Book PPID

28 OCT

Assembly News > Members of the Constitutional Court Dissenting Opinion KIP Decision Over Open Shapefile Ministry LHK

Members of the Constitutional Court Dissenting Opinion KIP Decision Over Open Shapefile Ministry LHK

Publish Date: 2016-10-24 14:15:32

Members of the Constitutional Court Dissenting Opinion KIP Decision Over Open Shapefile Ministry LHK

2016-10-24 14:15:32

Applicant Public and Private Dispute Board Simultaneously

2016-10-21 15:28:59

Petitioner's Request Hearing Held in Sumatra

2016-10-20 11:38:41

ICW Not Attend the First Session of the Dispute Information in KIP

2016-10-20 10:59:24

Donors Dispute Mini Market Alfamart to KIP

2016-10-19 14:55:22

Lumban Tobing Request Information Letter of the Chairman of the House of Representatives to President

2016-10-19 14:18:38

Applicant Information Request Fisheries High School Development

2016-10-19 13:51:56

Applicant Question Reason

Members of the Constitutional Court (Assembly Commissioner) KIP (Central Information Commission) John Fresly express different opinions (Dissenting Opinion) against the decision of the Constitutional Court ordered the Respondent to disclose information to the Applicant shapefile format. John read his dissenting after Chief Justice Dyah Aryani with members Evy Trisulo finished reading the verdict in the Meeting Room on the 5th floor KIP Jakarta on Monday (24/10).

Assemblies with single agenda verdict was attended by the parties, both the Petitioner and the power of Greenpeace Indonesia and the Respondent and the power of the Ministry of Environment and Forestry. MK which alternately reading the verdict in the trial that ended with amar putusa decide the information in shapefile format requested Applicant is information that is open to the public.

OPEN GOVERNMENT INDONESIA: Transparency, Participation, and Innovation

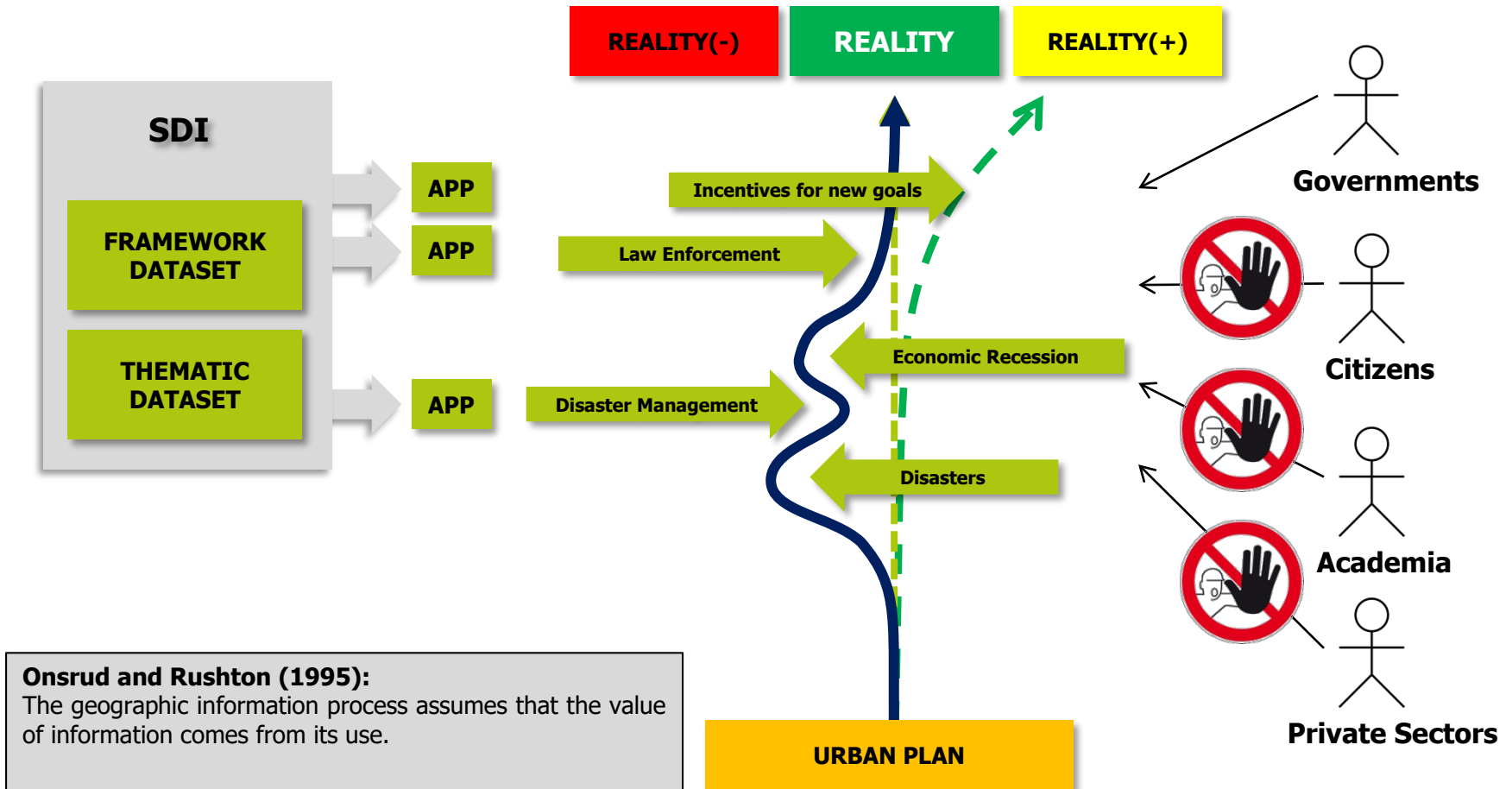


Open Government Partnership (OGP) established in September 20, 2011 by eight countries (include Indonesia) is a global multilateral partnership of governments and civil societies to make governments more accountable, participatory, and innovative in serving their citizens. Currently 64 countries have joined the organization and the number keeps expanding.

On the same day, Open Government Indonesia (OGI) was founded in response to OGP and the first inter-ministrial partnership to find effective solutions in making governments more efficient and responsive, transparent, participative, particularly with the use of technology and the strategic function of co-partnership between governments and civil societies.

Background: Recap

A City need to perform Urban Planning Monitoring



Geospatial Information in National Developments:

Legal Case in East Kalimantan-Kutai Timur Regency

Mining Permit

Forest Management Permit

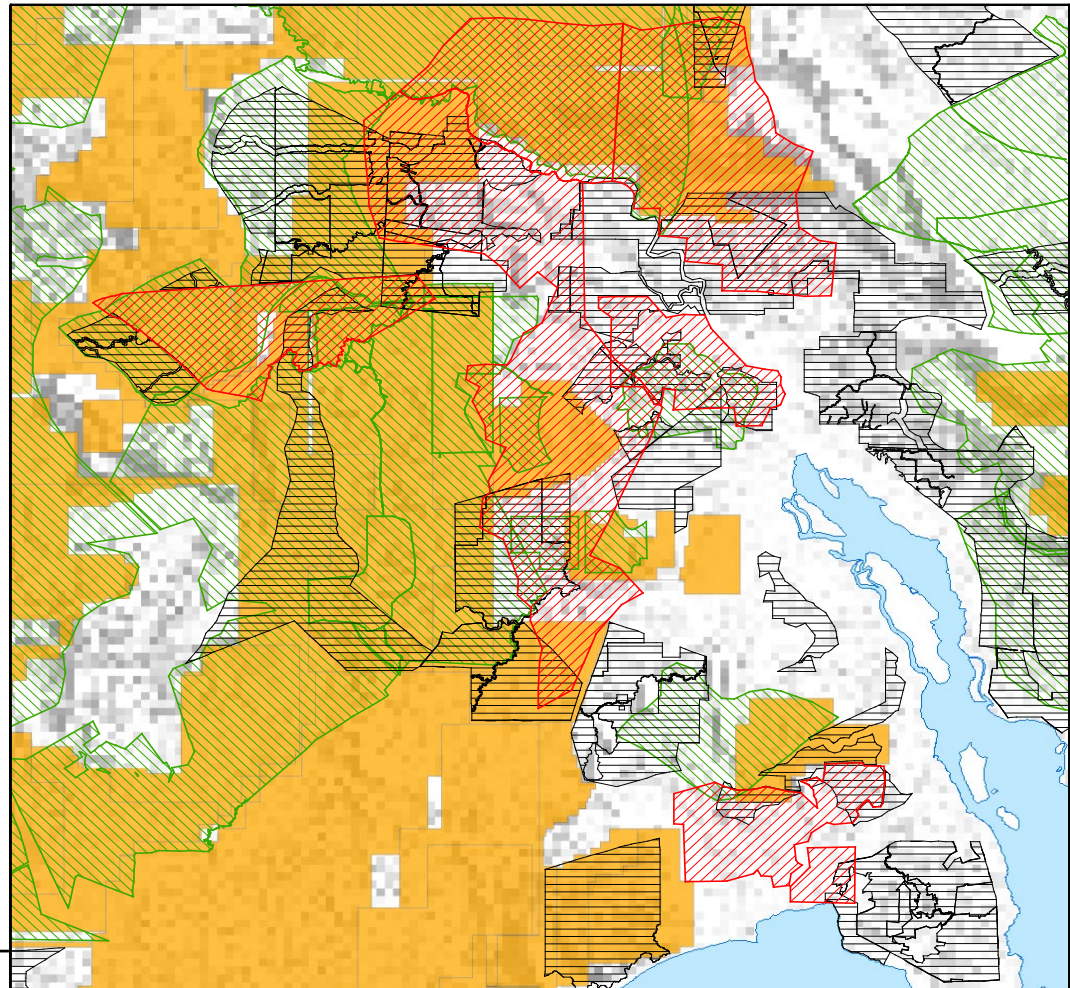
Cadaster Permit

Transmigration Permit

Tally:

convicted:	on trials:
3 governors	1 governor
12 majors	3 majors

Source: BIG and Min. of Environment and Forestry, 2016



Research Objective

The Ph.D. project will focus on how to improve spatial information sharing to support participatory urban planning monitoring by implementing two-ways direction and open data principles.

This research will cover:

- 1) Policy aspects, to examine data governance for Open SII for participatory urban planning monitoring;
- 2) Technical aspects, to develop working specification of Open SII and spatial data management to support participatory urban planning monitoring, and
- 3) Implementation aspect, to study how dimensions (geometry and time) of spatial information able to improve participatory urban planning monitoring.

Research Question

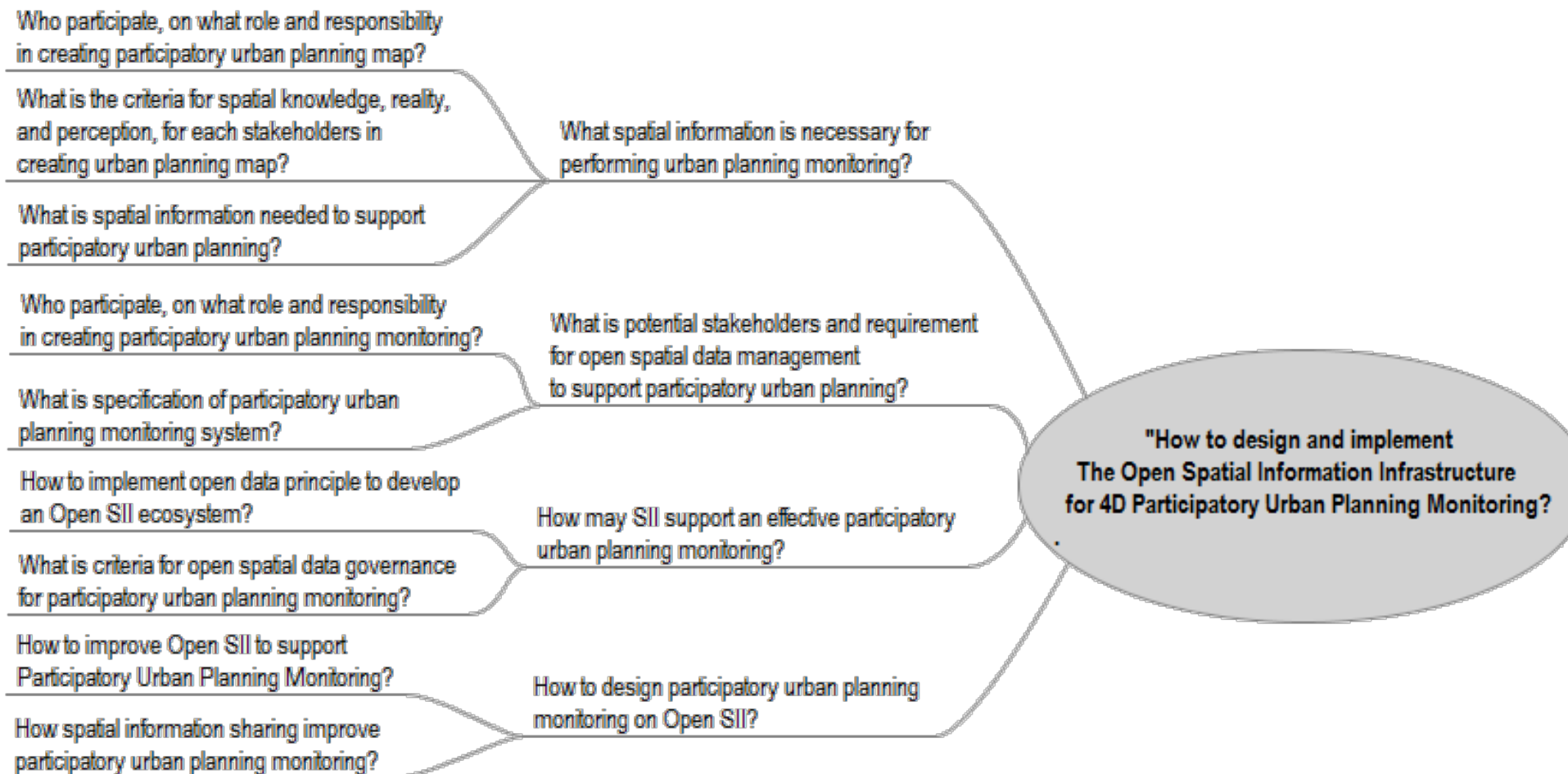
The research question that will answer by this research is:

"How to design and implement The Open Spatial Information Infrastructure for 4D Participatory Urban Planning Monitoring."

The accompanying research sub-questions that are related to this research, and will also be answered are:

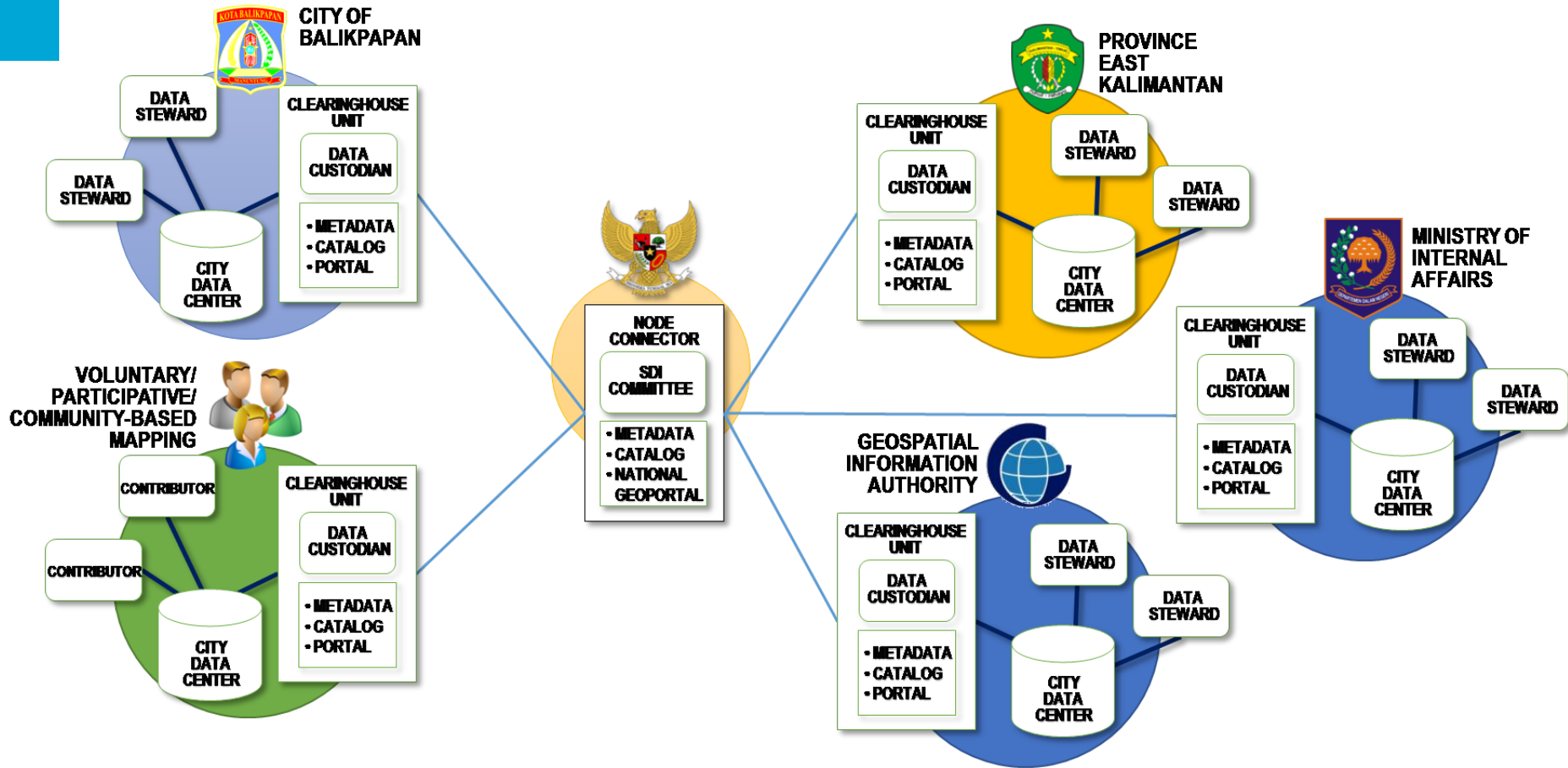
1. What spatial information is necessary for creating urban plans?
2. What are potential stakeholders and requirements for open spatial data management to support participatory urban planning monitoring?
3. How may Spatial Information Infrastructure (SII) support effective participatory urban planning monitoring?
4. How to design participatory urban planning monitoring on Open SII?

Research Question



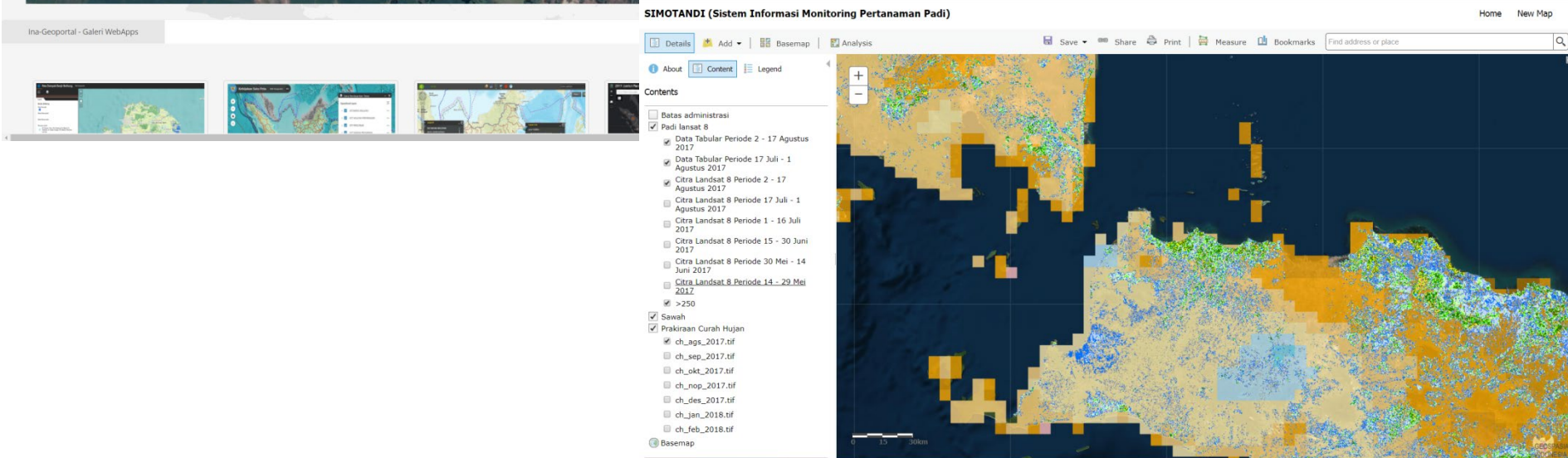
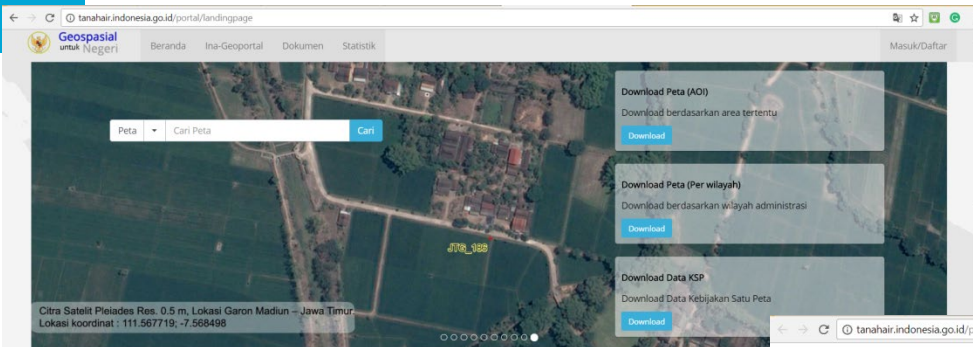
Geospatial Information in Open Government Indonesia:

Topology of Spatial Information Infrastructure: Case Balikpapan City



Geospatial Information in Open Government Indonesia:

<http://www.tanahair.indonesia.go.id>



4D Participatory Urban Planning: Design

A Global Perspective of Modern Land Administration Systems
(Enemark & Williamson, 2005) and Urban Planning



SDGs for Food



SDGs for Happiness



SPIRITUAL



ECOLOGICAL

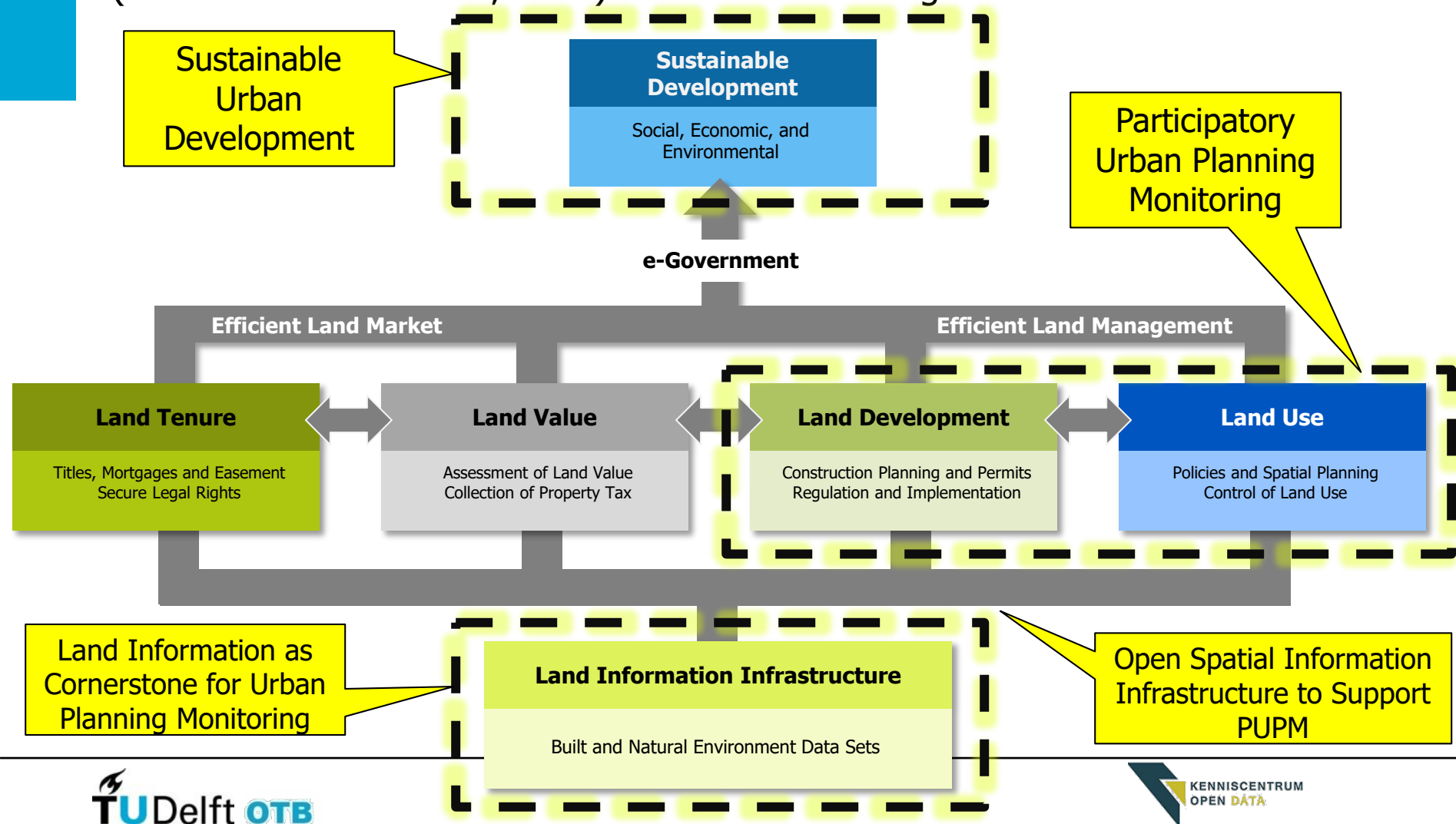


PEOPLE

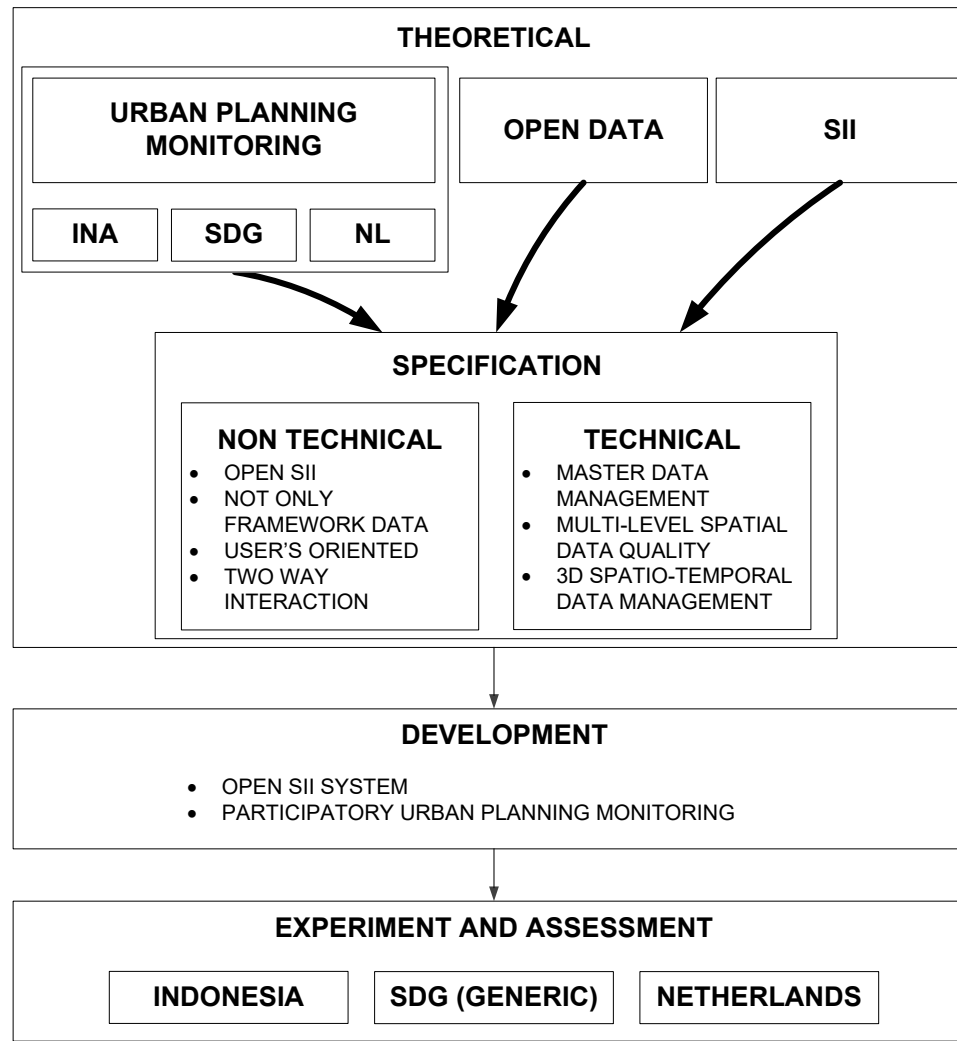
SUSTAINABLE DEVELOPMENT GOALS

4D Participatory Urban Planning: Design

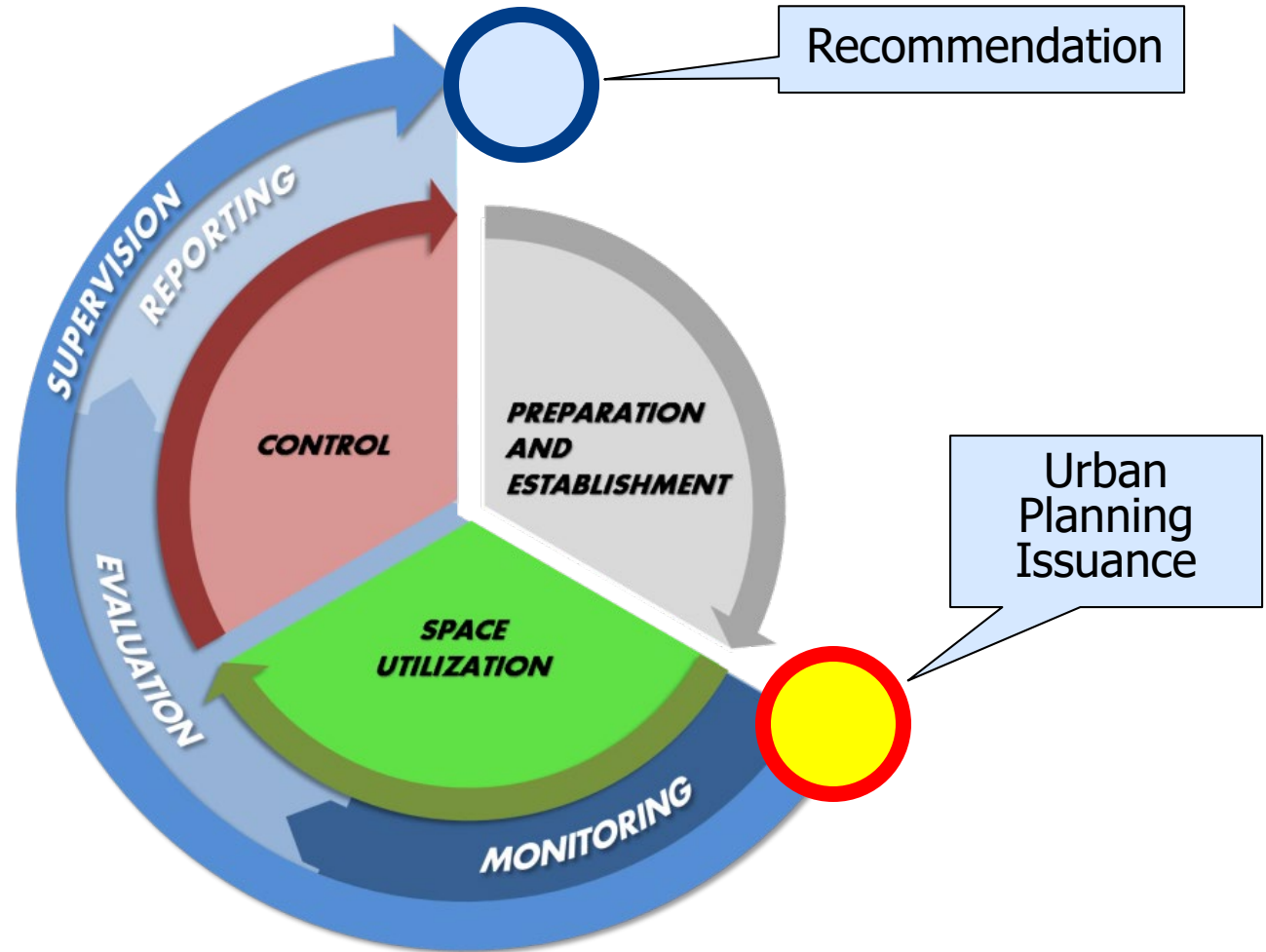
A Global Perspective of Modern Land Administration Systems
(Enemark & Williamson, 2005) and Urban Planning



Research Overview

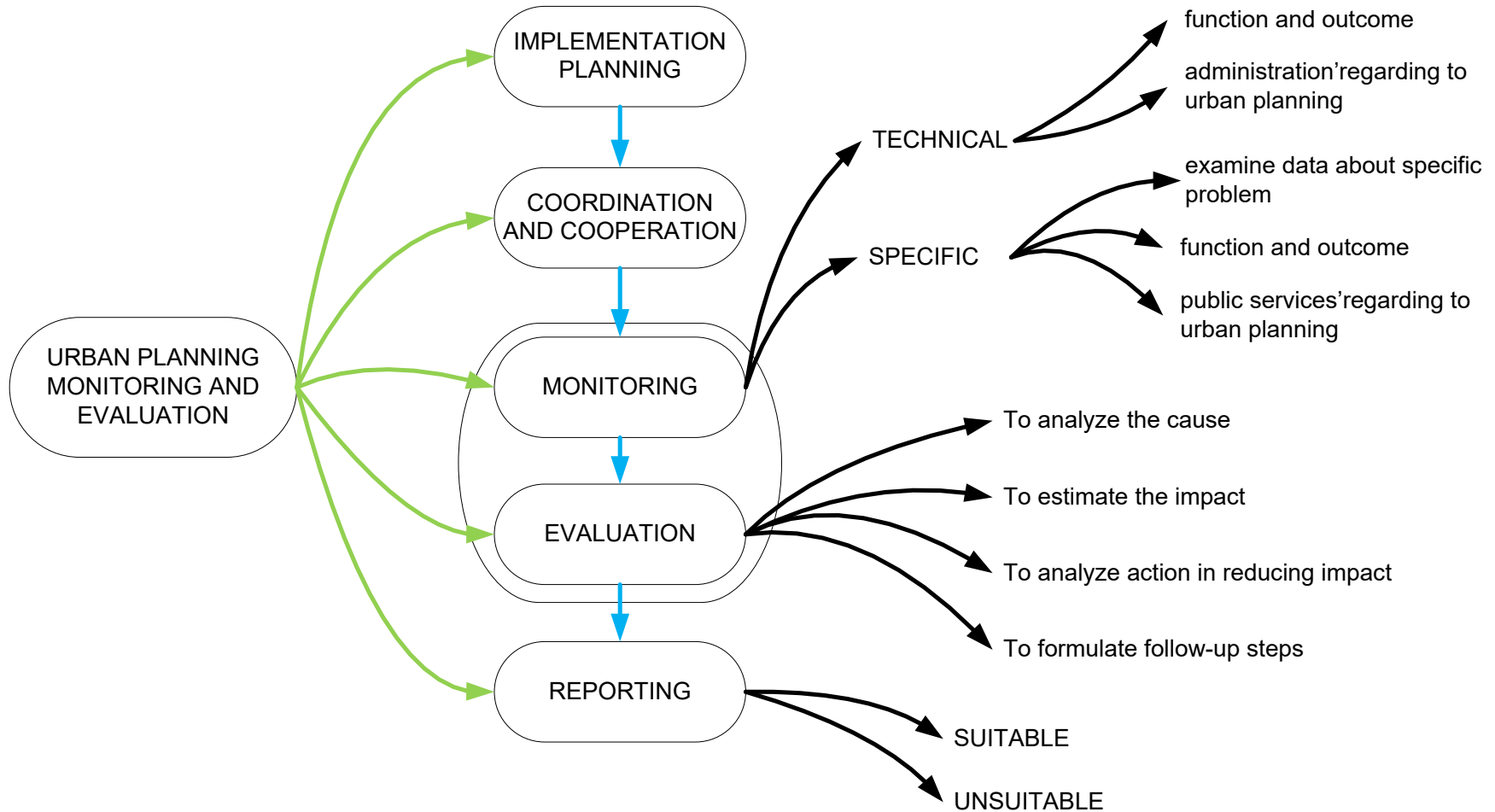


MONITORING IN URBAN PLANNING STAGES



Result from Literature Study and Observation

Urban Planning Monitoring Processes



4D Participatory Urban Planning: Design

Urban Planning Monitoring and Open Government (Data) (McCall, 2012)



Result from Indonesia visit

Anda bekerja di SEKTOR apa?

27 responses

What industry sector do you work in?

Apakah INSTITUSI/ORGANISASI prinsip "Data Terbuka" yang m

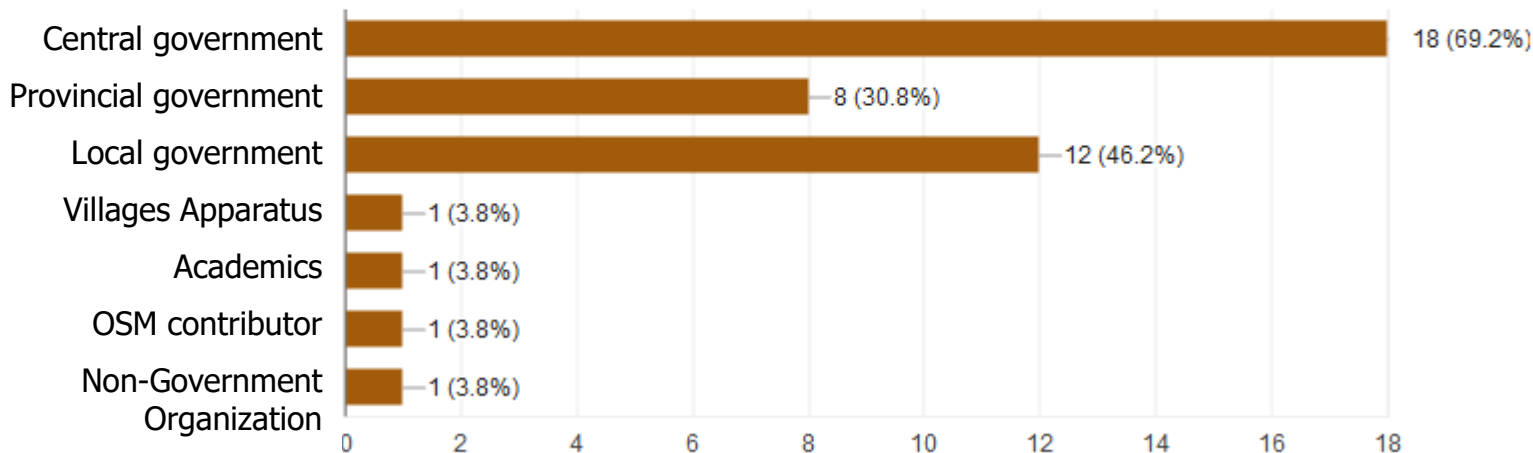
27 responses

Does the institute you are currently working agree to apply open data principle?

Jika INSTANSI/ORGANISASI tempat Anda mendapatkan manfaat dari penerapan pemerintah. Dari instansi manakah and publik tersebut?

26 responses

Has your company benefited from open data?



Result from Indonesia visit

Apakah INSTANSI/ORGANISASI online kepada MASYARAKAT untuk proses kerja, penyusunan

27 responses

Apakah INSTANSI/ORGANISASI sukarela (VGI) dari sumber internet memproduksi dan/atau pemutakhiran tertentu (misal: OpenStreetMap, .

27 responses

Apakah INSTANSI/ORGANISASI program infrastruktur informasi menyediakan akses terhadap informasi

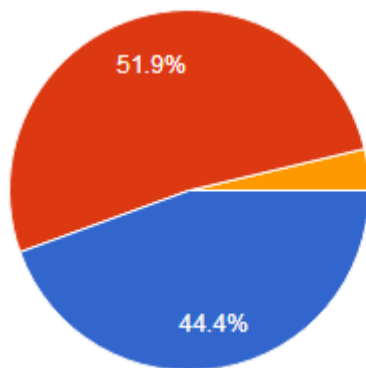
27 responses

Does your institution facilitate the communities to access data and to contribute data?

Does your institution use or take benefits from open data (such as OpenStreetmap)?

..

Does your institution actively involve in National or Local SDI?



- Already as a member and currently contributing to NSDI
- Have not yet as a member but plan to register and currently contribute to NSDI
- Will never be as a member and will not contribute to NSDI

Result from Indonesia visit

Apakah INSTANSI/ORGANISASI /
berbagi-pakai data dan informasi
akademisi dan masyarakat melal

27 responses

Does your institution has specific vision and mission on open data?

Apakah Anda secara aktif berpar
implementasi perencanaan kota
tempat Anda beraktivitas?

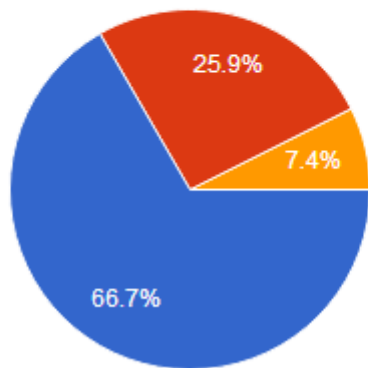
27 responses

Will you participate to monitor urban planning in your neighborhood or work place?

Apakah Anda menginginkan
perencanaan kota tersebut
diakses oleh publik ?

27 responses

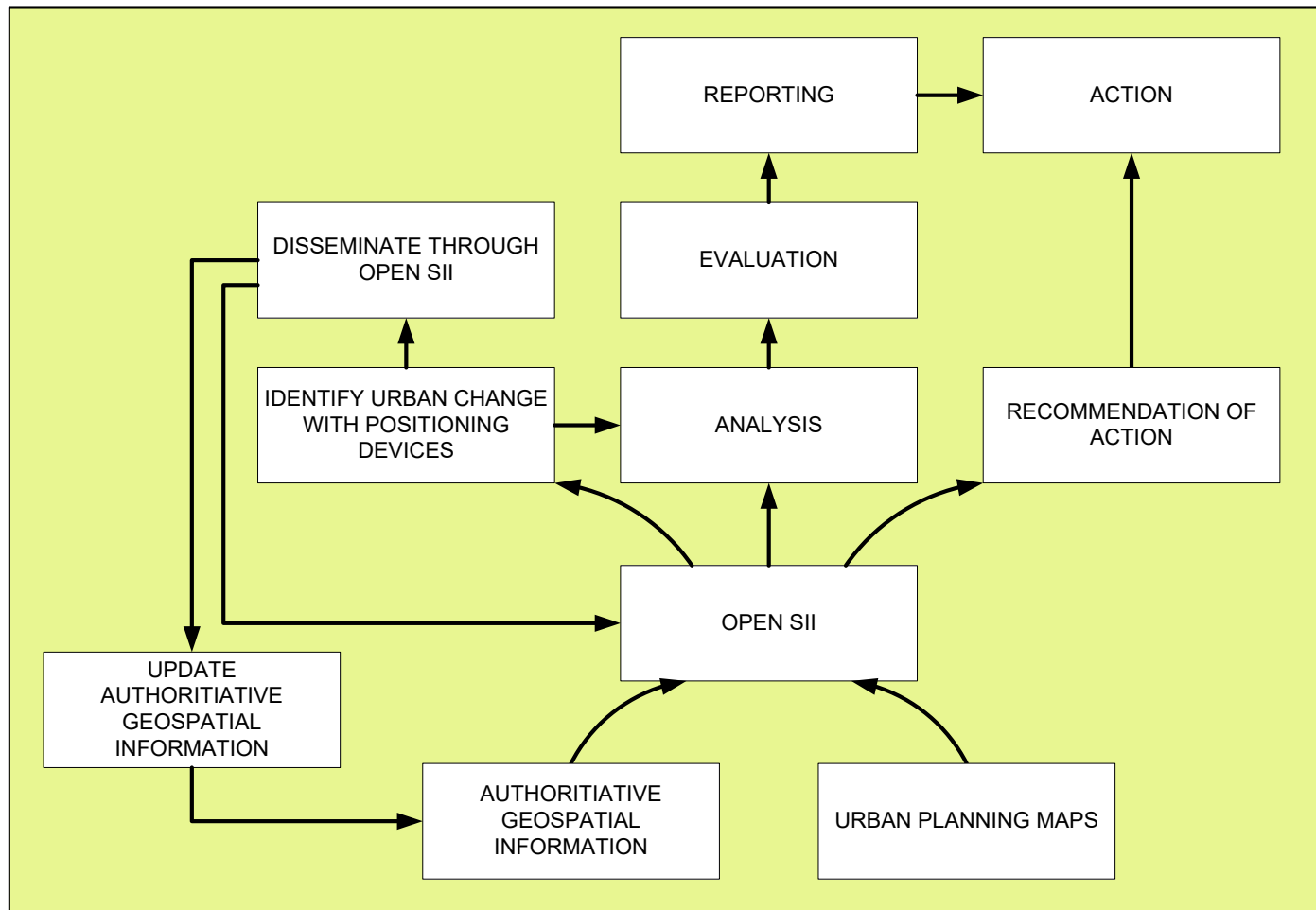
Do you agree if local government facilitate their citizen in urban planning monitoring and evaluation which can be accessed by public as open data?



- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

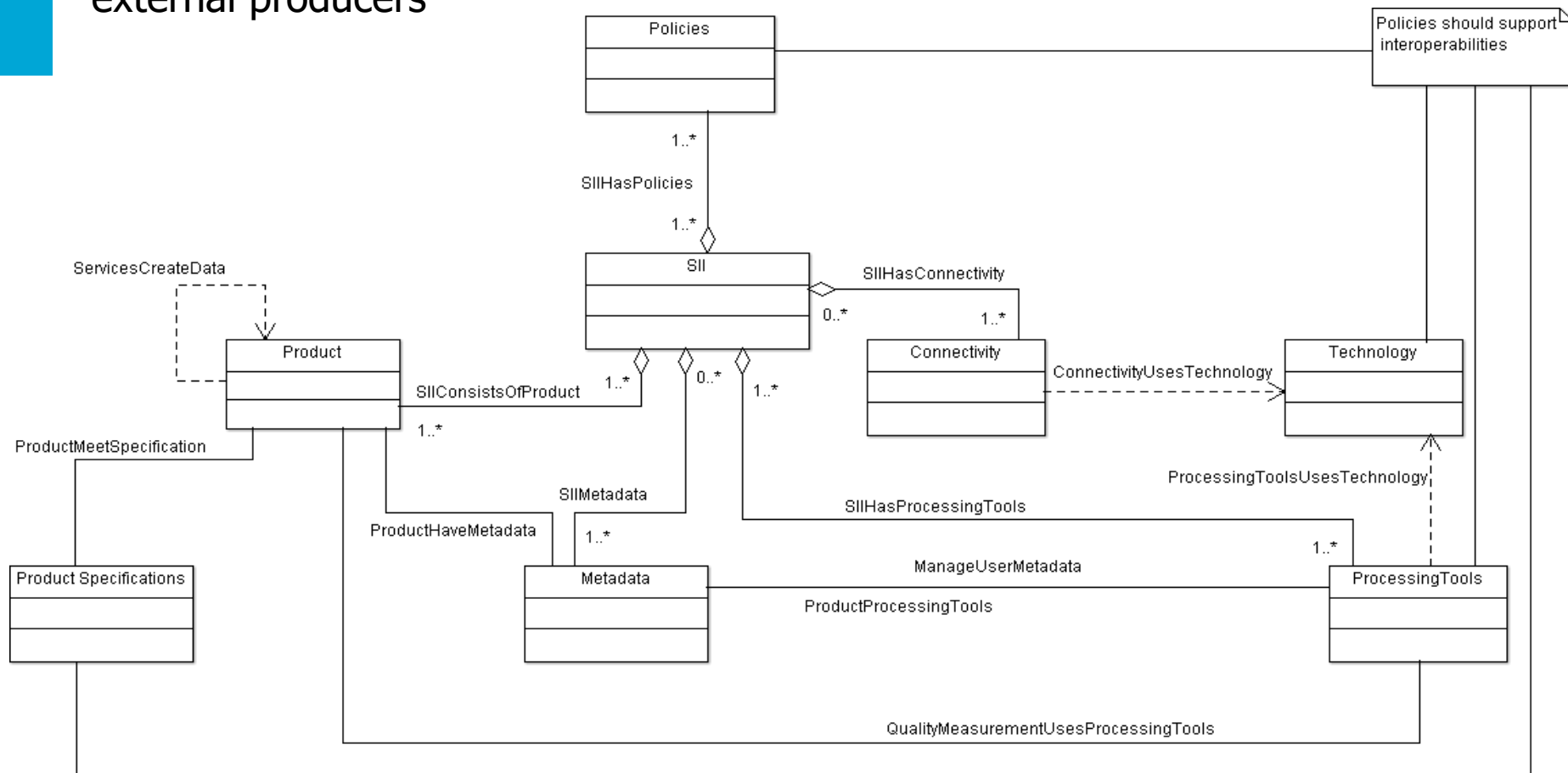
New Approach from Indonesia visit

Involving Citizen for Decision-making stages



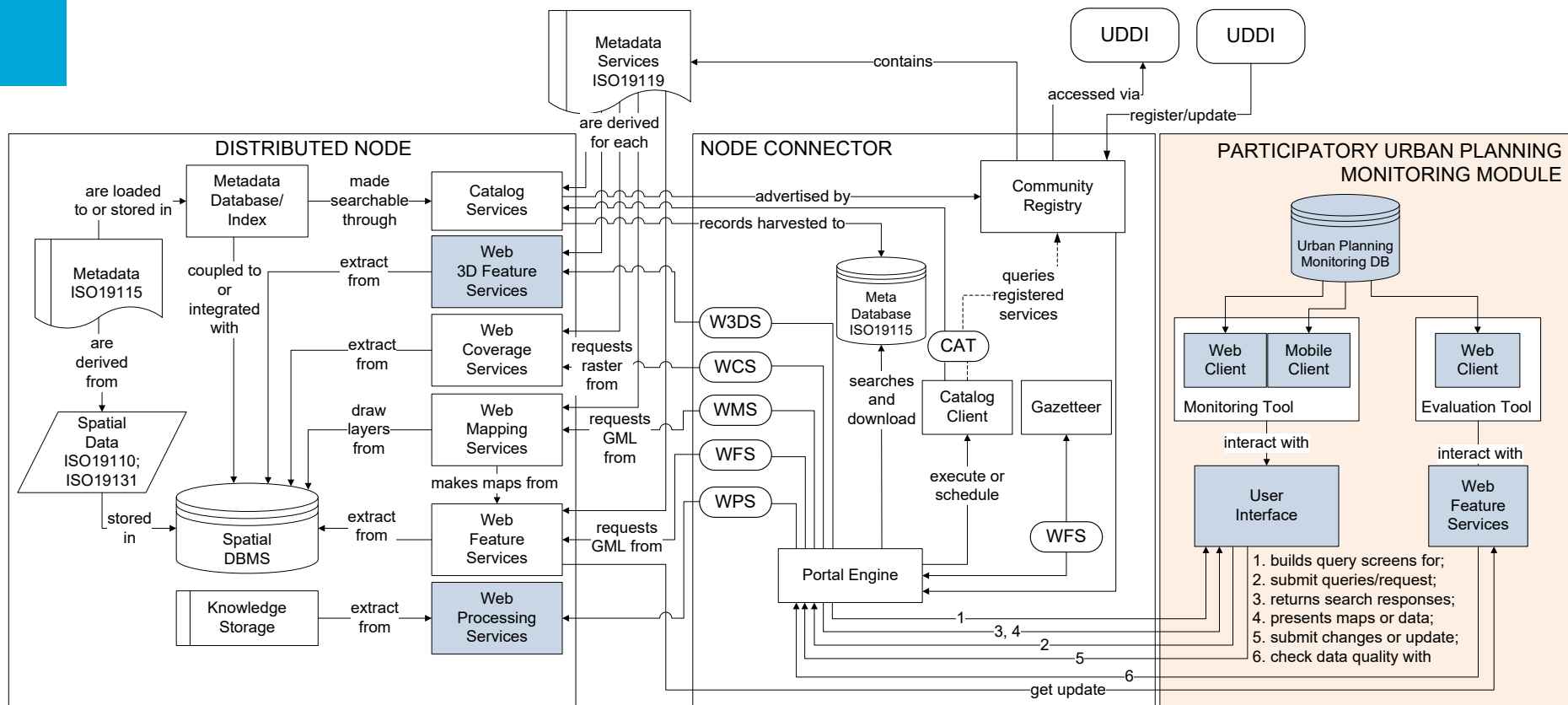
4D Participatory Urban Planning: Design

The High-level UML Classes of the Enterprise Viewpoint of an Open SII.
Processing Tools can assist spatial information quality from internal and external producers



New Approach from Indonesia visit

Proposed Technical Design (to support Open SII)



THANK YOU

LOOKING FORWARD TO DO RESEARCH WITH YOU.





Personalized multimodal journey planners

Bia Mandžuka
bia.mandzuka@fpz.unizg.hr



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda

- Research domain
- Ongoing challenges
- Societal relevance
- Research directions
- Research methodology
- Status & Planning

Research domain

- Urban mobility
- Multimodal Journey Planners
- Personalized, user-centric multimodal service
- Multimodal Travel Behaviour

Ongoing challenges



1. Data quality

2. Availability of data and/or information

The establishment of National Access Points (NAP) in each EU Member State

- Those NAPs will gather travel and traffic data from all type of transport from both private and public entities

3. Re-use of data

4. Interoperability

5. Data-security and privacy issues

Societal relevance



- a way of **empowering travellers**
- promoting the cleanest transport modes
- sustainable, clean and energy efficient urban transport
- MJPs promote advanced, personalized service for **all user groups**, especially for users with disabilities or reduced mobility, by providing them with information on facilities and support services
- Providing real-time information before and during travel will not only help individuals but will increase the efficiency of the transport system as a whole



Research directions

Good MJPs allow travellers to make **informed choices depending on their travel preferences and needs**

- The user, in this regard, **creates a customized journey**
- Existing multimodal route planners are limited in certain segments
- The preferences of end-users differ in choosing the most appropriate route, and thus the choice is a process of multi-criteria decision-making
- A variety of available mobility services (with the customized combination) = **it is possible to realize a personalized multimodal information service**



Research methodology

I step – Literature review

II step – Survey (identification of preferences and user requirements) – experts + users

III step – Results - Development of a multi-criteria decision-making model

Status & Planning



- **Current status:**

- analysis of literature
- finishing PhD qualifying exam

- **Plans:**

- define hypotheses
- develop the first version of the research methodology



Open data and legal databases - Evaluating the Quality of Legal Information Portals in Croatia

Margareta Habazin
mhabazin1@gmail.com

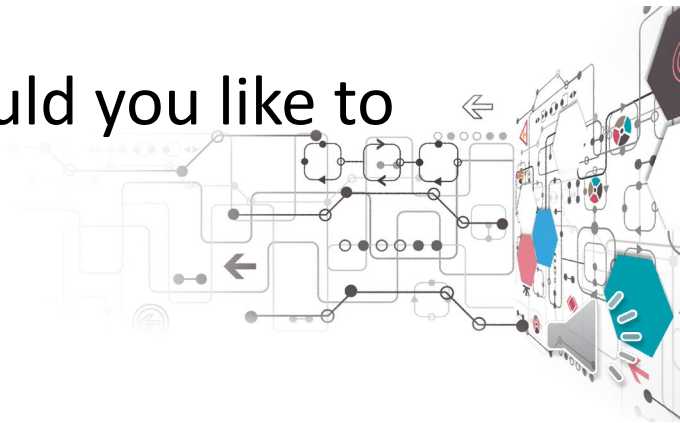


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



Agenda

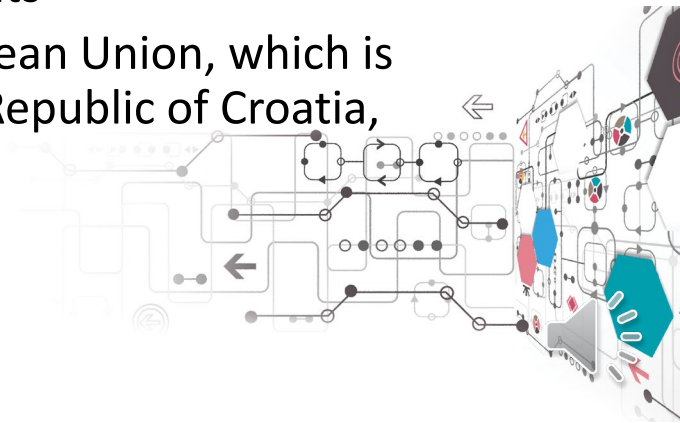
- Research domain
- Research challenge
- Contribution to the scientific body of knowledge
- Societal relevance
- Research question(s)/ hypotheses
- Research methodology
- Planning
- Status of the research
- With which other TODO partner would you like to cooperate and why?



Research domain

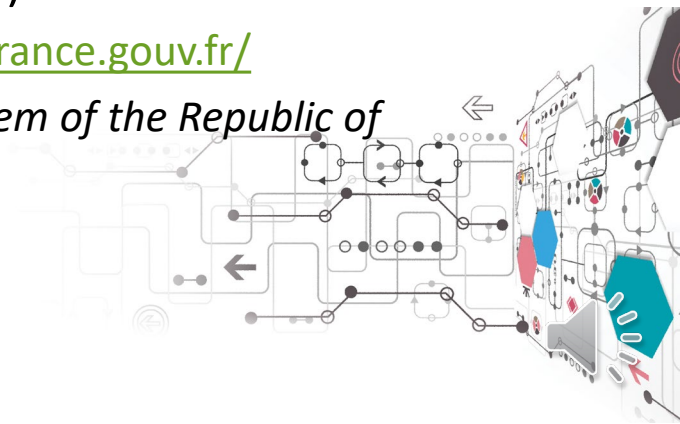


- Legal information and data tracked in the legal domain that include following:
 - laws and regulations,
 - international treaties,
 - rules of local government
 - case law of the Supreme Court, higher courts, the High Administrative Court, administrative courts
 - legislative decisions,
 - administrative decisions,
 - case law of tribunals, independent administrative bodies and other key institutions,
 - decisions of the European Court of Human Rights
 - primary and secondary legislation of the European Union, which is subject to a transfer in the legal system of the Republic of Croatia,
 - legal dictionaries,
 - official crime statistics,
 - other useful information.



Research domain

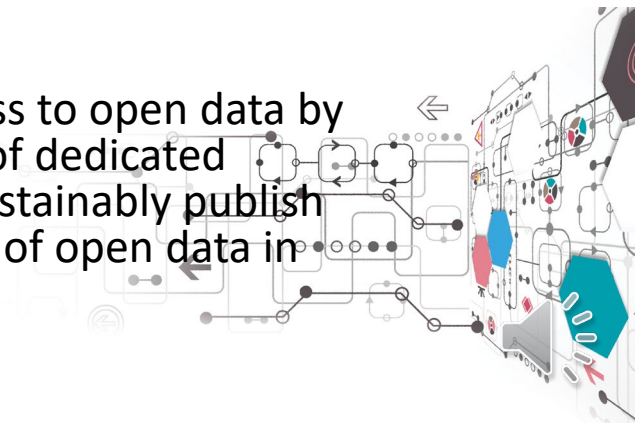
- Two Croatian official legal databases (portals) will be accessed and scrutinized:
 - Narodne novine (*The Official Gazette of the Republic of Croatia*) <https://www.nn.hr/>
 - Središnji katalog službenih dokumenata (*The Central catalog of official documents of the Republic of Croatia*) <https://sredisnjikatalogrh.gov.hr/>
- Also, one Croatian private legal database (portal) will be evaluated:
 - IUS-INFO - Pravni informacijski portal (*IUS-INFO - Legal information portal*) <https://www.iusinfo.hr/>
- Comparison with two EU legal databases (portals) will be done:
 - French legal database (*Légifrance*) <https://www.legifrance.gouv.fr/>
 - Slovenian legal database (*The Legal Information System of the Republic of Slovenia*) WWW.PISRS.SI





Research domain

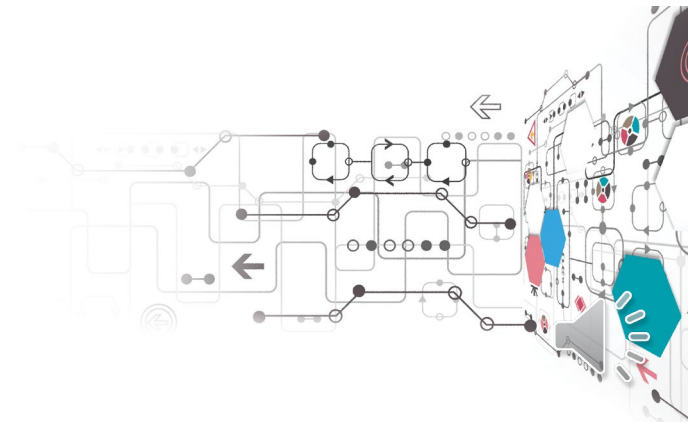
- This research will evaluate the quality of legal information portals on the national level by assessing the availability, accessibility, re-usability, and relevance of legal open data in Croatia.
- Further, it will analyze two EU countries (France and Slovenia) legal databases (portals) along with their publishing policies on open data.
- The research will closely evaluate and compare above mentioned legal open data portals (national and EU) to determine similarity and differences.
- Then, the research will aim to show that all three countries have created a suitable environment for the open data policies, but nevertheless do not yet comply with all the requirements of open data in their legislative open data provision.
- Finally, the research will try to indicate that limited access to open data by citizens, businesses, lawyers and third-parties, and lack of dedicated resources on the part of government organizations to sustainably publish legal data has significantly limited the expected benefits of open data in Croatia.





Research challenge

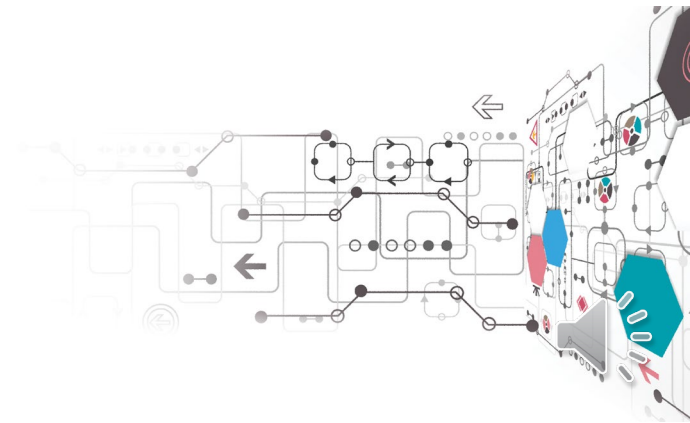
- Choosing the right methodology or procedure for conducting this research
 - Formulating appropriate research questions



Contribution to the scientific body of knowledge



- This research will assess issues related to the status quo of legal open data published in Croatia.
- By comparison, this research will try to identify barriers that prevent the effective use of legal open data, and to suggest how they can be overcome.





Societal relevance

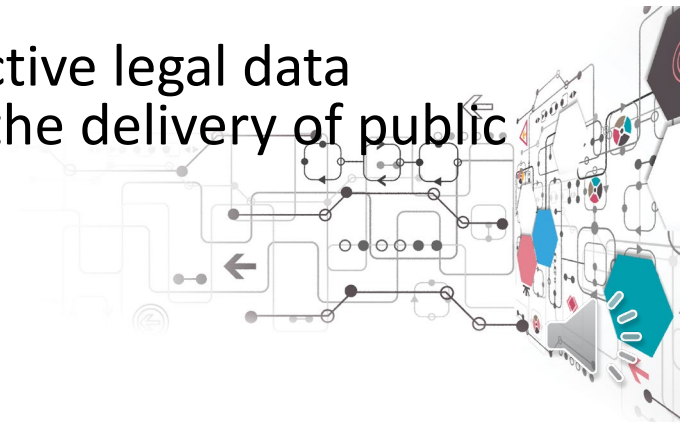
- The users of legal information and data come from both inside and outside of government.
- The major stakeholders that can benefit from the usage of legal information portals are:
 - Governments
 - Private Sector
 - Lawyers
 - Journalists and the media
 - Multilateral Organizations
 - Researchers
 - Civil Society
- In sum, the aim of the research will be to determine the needs of stakeholders regarding the desirable features of the legal information portals that could reduce the barriers and limitations to the use of open data.





Research question/ hypotheses

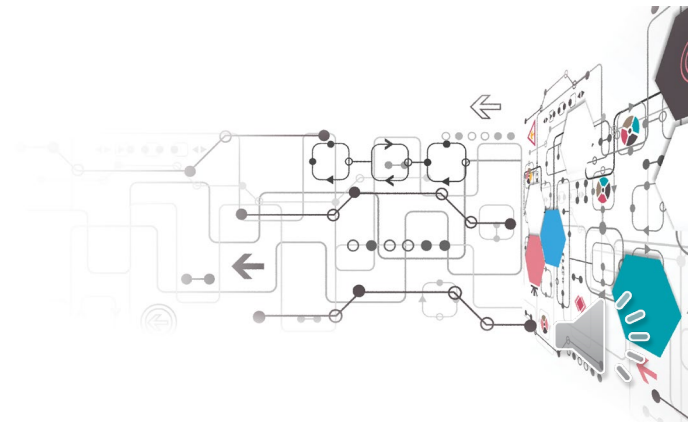
- What is effective governance of legal open data?
- What is the functional value of using open data (relative advantage)?
- What do stakeholders notice as the most common obstacle for using of legal information platforms?
- What are major shortcomings of selected legal information portals?
- Is transparency of legal open data that gives citizens an insight into how government works fullfield?
- What do stakeholders perceive as desired features of legal information platforms?
- What can government do to provide proactive legal data publication and to consequently improve the delivery of public service?





Research question/ hypotheses

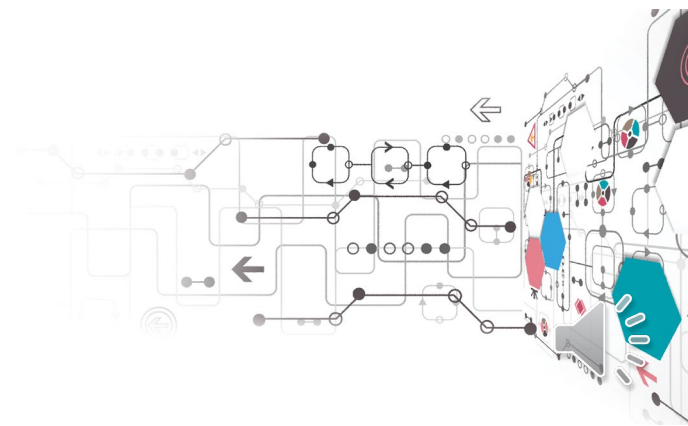
- The research will try to argue that the principle of one-stop service design applied to e-government e-services portals should be mapped onto the legal information portals, in order to offer respective stakeholder groups with a one-stop access to “data services”.



Research methodology



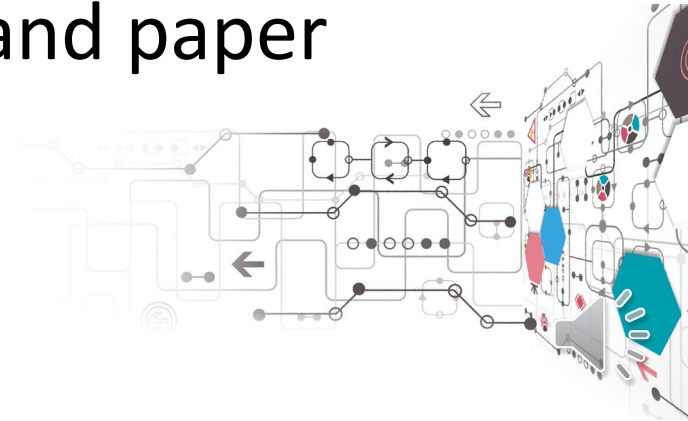
- Methodology that will be used for open data assessment:
 - Desk research
 - Analysis of current laws and regulations on open data, and open data policies
 - Potentially interviews with stakeholders
- This research will review the quality of legal information portals on the national and EU level.
- The following list of questions that is a non exhaustive list will be applied:
 - Is data in digital form?
 - Publicly available?
 - Is data available for free?
 - Is data available online?
 - Is the data machine-readable?
 - Available in bulk?
 - Openly licensed?
 - Is the data provided on a timely and up to date basis?





Planning & Status

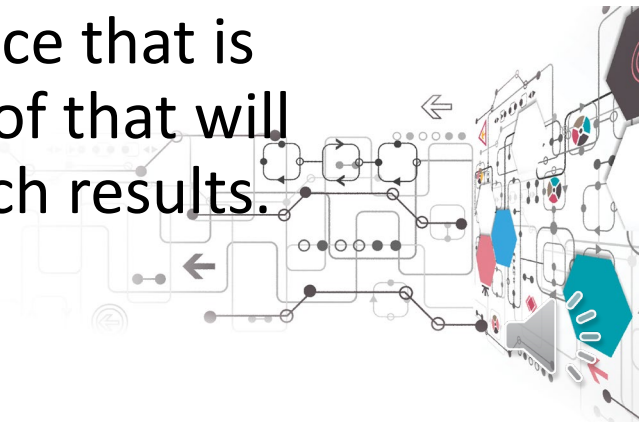
- Plan is to finish this education on open data before coming up with a final thesis that this research I will argue.
- Research is in progress and some preliminary findings on this topic are done.
- Formal procedure needs to be initiated.
- The research should be done and paper written by December.



With which other TODO partner would you like to cooperate and why?



- TUDelft – provide me with an insight on open data policy, legal aspects, and governance
- or
- FOI - offer me an insight on management of open data
- Both of them can provide me with advice that is specific, high-valued, and effective; all of that will help to push me towards better research results.





UNIVERSITY OF THE
AEGEAN



Evangelos Pikis

vaggelis.pikis@yahoo.com

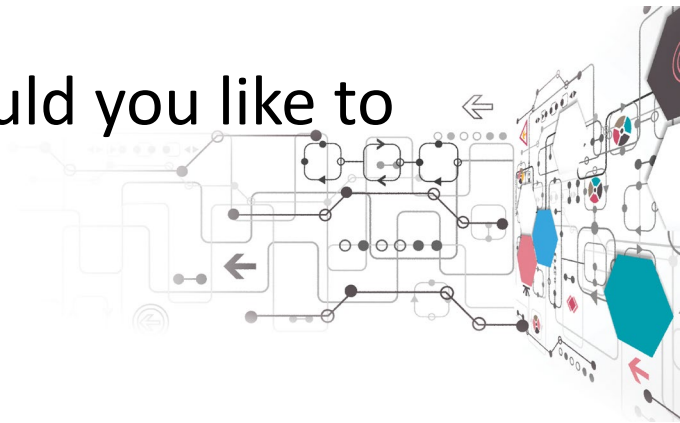


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



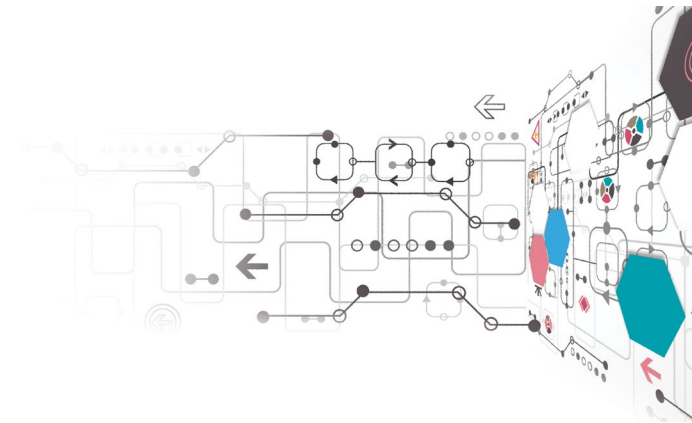
Agenda

- Research domain
- Research challenge
- Contribution to the scientific body of knowledge
- Societal relevance
- Research question(s)/ hypotheses
- Research methodology
- Planning
- Status of the research
- With which other TODO partner would you like to cooperate and why?



Research domain

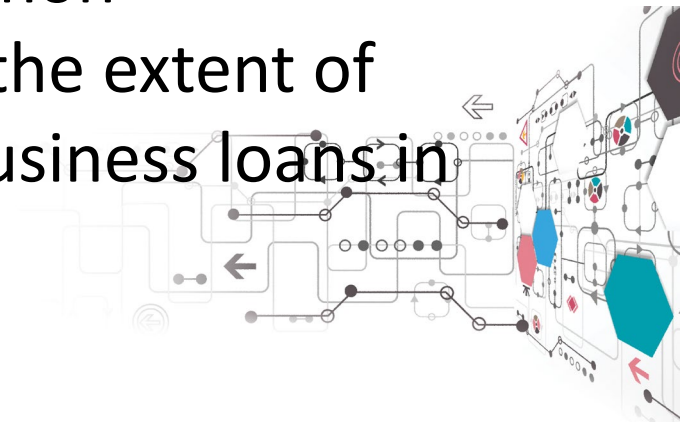
- Financial and Business Management





Research challenge

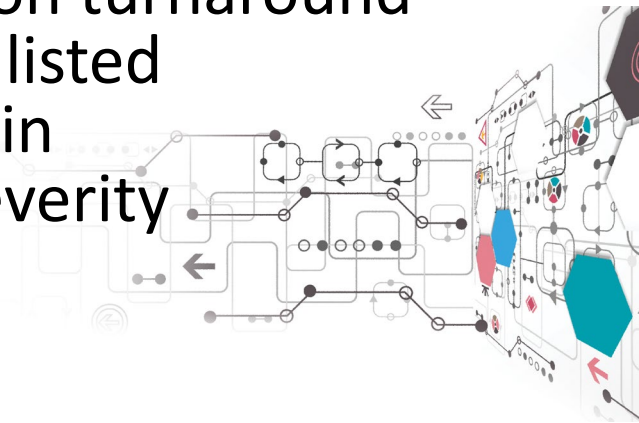
- Greece had in September 2019 a total of 97 billion business loans, of which 40 billion are non-performing loans. This means that 40% of business loans are non-performing.
- The fact that the 40 billion EUR business non-performing loans make up 21% of Greek GDP and the 11% of the Europe's total non-performing business loans reveal the extent of the problem of non-performing business loans in Greece.



Contribution to the scientific body of knowledge



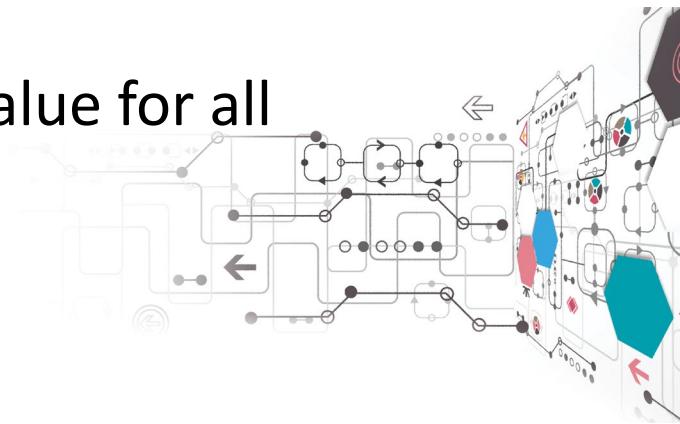
- Among, all these troubled businesses there is a large sample of business that have successfully restructured from which a researcher can draw valuable conclusions given the characteristics of each country's corporate structure and culture and its current financial situation
- We will try to clarify the whole process and answer the various questions that arise from studying extensively all the relevant literature on turnaround theory and many case studies, where listed companies in Greece faced a decline in performance and possibly financial severity



Societal relevance



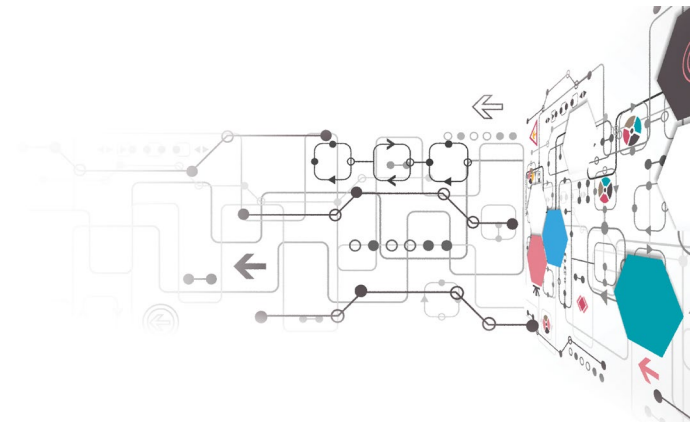
- The combination of the huge stock of non-performing business loans that still exists twelve years after the crisis in Europe and more specific in south Europe and Greece with the importance of rescuing these businesses for the economy and wider society, makes this study of turnaround theory more relevant than ever
- The banks' tolerance for these businesses and their survival have a negative impact on themselves, competitors and therefore to the whole economy.
- A successful turnaround plan creates value for all stakeholders.





Research question/ hypotheses

- What are the characteristics of a company that is most likely to be successfully rescued?
- How and with what restructuring strategies is it more likely to rescue a distressed business and re-create value for all stakeholders?
- Which restructuring strategies of a business are most efficient in times of economic downturn or in low-growth environments such as Greece's economic environment?





Research methodology

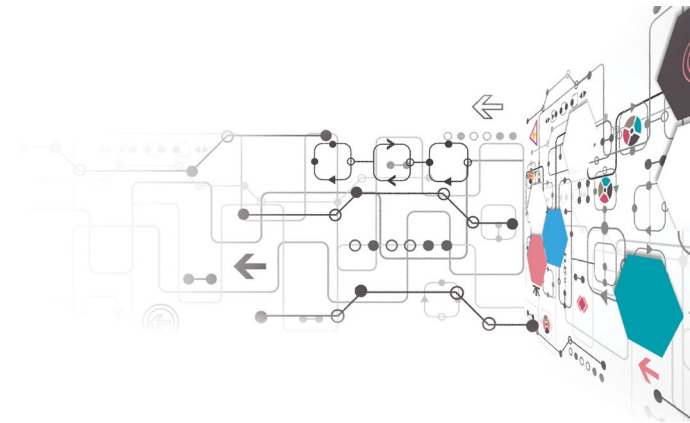
- We collect and analyze open data of the financial performance from companies which are listed on the Greek stock exchange.
- We gather numerical as well as textual data from the annual financial statements of the companies that are posted publicly on the website of each company.
- In addition, through questionnaires that we will send to these companies, we will study whether and with which digital transformation strategies they have succeeded in improving their business performance



Planning & Status



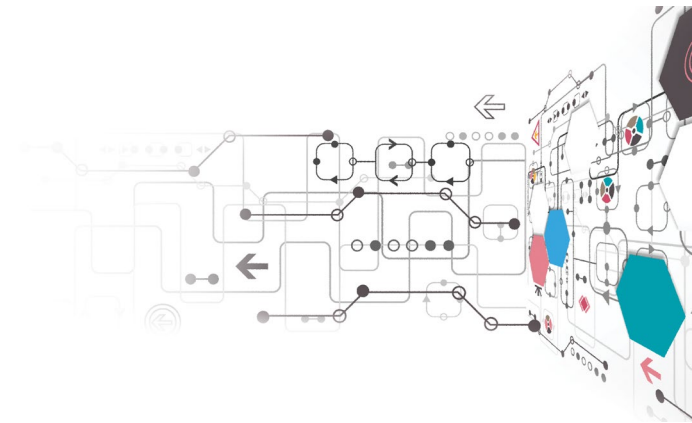
- We focus on parts of the literature that are useful for understanding restructuring theory and developing solutions
- Initial stage no publications



With which other TODO partner would you like to cooperate and why?



The most relevant department in my opinion is the Law Department
University of Zagreb





⇒ Croatian botanical databases – how open are they?



Filip Varga, Ms in Experimental Biology (FAZ)
fvarga@agr.hr

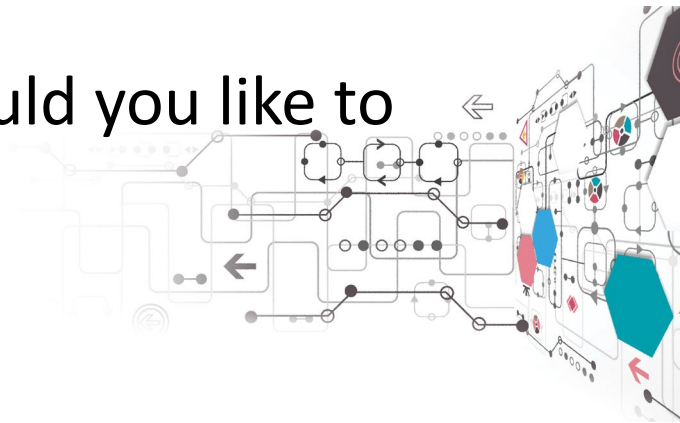


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Agenda

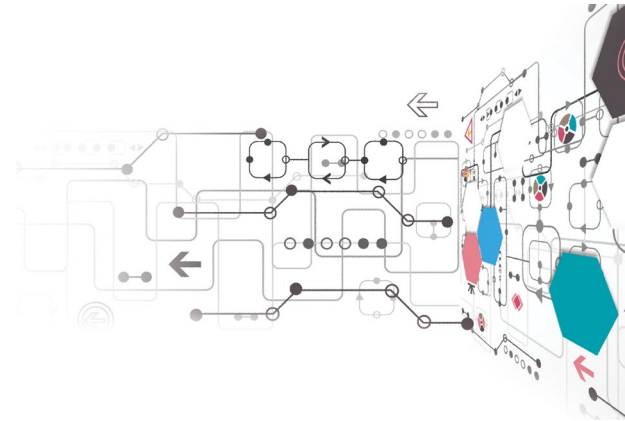
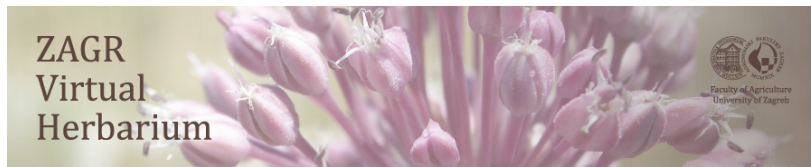
- Research domain
- Research challenge
- Contribution to the scientific body of knowledge
- Societal relevance
- Research question(s)/ hypotheses
- Research methodology
- Planning
- Status of the research
- With which other TODO partner would you like to cooperate and why?





Research domain

- Botanical databases in Croatia accessible through web-portals
- Largely set up by faculties, and museums
- Geospatial/ecological/usage data



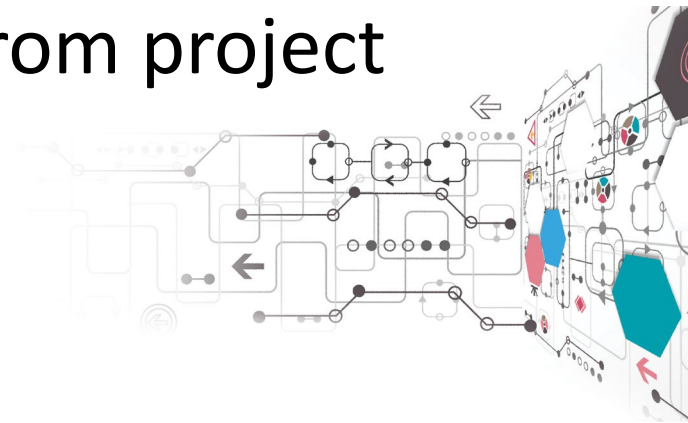


Research challenge

Specific KPI categories to assess in detail
(data quality/licensing/policy/transaction
cost/impact)

VS

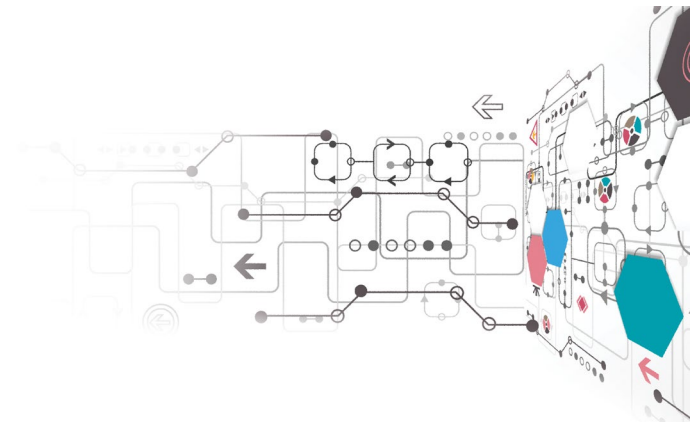
Broad assessment through multiple KPI
categories (employing help from project
partners)





Research challenge

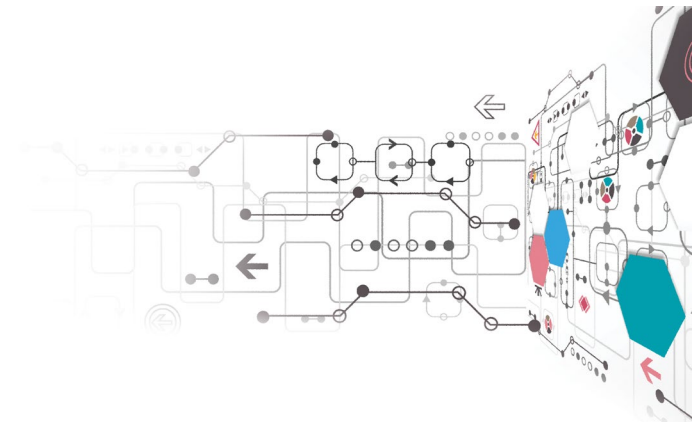
- Finding appropriate and unbiased quantification methods for comparing different databases



Contribution to the scientific body of knowledge

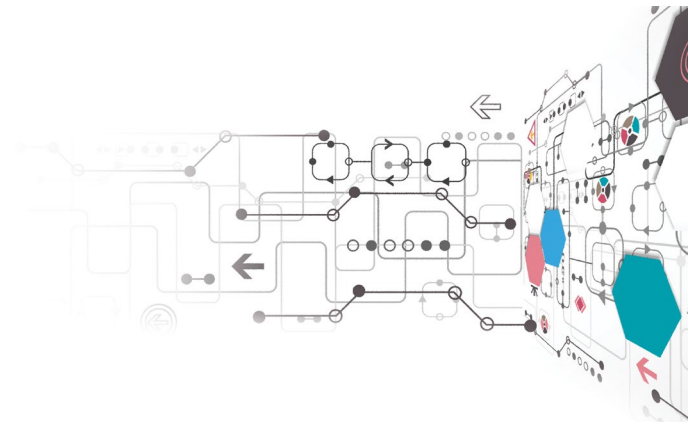


- Assessing the current state of botanical OD in Croatia
- Determining parts of the botanical ODE in Croatia that need to be improved



Societal relevance

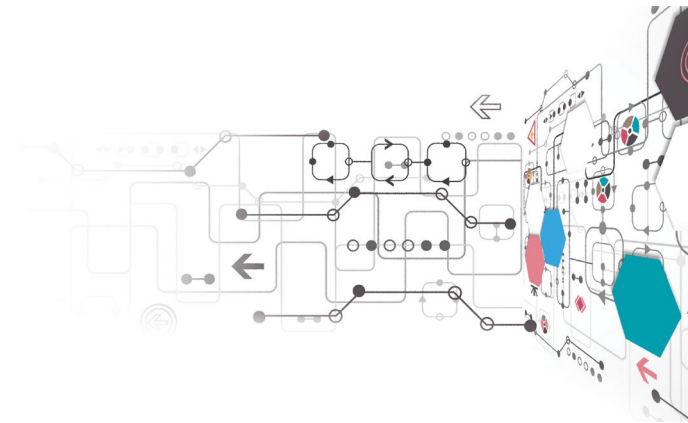
- Use of botanical OD in:
 - Agriculture (weed control/management)
 - Nature protection (protection of certain endemic and endangered species and habitats in order to conserve biodiversity)
 - Public health (allergenic plant species monitoring and management)





Research question/ hypotheses

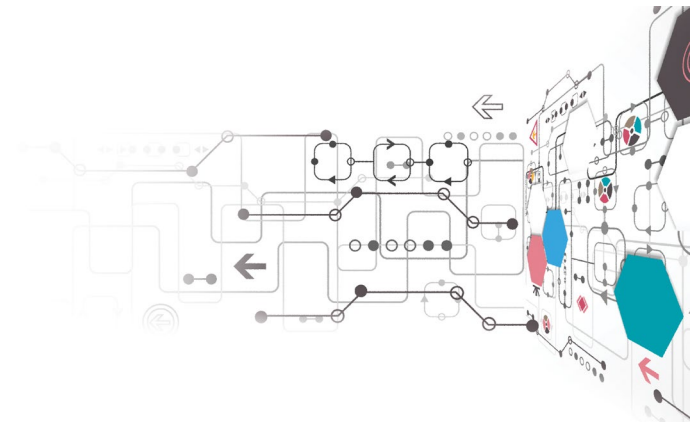
- In what state is the botanical ODE in Croatia (and possibly in comparison to other countries)
- How could the current state be improved





Research methodology

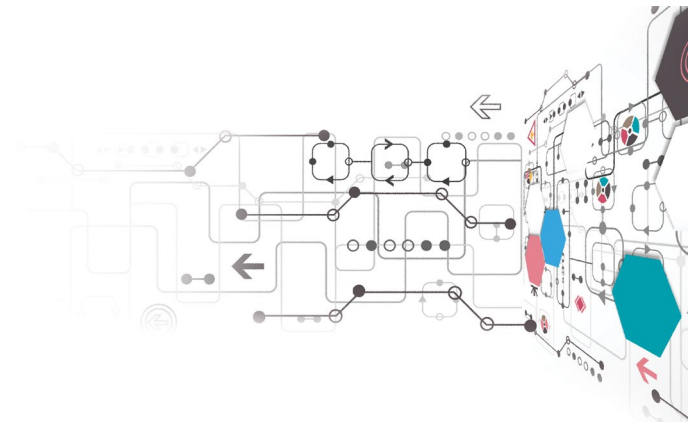
- Data collection
 - Surveys with researchers in the botanical field
 - Sample datasets from the databases (selected species)
 - Metadata from the databases
 - Citation reports from citation databases (WoS)
- Statistical Data analysis





Planning & Status

- Current status
 - Contacting the selected databases and enlisting their help in the assessment
 - Formulating the assessment framework (modifying the framework from Module 2)
 - Contacting the potential surveyors
- Future Plans
 - Data collection and Analysis



With which other TODO partner would you like to cooperate and why?



- Automation of OD assesment



- Experience in spatial OD



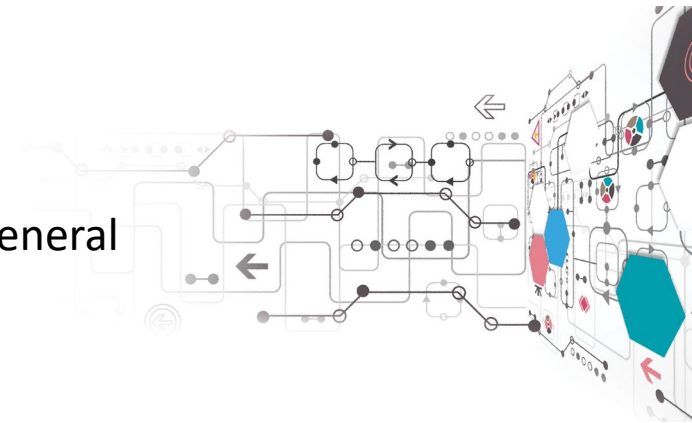
- Legal aspects of OD, policies and licenses



- ODP infrastructure and metadata



- Experience in spatial OD
- Experience and guidance with OD in general



4.2 Day 2: Research methodologies and challenges in open data life cycle

On the second day of the workshop the open data research challenges and research methodologies and techniques were presented and discussed.

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Wrap up of the previous day	Frederika Welle Donker ESRs (1-3)	Live + PPT BBB TODO Summer School
10:30-11:00	The open data research challenges and Assignment 1	Charalampos Alexopoulos	Live + PPT BBB TODO Summer School
11:00-11:30	Advanced Research Methodologies for open data	Euripidis Loukis	Live + PPT BBB TODO Summer School
11:30-12:00	Advanced Research Techniques for open data	Euripidis Loukis	Live + PPT BBB TODO Summer School
12:00-13:00	BREAK		
13:00-15:00	The open data research challenges		Offline + PPT + notes
15:00-17:00	Advanced Research Methodologies for open data		Offline + PPT + notes



TODO

Summer school

Day 2



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



⇒ **Wrap up of the previous day**

7-11. September 2020.

Larisa Hrustek, FOI

Emanuel Guberović, FER

Filip Varga, AGRI



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda

A

Opening of the TODO Summer school ▶▶

B

Recap of the Online Training
Programme Module 1 & 2 ▶▶

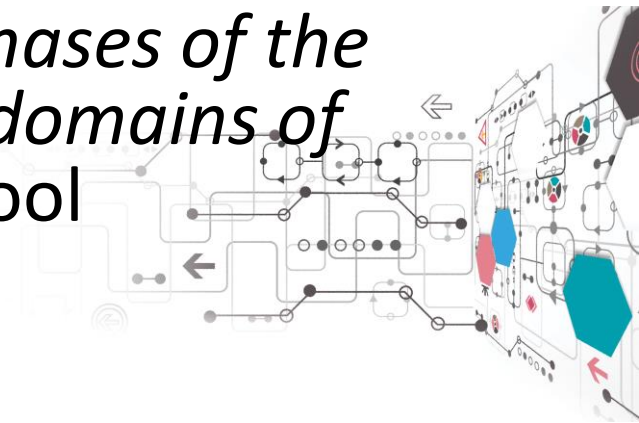
C

Status of open data in Croatia ▶▶

Opening of the TODO Summer school



- 5 days → 7. – 11. September 2020.
 - Online days 1, 2 and 3 → Live part + online part
 - In person days 4 and 5 → In person + live part
- Virtual room → Big Blue Button
- Program overview
- Part of WP 2: Capacity building
- Goal of the Summer school is *to enhance know-how of concepts, approaches and theories related to the different phases of the open data life cycle and different domains of open data* through a summer school



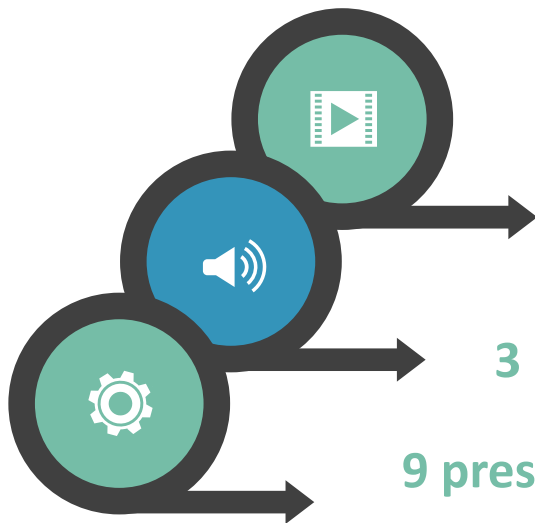
Opening of the TODO Summer school

First day → 7. September 2020.



Day 1: Introduction and recap

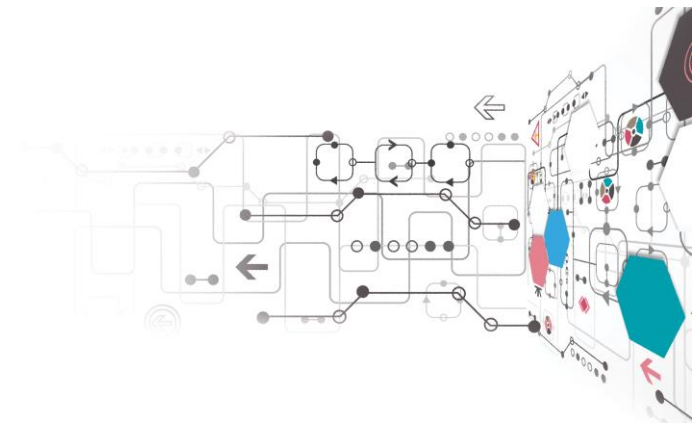
<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Welcome, introduction to the Summer school	Martina Tomičić Furjan Igor Pihir	Live + PPT BBB TODO Summer School
10:30-11:00	Introduction of participants	All participants	Live BBB TODO Summer School
11:00-11:30	Recap of the OTP Module 1 & 2	Bastiaan van Loenen Charalampos Alexopoulos	Live + PPT BBB TODO Summer School
11:30-12:00	Status of open data in Croatia	Anamarija Musa	Live + PPT BBB TODO Summer School
12:00-13:00	BREAK		
13:00-15:00	Presentation of TODO PhD research (plans) (UNIZG, TUDELFT, UAEGEAN)		Offline + PPT + forum
15:00-17:00	Presentation of TODO PhD research (plans)	Frederika Welle Donker ESRs, All participants	Live + PPT BBB TODO Summer School



28 participants

3 presentation

9 presentations of TODO PhD
research



Opening of the TODO Summer school



BigBlueButton - TODO Summer school online sessions - Google Chrome
bbb.foi.hr/html5client/join?sessionToken=vtqghjluuryhodhh

MESSAGES < Public Chat

Public Chat

NOTES

Shared Notes

USERS (28)

Ana Kutnjak (You)

Filip Varga

Drazen Tutić

Anamarija Musa

Anneke Zuiderwijk (TU Delft)

Barbara Stibar

Bastiaan van Loenen

Bia Mandzuka

Dragica Salamon

Emanuel Guberović

Frederika Welle Do...

Welcome to TODO Summer school online sessions!

For help on using BigBlueButton see these (short) tutorial videos.

To join the audio bridge click the phone button. Use a headset to avoid causing background noise for others.

This server is running BigBlueButton.

To invite someone to the meeting, send them this link: <https://bbb.foi.hr/b/mar-yjb-pg1>

Igor Pihir 10:11 AM
Dragica mic off please

Zeljko Bažić (offline) 10:19 AM
Hello, sorry being late!

Ivana Bosnic (FER) 10:25 AM
presents <3>)

Frederika Welle Donker 10:28 AM
hi igor

Send message to Public Chat

Partners

TU Delft

• Bastiaan van Loenen

• Frederika Welle Donker

BigBlueButton - TODO Summer school online sessions - Google Chrome
bbb.foi.hr/html5client/join?sessionToken=vtqghjluuryhodhh

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Bastiaan van Loenen

Bia Mandzuka

Dragica Salamon

Drazen Tutić

Emanuel Guberović

Filip Varga

version was long before we were introduced to OD ecosystem concept.)

Ivana Bosnic (F... 11:25 AM
I still don't get this answer on CC :-D

Drazen Tutić 11:26 AM
I would always ask the owner, when it is not clear.

Ivana Bosnic (F... 11:29 AM
"lies, damned lies and statistics" :-P

Drazen Tutić 11:31 AM
Personally, I am more and more amazed how open data (availability) is developing in Croatia. Check, e.g. cadastre and land book data, it is more open than in many EU countries.

Ivana Bosnic (F... 11:32 AM
I agree - for that discipline (and a few others), Drazen

Ivana Bosnic (F... 11:34 AM
why not share the screen?

Martina Tomićić 11:43 AM
Is someone recording the session on purpose?

Send message to Public Chat

TODO Summer school online sessions

Resume recording

Anamarija Musa

Open Data Operational

State of Play on open data - 2019

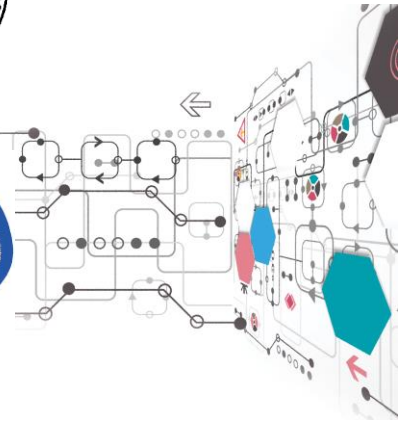
Croatia

Open Data Operational

11:59 07.09.2020



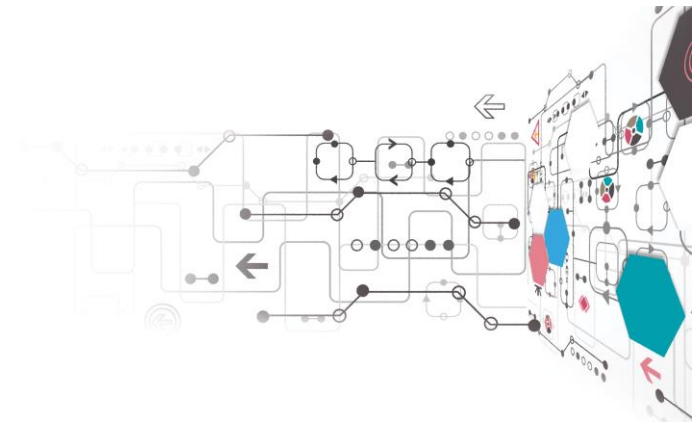
All partners of the project and participants of
TODO Summer school



Recap of the Online Training Programme Module 1 & 2



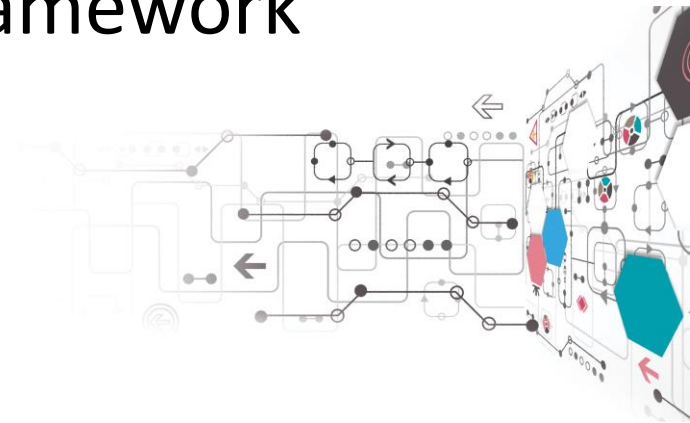
- Module 1 learning objectives
- Most common mistakes (RDF, data cube model, metadata, analysis, copyright CC-BY)



Recap of the Online Training Programme Module 1 & 2



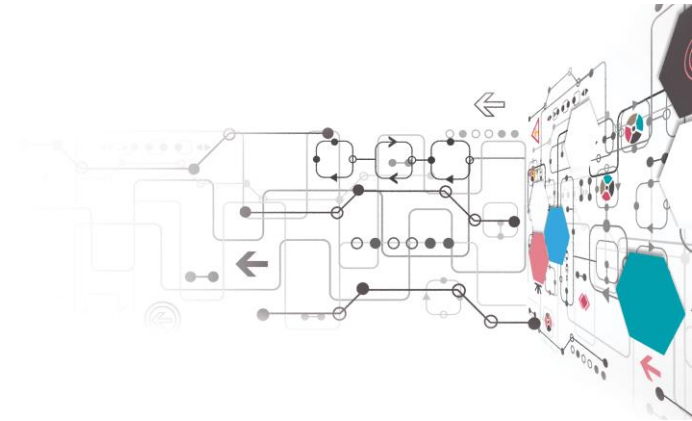
- Module 2 learning objectives (methods of ODE assesment, design of a new method)
- Interdisciplinary teams
- 8 different assessment frameworks
- Draft of a new assessment framework





Module 3: learning objectives

- Applying assessment models to a domain/disciplinary open data ecosystem
- Presenting the result in an appealing manner

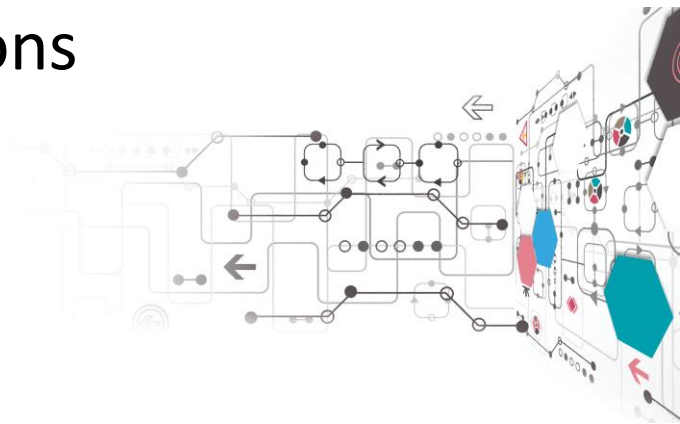




Open data research in Croatia

Understanding the current status of OD in Croatia by going through its:

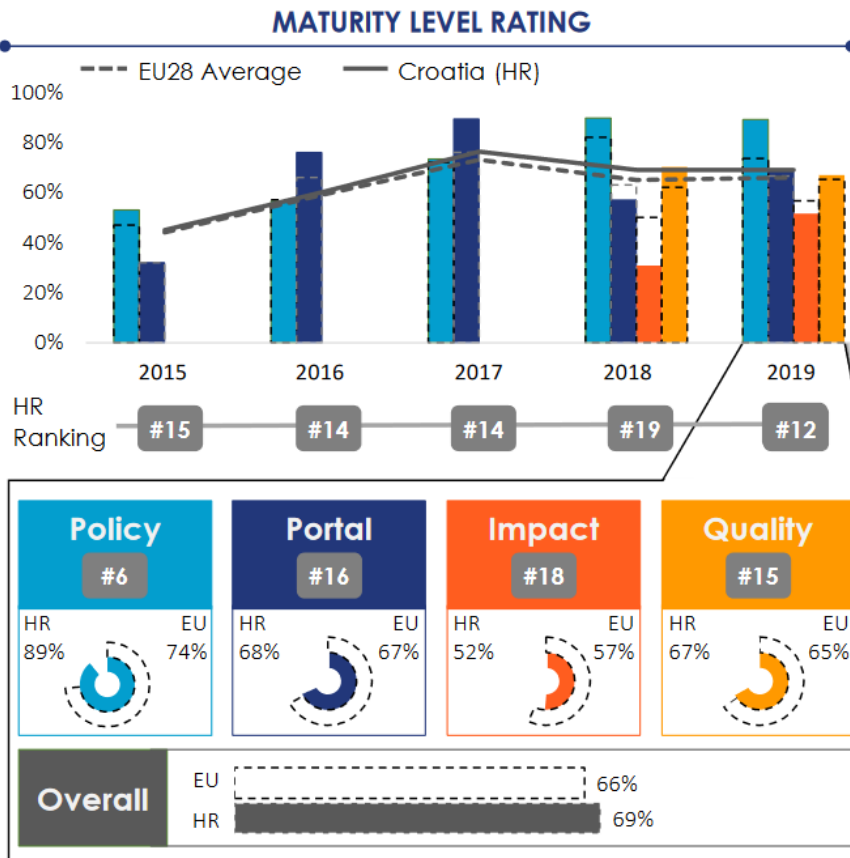
- Brief overview of policy and legal framework
- Stakeholders assessment
- Availability of OD portals
- OD success stories
- Available research and publications



Short summary of Croatian position in EU regarding the OD



State-of-Play on open data - 2019

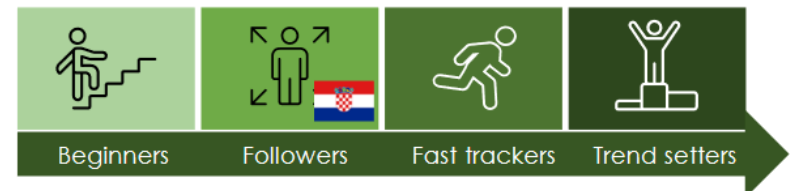
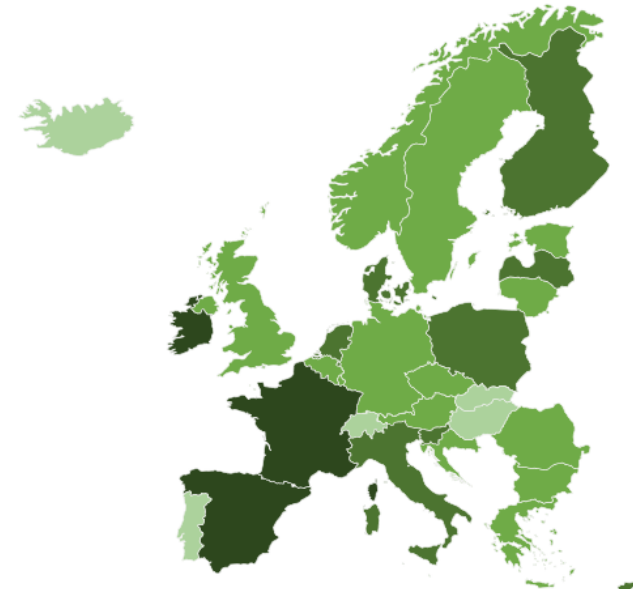


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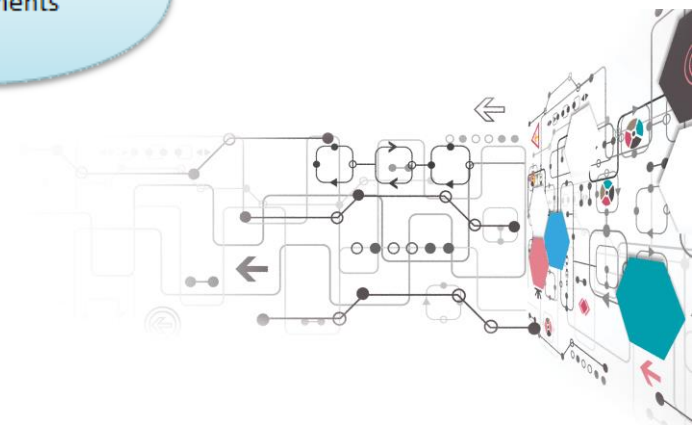
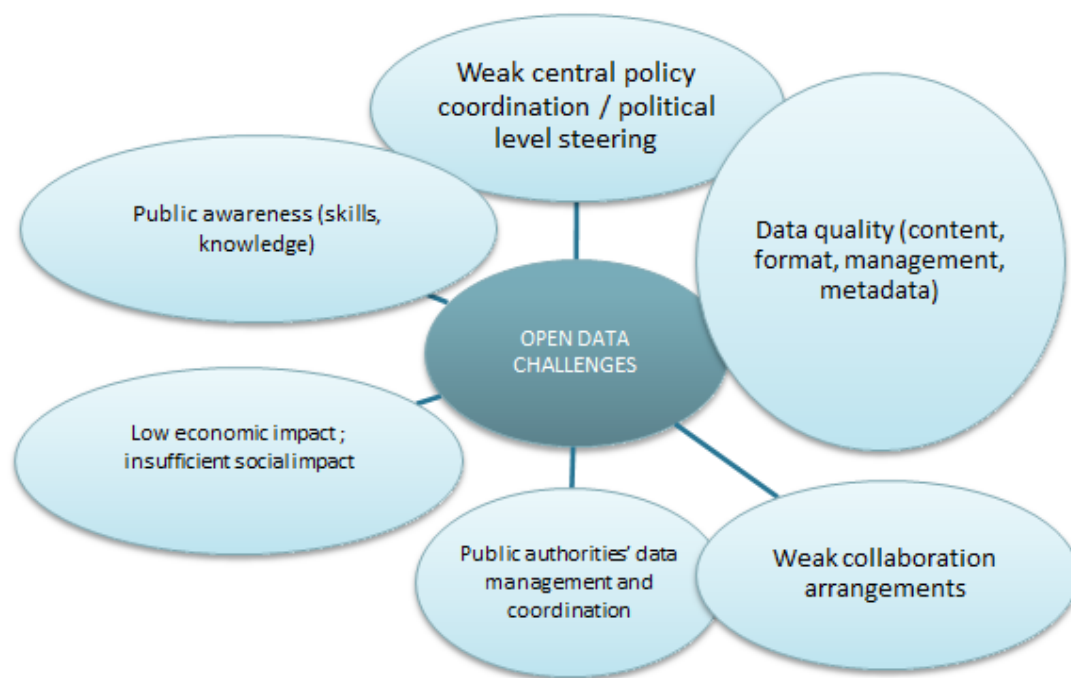
Croatia



OVERALL MATURITY LEVEL SEGMENTATION



Key challenges of the OD ecosystem in Croatia





OD Research Challenges

Charalampos Alexopoulos

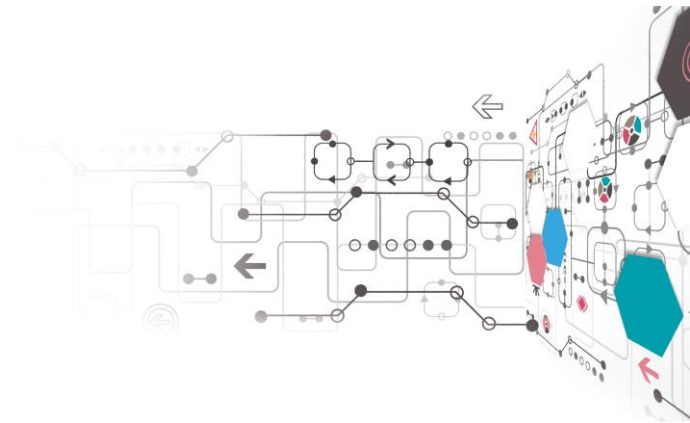


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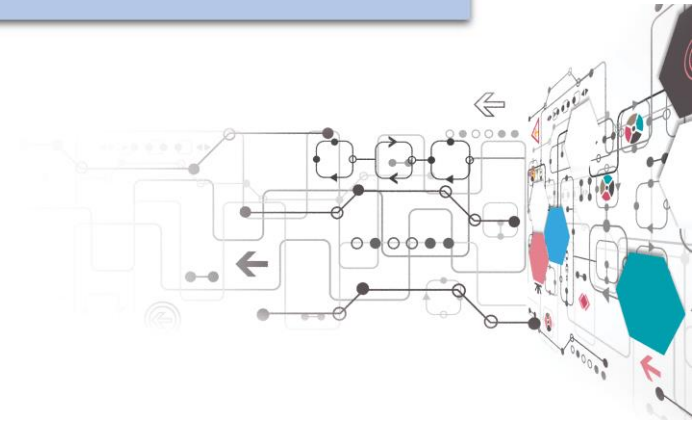
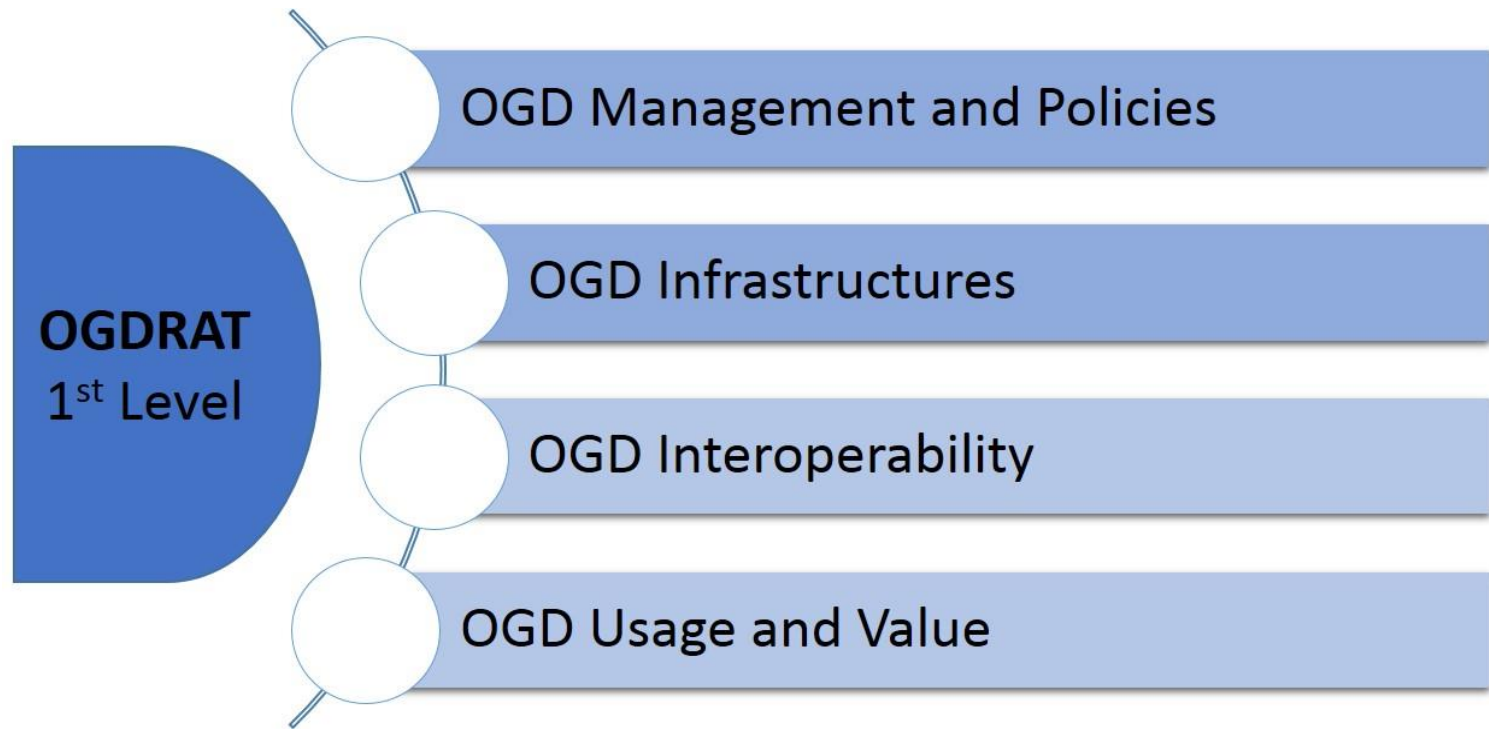


Contents

1. OD Research Challenges: A taxonomy
2. Strategic Research Challenges
3. Measuring Maturity: A Stage Model
4. Reading:
 - OGD RAT
 - Maturity Model
 - Full .ppt on Research Challenges



OD Research Areas Taxonomy



Research topics for the OGD Management & Policies research area



OGD Management and Policies

- 1.1 Policy and Legal Issues for OGD
- 1.2 OGD Anonymisation Methods
- 1.3 OGD Cleansing Methods
- 1.4 OGD Quality Assessment Frameworks
- 1.5 OGD Visualisation methods and tools
- 1.6 OGD Linking
- 1.7 OGD Publishing
- 1.8 OGD Mining
- 1.9 OGD Rating and Feedback

OGD Infrastructures

- OGD Portals Architecture
- Open Web Services / API's
- OGD User Profiling and Service personalisation
- OGD Long Term Preservation
- OGD Storage
- Cloud Computing for OGD
- Citizen - generated Open Data
- Sensor - generated Open Data

OGD Interoperability

- Metadata for OGD
- Multilinguality Issues
- Services Interoperability Standards
- Semantic Annotation
- OGD Ontologies
- Platform & Technical Interoperability
- Organisational Interoperability
- Controlled Vocabularies / Codelists Preservation

OGD Usage and Value

- Skills management for OGD
- Reputation Management
- OGD Uses
- OGD-based Entrepreneurship
- OGD Value & Impact Assessment
- OGD Needs Declaration
- OGD-based Accountability
- OGD Readiness Assessment
- OGD Portals Evaluation Frameworks
- OGD Innovation

Research topics for the OGD Infrastructures research area



OGD Management and Policies

- Policy and Legal Issues for OGD
- OGD Anonymisation Methods
- OGD Cleansing Methods
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- OGD Visualisation methods and tools
- OGD Linking
- OGD Publishing
- OGD Mining
- OGD Rating and Feedback

OGD Infrastructures

- 2.1 OGD Portals Architecture
- 2.2 Open Web Services / API's
- 2.3 OGD User Profiling and Service personalisation
- 2.4 OGD Long Term Preservation
- 2.5 OGD Storage
- 2.6 Cloud Computing for OGD
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- OGD-based Accountability
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- OGD Innovation

Research topics for the OGD

Interoperability research area



OGD Management and Policies

- Policy and Legal Issues for OGD
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- OGD Cleansing Methods
- OGD Quality Assessment Frameworks
- OGD Visualisation methods and tools
- OGD Linking
- OGD Publishing
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OGD Interoperability

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- 3.2 Multilinguality Issues
- 3.3 Services Interoperability Standards
- 3.4 Semantic Annotation
- 3.5 OGD Ontologies
- 3.6 Platform & Technical Interoperability
- 3.7 Organisational Interoperability
- 3.8 Controlled Vocabularies / Codelists Preservation

OGD Usage and Value

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- OGD Needs Declaration
- OGD-based Accountability
- OGD Readiness Assessment
- OGD Portals Evaluation Frameworks
- OGD Innovation

Research topics for the OGD Usage and Value research area



OGD Management and Policies

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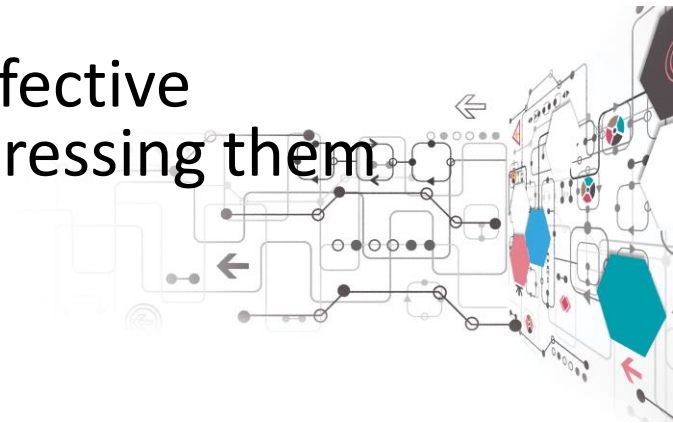
OGD Usage and Value

- 4.1 Skills management for OGD
- 4.2 Reputation Management
- 4.3 OGD Use
- 4.4 OGD-based Entrepreneurship
- 4.5 OGD Value & Impact Assessment
- 4.6 OGD Needs Analysis
- 4.7 OGD-based Accountability
- 4.8 OGD Readiness Assessment
- 4.9 OGD Portals Evaluation Frameworks
- 4.10 OGD Innovation

Multi-disciplinary Research on Societal Challenges Based on OGD



- OGD research can be conducted by using them as a basis of multi-disciplinary research on important societal problems and challenges that modern societies face.
- These data can be used by multi-disciplinary scientific teams in order to perform various sophisticated analyses from various disciplinary perspectives and gain useful synthetic insights into serious problems and challenges of modern societies
- Quite important for the design of effective solutions and public policies for addressing them



Examples of Multi-disciplinary research



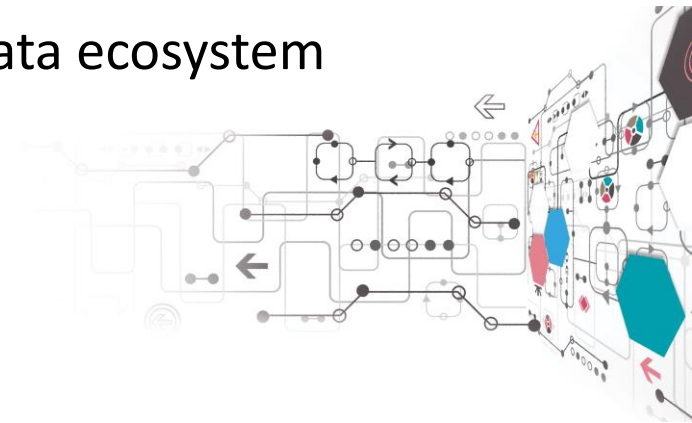
Societal Challenge	ICT-enabled Governance Research Topic	OGD Research Topic	Neighbouring Scientific Domain
Language divide and lack of cross-communities communication	<ul style="list-style-type: none"> Language and Cultural Interoperability 	<ul style="list-style-type: none"> Metadata for OGD Multilinguality Controlled Vocabularies and Codelists Preservation 	<ul style="list-style-type: none"> Information Intelligence Computer Science (Translation tools) Behavioural sciences
Anticipating unexpected crises	<ul style="list-style-type: none"> Social – Economic Simulation Models Policy Modelling Process Optimization for OGD (Accurate provision) 	<ul style="list-style-type: none"> Semantic Annotation Organisational Interoperability Sensor-generated open data 	<ul style="list-style-type: none"> Social and economic sciences
Enhanced collective cognitive intelligence (human / ICT-enabled) for better Governance	<ul style="list-style-type: none"> Modelling and Simulation Policy Analysis Identity Management 	<ul style="list-style-type: none"> OGD Mining Citizen-generated open data Visualization Information Management 	<ul style="list-style-type: none"> Economics Mathematics Sociology Computer Science



Strategic Research Challenges



- Challenge 1: “From best-effort-based to skill-based open data ecosystems.”
 - lack of skilled people to use open data.
- Challenge 2: existing open data ecosystems are neither user-driven nor balance demand-supply matching
 - from supplier driven to a user driven open data ecosystem
- Challenge 3: existing open data ecosystems are linear
 - from a linear to a circular open data ecosystem
- Challenge 4: current open data ecosystems are exclusive
 - from an exclusive to an inclusive open data ecosystem

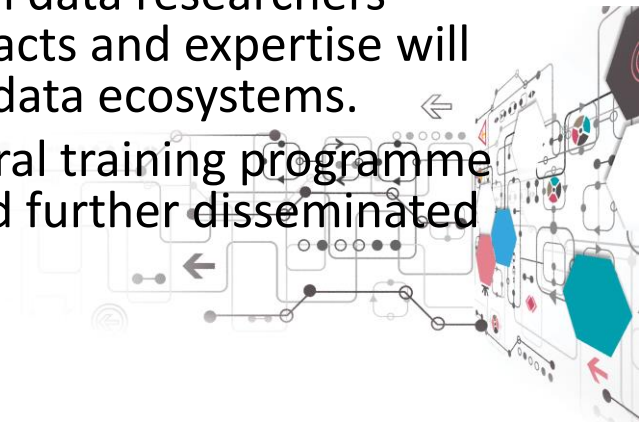


Addressing Challenge 1: Activities



The envisioned activities addressing the first challenge aims at the creation of a training programme in order to train a new generation of creative and innovative open data researchers

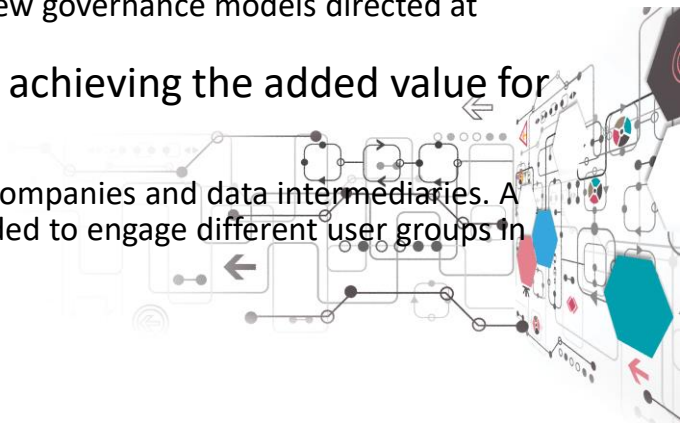
- To provide ESRs with knowledge and skills to apply holistic, interdisciplinary and intersectoral thinking and practice to design user-driven, circular, and inclusive open data ecosystems.
- To equip ESRs with the tools, models, structures, skills, and competences to convert their knowledge, ideas and research findings into new products and services for the EU market.
- To enhance the visibility and appeal of a career in open data research through advanced training and secondments in leading open data organisations with leading experts.
- To create an active life-long network of young open data researchers across sectors and countries, whose personal contacts and expertise will help Europe shape research and practice on open data ecosystems.
- To develop a state-of-the-art and innovative doctoral training programme on open data ecosystems, which could be seen and further disseminated as a best practice in open data training.



Addressing Challenge 2: Activities



- identification and classification of needs related to the provision of open data of a wide variety of representative user types
 - non-specialist data users, local government, journalists, students, NGOs, central/regional government, companies, artificial users, and data intermediaries. Special attention would be provided to the needs of disadvantaged groups (including elderly, women, disabled) to access and use open data and are therefore able to participate in and benefit from today's growing knowledge and information society. This research activity is the basis for developing technological and governance avenues to meet user needs.
- investigation of the technological requirements for the provision of Findable, Accessible, Interoperable and Reusable (FAIR) data for different categories of users
 - this includes identifying gaps between the needs of user groups and the current features of open data platforms and define and evaluate new approaches for designing user driven user interfaces for finding data that fulfils different findability and accessibility requirements from different domains, developing 'data integrators', enabling the technical interoperability of open data stemming from different domains, and determining the minimum and optimal set of metadata descriptions to be adopted to allow semantic interoperability of open data across domains and disciplines.
- identification of ways to sustainably involving producers and users in the open data ecosystem.
 - the governance and legal perspectives will be explored developing new governance models directed at maintaining and distributing value in the ecosystem.
- evaluation of the feasibility of the governance models for achieving the added value for their respective stakeholder group
 - non-specialist data users, journalists, students, NGOs, government, companies and data intermediaries. A new jointly developed governance model strategy framework is needed to engage different user groups in the open data ecosystem in a sustainable manner.

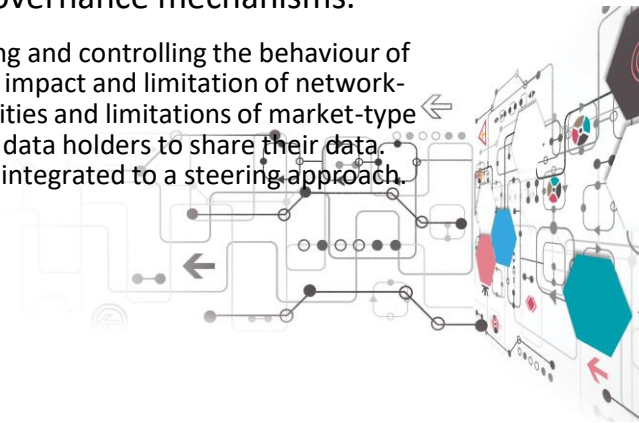


Addressing Challenge 3: Activities



The envisioned activities addressing the third challenge aims at analysing the processes of value creation and value capturing in open data ecosystems, by investigating the mutual relationships and interaction between different open data values and the factors determining the creation and capturing of value. It lays the foundation for closing the open data life cycle by improving the understanding of the contributions of open government data users and identifying avenues of organising this both in a technical and governance manner.

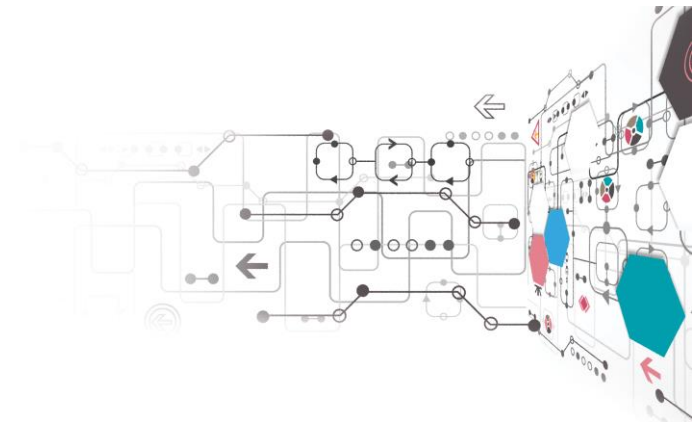
- Investigation of the motivations of non-government actors (both data holders and data users/processors) to become active contributors to the open data ecosystem by sharing their (non-government) data in the open data ecosystem.
 - The motivations will be identified and analysed for the various types of (non-government) data holders: citizens, journalists, students, NGOs, businesses, and intermediaries.
- Stimulation of non-government data holders to share open data using technical steering mechanisms. This activity builds on the previous one and examines which technical mechanisms can be used to promote non-governmental data holders to share open data.
 - It will explore the impact of technological choices and strategies in influencing and determining the behaviour of non-government data holders. It will also design user interfaces enabling NGD providers to readily provide their open data to the ecosystem. A 'data integrator' will consider the particularities of NGD to ensure integration with open government data, and a 'fake/ copy/paste open data checker' should ensure that only new open data is admitted to the ecosystem.
- Stimulation of non-government data holders to share open data using governance mechanisms.
 - This research activity explores the use of different steering mechanisms for influencing and controlling the behaviour of non-government data holders in the open data ecosystem. It will investigate the use, impact and limitation of network-based steering, based on cooperation and solidarity. It will also explore the opportunities and limitations of market-type steering, through competition and financial incentives, to stimulate non-government data holders to share their data. Non-government perspectives should be provided for all stakeholders and should be integrated to a steering approach.



Addressing Challenge 4: Activities



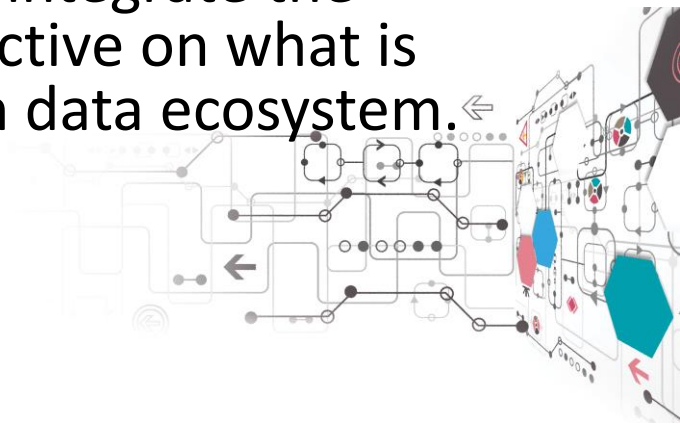
- The proposed activities to confront this challenge is to define the technological requirements and governance mechanisms to stimulate non-government actors to participate in the open data ecosystem and share their data as open data.
- An inclusive open data ecosystem incorporates both open government data and open non-government data, and incentivises all stakeholders (e.g., data providers, intermediaries, value adding resellers, enrichers, facilitators, end users) from all background (commercial, government, education, citizen) to contribute and share.
- National Strategy
- Institutional Strategies
- Application and Infrastructure development



Developing A Strategy for Open Data



- The development of a sustainable open data ecosystem requires it to match demand and supply, to be circular and inclusive.
- The combination of these three characteristics is essential to unlock the enormous potential of open data.
- Just like in natural ecosystems, the lack of any of the identified elements will have an impact on other elements of the ecosystem.
- Hence, it is of outmost importance to integrate the findings and develop a holistic perspective on what is needed to develop a sustainable open data ecosystem.



Developing A Strategy for Open Data: The mechanics



Allocate Roles and Tasks

- A thorough investigation of different models of allocating roles, tasks and resources in open data ecosystems is needed.
- The selection of the most suitable model or the design of a new one combining techniques from the already existing will fulfil this stage.
- i.e. Maturity Model

Value Activities

- Balancing and distributing value activities in a sustainable open data ecosystem need to be selected.
- This will be the result of how different open data values interact with each other and how open data values may be balanced to arrive at a sustainable open data ecosystem in which value creation and value capture processes are optimal.
- An evaluation system need to be also present in this endeavour (M3)

Strategy

- The development of an overarching sustainable strategy need to be present in order to ensure a sustainable (user driven, circular and inclusive) open data ecosystem creation.
- This strategy will add in different layers solutions for bridging open data supply and demand (e.g. derived from new legal and technical approaches, emerging technologies, public-private partnerships) and incorporate the different aspects required for ensuring circularity (e.g. assessment, use of enhancing technologies, and organisational values).

Maturity Identification: Stage Model



		Traditional OGD Infrastructures		Advanced OGD Infrastructures	
	Time	Point Zero	1 st Generation	2 nd Generation	3 rd Generation
General	Internet presence	OGD existence in silos accessed by application	OGD web presence	OGD web presence	OGD web presence
	Users	Distinction between Data Providers and Data Users	Distinction between Data Providers and Data Users	Data Procumers	Data Procumers
	Open Government level	Initial: Information broadcasting	Data Transparency: processes and performance	Open participation: Data quality, Public feedback, conversation, voting, Interactive communications, Crowd-sourcing	Open Collaboration: Interagency and with the public, Co-creating value-added services
	Value	N/A	Transparency & Accountability	Participation	Efficiency & Innovation

Maturity Identification: Stage Model

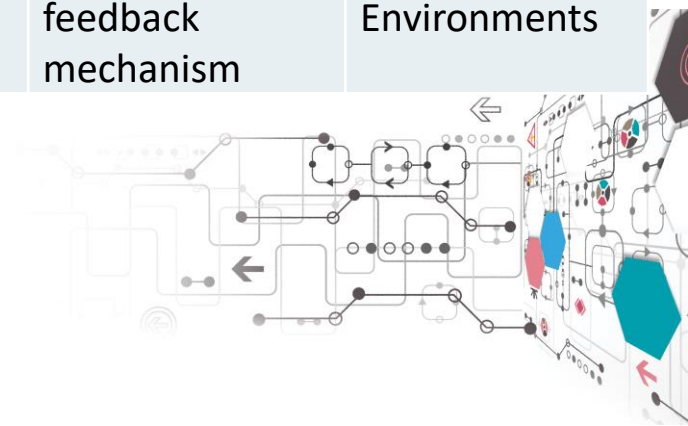


		Traditional OGD Infrastructures		Advanced OGD Infrastructures	
	Time	Point Zero	1 st Generation	2 nd Generation	3 rd Generation
Information Quality	Thematic perspective	N/A	Statistical, economical, census	Law, Transportation, GIS	All categories with proper data modelling
	Format	.xls, .pdf	html, .xls, .pdf	+ .csv + URLs	+ Linked data
	Metadata	Metadata Ignorance or Closed flat Metadata	Metadata Ignorance or Closed flat Metadata	Open Metadata for Humans or Open Reusable Metadata + contextual or detailed metadata models	Linked Open Metadata 3-layer metadata model (flat, contextual, detailed)
	RDF-compliance	No	No	Partially yes	Yes

Maturity Identification: Stage Model



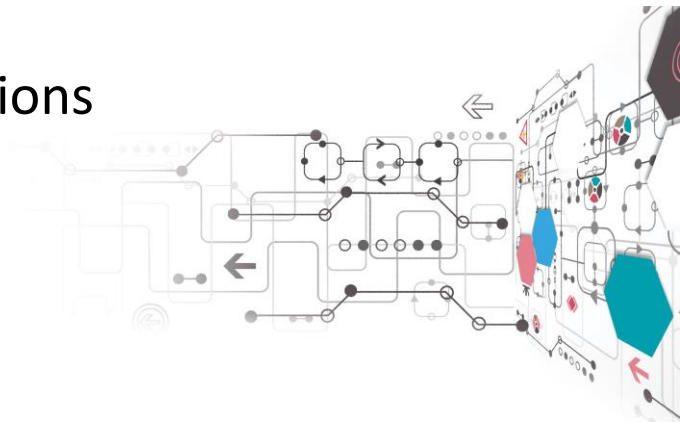
		Traditional OGD Infrastructures		Advanced OGD Infrastructures	
	Time	Point Zero	1 st Generation	2 nd Generation	3 rd Generation
System Quality	Functionality	N/A	Basic Web 1.0	Advanced Web 2.0	Supporting value creation
	Type	N/A	OGD direct provision portals	OGD direct provision & OGD aggregators	Collaboration Spaces
	Technology	N/A	Custom technologies	Open source	Open Source
Service Quality	License	N/A	Custom or N/A	CC share-alike	CC share-alike
	Quality Rating and Feedback Mechanisms	N/A	Web forms	+ Rating and feedback mechanism	+ Collaboration Environments



Assignment 1



- **Question A:** To what extent do you cover or address the open data research challenges in your already designed research? (estimation)
- **Question B:** what are the major barriers in terms of open data availability towards fulfilling your research project and how they could be addressed in your opinion?
- **Indicative Table:** Name | Organisation | Research Scope | Neighboring Research Domains | OD Research Domain | QA Answer | QB Answer
- **Delivery method:** 1-2 slides (.ppt)
 - include it also in your research presentations
- **Deadline:** Tomorrow morning session



Thank you for your attention!!



✓ Questions ?

✓ Further reading

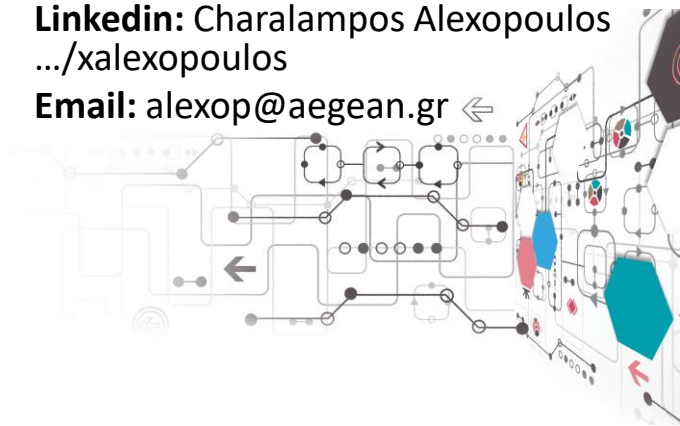
- ✓ Charalabidis, Y., Alexopoulos, C., & Loukis, E. (2016). A taxonomy of open government data research areas and topics. *Journal of Organizational Computing and Electronic Commerce*, 26(1-2), 41-63.
http://www.icsd.aegean.gr/publication_files/Journal/223360550.pdf
- ✓ Alexopoulos, C., Diamantopoulou, V., & Charalabidis, Y. (2017, September). Tracking the evolution of OGD portals: A maturity model. In *International Conference on Electronic Government* (pp. 287-300). Springer, Cham.
http://www.icsd.aegean.gr/publication_files/Conference/837744878.pdf

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Advanced Research Methodologies and Techniques for Open Data Research

Dr Euripidis N. Loukis

Professor

University of the Aegean



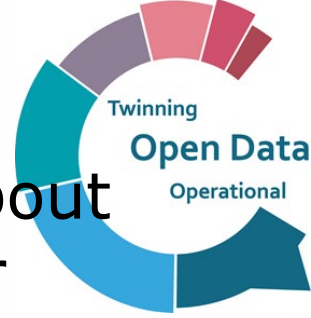
This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Introduction



- The main value of OD is that using them we (universities-research centers, firms, political analysts-parties) can conduct quite useful research
- concerning a wide variety of social and economic topics-phenomena,
- and extract/generate from OD knowledge about them
- Furthermore, very often we have to conduct research on data opening, relevant practices and systems,
- concerning adoption and factors affecting it, drivers and barriers, ecosystems generated around them,
- as well as use of OD and value generated from them

Introduction



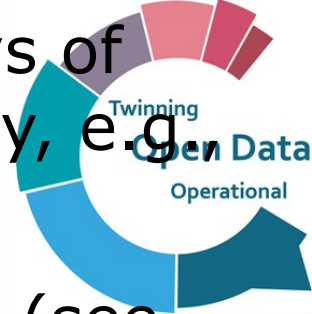
- So it is necessary to have good knowledge about methodologies and techniques we can use for conducting this research
- **Quantitative research**: surveys, descriptive statistics, correlations, regression models, structural equation models,
 - as well as advanced artificial intelligence techniques, such as machine learning
- **Qualitative research**: interviews, focus groups, analysis of textual data
- Use of existing theories concerning the specific topic-phenomenon of our research, for directing our research = defining specific elements-aspects to examine



Introduction

- What is social-business/economy research?
 - It aims to produce representations pictures of social and business/economic life/activity, focusing on specific important topics-phenomena
 - in order to achieve a better understanding of them,
 - and support decisions for making improvement interventions.
 - How does it compare to other ways of representing social and business life/activity?

Social – business research differs from other ways of representing social-business/economic life/activity, e.g. journalism, literature, etc., being superior



by emphasizing each of the following approaches (see Ragin, *Constructing Social Research*, chapter 1):

I. It addresses phenomena that are very significant for society – firms.

II. It uses existing theory → analytical frameworks

IV. It incorporates large amounts of appropriate evidence - data, purposefully collected (empirical research), e.g. through questionnaire, or existing data (e.g. EUROSTAT), interviews, focus groups, observation, possibly with participation, archives of public organizations -> dialogue of theories and data

V. It includes various forms of systematic analysis of the evidence/data.

Types of social-business/economy research



- **Exploratory**: aiming to gain a basic understanding of the specific phenomenon = which are the main elements-variables of it – dependent ones (outcomes) and independent ones (causes or factors affecting outcomes) – and their levels of values
- **Descriptive**: aiming at providing a comprehensive description of the phenomenon, covering the levels of all main elements of it – variables
- **Causal**: aiming at examining the relationships between the main dependent (outcome) variables and various possible independent variables, and identifying which of them really affect each dependent variable

The role of theory in social-business research



- A theory condenses a large amount of past experience and knowledge,
 - of numerous individuals, firms, etc., collected and analyzed through many previous studies
 - about which are the main elements of a specific phenomenon of social – business/economic life/activity
 - and what are the relationships between them.
- It is important to use a theory relevant to the topic-question of our study
- as a guide for defining the main elements-variables as well as possible relationships about them we will examine

The role of theory in social-business research



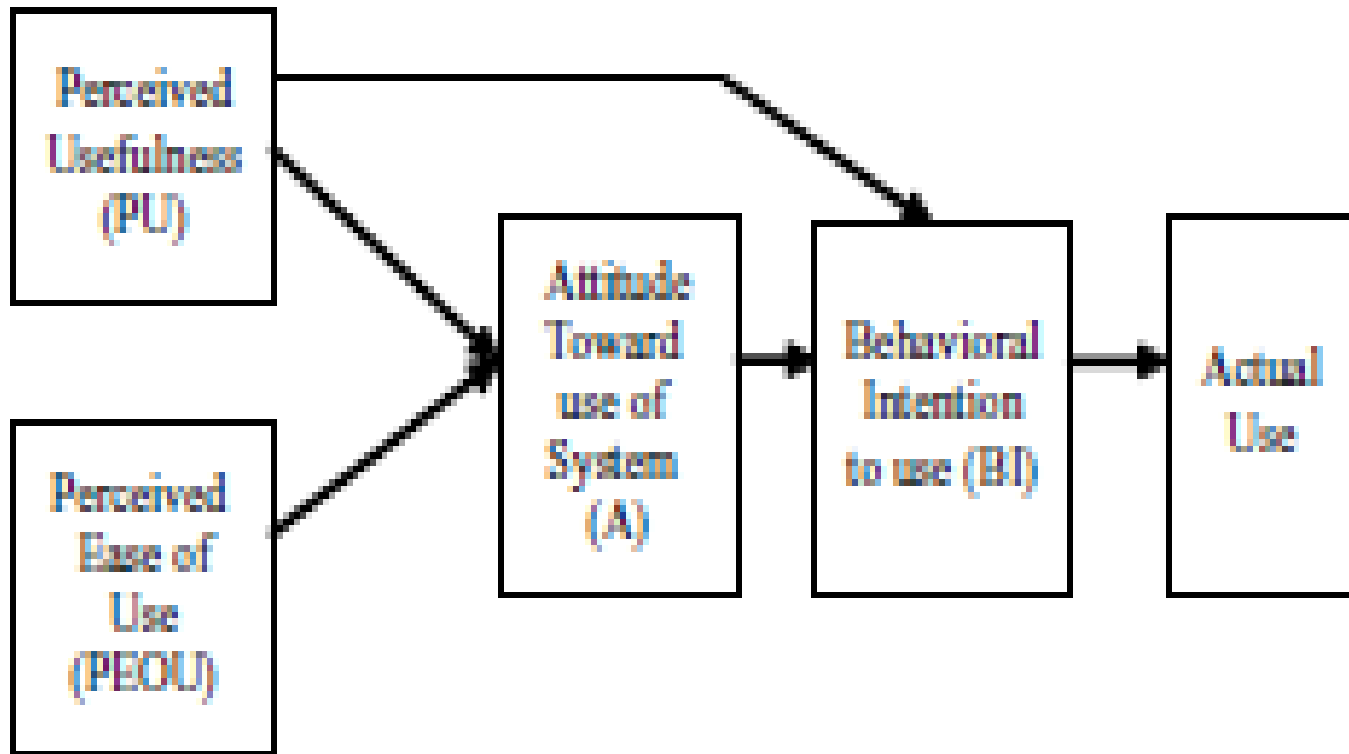
- However, the theory we decide to use as a basis of our study has to be elaborated and adapted to the specific research topic/questions of it
- → analytical framework (framework of analysis)
- For each of the main elements defined by our theory we usually have to define several specific variables to be examined
- based on the specific topic we study

Technology Acceptance Model (Μοντέλο Αποδοχής Τεχνολογίας)



- The intention to use a new technology (e.g. a new type of IS) and its real use,
- is determined by two main characteristics of it:
- its perceived '*ease of use*' (= the degree to which potential users believe that using it would require minimal effort)
- and its perceived '*usefulness*' (= the degree to which potential users believe that using it will enhance their job performance)

Technology Acceptance Model (Μοντέλο Αποδοχής Τεχνολογίας)

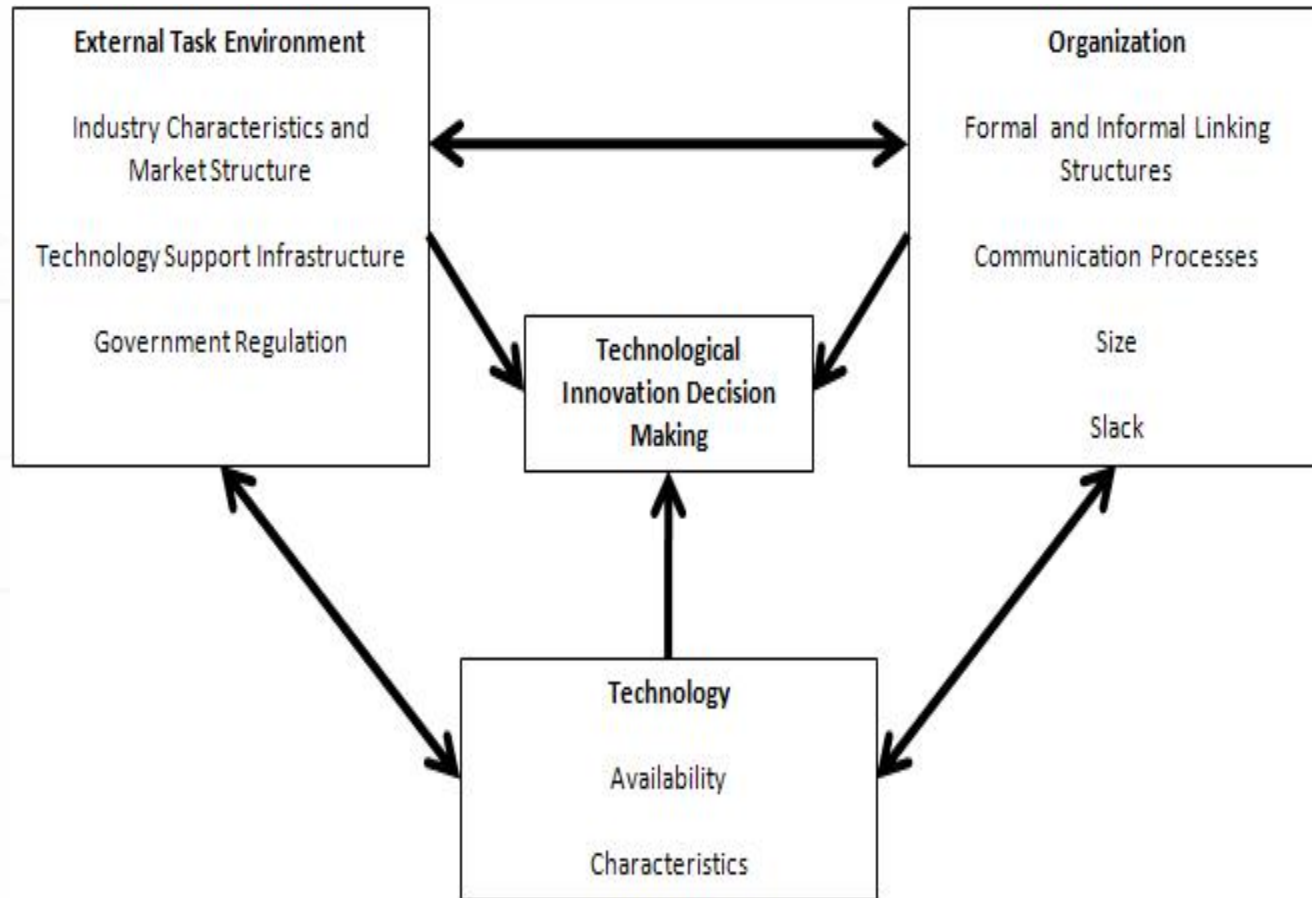


Diffusion of Innovations Theory (Θεωρία Διάδοσης Καινοτομίας)



Characteristic	Definition
Relative Advantage	The degree to which an innovation is perceived as better than the idea, work practice or object it supersedes
Compatibility	The degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters
Complexity	The degree to which an innovation is perceived as difficult to understand, implement and use
Trialability	The degree to which an innovation may be experimented with on a limited scale basis
Observability	The degree to which the results of an innovation are visible to others

Technology-organization-environment framework



Unified Theory of Acceptance and Use of Technology (UTAUT)



- Performance Expectancy
- Effort Expectancy
- Social Influence
- Facilitating Conditions

Leavitt's Diamond

- It constitutes one of the most „classical“ and widely recognized views of the firm in management science,
- which has been extensively used in IS research and practice for long time.
- It concerns the main elements of a firm:
 - task (= firm's goals/strategies and work processes for achieving them),
 - technology (= technology used for performing work processes),
 - people (= skills of firm's human resources)
 - and structure (= firm's organization in departments and also relationships, communication patterns and coordination among them).

IS Success

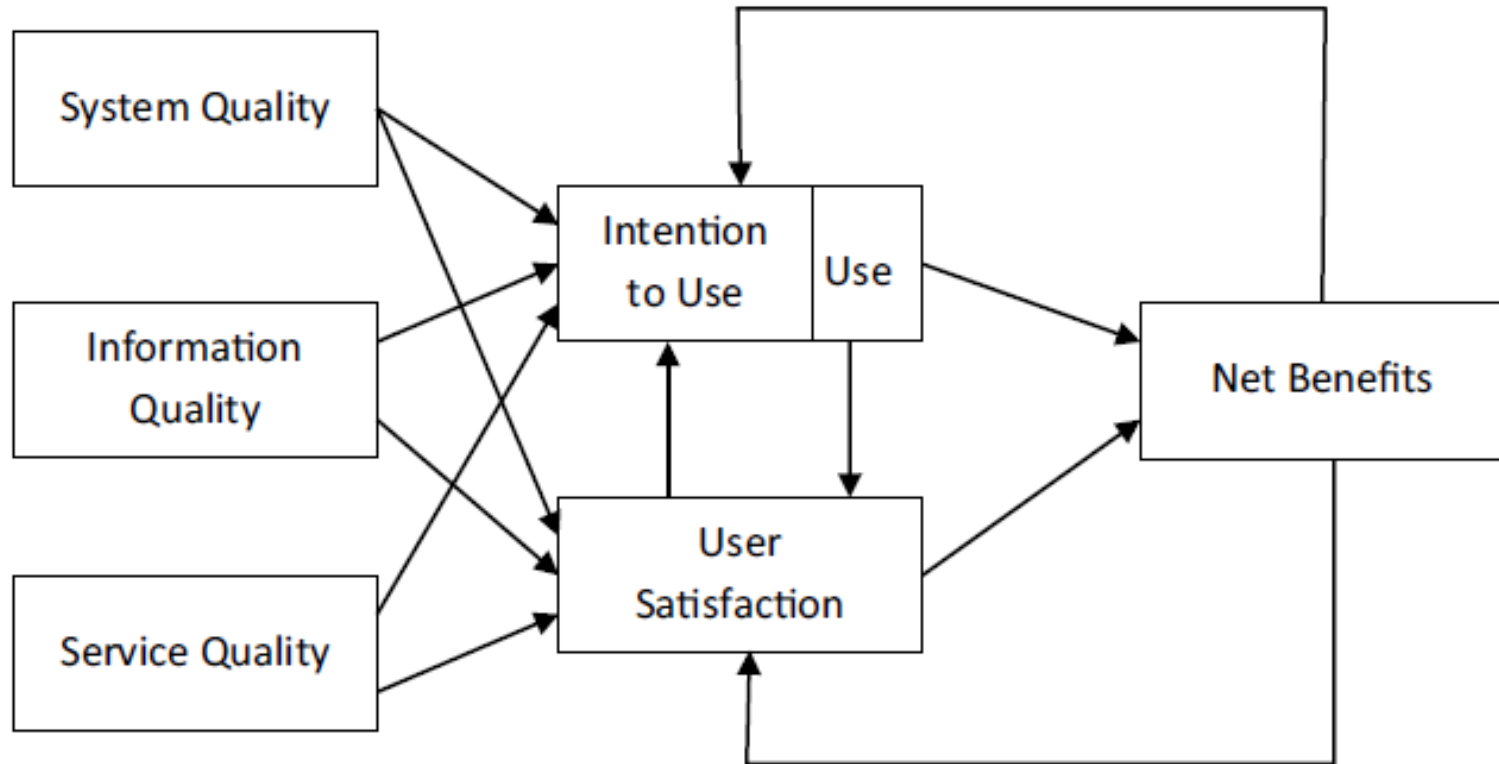
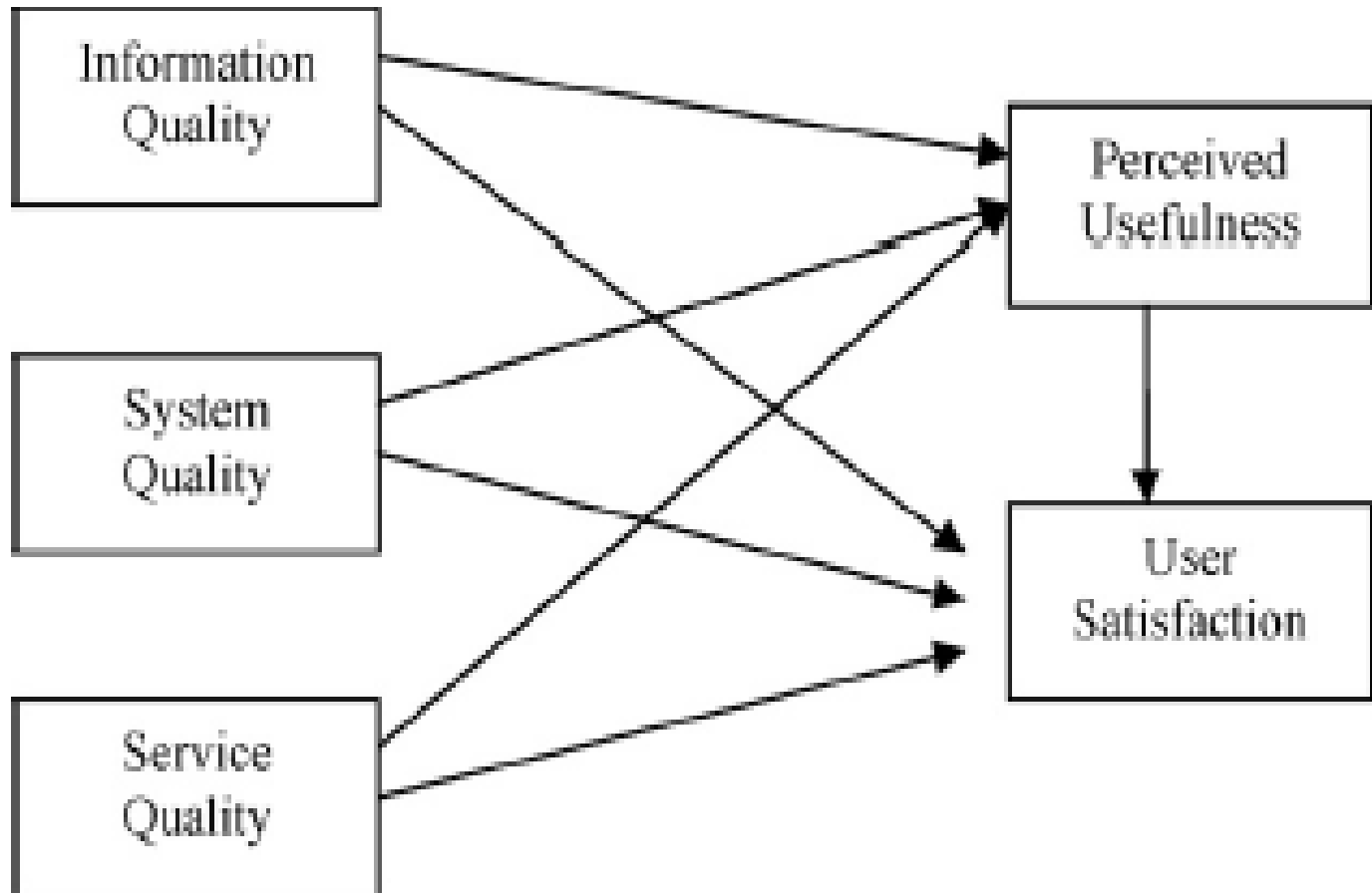


Figure 1.2: Updated DeLone and McLean IS Success Model (2003), used with permission.

IS Success





Organizational Change Phases

- **A. Unfreezing Phase:**

Highlight the disadvantages of the present situation (e.g. the existing work practices, procedures, values, etc) and their need to change

- **B. Change Phase :**

New work practices and procedures, and more generally, the new situation is formulated,

- **Γ. Freezing Phase:**

The new status is established, consolidated and strengthened, and workers become increasingly familiar with the new functions, processes, values, etc.

Recession/Decline Management

- Initially a 'retrenchment actions stage', which includes cost and possibly asset reduction,
- and at the same time (or followed by) optimization and rationalization actions,
- followed by a 'strategic actions stage', which includes changes or adjustments of how the firm competes in its traditional domains/markets (e.g., new products and services, changes or adjustments in its strategies for gaining competitive advantage),
- and then move to new markets or even domains

Stages of e-Government Growth



124

K. Layne, J. Lee / Government Information Quarterly 18 (2001) 122–136

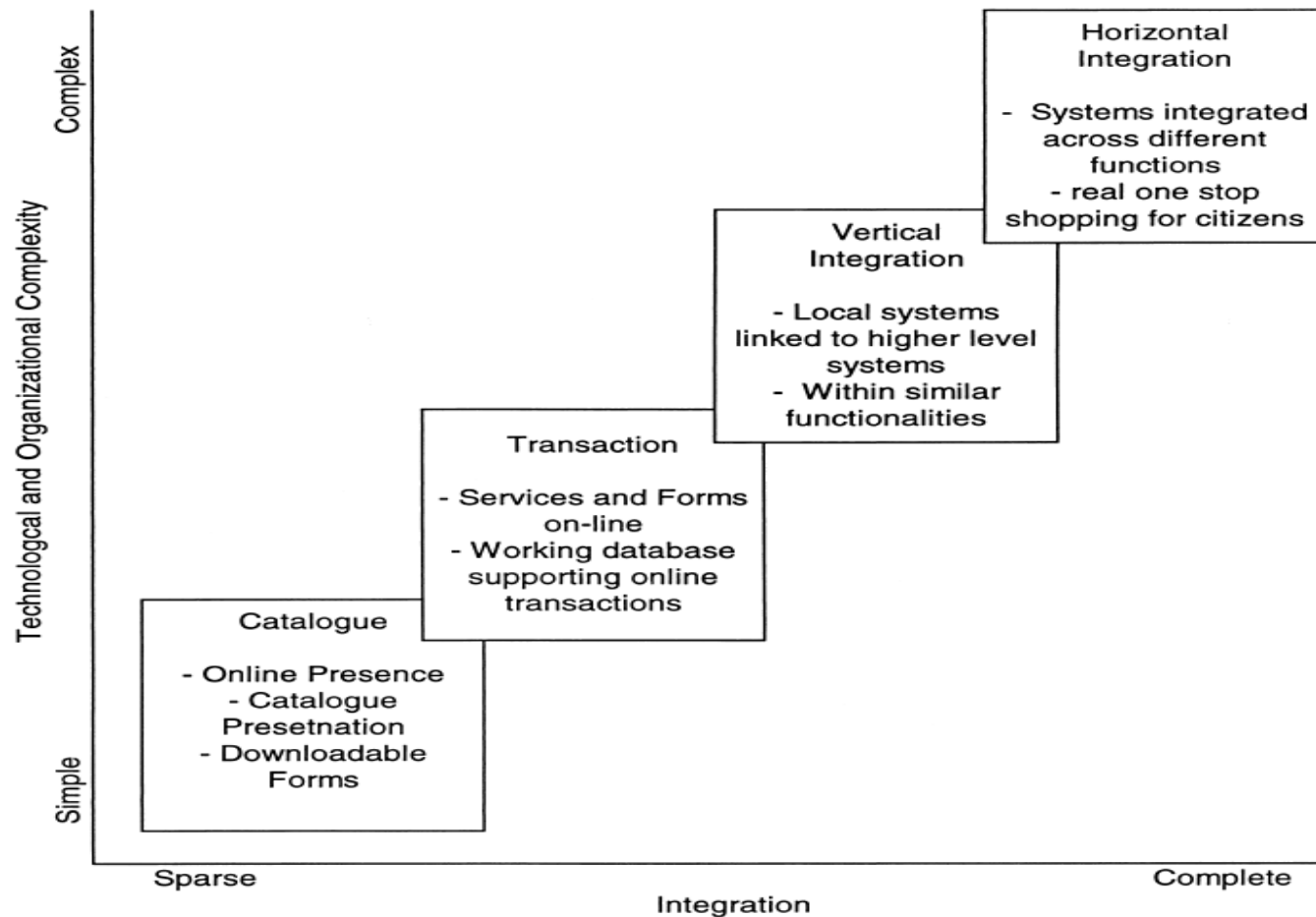


Fig. 1. Dimensions and stages of e-government development.

Social - Business Research

- Specify research topic
- Literature review
- Elaboration of specific research question (s) Examine existing relevant theories
- Formulate analytical framework = dependent variable(outcome)+independent variables (causes)
- Formulate research hypotheses
- Evidence/data collection (from some cases/units) – determine operational measure(s) for each variable (one or more), e.g. for firm size an operational measure is number of employees
- Evidence/data analysis (in quantitative research : use of statistical techniques)
- Conclusions – Pictures
- Theories test - modification – enrichment ?
- Dialogue of theory - evidence



Qualitative - Quantitative Research



- Qualitative research examines a small number of cases,
- but in big detail-depth (examining in each case numerous elements - features and relationships between them)
- usually through interviews or focus groups
- Quantitative research examines a large number of cases (hundreds or even thousands)
- but in less detail (examining a small number of strictly predefined elements-features of each),
- aiming to identify general pictures of social or business life
- i.e. general patterns and relationships,
- which do not concern one unit (e.g. person, firm, government agency) or a small number of units, but the whole population of them (general pictures)
- By averaging values of a variable over many cases, the peculiarities of some cases (will too large or too small values) disappear, and only general trends remain



Quantitative Research

- Usually qualitative research is used in the early stages of the research on a new topics/ phenomena,
- in order to provide a first understanding of their main elements and their interconnections
- and then quantitative research is used in order to provide more general pictures (= purified from peculiarities of some individual cases),
- which are a more reliable basis for decision making and for designing strategies (policies),
- and then qualitative research might also be used in order to understand more the identified relationships (especially the ones that we cannot understand – are against initial expectations – research hypotheses)



Quantitative Research

- Its basic idea is that the best way to identify general patterns and relationships,
- is to examine phenomena across many cases,
- and then combine/condense these data,
- since this eliminates ('averages out') peculiarities of individual cases
- and only general patterns and relationships (and therefore more useful) remain.
- They are based on quantifying (measuring) various features of examined cases,
- which vary across cases --> variables
- and then on processing collected data using statistical methods → more general images

Quantitative Research



- In the quantitative research the processing of data is based on examining the degree of co-variation - similar variation - of various features-variables in many cases
- = how the variation of the cases in one variable is linked with the variation of them in other variables,
- i.e. to what extent if a case has a higher (lower) value than the average in one variable A, it has a similarly higher (lower) value than the average in the other variable B as well – this might indicate a relationship.
- Relationship between features/variables A and B might indicate that:
- A causes B, or B causes A,
- or that both are affected significantly by a common variable C

Quantitative Research



- In quantitative research we condense large amounts of data into a few numbers,
e.g. correlation coefficients among pairs of variables
- leading to the identification of more general relationships, as they are based on many cases/units, they are more general trends
- While qualitative research produces much more detailed and in-depth pictures, which might not be general (specific to some cases)
- So quantitative research produces less detailed pictures, but more general so it sacrifices depth and detail for generality



Quantitative Research Process

- It is based on some variables, which should be measured across a large number of cases (units)
- A main difficulty is that the cases (units) to be examined, and the aspects of them (variables) we will focus on, should be fixed at the beginning of the study.
- For this purpose it is necessary to have a theoretical background,
- one or more relevant theories, which define the main elements of the phenomenon, and relationships among them, we should focus on.
- This will be elaborated (adapted to the specific objectives and phenomena we study, as theories are usually more general) into an analytic framework
- which includes the main variables to be measured



Quantitative Research Process

- and also the expected relationships among them according to our theoretical background, and also previous empirical research, or even logic arguments = research hypotheses,
- which will be tested using the data we will collect → support or rejection.
- Then for each variable measures(indicators)(μέτρα/δείκτες) are developed (simple or composite = a single item or a set of items), which should be easy to practically implement, operational
- Operationalization = define one or more measures/indicators for measuring a variable (that might be abstract - not easily observable)
- Data are collected (usually through a questionnaire survey, or even using existing datasets = secondary analysis (e.g. Statistical Authorities , such as ELSTAT or EUROSTAT, OECD, EU, open government data)
- and then processed (descriptives, correlations, ...)
- The results are used for testing hypotheses and for formulating synthetic pictures of the phenomenon

Sampling

- Probability Sampling: representative sample of the whole population: all units of it have equal probability of being selected in the sample:
 - Simple random sampling (table of random numbers or random number generator)
 - Systematic sampling (e.g. every tenth unit – problem if the list is on non-random order)
 - Stratified Random Sampling (if the population consists some discrete subsets, we want the sample to have them in the same proportions as the population: sub-samples for all groups randomly selected from them)

Sampling

- Non-probability Sampling: not representative sample, so they do not lead to such representative-general conclusions:
 - Convenience sampling (select a sample I can have access to, e.g. my colleagues, friends, businesses in my area)
 - Volunteer Sampling (people or firms who volunteer – they may be not representative)
 - Snowfall Sampling (start from an initial small sample, and then proceed with units - people or firms – suggested by the ones of the initial sample)

Types of quantitative data

- There are four types of measures that can be used for measuring a variable (from less to more detailed/informative),
- which are themselves variables as well:
- Nominal (taking some discrete values without any particular order, e.g. man/woman = 0/1)
- Ordinal (taking some discrete values having an order, e.g. degree of agreement 5 levels Likert-type scale)
- It is meaningless to use mathematical operations on the above types of measures (e.g. average), since they use numbers as codes, not numbers by nature that measure quantities → use of relative frequencies instead
- Interval (numbers by nature – not as codes – the distance between them is constant) – but not including an absolute zero (arbitrary), e.g. °C → for them we can use addition and subtraction, calculate average
- Scale (as in interval measures, but there is an absolute zero point) → all four mathematical operations

Initial data



X1	X2	Xn	Y
...
...
...
...
...



Processing - Analysis

- Calculation of descriptives - for each variable they provide useful information about the values it takes
- For nominal and ordinal variables: relative frequency tables (= relative frequencies of its discrete values)
- For interval and ratio variables: average and standard deviation
- Then we proceed to correlation analysis = estimate the strength of co-variation - relationship between two variables
- The main measure used for this purpose is the Pearson Correlation Coefficient = a measure of linear relationship between continuous variables (interval or ratio) – usable also for ordinal variables
- between +1 and -1: statistically significant (high likelihood of being non-zero) positive or negative,
- statistically non-significant (its confidence interval includes zero, so we cannot conclude with high likelihood that it is not zero)

$$\frac{\sum [(x_i - x_{av}) / \sigma_x * (y_i - y_{av}) / \sigma_y]}{N}$$

N

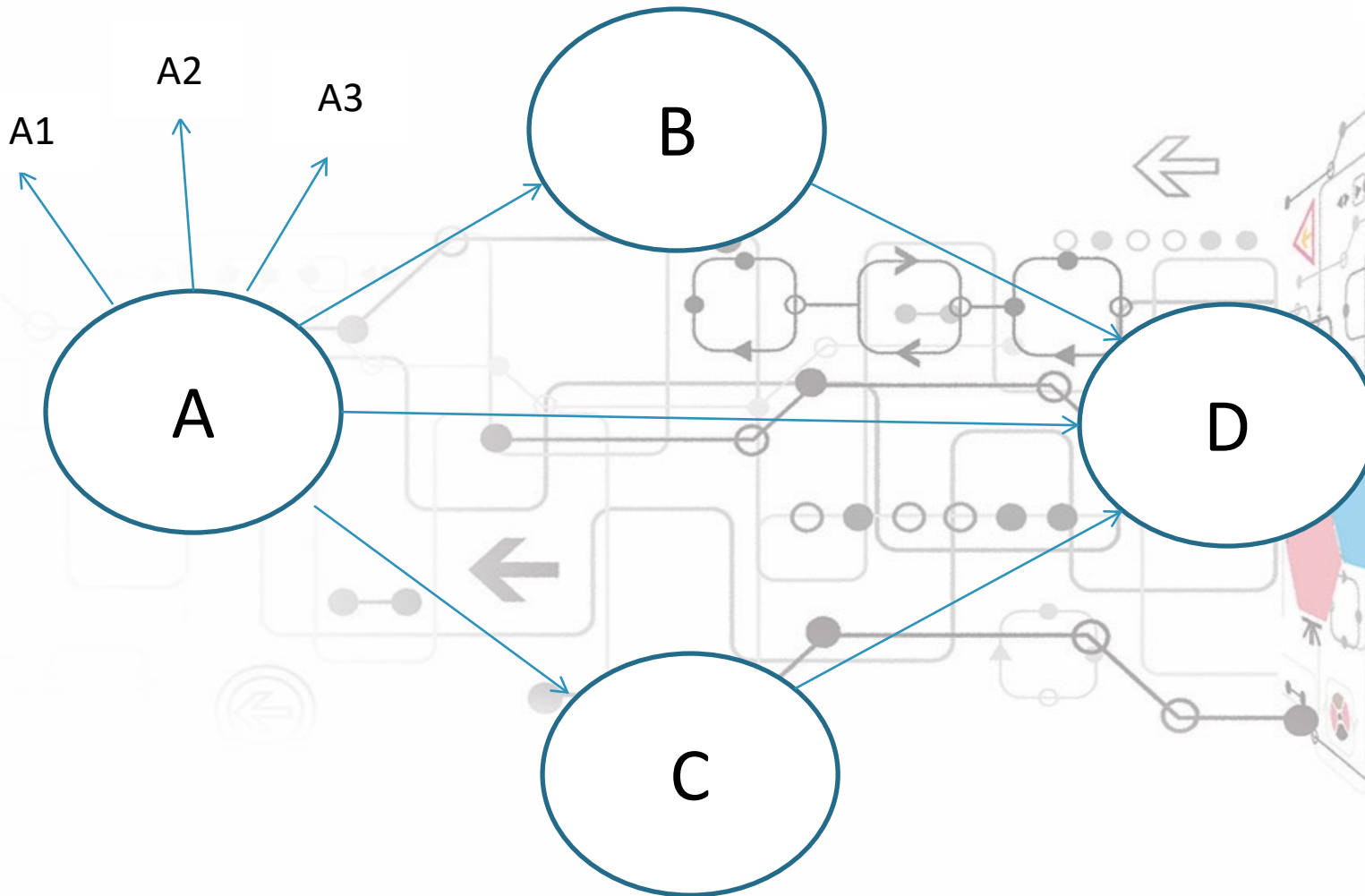
Processing - Analysis

- For ordinal variables there are other measures of strength of association between and ordinal variables (e.g. Kendall's Tau-b and Tau-c, Sommer's d)
- ANOVA : association between a continuous variable and a discrete valued one:
- do the averages of the continuous variable differ for different values of the discrete one ?
- Linear regression: estimate a model

$$y = a + b_1 * x_1 + \dots + b_n * x_n$$

Identify the statistically significant b_i (with high probability of being non-zero)
 → independent variables really affecting the dependent
- Problem of multi-collinearity: if high correlation between independent variables then estimated coefficients b_i can be highly inaccurate
- If the dependent variable is binary then the basic algorithm (called 'Ordinary Least Squares' (OLS)) does not provide accurate estimations
- → another algorithm should be used: the 'binary/bi-nomial logistic regression'

Structural Equation Modeling



Structural Equation Modeling

- It is used for estimating a network of relationships,
- between variables measured using multiple measures (called also items or indicators) – being abstract concepts
- This network can include several layers,
- including (in the intermediate layers) variables which are both independent (affecting other variables) and dependent (affected by some other variables)



UNIVERSITY OF THE AEGEAN



Artificial Intelligence Machine Learning from Open Data – An Introduction

Dr Euripidis N. Loukis

Professor

University of the Aegeam



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Introduction



- Artificial Intelligence (AI) includes a group of techniques that enable computers to perform tasks of higher intelligence, approaching the human one,
- by learning from their environment,
- and then using the knowledge they have extracted from it for taking or proposing action
- While the first generation of AI was based on pre-defined by humans ('Symbolic AI')
- = many IF..... THEN.... rules extracted from experts (expert systems)
- the second generation of AI was based on such rules extracted automatically by computers through advanced processing of past historic data ('Statistical AI'),
- from which models are constructed that consist of sets of such rules
- This allows the highest possible knowledge extraction from OD

Machine Learning



- In this second generation of AI the most representative and widely used techniques are definitely the Machine Learning (ML) ones.
- They enable exploiting historic past data we possess for a number of units (e.g. individuals, firms, etc.): for each unit the value of an important **outcome variable Y** -usually with a small number of values
 - such as purchase or not of a product,
 - repayment or not of a bank loan
 - payment or not of taxation (tax evasion),
 - level of criminal activity of a high risk young person
- as well as the values of some other **variables-characteristics X1, X2, Xn** of the units, which might affect the outcome, or might be possible causes of this outcome, such as demographics, etc.
- for estimating a model $Y=Y(X1,X2..Xn)$ – usually a decision tree
- The outcome variable Y is called **dependent variable**, as we expect it to depend on the characteristics X1,X2. called **independent variables**

Machine Learning



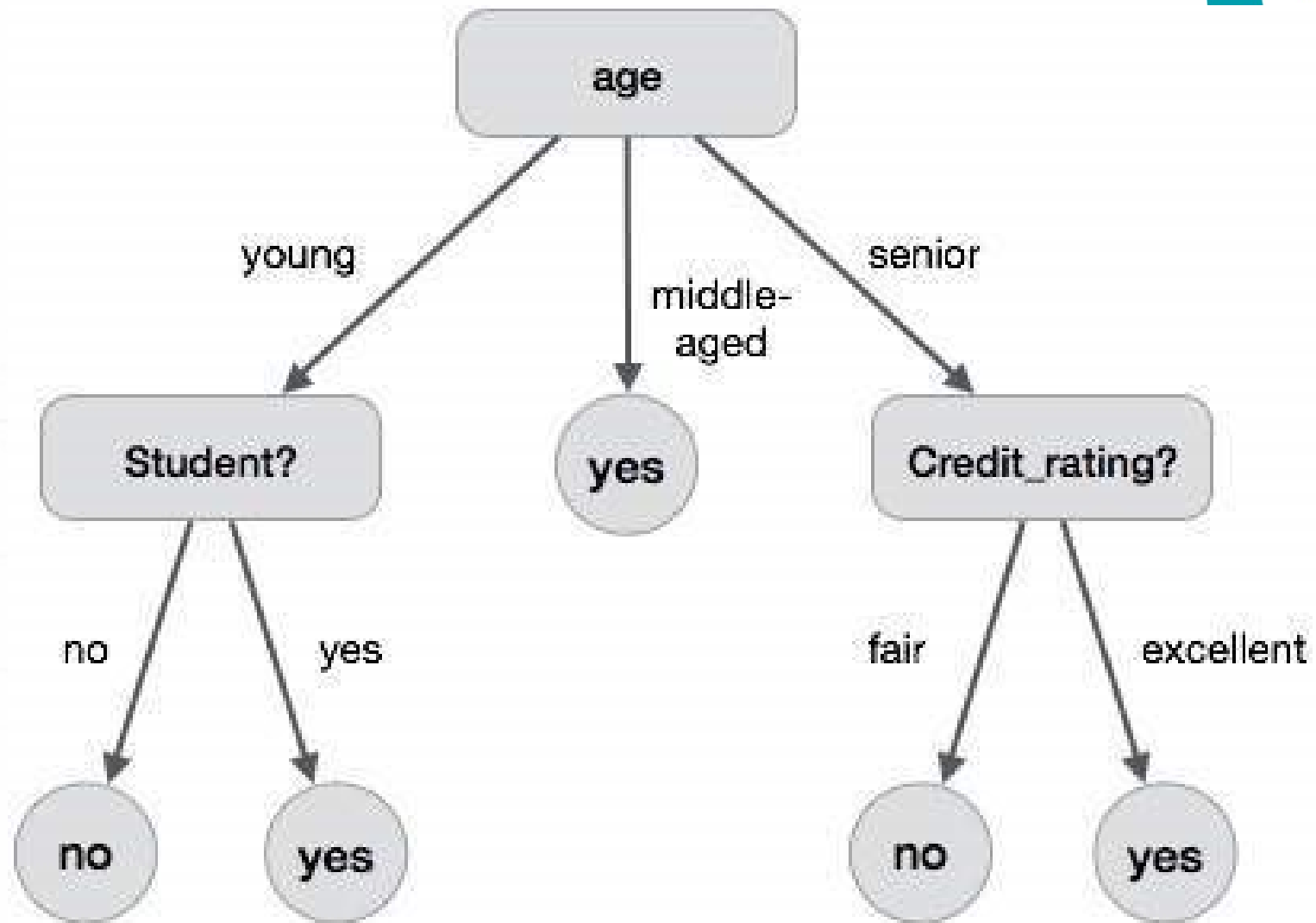
- Each of the **'internal' nodes** concerns one of the independent variables = is a check for the value of an independent variable,
- while each final **'leaf' node** concerns the dependent variable = is a resulting value of the independent variable (usually with a probability)
- These models (=sets of rules) enable on one hand **deeper insights**,
- as they reveal among the usually numerous independent variables – characteristics of the units which are ones that affect-influence most the dependent variable - outcome
- and on the other hand enable making **predictions** for a new unit (e.g. individual, firm) of the value of the dependent variable-outcome based on its characteristics – values of independent variables for it.
- Such a model is actually a set of IF....THEN.... rules extracted auto-matically from the historic data,
- which are called **'training data'**, as through these data the model has been developed = trained for predicting Y for a new unit from X1,X2..

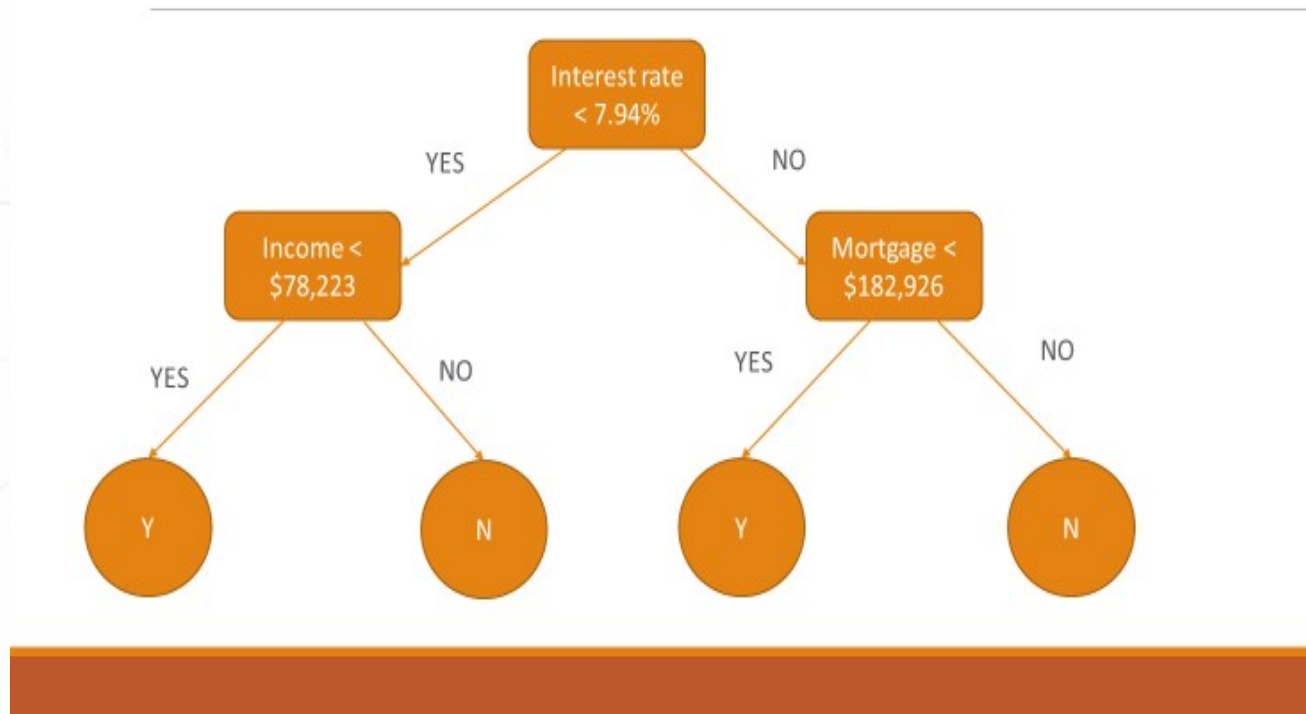
Machine Learning

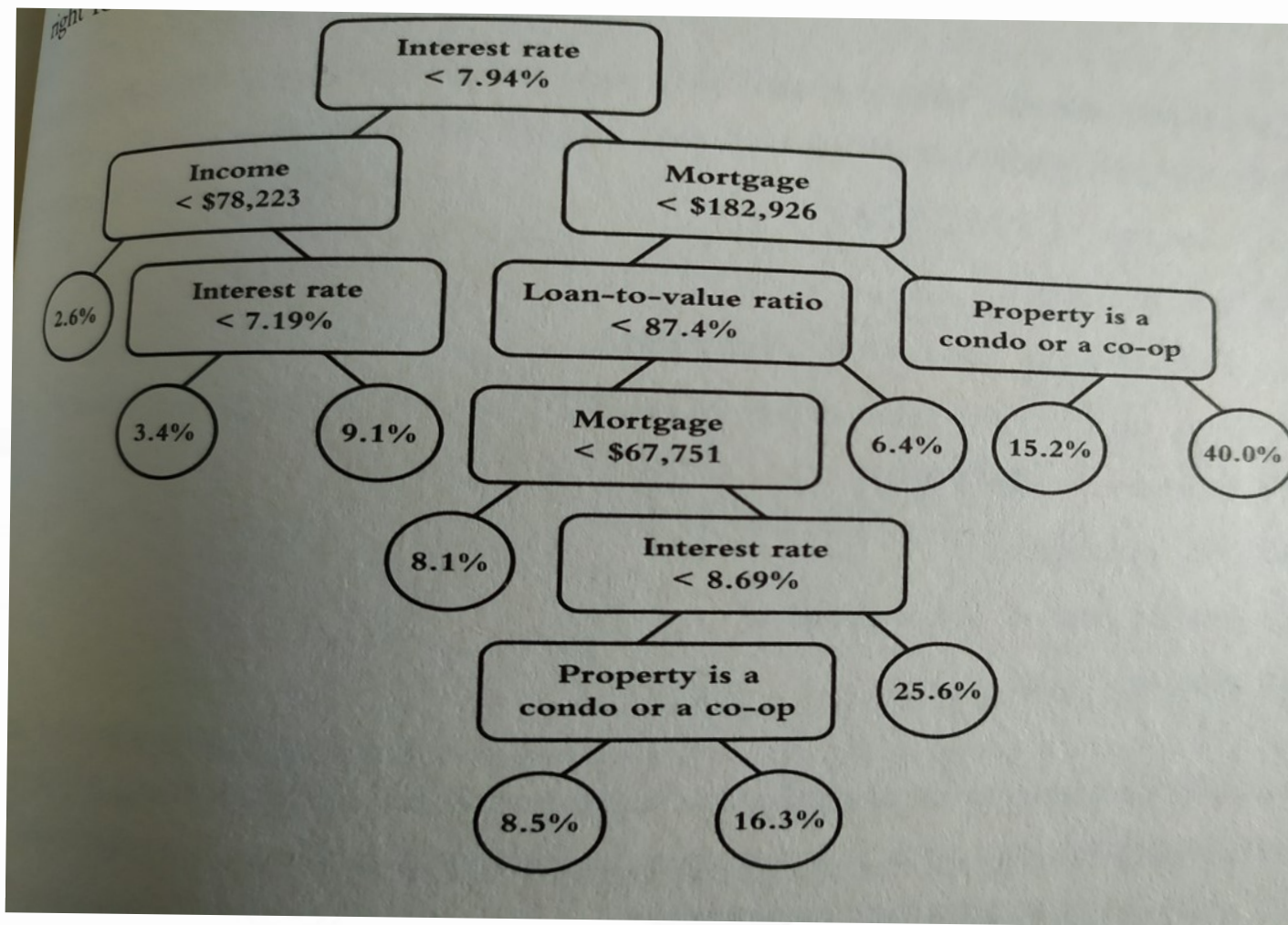


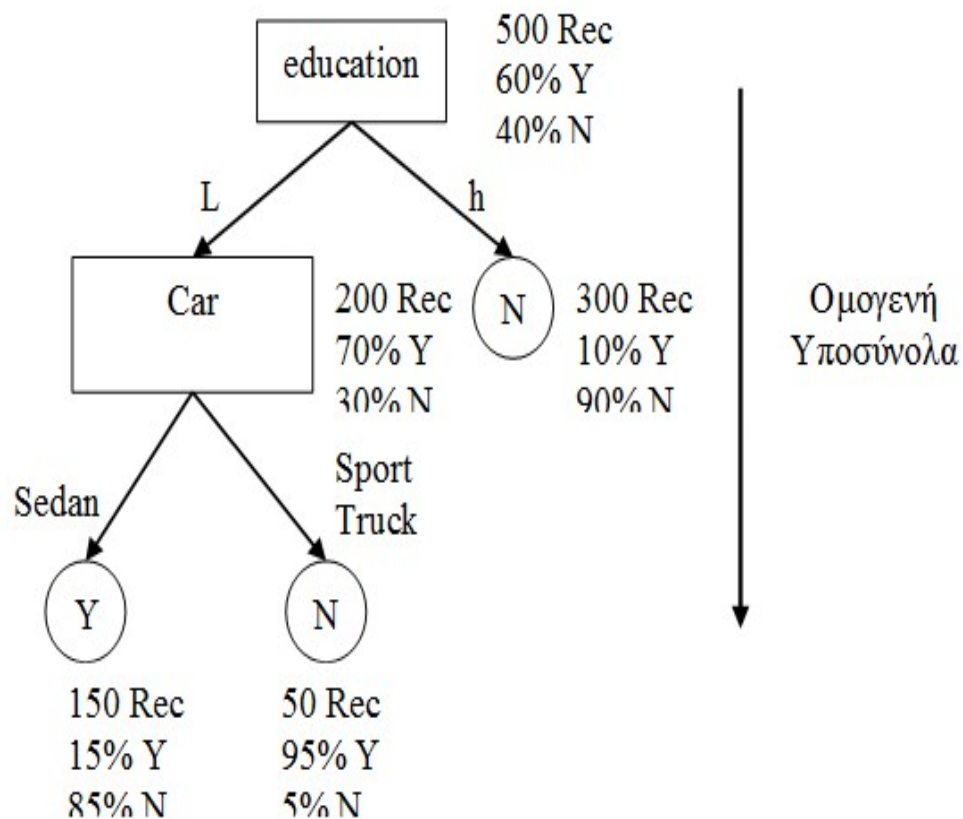
X1	X2	Xn	Y
...
...
...
...
...

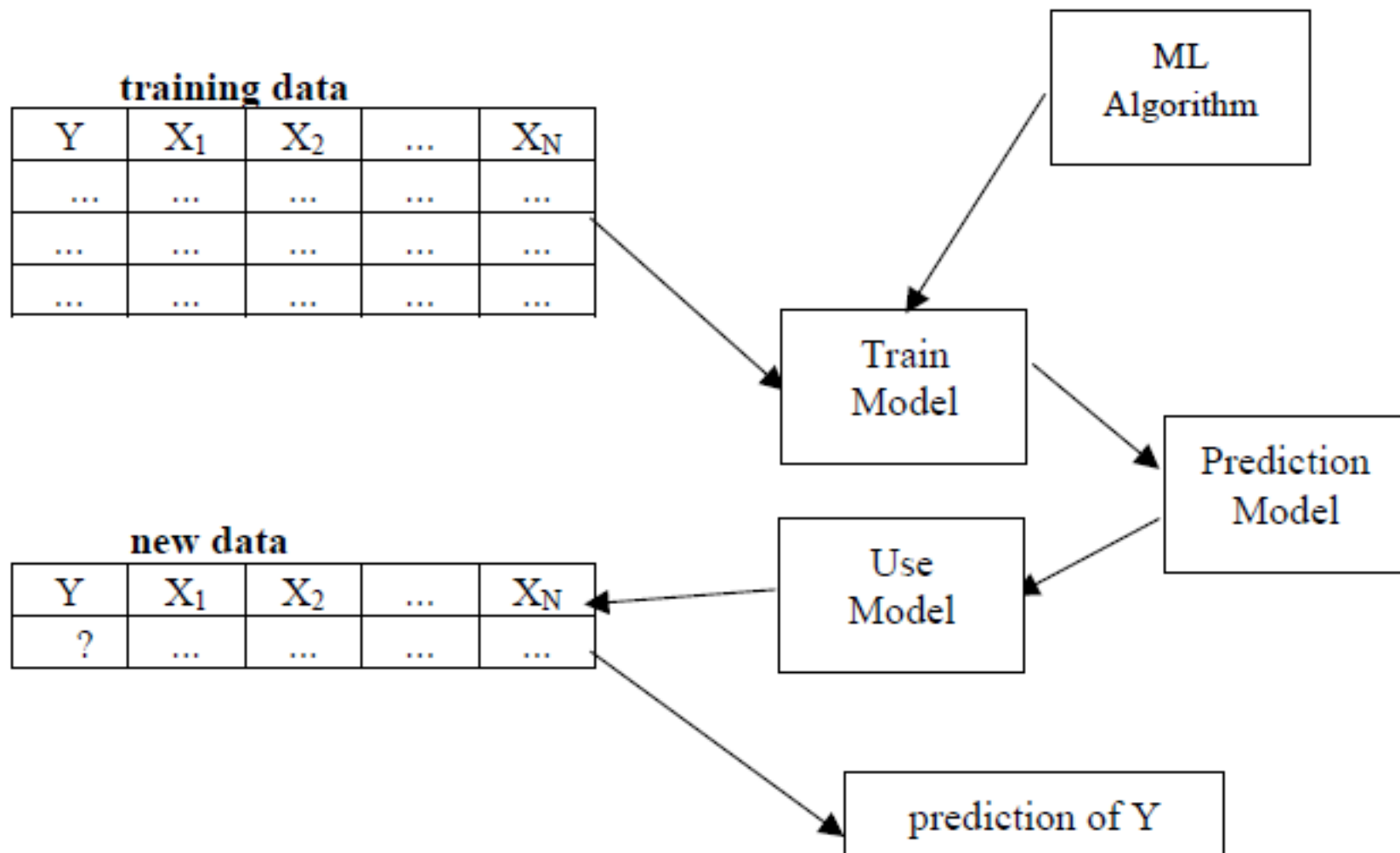












Machine Learning - Classification



- There are some ML algorithms for the case that the dependent variable has a small number of discrete values (usually 2-3),
- each of them constitutes the 'class' to which a unit can belong with respect to the dependent variable.
- These algorithms are called **'classification' algorithms**, and the main categories of them are:
 - ☐ Decision Trees Classifiers
 - ☐ Artificial Neural Networks Classifiers - Deep Learning
 - ☐ Support Vector Machines Classifiers
 - ☐ Nearest Neighbor Classifiers
 - ☐ Bayesian Classifiers
 - ☐ Random Forest Classifiers
- Some of these algorithms have versions for continuous dependent var.

Machine Learning - Classification



- So practically for each specific prediction task-problem we have we assess the prediction (classification) accuracy of each algorithm
- = the percentage of units of the training set + of another additional test set (data from units different from the ones of the training set, from which the model has been estimated – trained)
- for which it provides correct class prediction,
- and finally select the algorithm with highest prediction accuracy.
- For assessing and comparing the prediction accuracy of AI/ML algorithms we usually follow the **k-fold cross validation procedure**:
 - We divide the data set we have randomly into k equal sections (folds),
 - we use the first sections as test set, and the remaining k-1 sections as training set → model estimation → calculation of its class prediction accuracy in the test set
 - The same is repeated using the second, third, etc. part as test set, and the remaining sections as training set, and calculating prediction accuracies
 - The average of these k prediction accuracies is calculated as an overall assessment of prediction accuracy

Machine Learning - Classification



- If this estimated assessment of prediction accuracy is satisfactory for the specific prediction task-problem,
- then we can conclude that the specific dependent-outcome variable can be satisfactorily predicted,
- using these specific independent variables – characteristics.
- On the contrary, if this estimated assessment of prediction accuracy is not satisfactory for the specific prediction task-problem,
- then we try to improve it by adding more independent variables – characteristics to be used for the prediction

Machine Learning - Regression



- There are some other ML algorithms for the case that the dependent variable is continuous
- These algorithms are called 'regression' algorithms,
- they estimate a prediction model usually having the form of an equation

$$Y = b_0 + b_1 * X_1 + b_2 * X_2 + ... + b_n * X_n$$

- The main categories of regression algorithms are
 - ☐ Ordinary Linear Regression (OLS)
 - ☐ Non-linear Regression
 - ☐ Binary Logistic Regression
 - ☐ Ordinary Regression
 - ☐ Nominal Regression

Ordinary Linear Regression



Area	S	A	P	cs
Selkirk	101.8	1.3	0.2	20.40
Susquehanna	44.4	0.7	0.2	30.5
Kittery	108.3	1.4	0.3	24.6
Acton	85.1	0.5	0.6	25.5
Finger Lakes	77.1	0.5	0.6	25.5
Berkshire	158.7	1.9	0.4	21.7
Central	180.4	1.2	1.0	6.8
Providence	64.2	0.4	0.4	12.6
Nashua	74.6	0.6	0.5	31.3
Dunster	143.4	1.3	0.6	18.6
Endicott	120.6	1.6	0.8	19.9
Five-Towns	69.7	1.0	0.3	25.6
Waldeboro	67.8	0.8	0.2	27.4
Jackson	106.7	0.6	0.5	24.3
Stowe	119.6	1.1	0.3	13.7



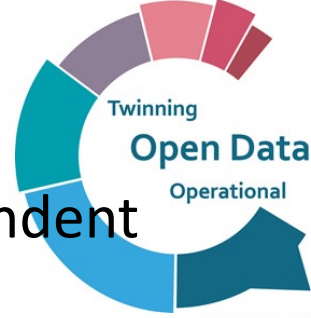
Ordinary Linear Regression

$$S = \beta_0 + \beta_1 * A + \beta_2 * P + \beta_3 * CS + e$$

$$= 65.705 + 48.979 * x_1 + 59.654 * x_2 + 1.838 * x_3$$

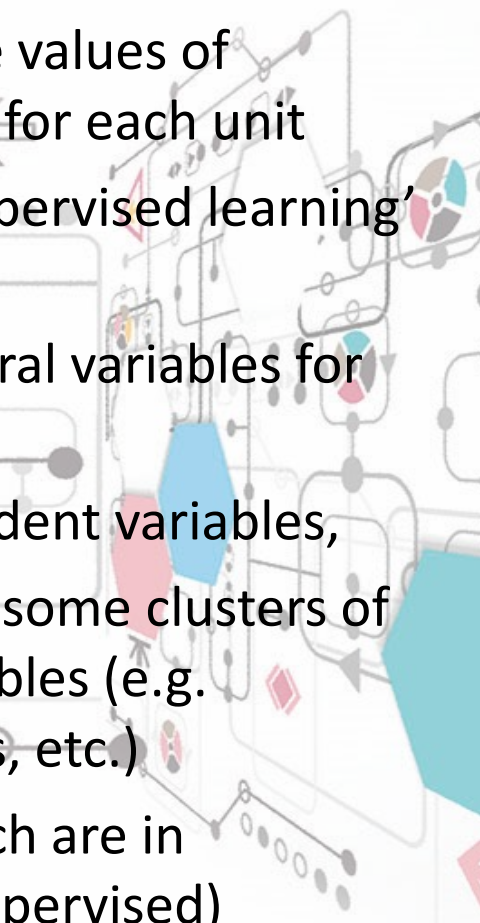
Machine Learning

- More training data (data from more units: value of dependent variable + values of independent variables)
- result in higher prediction accuracy of the models estimated from them (= higher probability of correct prediction of the value of the dependent variable for a new unit).
- Though most of the AI technologies, and in particular the ML ones, exist for several decades,
- it is only recently that there has been a very high interest in their 'real life' application and exploitation, mainly by private sector firms, and to a lower extent by government agencies, due to:
 - ❑ availability of large amounts of data for more effective training of AI algorithms (in order to extract more reliable models)
 - ❑ advances in computing power and reduction of its cost;
 - ❑ substantial improvements of AI algorithms



Supervised – Unsupervised Learning



- The previously mentioned algorithms are called ‘supervised learning’ ones,
 - as they learn (i.e. they are trained) in a highly supervised by us way
 - = we give to them examples of many units, which include values of independent variables + value of the dependent variable for each unit
 - There is also another category of algorithms called ‘unsupervised learning’ ones,
 - in which we give for a number of units the values of several variables for each of them,
 - without discriminating between independent and dependent variables,
 - Based on these data these algorithms extract from them some clusters of units = groups of similar units with respect to these variables (e.g. consumers’ actions-behaviors, firms’ economic indicators, etc.)
 - → these clusters constitute the ‘classes’ of the units, which are in unsupervised learning discovered, and not given (as in supervised)
- 

Applications in Government



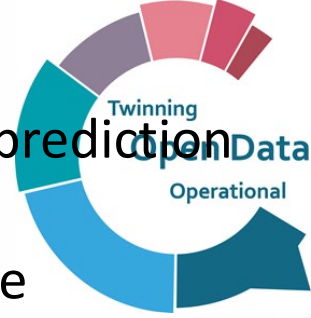
- AI has started being used in a variety of public sector thematic domains for various purposes,
- for instance in education, for the prediction of applicants for teacher positions who will be more effective and successful, in order to support making the optimal recruitment decisions
- in social policy, for the prediction of higher risk youth concerning criminal activity, in order to target prevention interventions;
- in restaurant hygiene inspections, for using the social media on-line reviews in order to discriminate severe offenders from the restaurants with no regulation violations, in order to optimize inspections
- in immigration management, for an initial classification of applications as approved, denied, or gray area, in order to support officers responsible for making decisions for them
- in healthcare, for diseases' diagnosis and treatment planning
- in public security, for predictive police patrolling, in order to use more effectively scarce human resources,
- in taxation, for discovering firms/individuals who evade taxes

Applications in Government



- Research in this area has identified four main types of AI use - exploitation in government:
- i) for 'relieving' (AI performs mundane tasks, and frees public servants' time for more valuable tasks);
- ii) for 'splitting up' (AI takes a part of a job, and leaves public servants to do the remainder (e.g. a finalization or 'fine-tuning'))
- iii) for 'replacing' (AI carries out an entire job performed by public servants);
- iv) for 'augmenting' (AI technology provides support to public servants for performing a cognitive job more effectively, by complementing their skills).
- Similar hold for the private sector as well
- Increase of unemployment ? – this is going to happen if iii) (or even i) or ii) to a significant extent) prevails

Problems of AI in Government



- If training data used by AI algorithms for constructing (training) prediction models are not representative,
- then the resulting models can be biased towards or against some predictions, specific citizens' or firms' groups.
- The prediction provided by such models for a new unit is a 'black box' one: it is not clearly justified.
- However, this is a problem because government organizations have to justify fully their decisions – so such AI-based predictions should be used only for appropriate purposes in government
- For many decisions (e.g. concerning granting various allowances or financial assistance) the criteria (e.g. characteristics of applicant citizens and firms to be taken into account – threshold values of them) are defined by law, so corresponding rules have to be predefined (entered) directly by humans (like 'Symbolic AI') and not extracted from data

Our Research



- **Using Government Data and Machine Learning for Predicting Firms' Vulnerability to Economic Crisis**
- Economic crises one of the most severe and threatening problems of market-based economies.
- The fluctuations that economic activity often exhibits, and also some critical events, such as banking crises, epidemics (like the corona virus one), increases of prices of important goods (e.g. oil or gas), etc.,
- can lead to significant economic recessions and crises;
- these can result in big reductions of firms' production, procurement, investment, innovation as well as employment,
- with serious social consequences, such as increase of unemployment and poverty.

Our Research



- Governments repeatedly face such challenges,
- which necessitate serious interventions,
- aiming on one hand at avoiding or reducing economic crises (at the macro-economic level),
- and on the other hand at mitigating their negative consequences for firms and individuals (at the micro-economic level).
- The most usual of the latter interventions is the provision of support to the most vulnerable firms in the beginning of such crises, or even before this, when an economic crisis is in sight.
- Quite useful for the effective implementation of such interventions can be the prediction of the vulnerability of the individual firms that apply for such government support,
- which allows focusing the scarce economic resources on the most vulnerable firms.

Our Research

In this direction our paper presents a methodology for using existing government data,

on one hand from Taxation Authorities (concerning firms' sales revenue, profits, employment, etc. decrease during the crisis), and on the other hand from Statistical Authorities (concerning human and technological resources, structures, processes, strategic orientations, etc. of the same firms);

in order to predict the vulnerability of individual firms to economic crisis,

based on Artificial Intelligence (AI) Machine Learning (ML) algorithms.

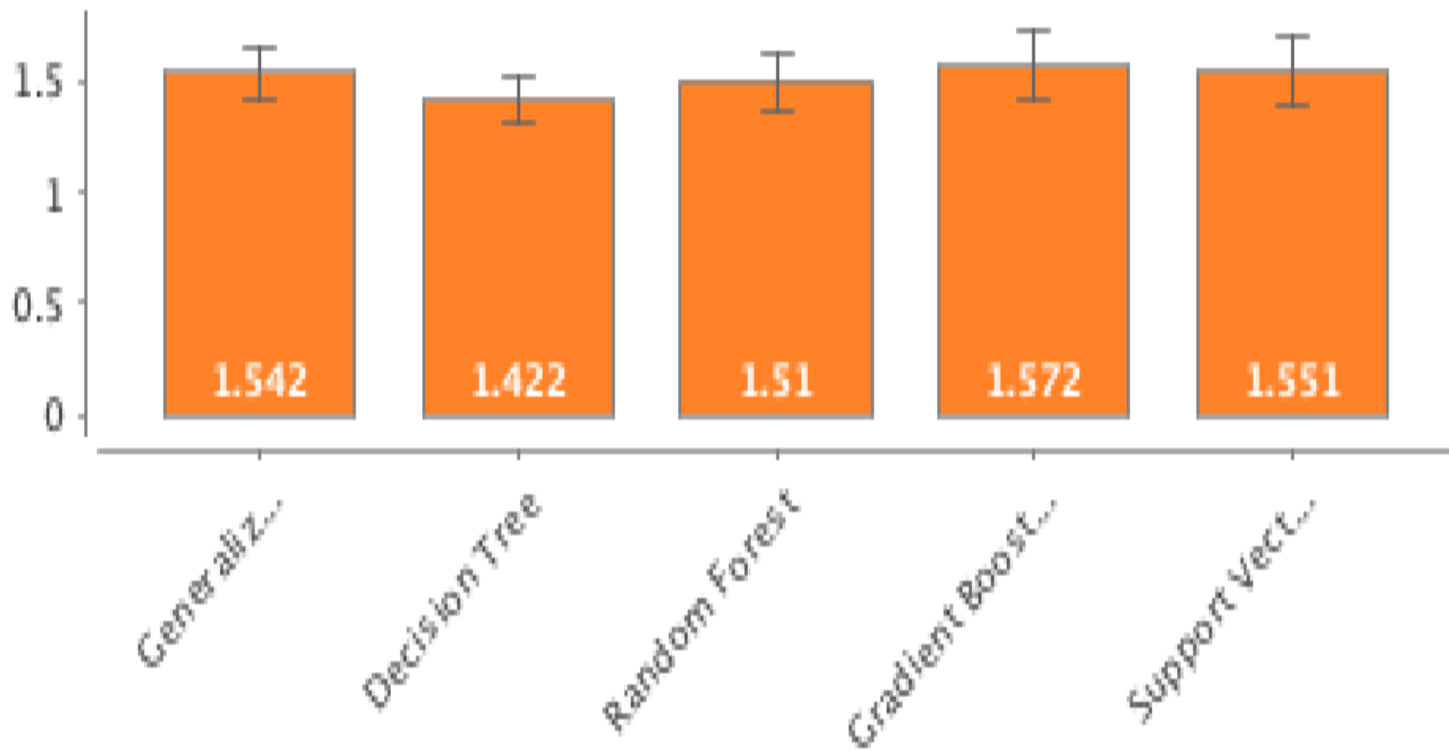
A first application of the proposed methodology, based on existing data from the Ministry of Finance and the Statistical Authority concerning 363 Greek firms for the economic crisis period 2009-2014, gave encouraging results.



Our Research



Absolute Error



4.3 Day 3: Understanding disciplinary research methodologies

On Day 3, the single disciplinary open data approaches on the open data life cycle of all partner university were shared and discussed in the context of the development of an initial interdisciplinary multi-domain research approach. The afternoon of Day 3 was dedicated to the next iteration of the TODO Open Data Interdisciplinary Assessment Framework.

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Wrap up of the previous day	Frederika Welle Donker ESRs (4-6)	Live + PPT BBB TODO Summer School
10:30-11:00	Looking ahead to day 3... from disciplinary to Interdisciplinary research	Frederika Welle Donker	Live + PPT BBB TODO Summer School
11:00-12:00	Disciplinary research methodologies: Practices from FOI, TUDELFT, LAW, FER	All participants	Live + PPT BBB TODO Summer School
12:00-12:30	BREAK		
12:30-13:30	Disciplinary research methodologies: Practices from UAEGEAN, GEOD, AGRI, TRANS	All participants	Live + PPT BBB TODO Summer School
13:30-15:00	Interdisciplinary research		Offline + PPT + notes
15:00-17:00	Interdisciplinary assessment framework (IAF) of TODO 2.0	Bastiaan van Loenen	Live + PPT



TODO

Summer school

Day 3



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



Wrap up of the previous day

7-11 September 2020.

Margareta Habazin. LAW
Bia Mandžuka. TRANS
Adam Vinković, GEOG



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda

- **Advanced Research Methodologies and Techniques for Open Data**
- **OD research Challenges**

1. Professor Dr Euripidis N. Loukis



Advanced Research Methodologies Techniques for Open Data

The screenshot displays a BigBlueButton online session interface. On the left, a chat window titled "Public Chat" shows a list of participants and their messages. The main area on the right features a video feed of a participant and a presentation slide titled "Technology Acceptance Model (Μοντέλο Αποδοχής Τεχνολογίας)". The slide contains a flowchart illustrating the model's components and their relationships.

Chat Window (Public Chat):

- strangely enough, there are some differences between Flemish and Dutch expressions even though it is the same language
- Ivana Bosnic (FER) 10:02 AM: yeah, for sure.
- Agung Indrajit 10:03 AM: hello
- Larisa Hrutek 10:03 AM: can we start?
- Larisa Hrutek 10:11 AM: yes
- Dragica Solamon (FER) 10:11 AM: Hi, everyone!
- Bla Mandzuka 10:05 AM: yes!
- Martina Tomić 10:05 AM: I have sent prof. Euripides the link to bbb on skype...
- Dragica Solamon 10:05 AM: Thank you, quite understandable
- Barbara Sibera 10:06 AM: very clear explanation

Presentation Slide: Technology Acceptance Model (Μοντέλο Αποδοχής Τεχνολογίας)

The slide shows a flowchart with the following components and relationships:

- Perceived Usefulness (PU)** and **Perceived Ease of Use (PEOU)** both point to **Attitude Toward Use of System (A)**.
- Attitude Toward Use of System (A)** points to **Behavioral Intention to use (BI)**.
- Behavioral Intention to use (BI)** points to **Actual Use**.



Introduction

The principal value of Open Data (OD) - provide a wide variety of users with an opportunity to:

- conduct useful research
- extract, gain, and expand knowledge

on a large array of social and economic topics

on open data, relevant practices and systems

on use of OD and value generated from them

Methodologies and techniques to conduct research



Two key approaches:

Quantitative research: surveys, descriptive statistics, correlations, regression models, structural equation models etc.

Qualitative research: interviews, focus groups, analysis of textual data



Social-business/economy research

- goal to generate representative images of social and business/economic life/activities, focusing on certain important topics-phenomena
- differs from other ways of representing social-business/economic life/activity by being superior.



Types of social-business/economy research

- **Exploratory**: a basic understanding of the specific phenomenon
- **Descriptive**: provide a comprehensive description of the phenomenon
- **Causal**: examining the relationships between variables

The role of theory in social-business research



- a theory must be relevant for the specific topic-question of a study
- the theory should be elaborated and adapted to the specific topic-question of the study (analytical framework)
- the theory will provide guidance for defining the main variables that will be examined and which relationships between them to examine

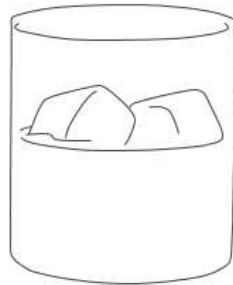


Models & Theories

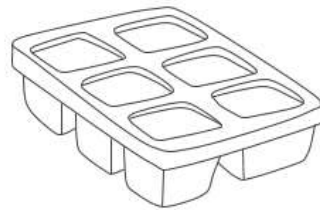
1. Technology Acceptance Model
2. Diffusion of Innovations Theory
3. Technology-organization-environment framework
4. Unified Theory of Acceptance and Use of Technology (UTAUT)
5. Leavitt's Diamond
6. IS Success

(Ferro, E., Euripidis Loukis, Y. Charalabidis and M. Osella. "Policy making 2.0: From theory to practice." *Gov. Inf. Q.* 30 (2013): 359-368.)

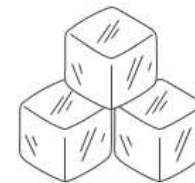
Organizational Change Phases



Unfreezing



Changing

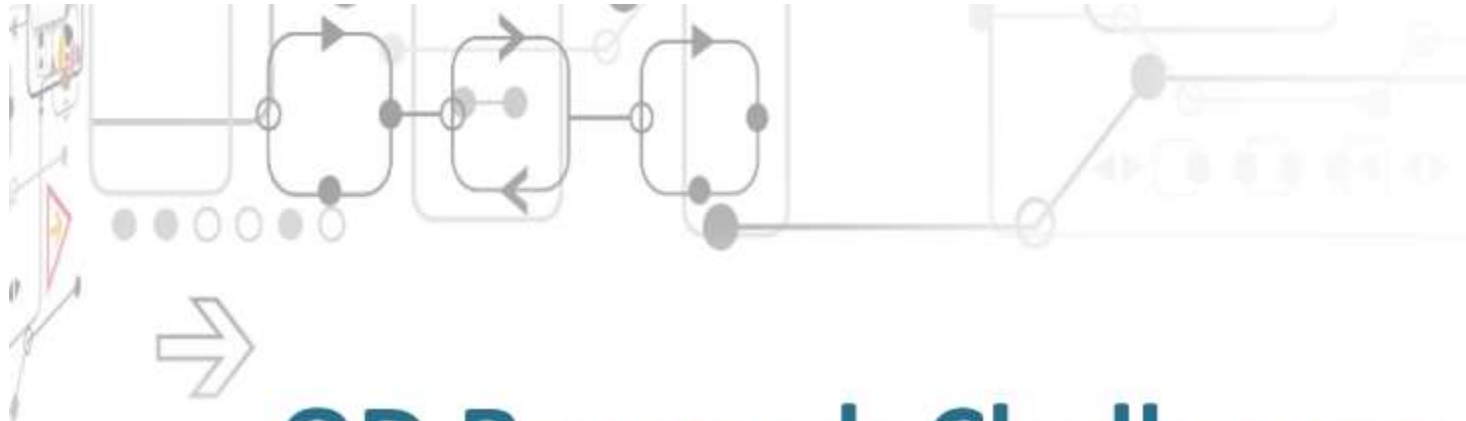


Refreezing

Recession/Decline Management

- “retrenchment actions stage”
- “strategic actions stage”

The second presentation



OD Research Challenges

Charalampos Alexopoulos



OGDRAT / OGD research topics

- Management and policies
 - legal issues, QA, visualisation, mining, publishing
- Infrastructures
 - portals, API's, storage, cloud, citizen-generated OD, sensor-generated OD
- Interoperability
 - metadata, multilinguality, platform & technical & organisation interoperability
- Usage and Value
 - skills, impact & readiness assessment, needs analysis



Multidisciplinarity of OGD

- usage of OGD in multi-disciplinary research can:
 - bring focus on important problems and challenges of modern societies
 - give insights about societal issues from different perspectives if conducted by various disciplines
 - be important when creating solutions and public policies

Research challenges & activities to address them



1. Lack of skilled workforce
 - create a training program for a new generation of OD researchers
2. Supplier driven → user driven
 - identify needs & tech. requirements of different users, find ways for a sustainable OD ecosystem
3. Linear → circular
 - identify value creation & OD sharing for all actors in the OD ecosystem
4. Exclusive → inclusive
 - stimulate non-government groups to participate in OD ecosystem (national & institutional strategies, infrastr. development)



Developing a Strategy for OD

1. Allocate roles and tasks
2. Identify value activities (on using and publishing OD)
3. Draft the strategy

Explanation of the Maturity model



- distinction of traditional and advanced OGD infrastructures
- metrics for different parameters of quality assessment → General, Information quality, System quality, Service quality

Assignment 1



The screenshot shows a BigBlueButton online session interface. On the left, there is a sidebar with sections for "MESSAGES", "NOTES", and "USERS (26)". The "MESSAGES" section is active, showing a "Public Chat" window with a list of participants and their messages. The "NOTES" section shows "Shared Notes". The "USERS" section lists 26 participants. The main area displays a presentation slide titled "Assignment 1". The slide contains a list of questions and instructions for the assignment. The bottom of the screen shows a Windows taskbar with various icons and a system clock indicating 12:35 PM on 9/8/2020.

MESSAGES

Public Chat

Bla Mandzuka

NOTES

Shared Notes

USERS (26)

Margareta H... (You)

Adam Vinković

Agung Indrajit

Alen Džidić

Ana Kutzjak

Anamarija Mura

Barbara Stibar

Baziljan van Loe...

Public Chat

Igor Pihir 12:07 PM
Thank you

Nikolina Zajdela 12:07 PM
Thank you

Martina Tomićić 12:08 PM
wh ever was recording, let me know, to send you the link with the recording who ever...

Filip Varga (AGRI) 12:09 PM
I didn't record but would like the recording as well if it's possible

Margareta Habazin 12:09 PM
I am recording

Margareta Habazin 12:09 PM
I was trying to save this but I don't know how

Margareta Habazin 12:10 PM
If you can send us a link...that would be great

Martina Tomićić 12:11 PM
yes, later today I will get the link, will upload it then to moodle in day 2 part

Filip Varga (AGRI) 12:14 PM
Thank you Martina

Assignment 1

- **Question A:** To what extent do you cover or address the open data research challenges in your already designed research? (estimation)
- **Question B:** what are the major barriers in terms of open data availability towards fulfilling your research project and how they could be addressed in your opinion?
- **Indicative Table:** Name | Organisation | Research Scope | Neighboring Research Domains | OD Research Domain | QA Answer | QB Answer
- **Delivery method:** 1-2 slides (.ppt)
 - include it also in your research presentations
- **Deadline:** Tomorrow morning session



⇒ Interdisciplinary research

Frederika Welle Donker

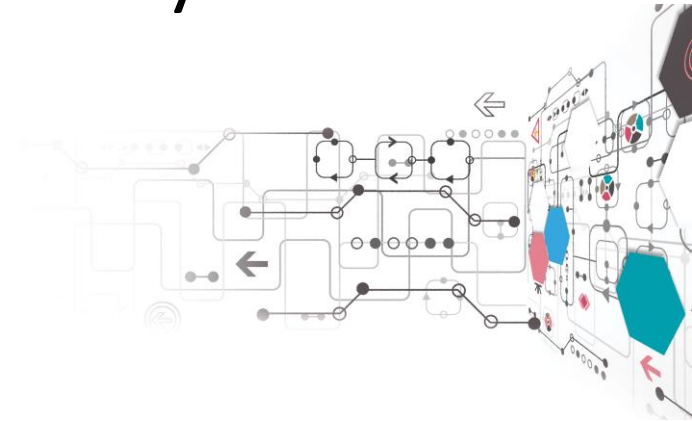


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One of TODO's main goals

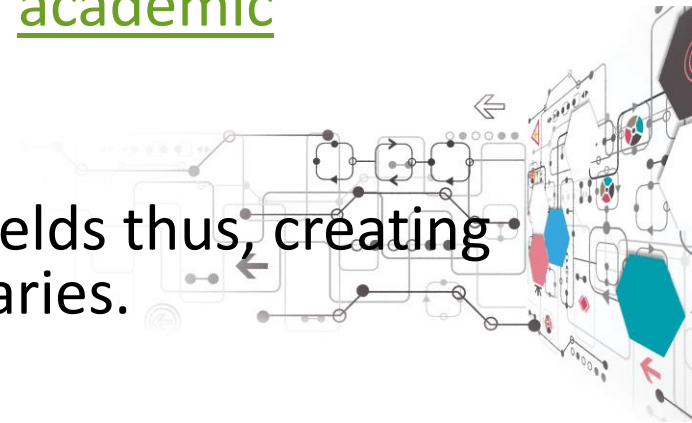
- The project "Twinning Open Data Operational" (TODO) aims to leverage the interdisciplinary scientific excellence and innovation capacity of the University of Zagreb (UNIZG) in the field of open data to boost the supply and use of open government data in Croatia and beyond



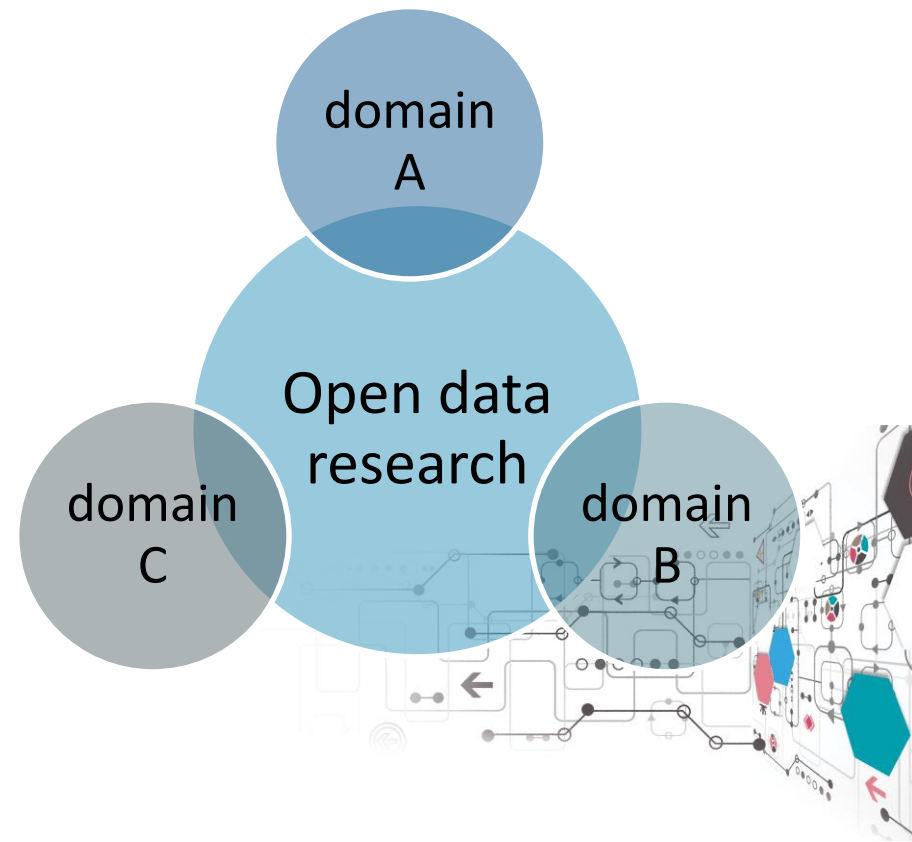
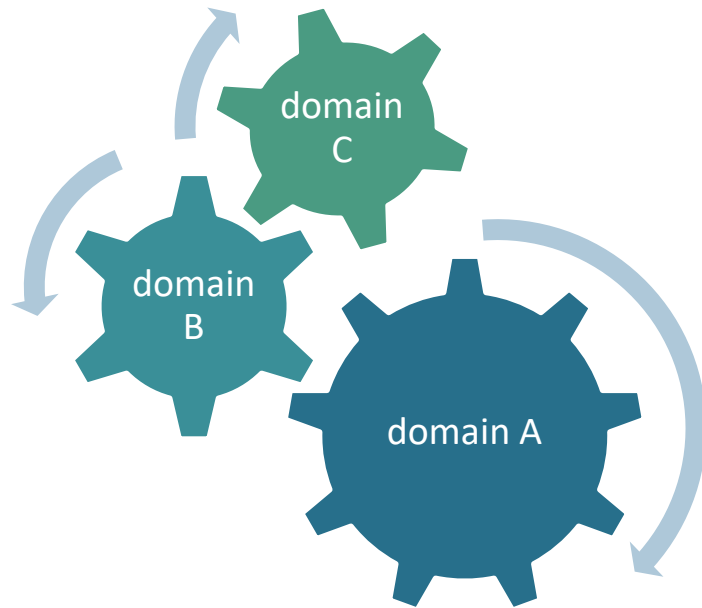
What is interdisciplinary research?



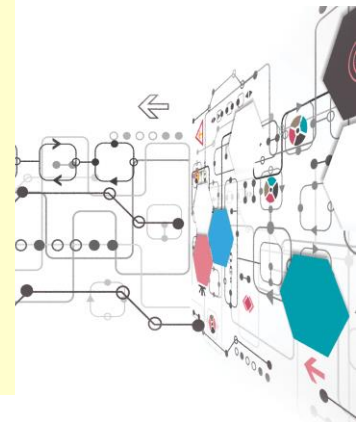
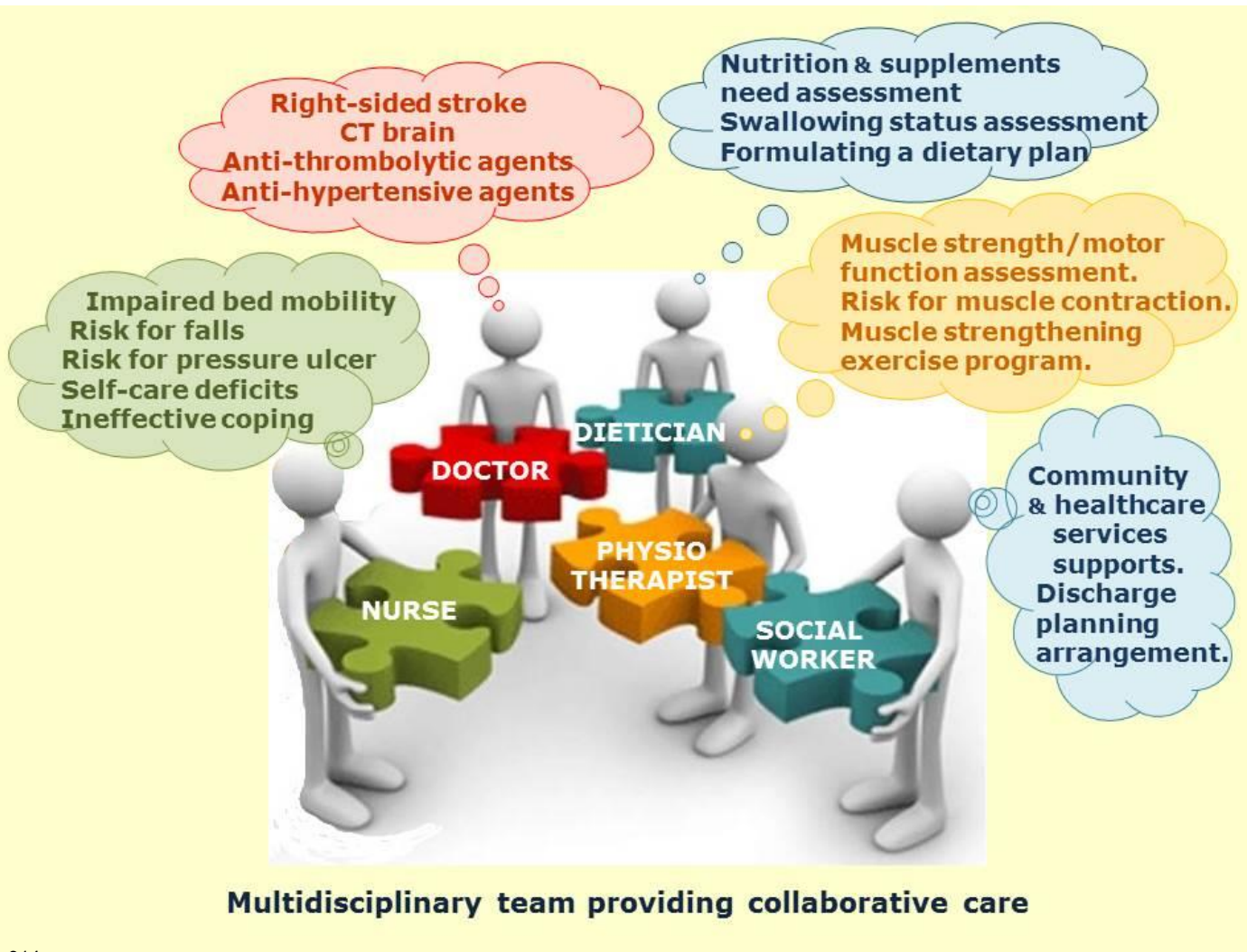
- *"Interdisciplinary research is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice."*
(https://nsf.gov/od/oia/additional_resources/interdisciplinary_research/definition.jsp)
- involves the combining of two or more academic disciplines into one research project.
- draws knowledge from several other fields thus, creating new insights by thinking across boundaries.



Multidisciplinary versus interdisciplinary

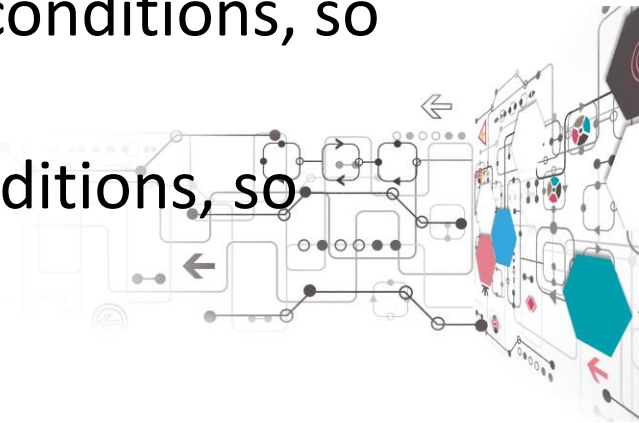


Example of an interdisciplinary approach in hospitals



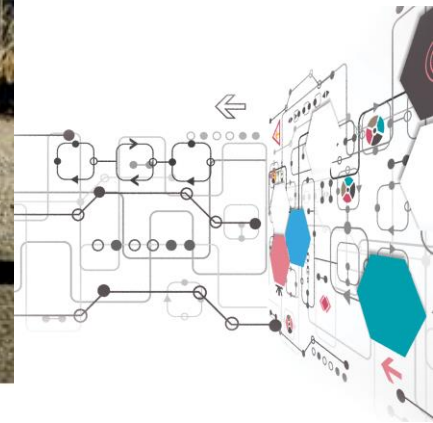


- Started with a dream of 2 students in 1999
- 10 students from many disciplines: mechanical engineering, applied physics, applied earth sciences, aeronautic engineering, electrical engineering, informatics, technology management & policy
- Need big sponsors, so PR expertise
- Need to have knowledge of local road conditions, so GI expertise
- Need to make the most of weather conditions, so meteo expertise

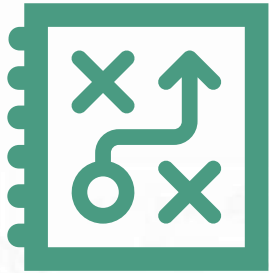


And even then

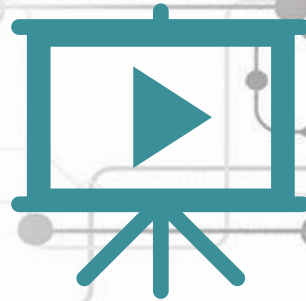
- After 7 times world champion, this in 2019 on the final leg ...



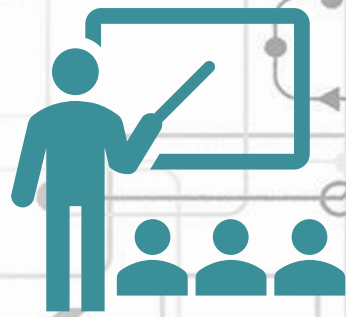
What do we need for TODO interdisciplinary research?



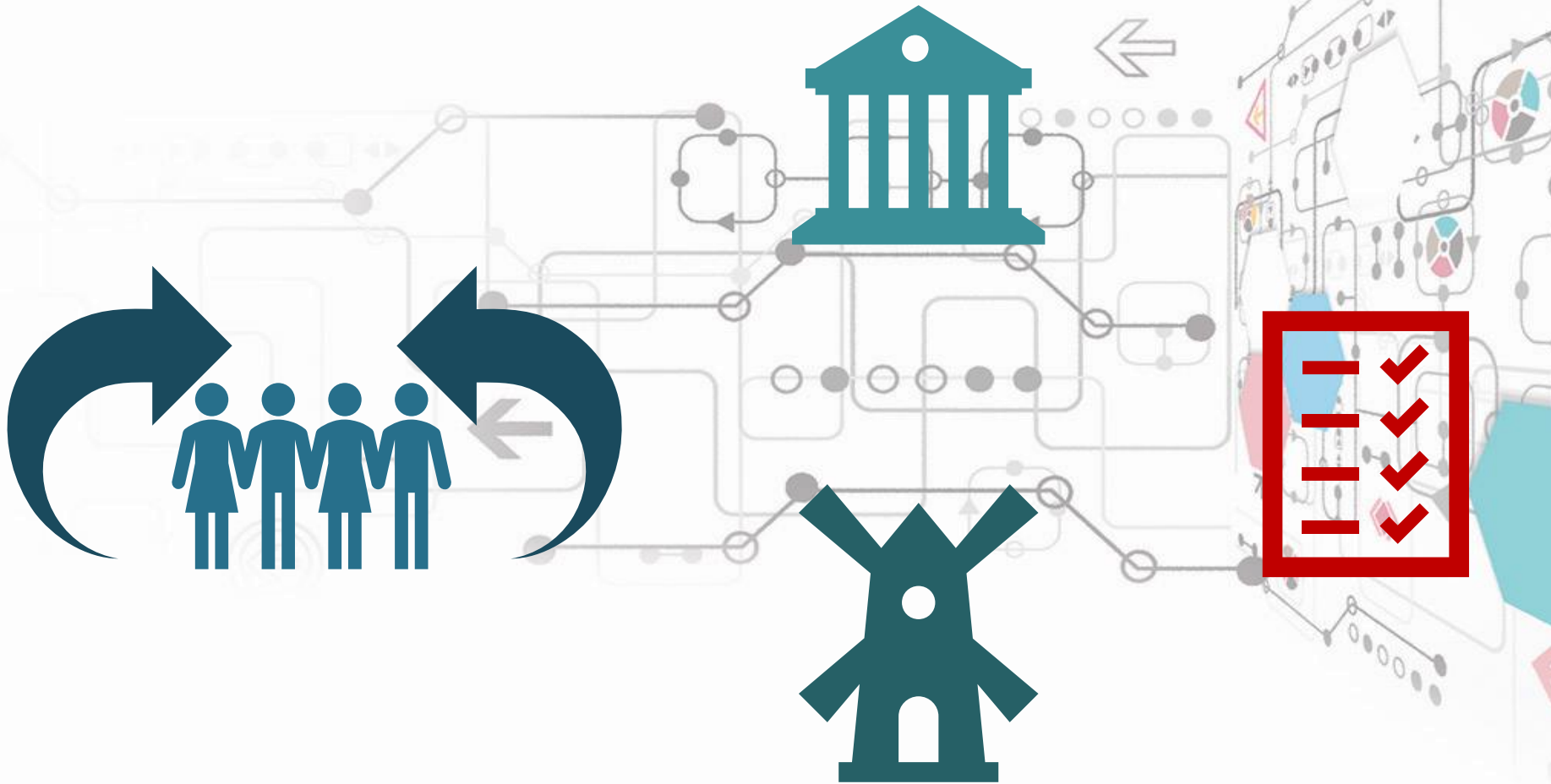
Steps for interdisciplinary research



ESR interdisciplinary research



More activities to foster interdisciplinary research





Special research groups

- formalized at each UNIZG faculty. ←
- research groups will get formal recognition and approval of faculty boards
 - research (open data) labs, or similar units.
 - will become central and permanent places for engaging interdisciplinary and multidomain research.

Dissemination of interdisciplinary research

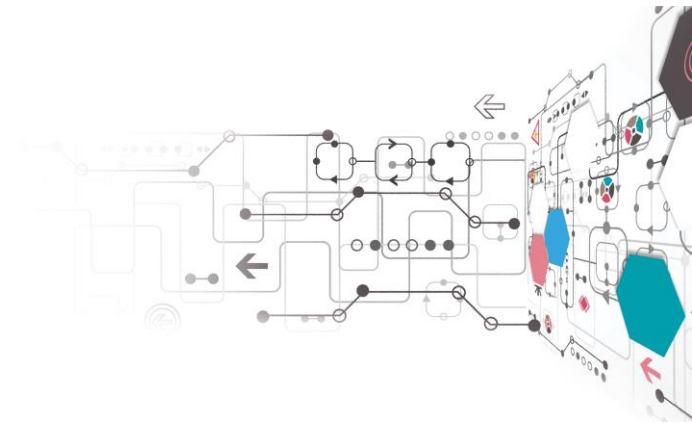




Open data research output

UNIZG Faculty	Single discipline		Interdisciplinary	
	Open data development	Applications of open data	Open data development	Applications of open data
GEOD	2	9	2	5
FER	2	2	1	8
FOI	0	5	3	2
LAW	1	1	1	1
TRANS	1	2	1	1
AGRI	1	10	0	6

- Research with open data
- Research on open data



Interdisciplinary research



Mix of UniZG
faculties
with UAgean
& TUD

01

02

Mix of students

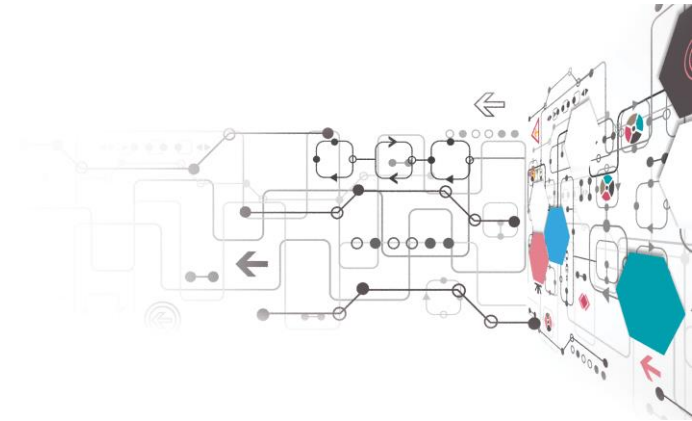


04

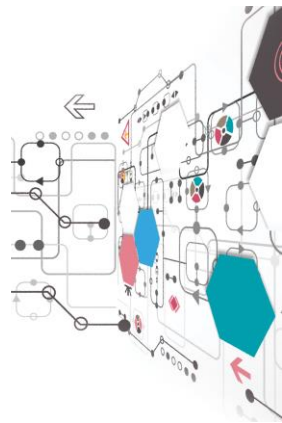
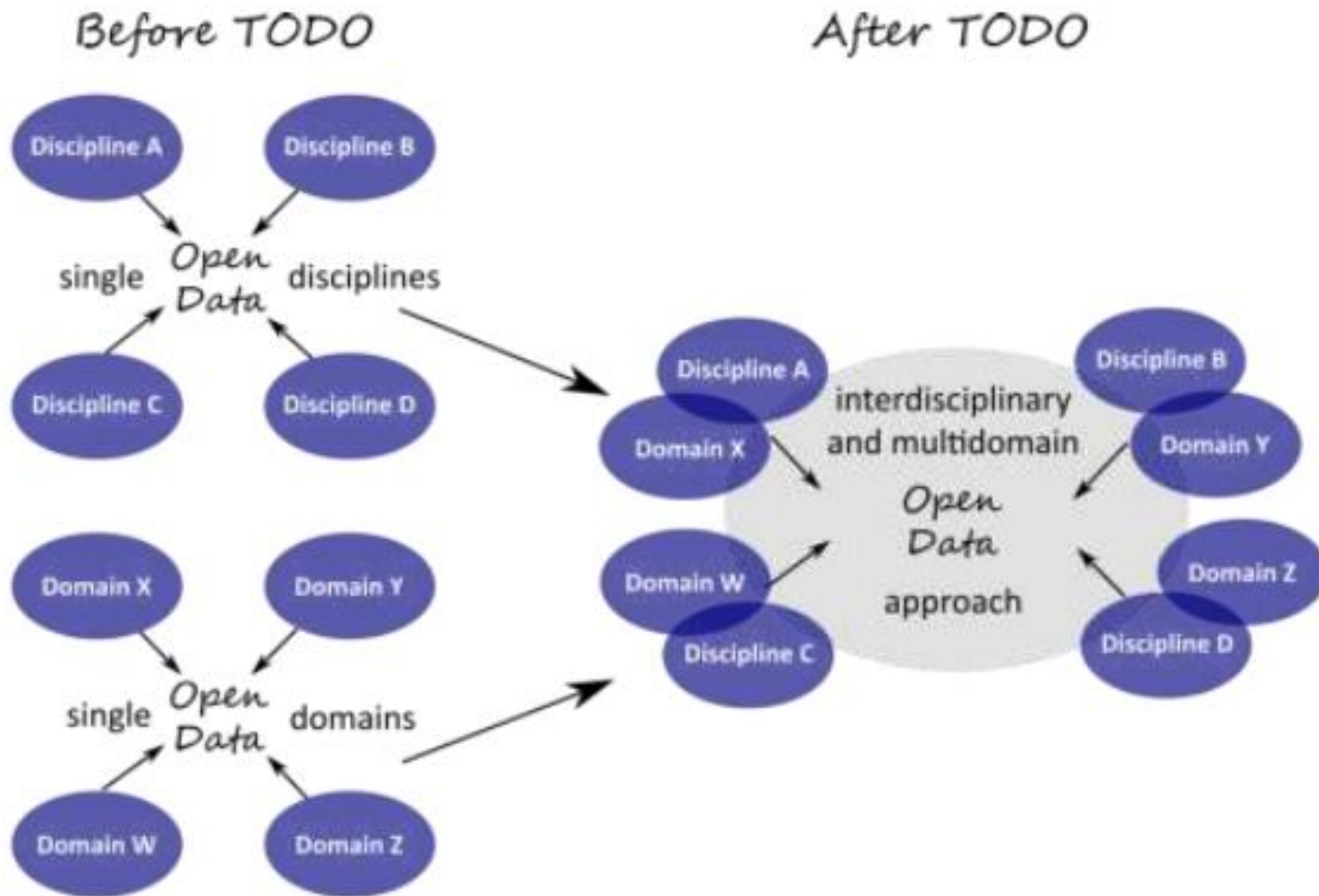
Mix of insights

Mix of domain
expertises

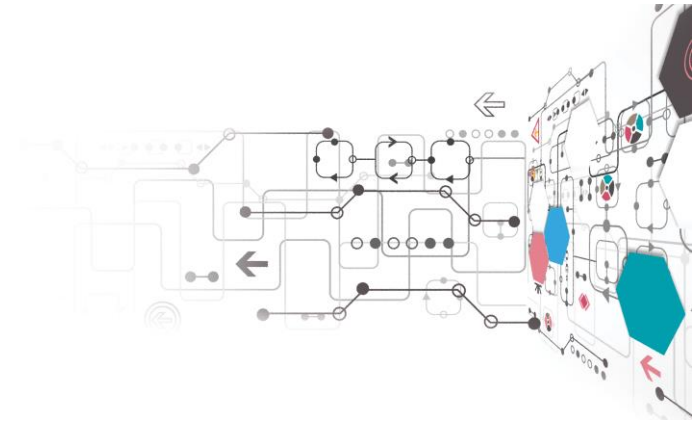
03



Our goal



Questions





⇒ Disciplinary research methodologies FOI

Neven Vrček, Renata Mekovec, Martina Tomičić Furjan, Igor Pihir, Nikolina Žajdela Hrustek, Larisa Hrustek, Ana Kutnjak, Barbara Šlibar, Jura Kapustić

nvrcek@foi.unizg.hr, martina.tomicic@foi.unizg.hr, ipihir@foi.unizg.hr, renata.hudek@foi.unizg.hr, nzajdela@foi.unizg.hr, lhrustek@foi.unizg.hr, akutnjak@foi.unizg.hr, bslibar@foi.unizg.hr, jkapustic@foi.hr



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda



A

About FOI



B

FOI Team



C

Open data research



D

Research methodologies



E

Status of open data on local level



F

Open data research challenges



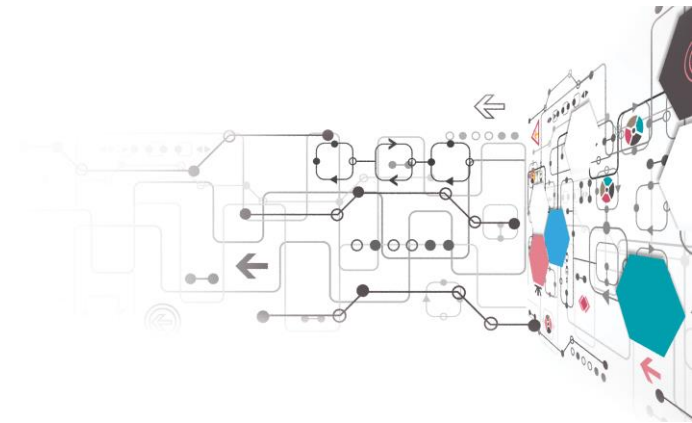
G

Opportunities to cooperate



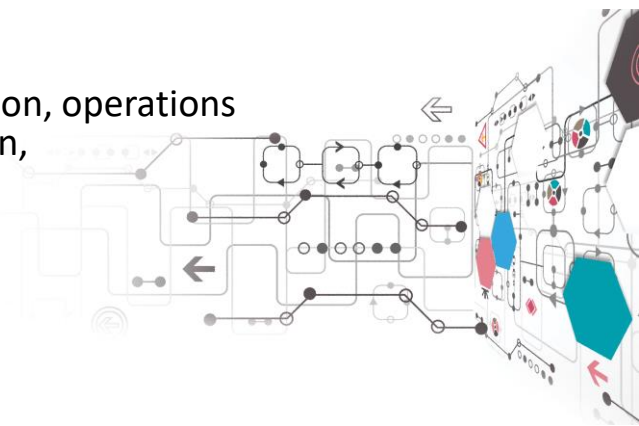
Faculty of Organization and Informatics, University of Zagreb

- providing education in information technology and information sciences – 2876 students, 12 study programmes
- involved in several EU funded projects and programmes, academia-industry cooperation projects and scientific/research projects in line with national research policy and funded by the state – 25 active projects
- scientific and research activities are focused on research fields and topics:
 - *Technology enhanced learning,*
 - ***ICT application in private and public sector,***
 - *Information systems management,*
 - ***Business process reengineering,***
 - ***E-government,***
 - ***Organizational design,***
 - *Decision support systems,*
 - *Electronic and mobile business,*
 - ***Software engineering, programming tools, paradigms and methods,***
 - *Service oriented architectures,*
 - *Information systems security,*
 - *Biometrics,*
 - *Multimedia systems,*
 - ***Quantitative methods for decision making,***
 - *Risk analysis,*
 - ***Project management and Strategic planning***



FOI Team

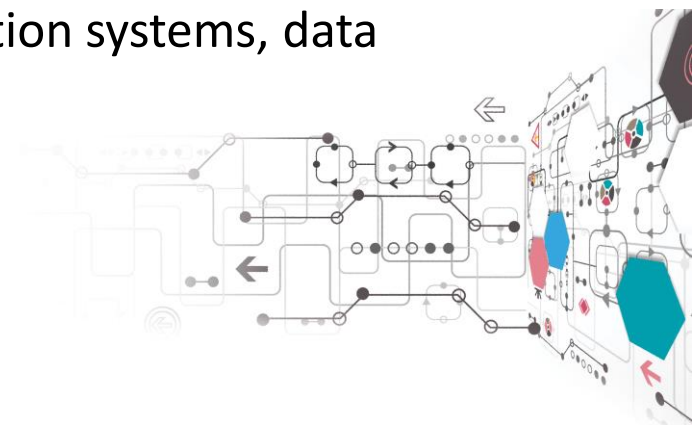
- Neven Vrčec (Full Professor with Tenure)
 - fields of interests: strategic planning of information systems' development, e-commerce and IT applications in business sector, business performance measurement and digital signal processing
- Renata Mekovec (Associate Professor)
 - fields of interests: privacy and personal data protection, e-service quality and evaluation of e-service quality, e-service users' perception of privacy and e-service quality
- Martina Tomičić Furjan (Assistant Professor)
 - fields of interests: strategic planning of information systems, strategic development and implementation of information and communication technology and organizational performance measurement, digital transformation
- Igor Pihir (Assistant Professor)
 - fields of interests: business process improvement and reengineering with use of information and communication technology, use of e-business, digital transformation, implementation of complex information systems, integration of information systems or investment plans for process improvement in government or private companies and public sector
- Nikolina Žajdela Hrustek (Assistant Professor)
 - fields of interests: operations research, modelling and simulation, operations management, project management, e-government, e-inclusion, digital divide, digital inclusion





FOI ESR Team

- Larisa Hrustek
 - fields of interests: digital transformation of business processes, the role of the open data in digital transformation in economy and public administration
- Ana Kutnjak
 - fields of interests: digital transformation (economic aspect of use of open data in digital transformation), business process management and improvement and operations management
- Barbara Šlibar
 - fields of interests: open data, decision making, learning in higher education
- Jura Kapustić
 - fields of interests: machine learning, information systems, data privacy, data management, open data



Open data research

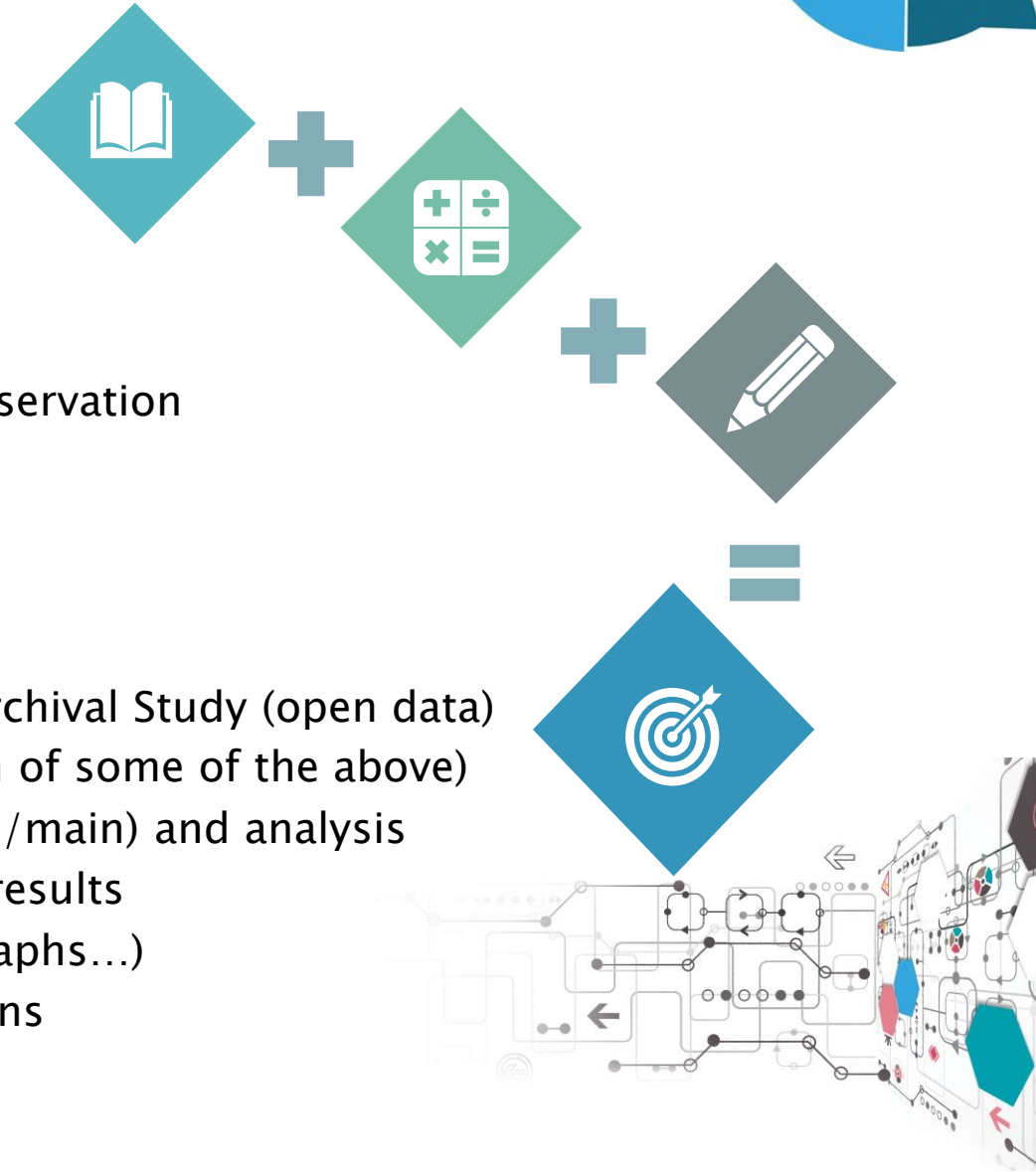


- Open data life cycle – What role FOI can play?
- **Creators (or reusers)/Researchers**
 - use data to create information,
 - use data to create applications and services,
 - use data for research purposes,
 - use data for analyses and insights, visualisations,
 - use data to create recommendations for policymakers for creating principles and measures to generate outcomes
- Research with open data – on secondary data from national and international open data portals (Croatian Bureau of Statistics, EUROSTAT, EUROPEAN DATA PORTAL, Croatian open data portal, Local government OD Portal(s) – Rijeka; Zagreb; Varaždin, data.gov.uk, data.gov., open.canada.ca...)
- Research on open data – FOI doesn't perform research on open data



Research methodologies

- Literature review
- Problem identification
- Research questions
- Research goals
- Research hypotheses
- Selection of research method:
 - Observation / Participant Observation
 - Surveys
 - Interviews
 - Focus Groups
 - Experiments
 - Secondary Data Analysis / Archival Study (open data)
 - Mixed Methods (combination of some of the above)
- Conduction of the research (pilot/main) and analysis
- Identification / establishment of results
- Results presentation (models, graphs...)
- Conclusions and recommendations
- Future work



Status of open data in Domain/ Discipline



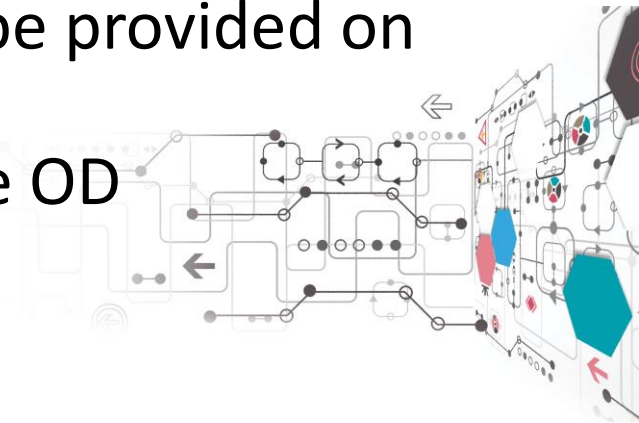
- Local government OD Portal(s) – Rijeka; Zagreb; Varaždin
- Small number of published datasets per local OD portal
- Feedback or rating mechanism is not implemented
- Mostly information about dataset license is visible through the metadata (cc-by)
- Resource URL is mostly provided within metadata
- There is no metadata about data quality
- Historical versions of datasets are not published (only the latest version of the resource is available)
- Assessed local portals are based on a recognized data management system (CKAN or DKAN)
- Metadata are mostly published in national language
- Datasets are not published frequently and those that are published are not updated frequently or at all
- There is no evidence of the application of published datasets



Open data research challenges in domain/ discipline



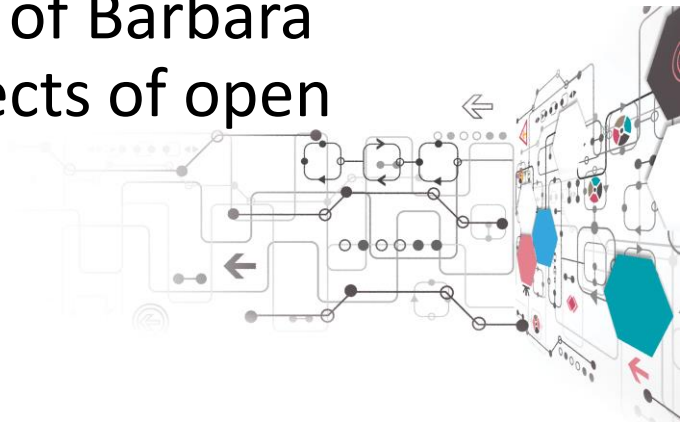
- Publish datasets must be frequently publish and updated
- Since there are a small number of datasets published on portals there is no evidence of the use of such data to our knowledge
- Assessed portals should be upgraded in order to offer feedback mechanism to an end-user
- Development of open data strategies should be based on best practices
- Datasets as well as metadata should be provided on widely used language
- There is need for events that promote OD

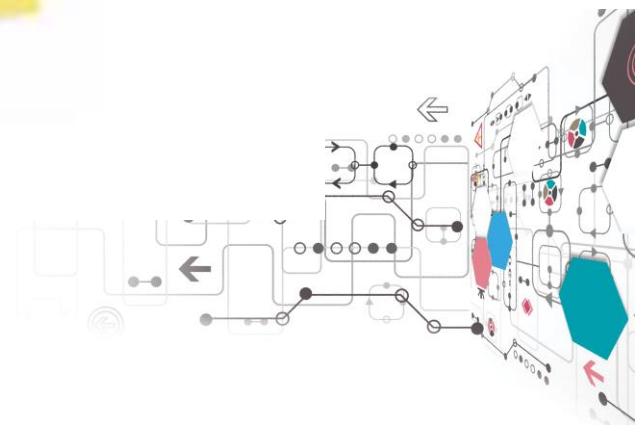


Opportunities to cooperate in TODO



- TRANS – open data for Digital transformation (Smart cities)
- AGRI – cooperation on PhD thesis of Larisa Hrustek
- LAW - data privacy, citizen empowerment, open data policy / governance, open data costs, legal issues: licences (copyright), personal data and anonymisation, fiscal/budgetary, environmental, healthcare, social security
- TUDelft - cooperation on PhD thesis of Barbara Šlibar - assessment of technical aspects of open data







⇒ Delft University of Technology (TU Delft)

Bastiaan van Loenen, Marijn Janssen,
Hendrik Ploeger, Frederika Welle
Donker, Anneke Zuiderwijk



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Team



Dr. Anneke Zuiderwijk



Dr. ir. Bastiaan van Loenen



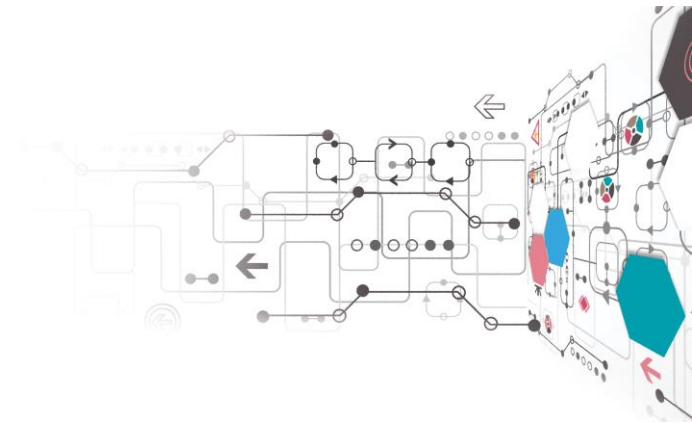
Dr. ir. Frederika Welle Donker



Dr. mr. Hendrik Ploeger



Prof. dr. ir. Marijn Janssen



Faculty of Architecture and the Built Environment

Knowledge Centre Open Data

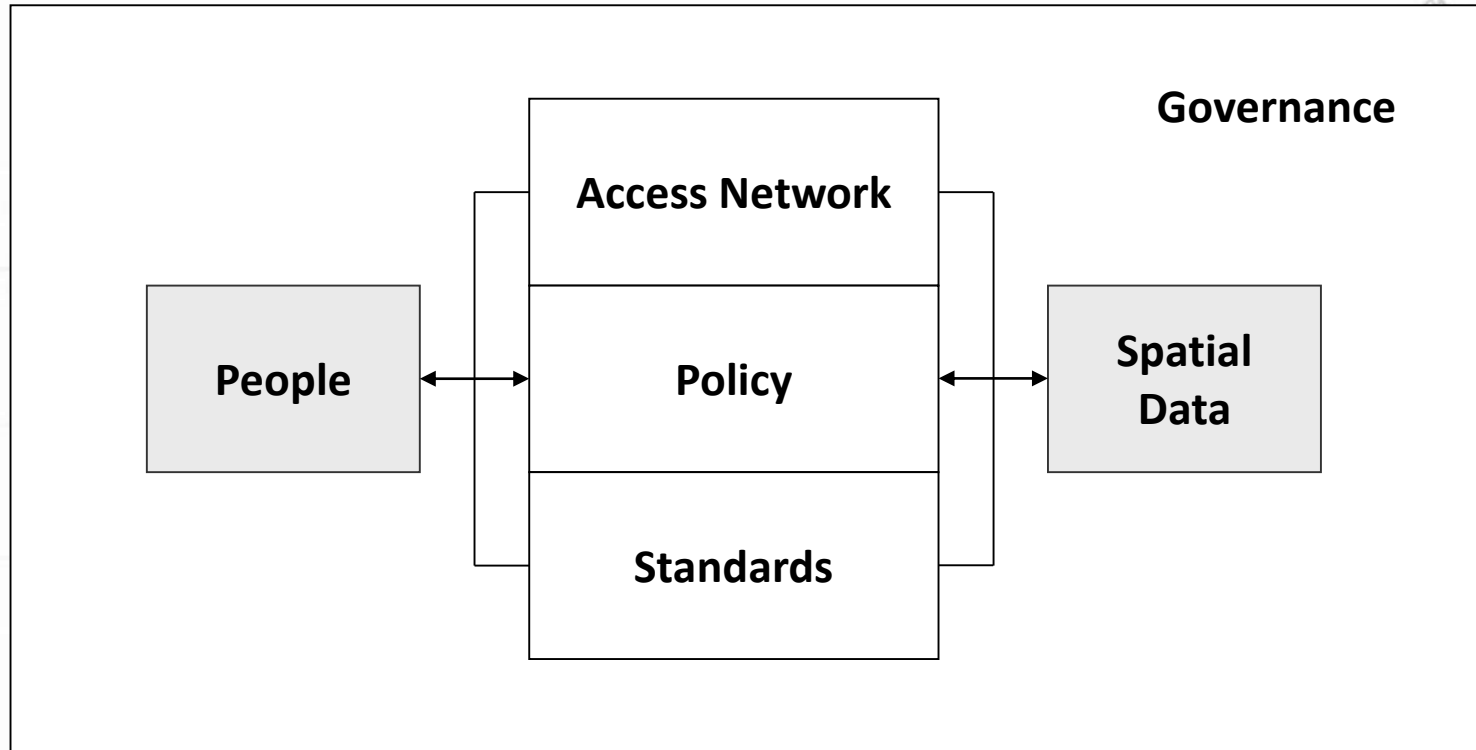


Research focuses on the governance of open data, its impact, legal and financial conditions for implementing and adopting open data policies.

- Governance of open data
- Legal aspects of open data
- Open data business models
- Assessment of open data infrastructures
- Use and users of open data
- Scope:
 - Spatial data and
 - The Built Environment

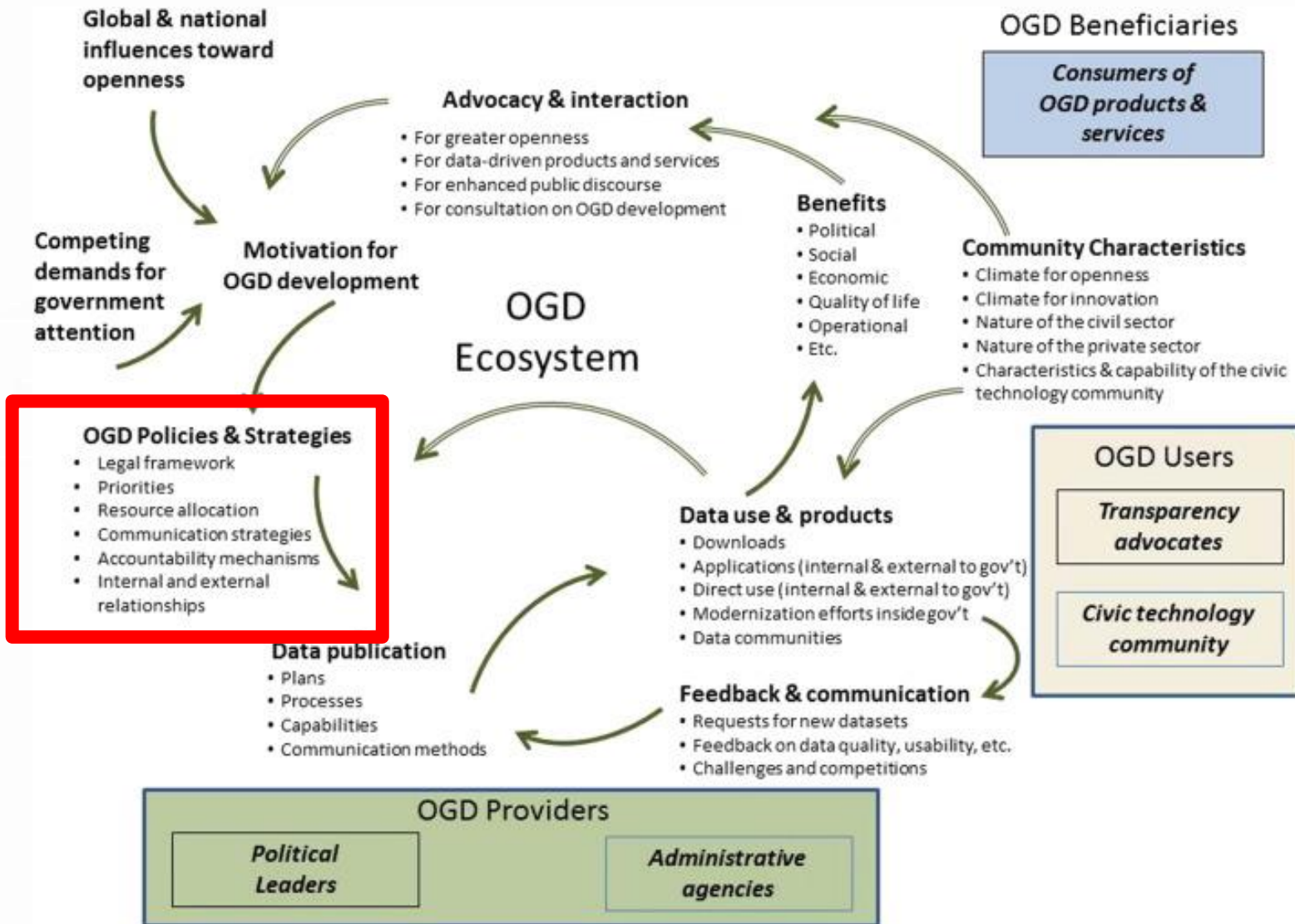


Spatial data infrastructure concept



Source: Nature of and Relations between SDI-Components (Rajabifard *et. al.* 2002)

Open data ecosystem



(Source: Dawes et al. 2012)

Faculty of Technology, Policy and Management

Dr. Anneke Zuiderwijk & Prof. Marijn Janssen



Faculty of Technology, Policy and Management



- Anneke: Assist. Prof. of Open Data
 - Theory development concerning infrastructural and institutional arrangements
 - that incentivize open data sharing and use behavior
 - by governments, researchers, companies and citizens
 - from different disciplines and domains
- Multi-actor, multi-disciplinary



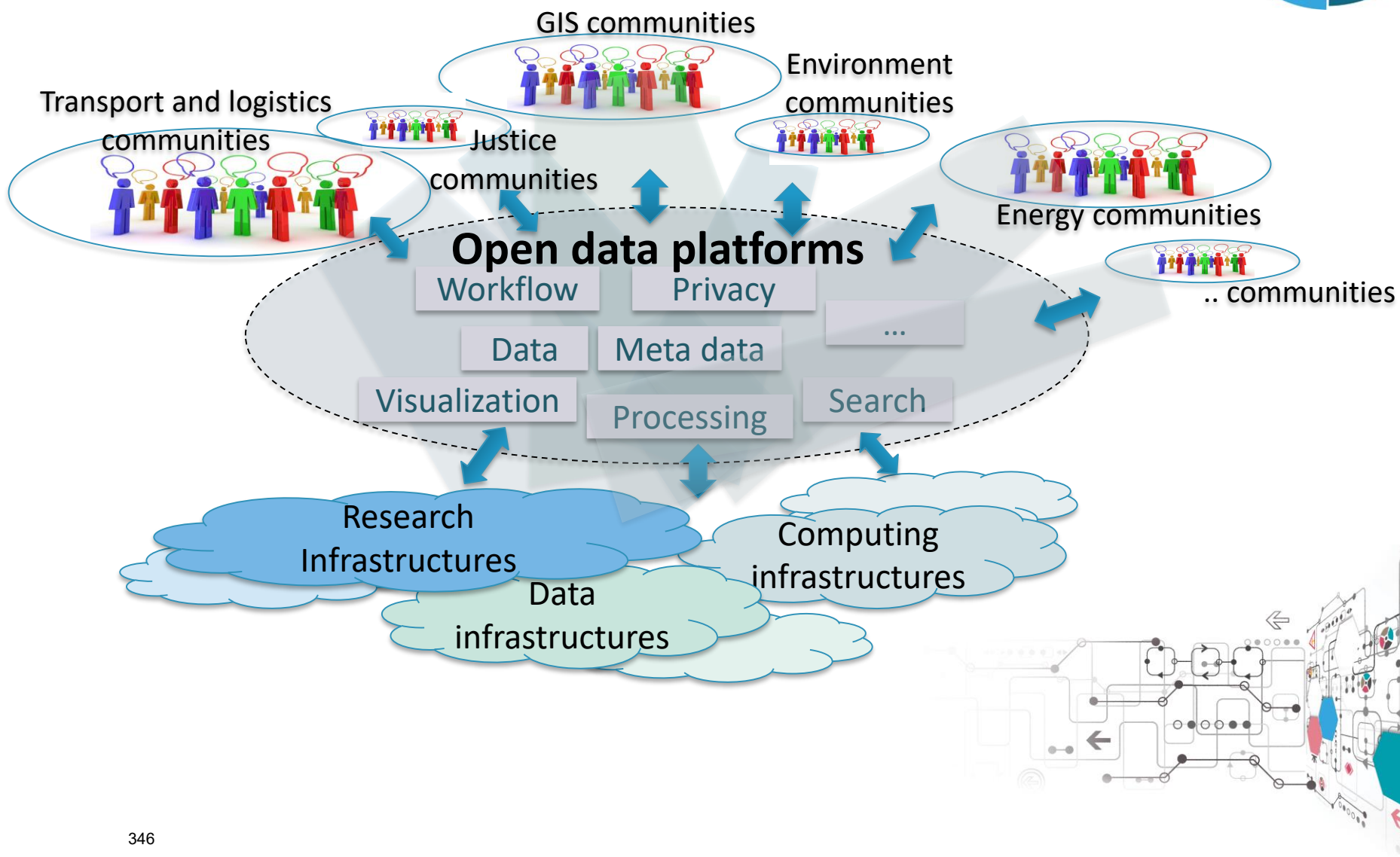
Faculty of Technology, Policy and Management



Marijn: Prof. of ICT and Governance

- ICT-architecting in situations in which multiple public and private organizations need to collaborate
- ICT & Governance, new forms of governance, open data
- Infrastructure
- Orchestration
- Digital Government

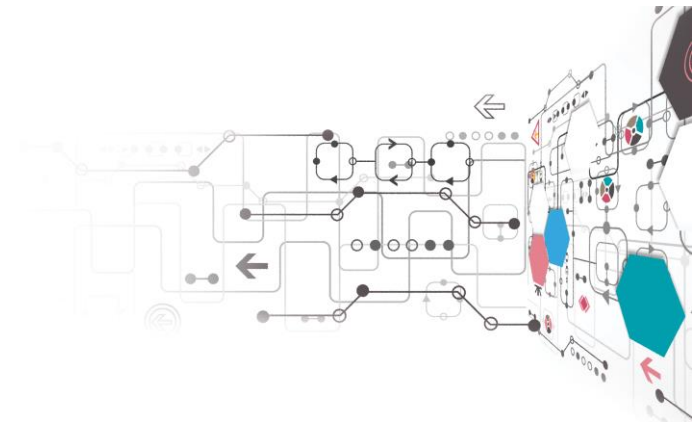




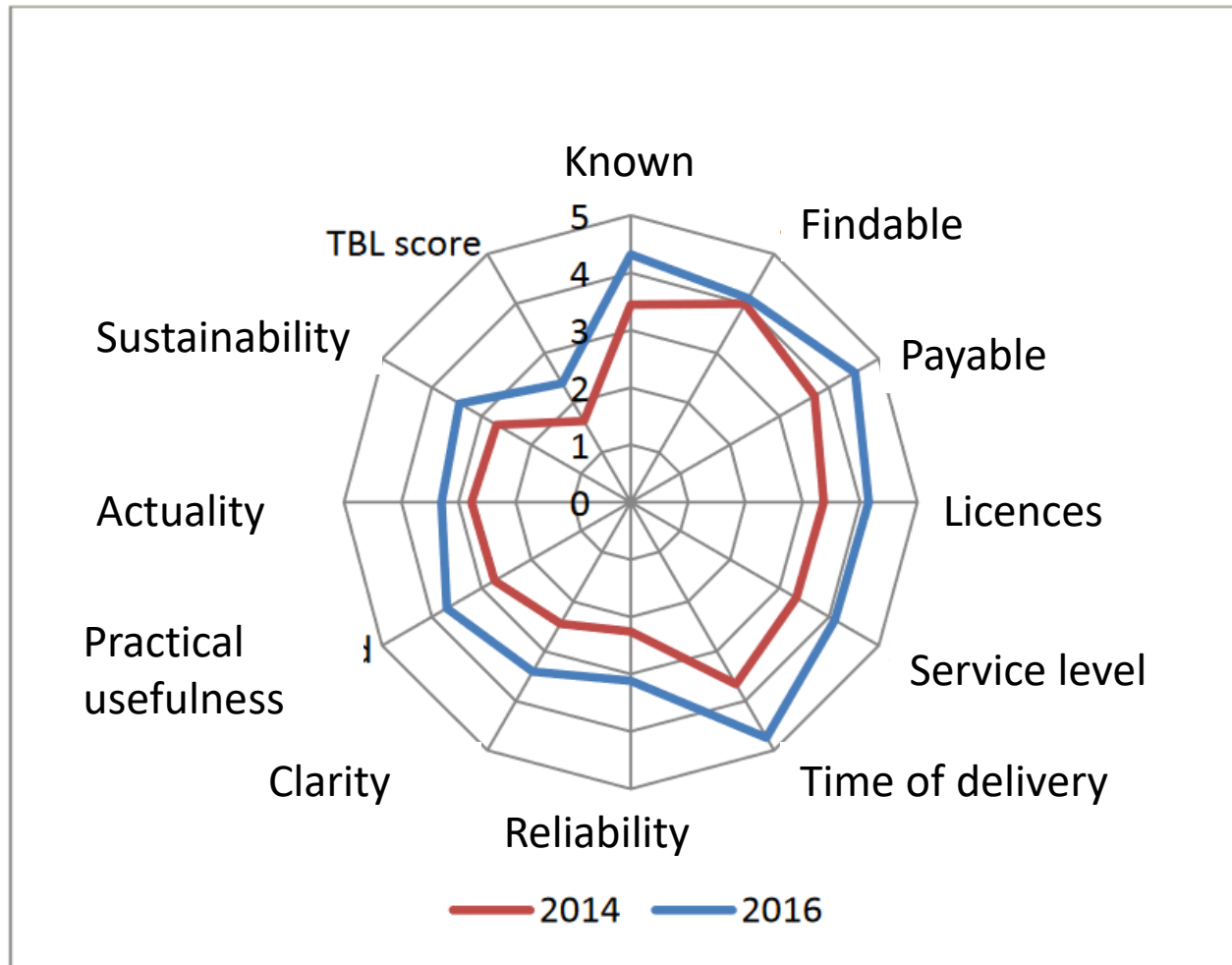


Research methods

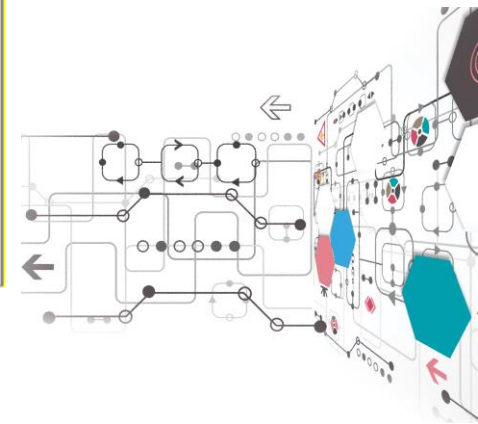
- Qualitative research:
 - Case studies
- Quantitative research:
 - Surveys
 - Cost benefit analyses



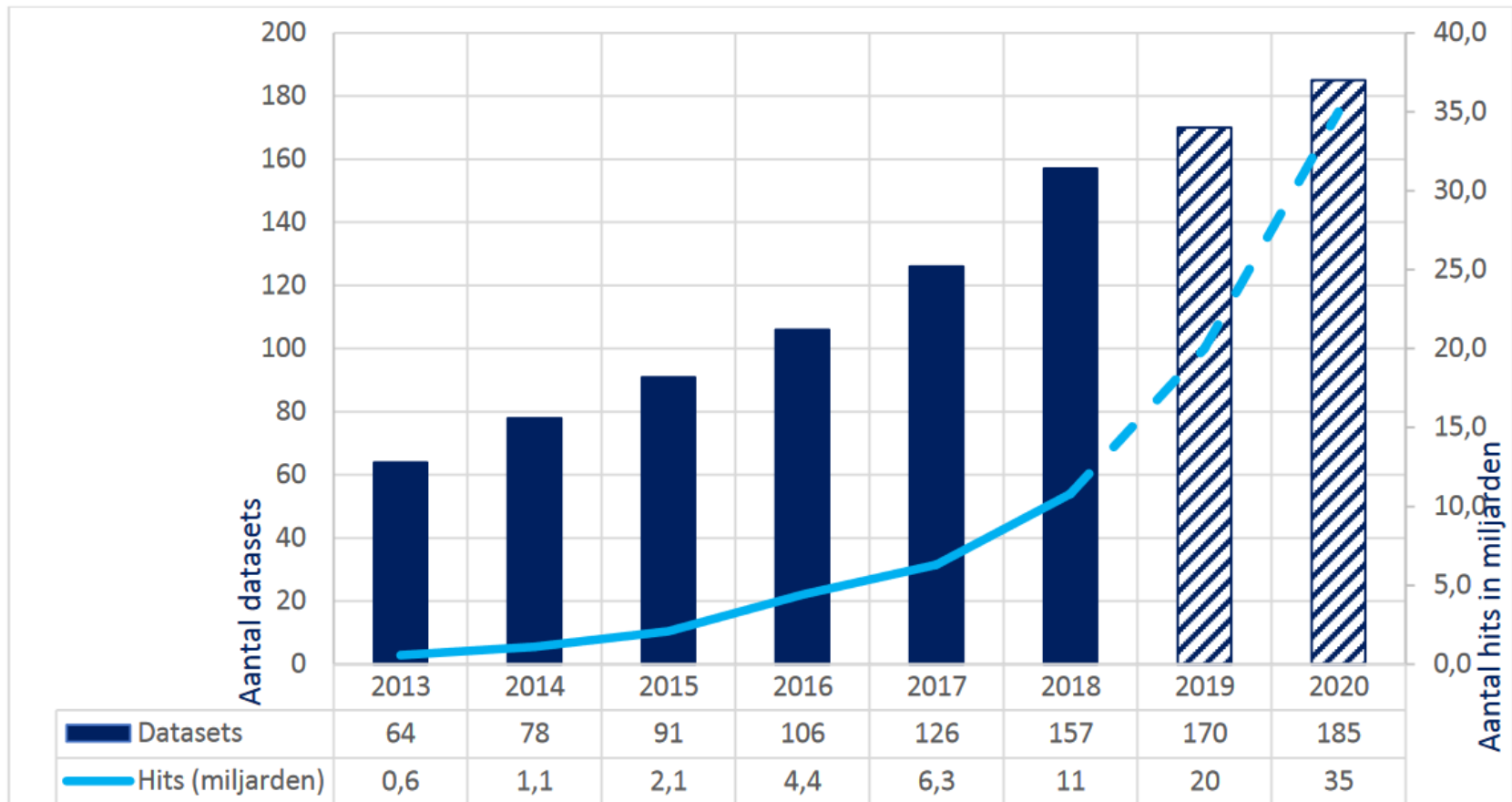
Status of open data in the Netherlands: domain GEO (1)



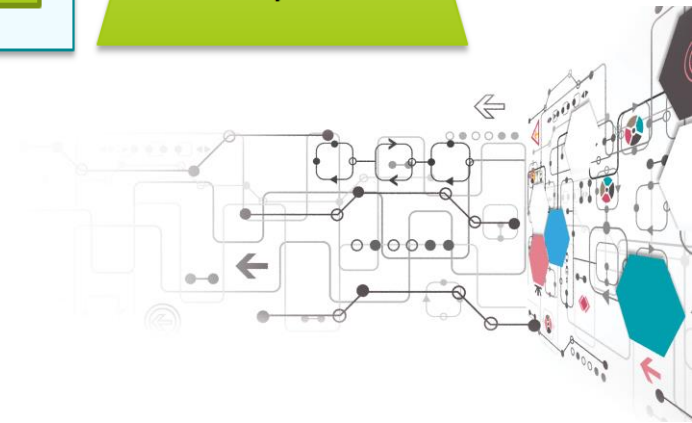
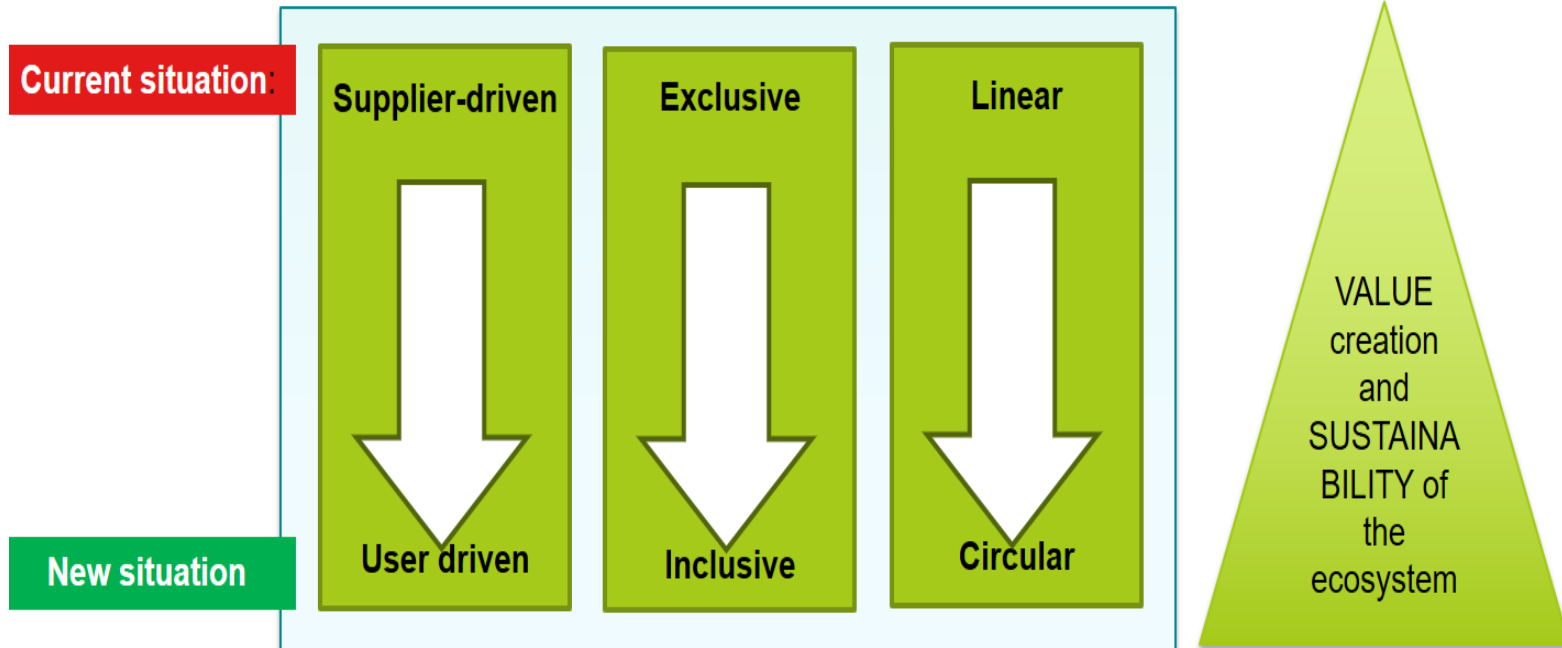
Figuur 26: Geaggregeerde score van de 2014 en 2016 Top 20



Status of open data in the Netherlands: domain GEO (2)



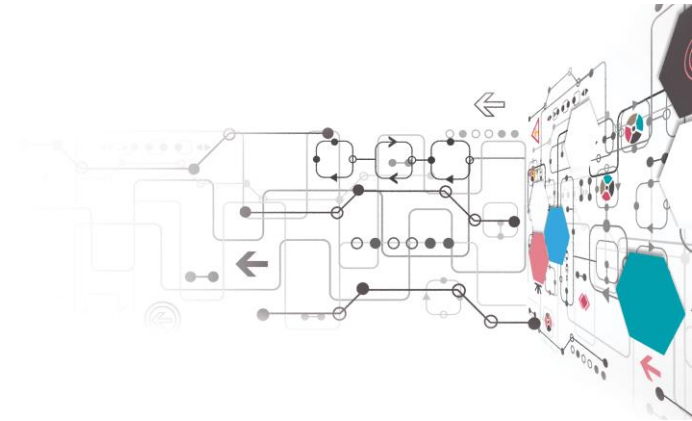
Open data research challenges in your domain/ discipline



Opportunities to cooperate in TODO



- Interdisciplinary approach
- ESR projects
- New research avenues
- Joint research/papers



Further information

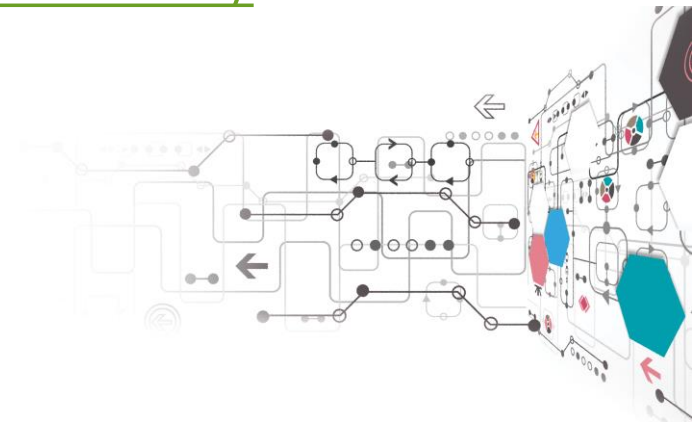


KNOWLEDGE CENTRE OPEN DATA
Delft University of Technology

<http://www.kc.opendata.eu>



<https://www.tudelft.nl/en/tpm/about-the-faculty/departments/engineering-systems-and-services/>





⇒ Faculty of Law, University of Zagreb

Anamarija Musa, Tihomir Katulić, Petra Đurman, Tereza Rogić
Lugarić, Marko Jurić

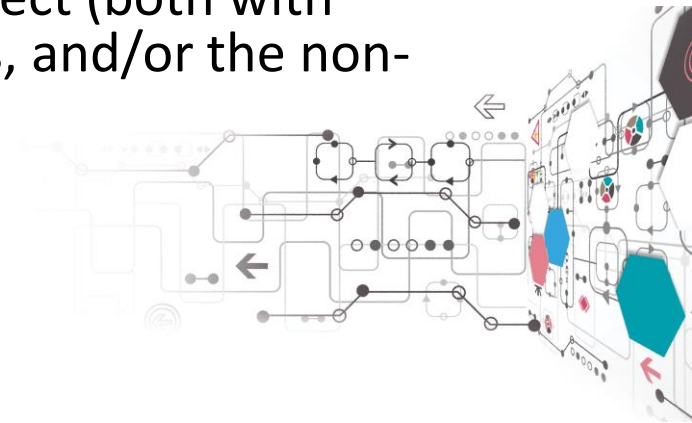


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda

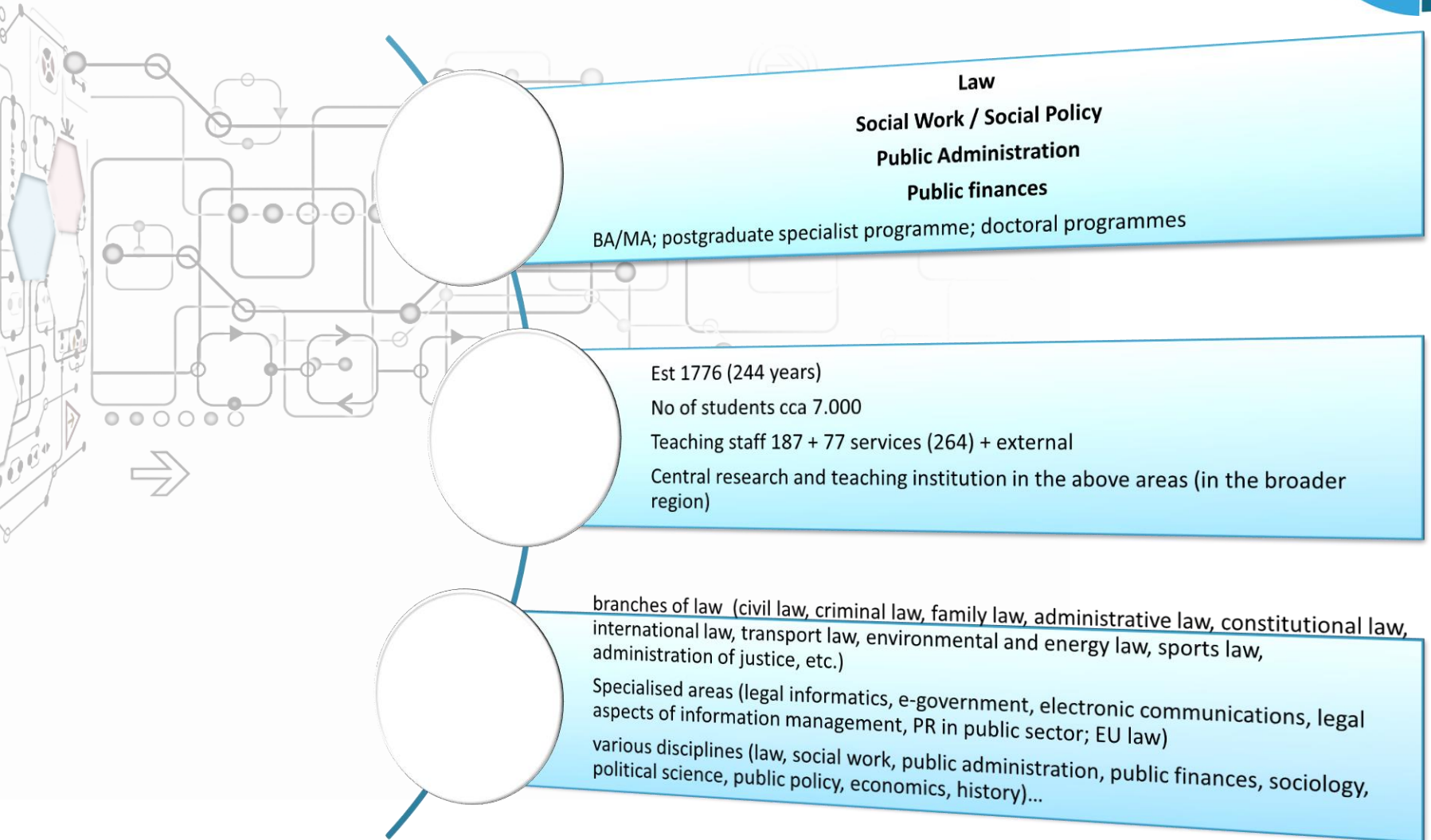


- Introduction of the LAW team
- Focus of research :
 - Research with open data (using open data for your research)
 - Research on open data (e.g., assessment of ecosystem, laws to improve reuse, etc)
- Research methodologies
- Status of open data in your domain/ discipline: results of OTP M3 assignment
- Open data research challenges for the institute's domain/ discipline
- opportunities to cooperate within the project (both with UNIZG partners, the international partners, and/or the non-academic partners).
- other



FACULTY OF LAW

Where are we coming from?



Team LAW

(+ broader group – OD supporting project; + ESR)



Associate professor Dr
Anamarija Musa /
Department of Public
Administration



- Main field / topic: Public administration, public sector organisations, regulation, transparency, e-government
- Legal framework for open data; transposition of the PSI/OD directive/ requests; online availability; restrictions
- Governance / Policy / stakeholders
- Institutional (political, legal) data

Postdoc researcher Dr
Petra Đurman /
Department of Public
Administration



- Main field / topic: Public Administration, Regulation & Policy / Participation
- OD topics:
- OD Governance & Policy social impact)
- E-Participation (collaboration among stakeholders;
- Institutional (political, legal) data

Associate professor Dr
Tereza Rogić Lugarić /
Department of
Financial Law and
Public Finances



- Main field: Tax law, public finances, city finances / Tax transparency, data exchange, tax secrecy
- OD topics:
- Fiscal implications of open data (charging)
- Open budgets
- Tax & public finances data

Assistant professor Dr
Tihomir Katulić /
Department of Legal
Informatics



- Main field / topics:
- IT law / cybersecurity, IoT; intellectual property law, privacy
- OD topics: copyright (licences, databases); privacy;
- Electronic communication data

Assistant professor Dr
Marko Jurić /
Department of Legal
Informatics

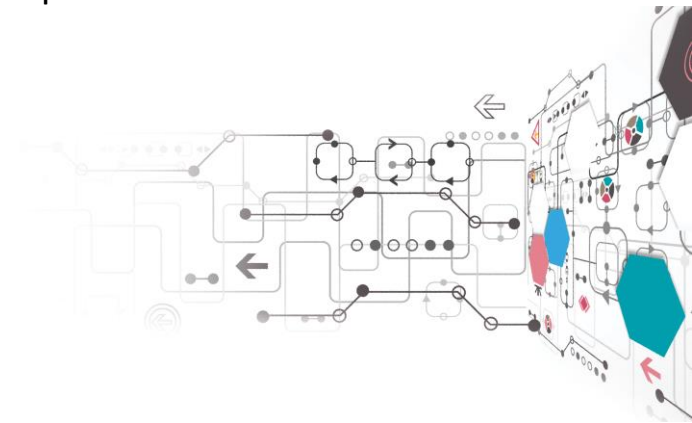


- Main field/ topics:
- IT Law / intellectual property law; privacy
- OD topics: privacy; copyright, databases & licences ;

Open data research



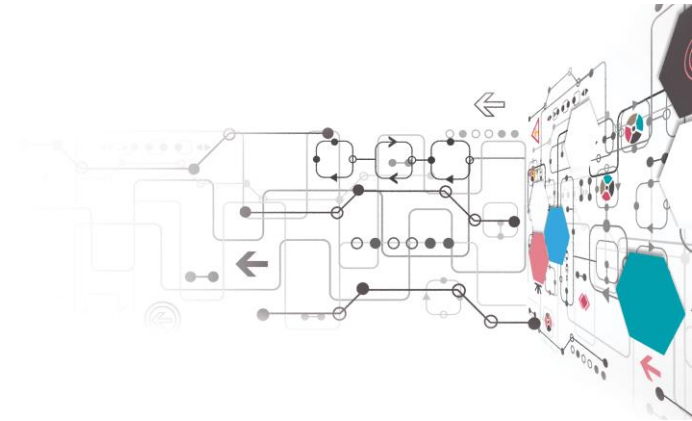
- **Research with open data (based on open data, using open data)**
- Special interest in specific datasets:
- Core: institutional & legal & political data (public organisation performance, organisational, financial, legislation & judicial)
- Sectoral: crime, environment, traffic, land registers, institutional performance; policy outcomes in different areas... actually, any possible area...)
- **Research on open data**
- Policy & Governance (policy formulation/implementation; stakeholders –decision-making and coordinating institutions; PA principles; organisational change; public bodies types and management; corruption, accountability, transparency; self regulation and co-regulation - internationally)
- Legal framework (EU directive transposition; specific legal issues – licences, databases, exclusive rights, transparency, request procedure and review; data protection & anonymisation; other restrictions)
- Users - Collaborative arrangements
- Assessment





Research methodologies

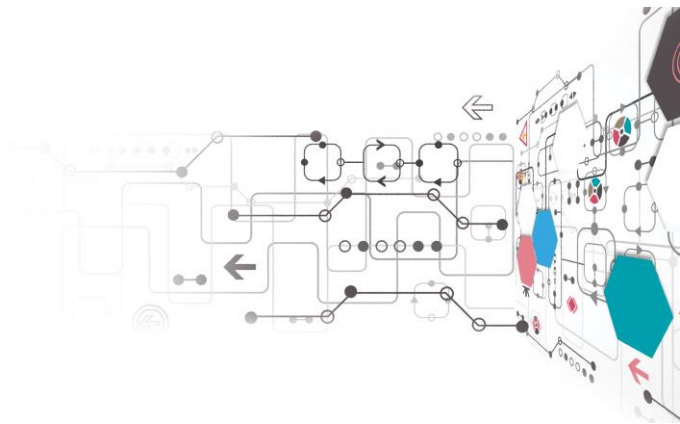
- Legal analysis
- Content analysis
- Surveys/questionnaires / interviews
- Case studies





Status of open data in law/social work/public administration domain

- Early years of open data research / research based on open data developing phase
- Hard to detect OD based papers (CROSB database – 9 items for LAW; Croatian and Comparative Public Administration – 10 papers 2015-2020 use open data)
- Open data group established (project TODO + others)
- Supporting project 'Open data: institutional, legal and financial aspects' (2020-2021)
- In addition to the TODO activities:
- Databases mapping
- Needs assessment
- Workshops (phd; other)



Questionnaire on the understanding and the use of OD at the Faculty of Law UniZg



BASIC INFO ON THE SURVEY

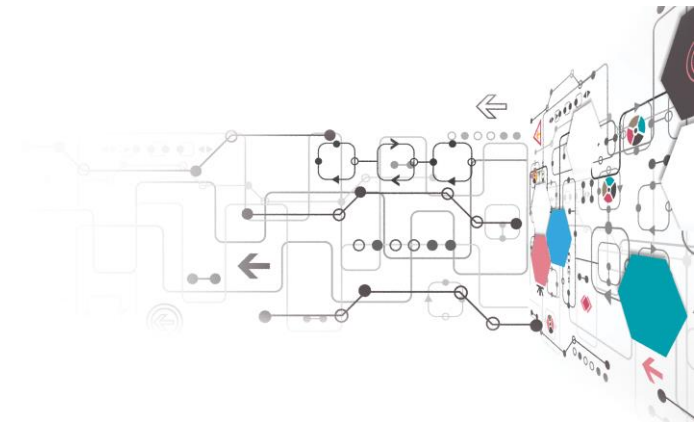
- Timeframe: 1 – 8 September 2020
- Research population: 187 academic staff (researchers & lecturers, full time)
- Response rate: 42 (22,5%)
- Number of questions: 19
- Type of questions: closed (except 1 - open), assessment based on Likert scale or multiple choice
- Goal: determine basic familiarity with the concept of open data / gain insight on the needs and experience with open data

RESPONDENTS

MALE	FEMALE
40,5%	59,5%

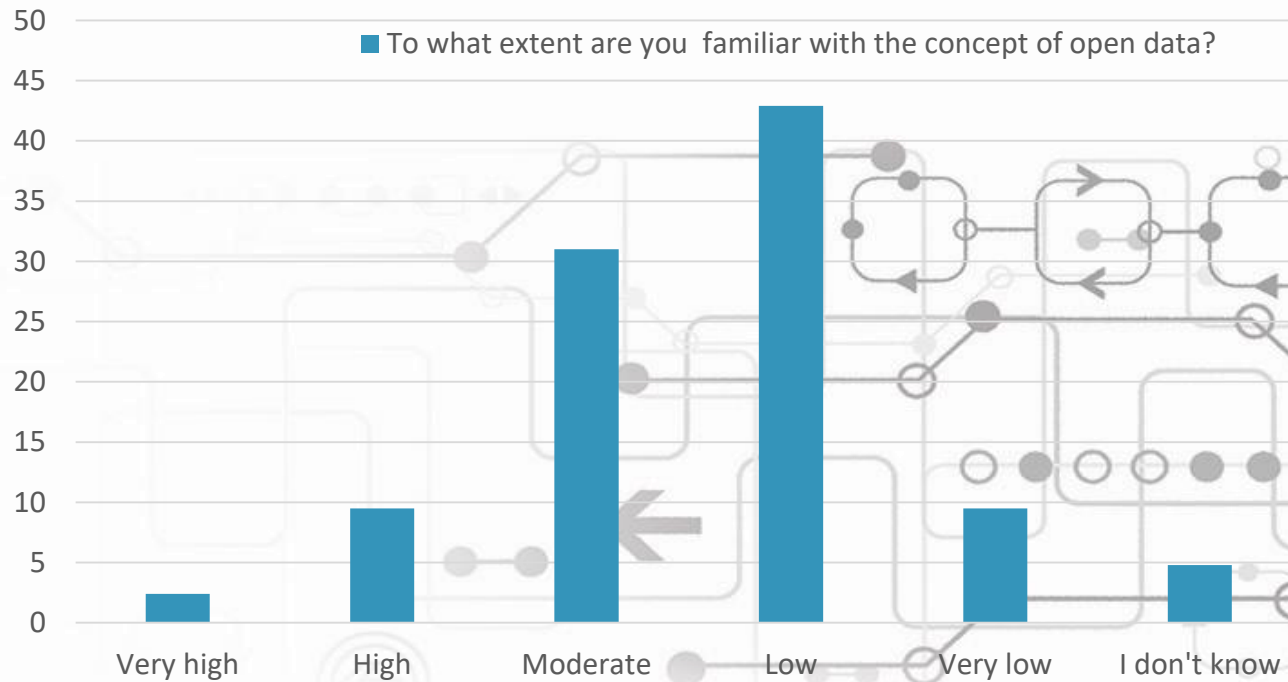
ACADEMIC DEGREE	%
ASSISTANT	11,9
POSTDOC	9,5
ASSISTANT PROFESSOR	35,7
ASSOCIATE PROFESSOR	11,9
FULL PROFESSOR	9,5
TENURED PROFESSOR	21,4

AGE	%
24-29	2,4
30-39	42,9
40-49	31
50-59	16,7
60+	7,1

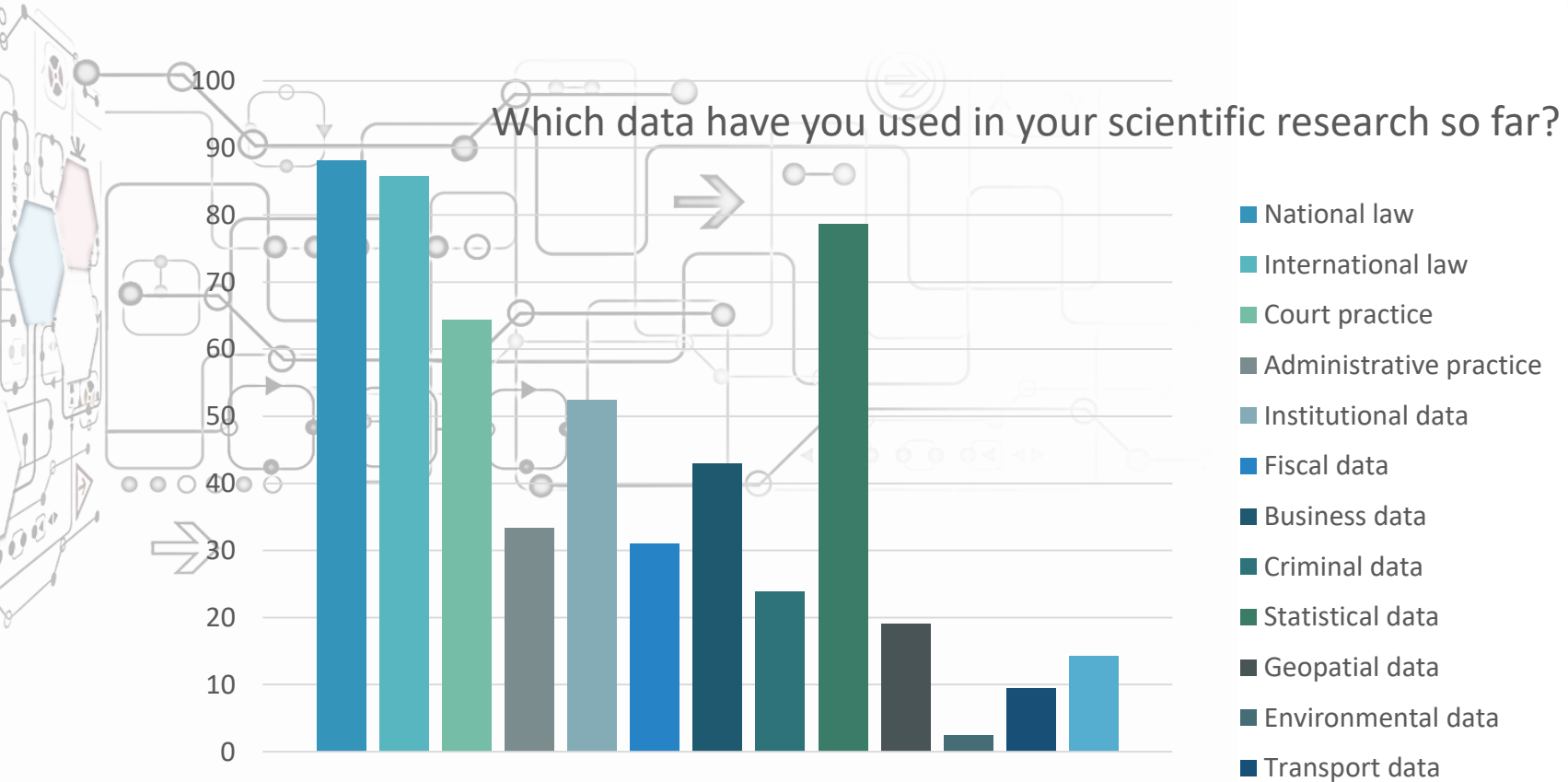




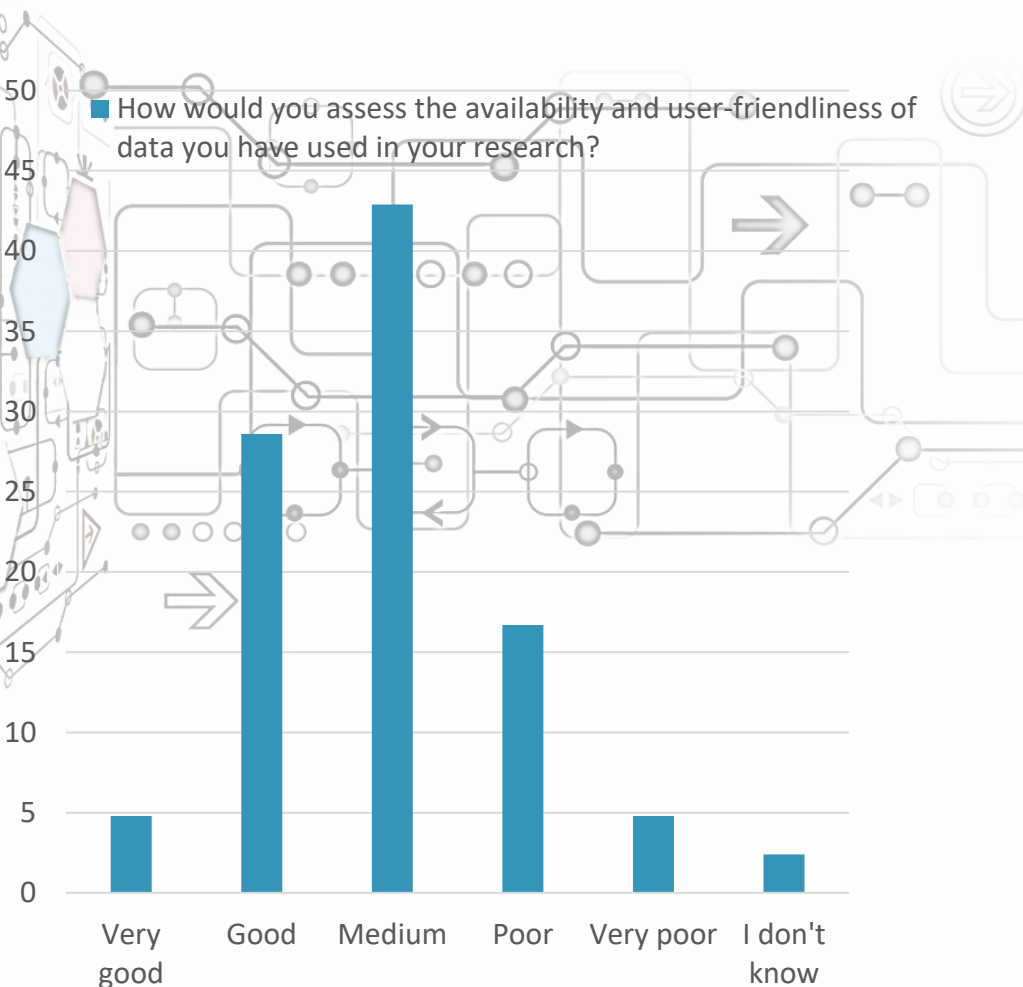
Familiarity with the concept of **Open data**



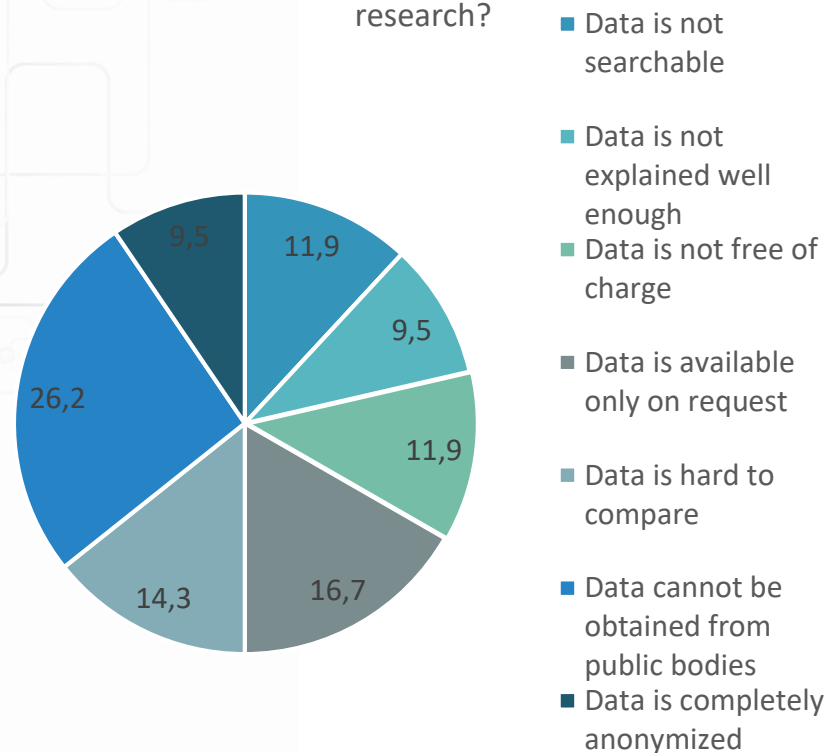
Research based on open data (I)



Research based on open data (II)



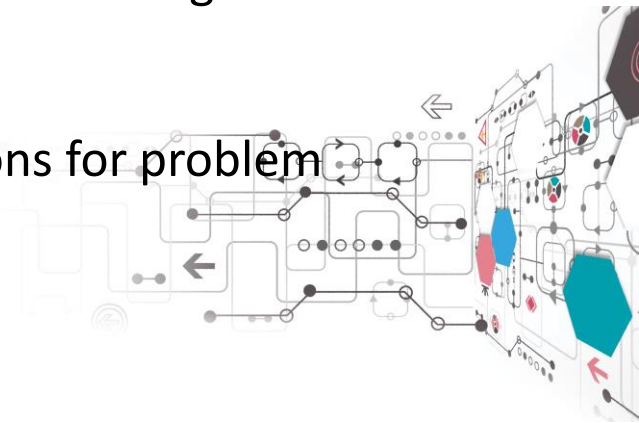
What have you found most problematic in searching and using data for your scientific research?





Status of open data

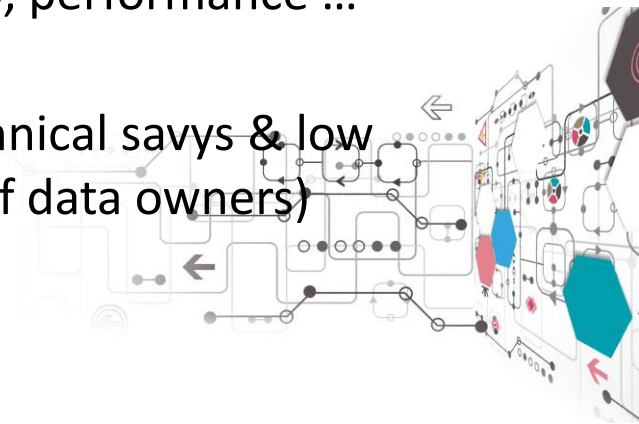
- Module 3 Assessment framework
- Open data portal of the RC (not specialised; institutional, political data; direct result of OD policy/law) – key findings:
 - No action plan for policy
 - No coordination, not updated
 - Low level of user inclusion
 - Impact not assessed
- Areas of special interest
- Policy / strategy – all issues relevant
- Availability – licences, charging, accessibility (formats as a legal requirement)
- Portal – scope, collaborative arrangements
- Impact – fiscal impact/economic; social repercussions for problem solving



Open data research challenges in your law / public administration



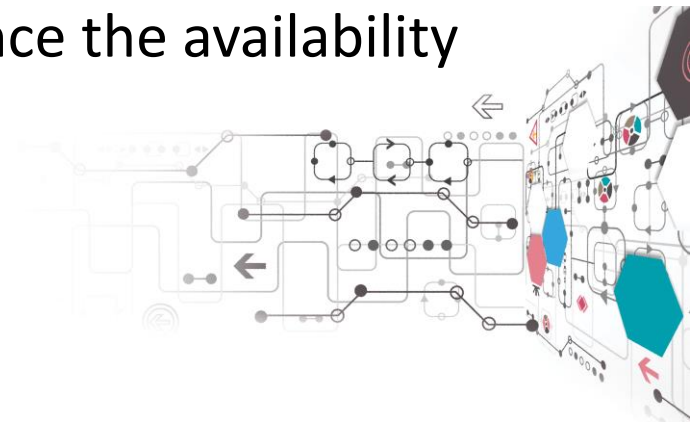
- **Research on open data**
- Challenge 1: Developing interest above the project scope (siloisation)
- Challenge 2: Legal frameworks national colours (but also an advantage for comparison and learning)
- And many more
- **Research based on open data**
- Challenge 0: To raise awareness among researchers in domain on their 'right to open data' – raise the demand (transparent, ...) – user oriented experience
- Challenge 1: Availability of data (sensitivity, privacy, performance ... no place to hide)
- Challenge 2: Data formats (social sphere – not technical savys & low ability to understand technical issues on the side of data owners)



Opportunities to cooperate in TODO



- Opportunity to learn (study visits, Erasmus or other programmes)
- Research / joint papers – advantage of exploring horizontal issues (e.g. privacy; governance) / sectoral issues – e.g. transport; environment; IT regulation
- Training programmes / workshops development
- Knowledge & Skills exchange
- New projects
- Cooperation with institutions – to enhance the availability of data





UNIZG Faculty of Electrical Engineering and Computing



Ivana Bosnić, Emanuel Guberović,
Igor Čavrak



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Team



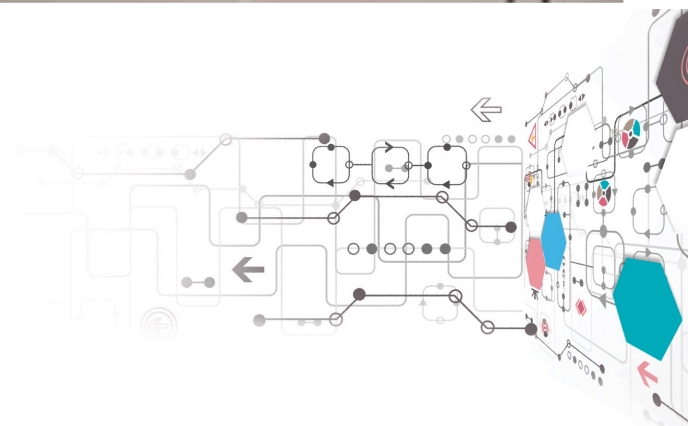
Ivana Bosnić



Igor Čavrak



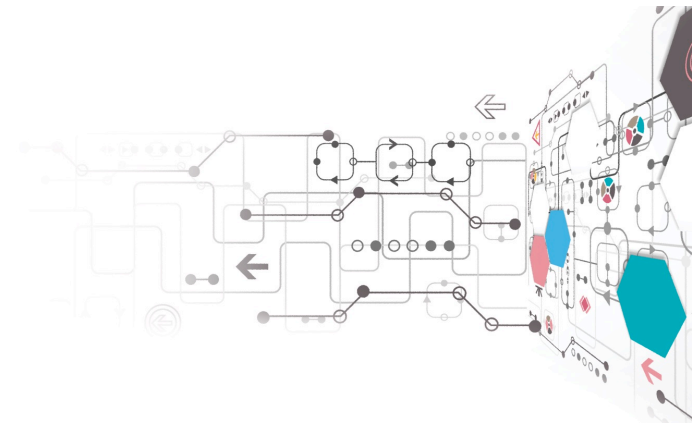
**Emanuel
Guberović**





Open data research

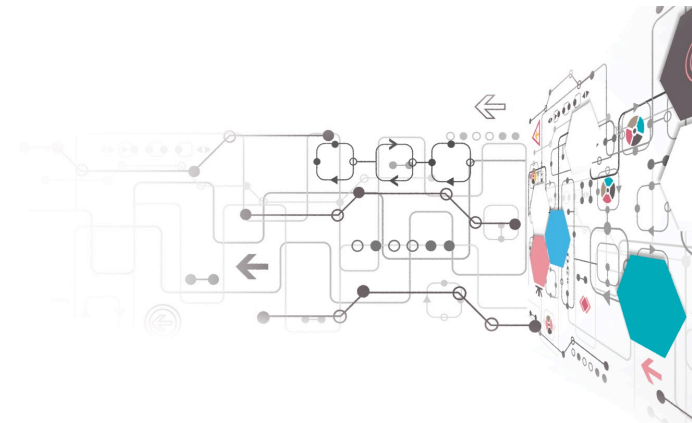
- Link to the OD life cycle
 - *More focused on demand side: (find), integrate, reuse*
- Research with open data
 - Using open data sets
 - Complex networks, ML datasets, ...
- Research on open data





Research methodologies

- Educational domain (Software engineering)
 - Case studies
 - Longitudinal studies
- Computer science/engineering domain
 - Models
 - Experiments

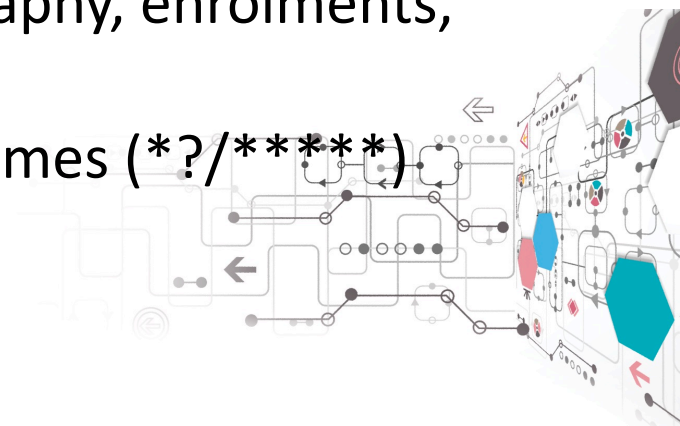


Status of open data in Croatian HE



- Ecosystem: higher education in Croatia
 - Organization: SRCE - University Computing Centre (University of Zagreb*)
 - Data published under organisational OD Policy, no OD strategy
 - Croatian OGP does not mention HE open data
 - Two datasets assessed:
 1. Higher education data - demography, enrolments, exams, etc... (**/*****)
 2. Higher education study programmes (*?/*****)

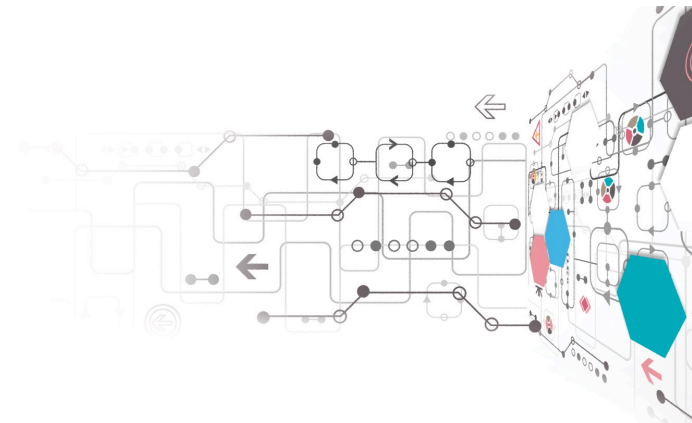
* - includes all HE institutions in Croatia



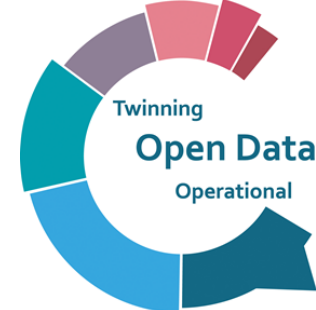


Findability & accessibility

- Both easily findable, accessible and free
 - dset1 – specific license (organizational), static, versioned
 - dset2 – no license (strictly speaking not a dataset, requires scraping – but SHOULD BE a dataset)
 - Many interesting data available over non-public API !
- Portal (site?) functionality – rudimental, no feedback, no dataset usage statistics
- Metadata exists
 - not adhering to standards
 - complete



Usage and promotion

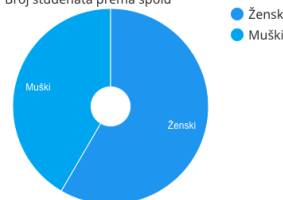


https://codeforcroatia.org/projects/isvu_dashboard

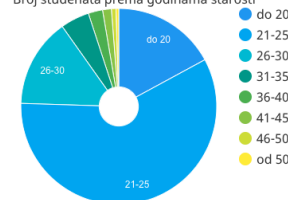
- Some involvement from open community
- Lack of studies showing potential economic, social benefits ...
- Some promotional events organized annually, not specifically related to OD

Upisani studenti prema spolu i starosti

Broj studenata prema spolu

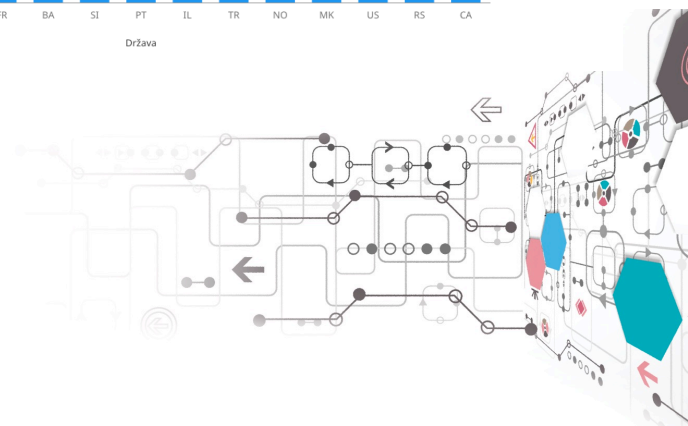
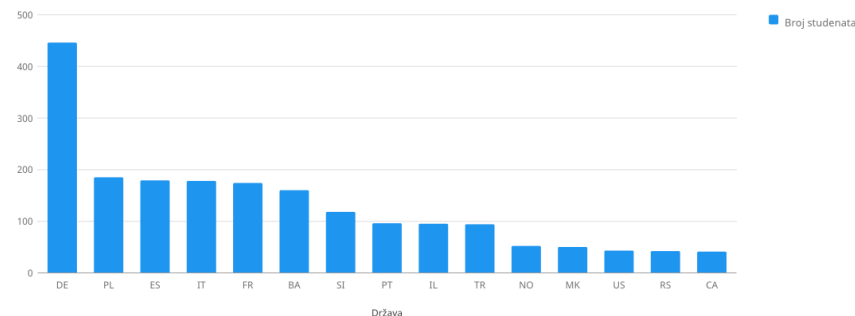


Broj studenata prema godinama starosti



Strani državljani

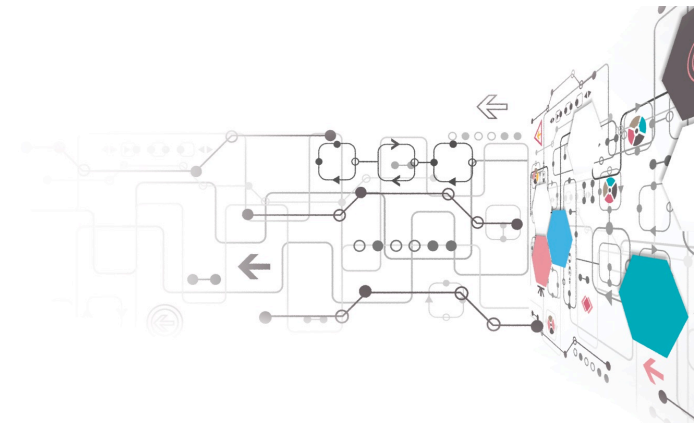
Prikazan je broj studenata sa stranim državljanstvima (prvih 15 državljanstava) koji aktivno studiraju u tekućoj akademskoj godini.



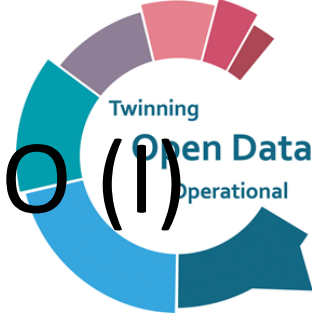
Open data research challenges in your domain/ discipline



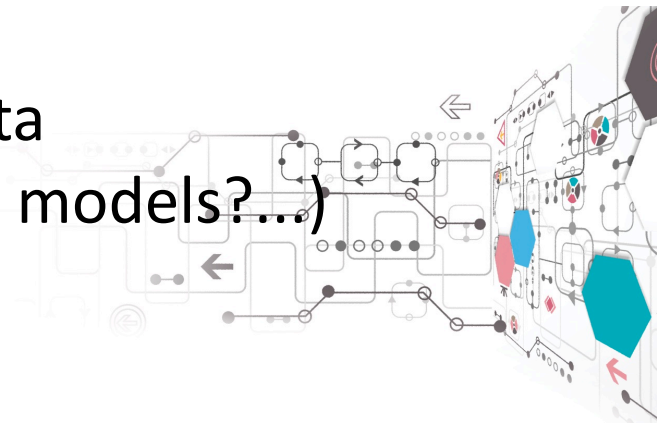
- Education
 - educational open data is scarce
 - the benefits of opening the educational data are not recognized
 - better metadata and interoperability to support cooperation among higher education institutions (e.g. detailed study programs)
 - using open data for education (the other way around :-)
- Open Computer Systems (overarching concept)
 - Interoperability
 - Scalability
 - Adaptability
 - Portability
 - ...



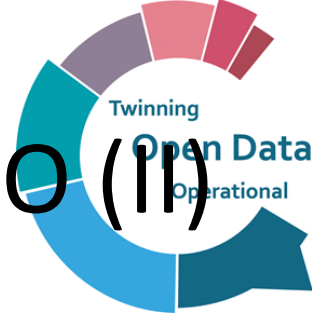
Opportunities to cooperate in TODO (I)



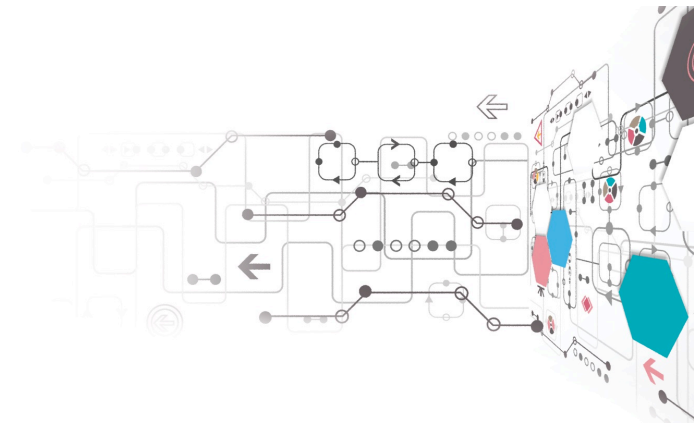
- Promoting and exploiting open data in education, value creation
- Study of complex (socio-)technical systems
 - Offline (open) data-sets
 - Real-time (open) data streams
- Application of novel AI techniques on domain-specific problems
 - Exploiting domain-specific open data
 - Reaching beyond open data? (open models?...)



Opportunities to cooperate in TODO (II)



- Interdisciplinary approach
 - Education
 - IoT and resulting (open) data
 - application of AI methods
- Joint research and publications
- Joint project proposals



Thank you !



University of the Aegean

Department of Information and Communication Systems Engineering



Information Systems Laboratory

Excellence in Electronic Governance and Electronic Business Research

The University of the Aegean



Operates in 6 islands of the Aegean Sea (Lesvos, Samos, Rhodes, Chios, Syros, Lemnos) and Athens.

Information Technology Department is based in Samos

- A young, dynamic, research oriented, innovative university
- A university with a strong multi-disciplinary nature, combining mathematics, social sciences, environmental studies, management, informatics

The IS Lab



A multi-disciplinary research team within the Department of Information and Communication Systems Engineering, doing research and high-level consulting, internationally



A team of 15 skilled researchers (professors, post-doc, PhD and MSc students, senior engineers) with more than 50 collaborating experts in Greece and worldwide



Strong grounding on student and citizen communities (competitions, collaborative large scale lab prototypes, social media – based interaction, crowdsourcing)



Strategic alliances with research centres, industry and organisations in Greece and Europe.

Activities

Research projects

in Greece and European Union (HORIZON, FP7, CEF, e-Infrastructures, ERASMUS, INTERREG, Greek CSF/RTD programmes)

Industry-Academia programmes and projects
(Student practice, industry-oriented theses, PhD research, targeted research, Lifelong learning seminars)

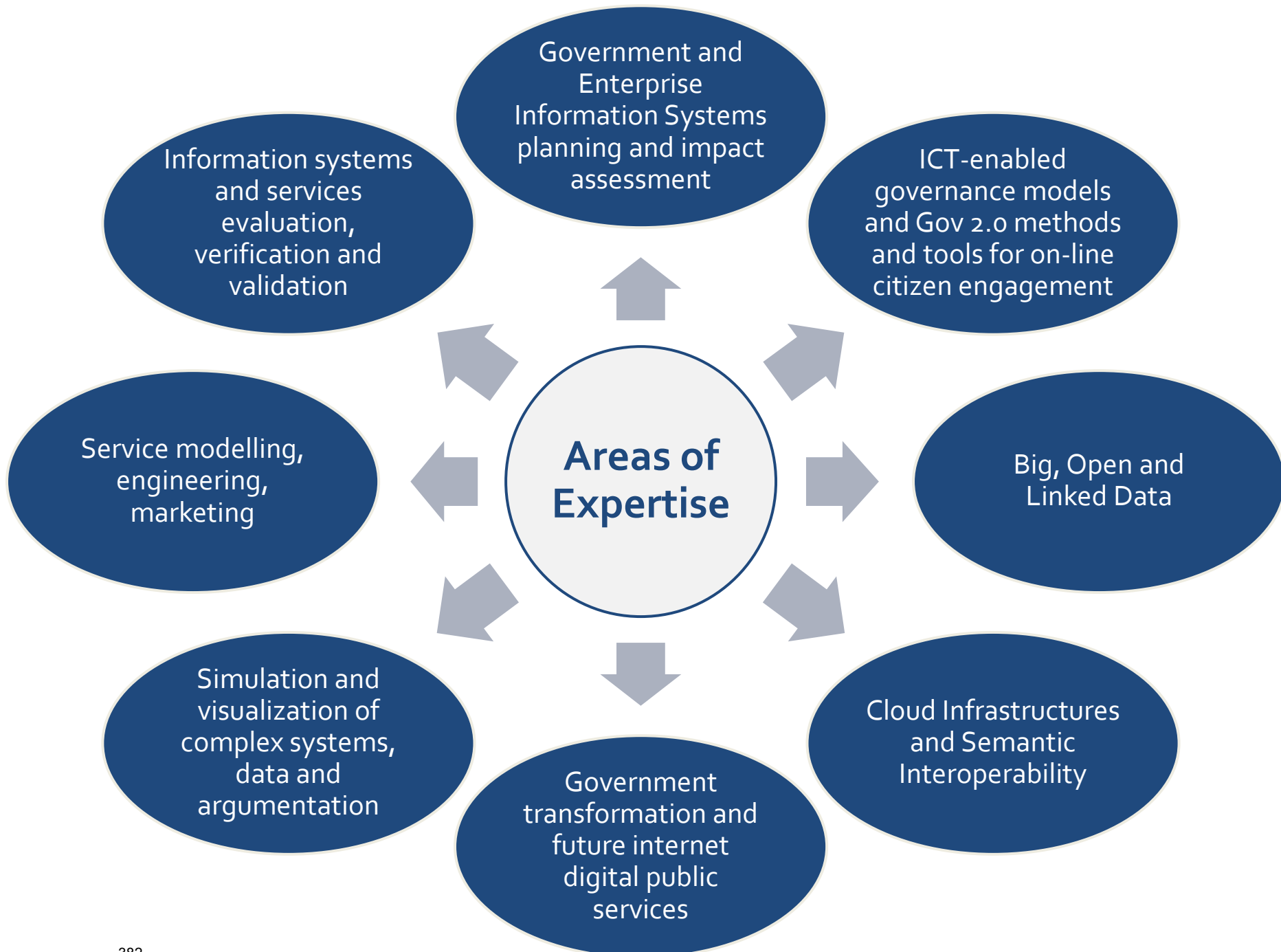
High-level, innovation-oriented consulting

for Governments, and Businesses worldwide (in partnership with industry)

Scientific global-scale initiatives

(WeGov Awards, The Samos Summit, Aegean Startups)

Dissemination and Training Activities



Research Projects – Digital Governance



(Erasmus+ KA) Scientific foundations, training and entrepreneurship activities in the domain of ICT-enabled Governance



(H2020) Strengthen the scientific excellence and innovation capacity of the UNIZG in the field of open data



(CEF-Telecom) EU-wide Legal text mining using big data processing infrastructures: Enhanced access to Big Open Legal Data

Research Projects – Digital Governance



Social Media networking with online media and stakeholder groups for EU policy - making



European network for the exchange of experience and ideas around implementing open data policies in the public sector



Policy Formulation and Validation through non moderated crowdsourcing



Infrastructure for Open, Linked Governmental Data Provision towards Research Communities and Citizens



Policy Making through eParticipation with a set of novel tools in an environment of multimedia Web 2.0 applications.



Network of EU stakeholders to shape the EU Future Services enhancing User Centricity



eParticipation for Energy and Environment (municipalities from Netherlands, Czech Rep, Greece, UK)



Participative legislation formation (Greek, Austrian, Lithuanian parliament)

Research Projects – eBusiness & Interoperability



Provision of basic and composition of value-added interoperable services mostly to SMEs - Enterprise Mashups



Greek eGovernment Interoperability Framework: full specification of standards, governmental XML schemas and service repository for the Greek Government.



Startup Farm: A strategic partnership to reinforce agricultural education and skills for future ecofarmers



E-learning Service for the Interoperability Network in the area of European cultural heritage to allow for more trans-European cooperation(e-Ten)



Process modelling methodologies and tools for Intelligent Collaboration and Transaction Environments in Public Administration Networks



Technology innovation in SME's, a network of Greek SME's and international technology providers

Other Projects



Empowering eParticipation by providing fundamental democratic actions to the citizens (e.g. e-Voting, e-Consultation, opinion polls, e-Complaining)

INTEGRATE

Technology innovation in SME's, a network of Greek SME's and international technology providers

Heraclitus II

Operational Programme "Education and Lifelong Learning 2007-2013" on Enterprise Information Systems

Electronic Services Systems Design for various Greek Municipalities (Samos, Trikala, Ano Liossia) and Regions

Projects and studies on Enterprise Modelling Tools, Enterprise Portals and Knowledge Management systems for businesses and administrations

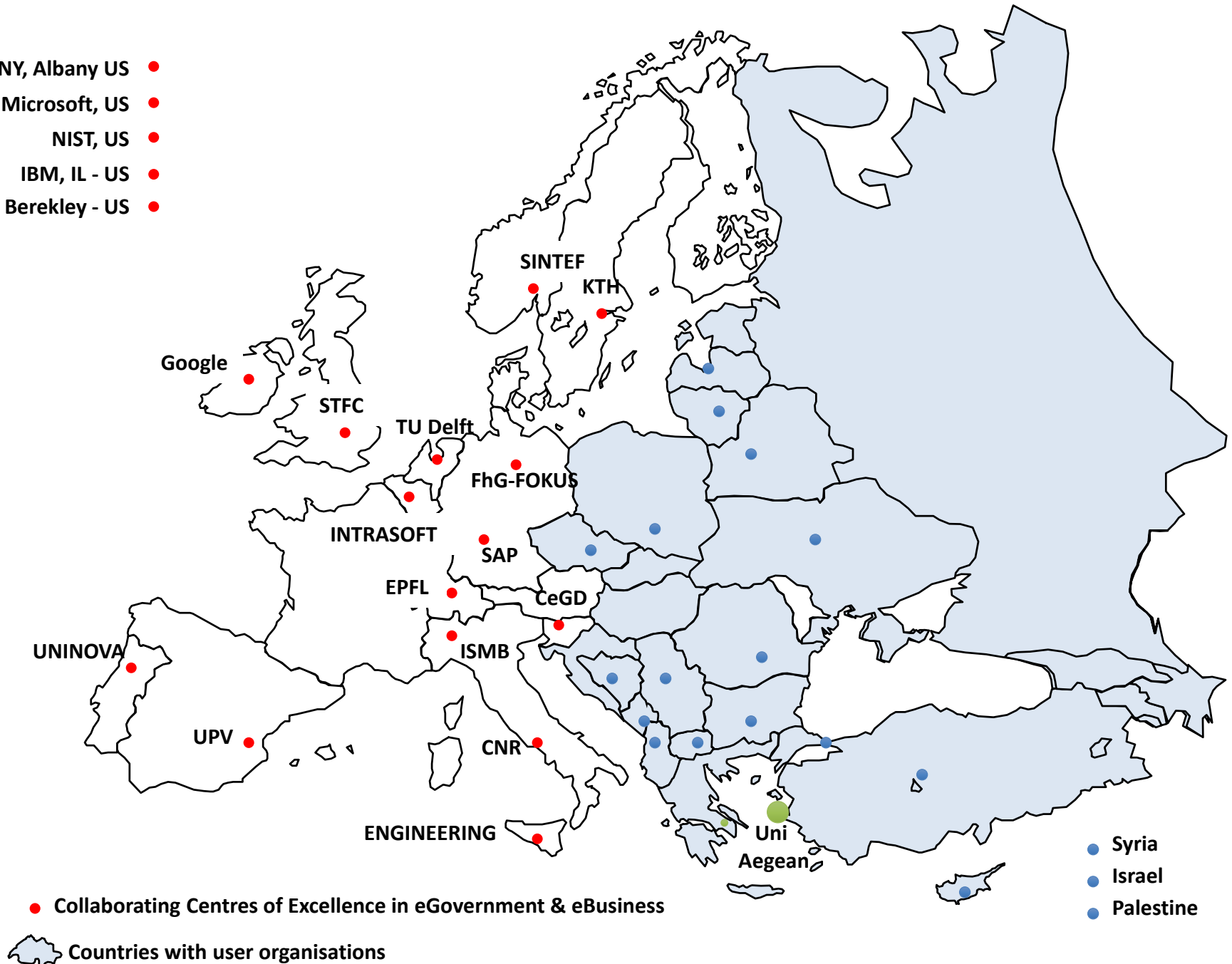


An International Network

Partners

- **Greece** (user organisations, industry, government, NGO's, universities)
- **Balkans** (Albania, Bosnia & Herzegovina, Bulgaria, Croatia, FYROM, Montenegro, Romania, Serbia, Slovenia, Turkey)
- **Mediterranean** (Cyprus, Syria, Israel, Egypt, Tunisia, Morocco, the Gulf Countries)
- **Eastern Europe** (Czech Rep, Slovakia, Hungary, Latvia, Lithuania, Russia)

SUNY, Albany US ●
 Microsoft, US ●
 NIST, US ●
 IBM, IL - US ●
 Berekley - US ●



Key Partners in Greece



NATIONAL
TECHNICAL
UNIV. ATHENS



UNIVERSITY OF
PELOPONNESE



ATHENS UNIVERSITY
OF ECONOMICS &
BUSINESS



Ministry of
Finance



Union of
Prefectures



Union of
Municipalities



Ministry of
Interior



Federation
of ICT
Industries

Recent Awards for IS-LAB Staff



- Among the 10 most prolific researchers in the domain of eGovernment, worldwide
- Among the 10 most prolific researchers in the domain of open data, worldwide
- “Best Paper Award”, International Conference 15th IFIP Electronic Government (EGOV) 2016 and ePart 2016 conference on Electronic Government,, Guimaraes, Portugal, September 2016
- “WeGov Awards”, first prize in the 1st Greek eGovernment Student Competition, for the 1-minute company registration process, 2010.
- “e-nnovation”, first and second prize in the PanHellenic Business Students Competition on innovative business ideas, 2009 – 2010.
- “Best Paper Award”, International Conference on Electronic Government, for the eGovernment Service Registry, Torino, September 2008
- “Best Paper Nominee, eGovernment Track”, Hawaiian International Conference on System Sciences (HICSS), Hawaii, January 2009
- “Best Paper Nominee”, International Conference on Electronic Government, Linz, September 2009
- European Commission eGovernment Awards finalists – 3rd place, with the Greek ERMIS case, Malmoe, Sweden, November 2009



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PART II: Training & Fostering Students' Excellence Activities

Workshops & Training Activities

- Organisation of international **scientific and industrial workshops** (in ECIS, ICIS, i-ESA, eChallenges, eGOV DEXA, etc)
- Postgraduate courses in eGovernment in cooperation with NTUA and EPFL (Athens, Samos, Lausanne)
- Targeted **training sessions** with industry and research (more than 30 updated training modules) for students
- Targeted training sessions (**seminars**) on e-Government for civil servants
- Targeted training sessions (**seminars**) on business management for SMEs
- Summer Schools on:
 - Open and Collaborative Governance
 - Big Data Analysis in Earth Sciences
 - E-Business
- More than 300,000 pages of **indexed information** on eGovernment and eBusiness

Postgraduate Programmes (e-learning)



Digital Governance

- Knowledge and skill enhancement regarding a plethora of Information Systems that can be deployed in the public sector
- Ability of constructive participation in development projects for several Information Systems in the public sector with several roles

Digital Innovation and Entrepreneurship

- Theoretic and practical approach of Electronic Business matters
- Innovation, productivity and business spirit enhancement
- Deep understanding of new business practices

The AEGEAN Collaborative Courses



- Every University Lesson is open to the public and to enterprises ([via electronic media](#))
- ICT companies provide [specialised trainers](#), giving to students latest knowledge
- The best students get a “prize” visiting the [ICT companies and research centres](#) for further collaboration
- Students get targeted research projects for the Diploma and MSc theses

The AEGEAN Industry Internships



- Every student has to work for a summer period in an ICT-oriented company
- There is an established network of more than 30 companies and organisations that accept students from the Lab
- Usually, students get to work on innovative projects and then continue the collaboration within a joint research project
- A good proportion of successful students are considered for a job offer

Fostering Entrepreneurship

- A nation-wide competition for startups leveraging on Aegean offerings (tourism, agriculture and food products, culture, maritime environment)
- A network including more than 100 business mentors and incubators
- Industry and venture capitals provide seed financing and prizes

www.aegean-startups.gr

Fostering eGov Excellence

- A nation-wide students competition for innovative ideas and applications in electronic governance
- Teams from more than 15 universities take part each year
- ICT Companies provide the prizes (typically at the range of 2000 EUR)

wegov.blogspot.gr

Samos Summit & OpenGov Summer School



- Organised every summer, is a world-wide high level meeting on ICT issues that are important for the society
- Bringing together high caliber scientists, industry executives and policy makers
- 5 days of workshops, technology transfer and discussion on new research challenges in conjunction with the International Open Government Summer School
- Topics so far: Governance and Policy Modelling, Future Internet, Open Data and Interoperability, Government 3.0, Smart Cities

www.samos-summit.org

The Berkeley GVL Network

Universtiy of the Aegean is the Greek representative at the UC Berkeley Global Venture Lab, an international network of universities and organisations that excel in youth entrepreneurship programmes and ideas





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PART III: Society-driven technology transfer

The Digital Government Research Centre



- Brings together research organisations, public administration and industry, designing and showcasing new models and tools for public governance at all levels
- Supports the implementation of modern approaches and methodologies for governance at local, national and international level
- Offers in Greek society access to more than 100 qualified employees - researchers from Greece and abroad, able to contribute to the analysis, planning, implementation and dissemination of innovative eGovernment solutions with high added value for the Greek Public Sector, the business community and society

www.dgrc.gr

Digital Governance Research Center

- Digital Governance Research Centre (DGRC) is a research centre for the supporting the research, education, planning and implementing of modern approaches and methodologies for governance at local, national and international level.
- DGRC is an initiative of university laboratories and research centres, bodies of public administrations, businesses and citizens ' organizations, under the coordination of information systems Laboratory of the Department of information and communication systems engineering, University of the Aegean.
- **DGRC provides its expertise in several public sector organisations in Greece:**
 - Hellenic Parliament (HEP)
 - General Secretariat of Information Systems of Public Administration (GSIS-PA)
 - Central Union of Greek Municipalities (KEDE)
 - Company for Local Administration (EETAA)
 - Municipality of Athens
 - Municipalities of Samos
 - Athens Bar Association (DSA)



DGRC Recent Developments

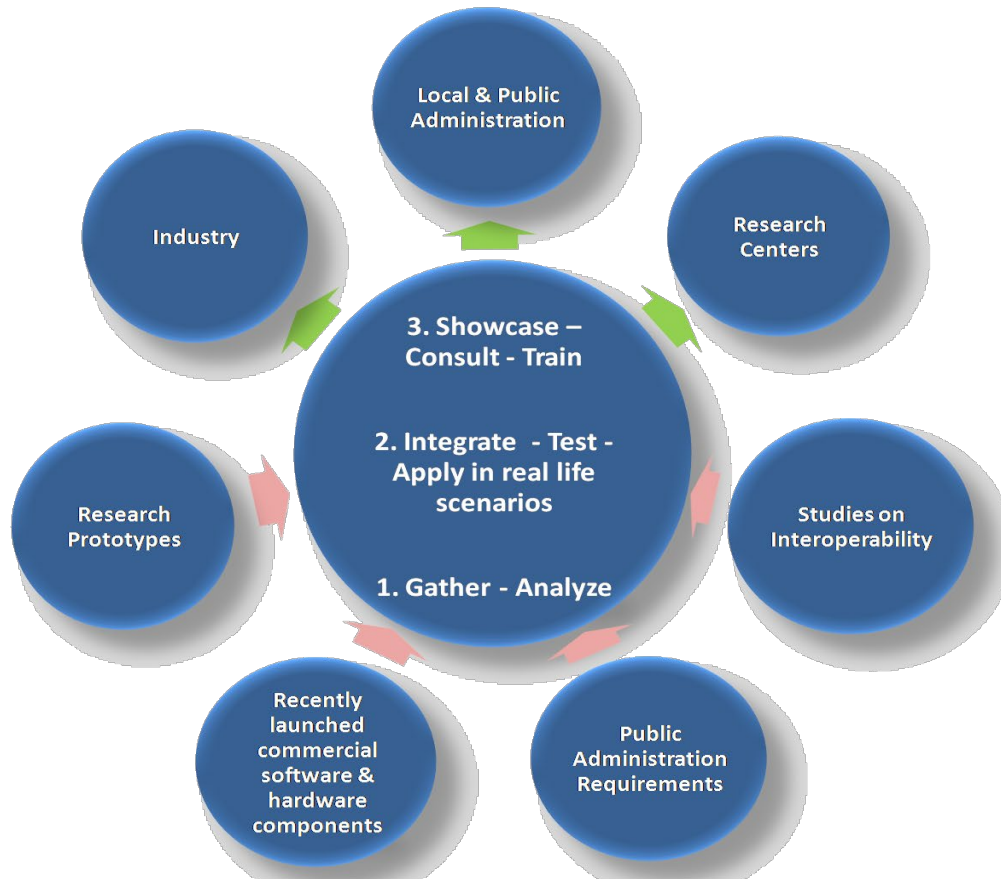
- **ESB design**, for the Ministry of Administrative Reform
- **eGov Central Portal**: Evaluation and exploitation, for the Ministry of Administrative Reform
- **Interoperability Framework** for the Union of Greek Municipalities
- **Design and Implementation of Open Source Software Registry** for the Union of Greek Municipalities
- **Open data movement**: An action plan for Greece for the Union of Greek Municipalities
- **Smart cities developments**: The current status for the Union of Greek Municipalities
- **Cloud adoption** for the systems of the Greek Company of Local Development and Administration

Research Prototypes of DGRC

EGOVSIM	A simulation-based system for process reengineering in the Public Sector
eGOVLEXICON	Lexicon of terms used in eGovernment
Interop Wiki	A wiki for providing information on the Greek e-Government Interoperability Framework
OpenData Wiki	A wiki based handbook offering basic information on Open Data and guidelines on how Open Data can be released
Mobile Applications	Android, Windows 7 Mobile and iPhone OS development platforms and prototype apps.
Aegean Cloud	One of the first university school-level virtualisation infrastructures, including utilisation of private and public clouds
Municipal eParticipation Portals	A fully working approach, for launching and supporting municipal deliberation campaigns (based on IMC – eDialogos / EU eGov 2009 Nominee)
The Services Registry	A platform prototype for management of eGovernment Services, combining Service Metadata, Process (BPMN), Data (XML) and eGovernment ontologies
eID infrastructures	Comparative evaluation and showcase scenarios combining the Greek eGIF eID Standardisation, Microsoft GENEVA Platform, STORK pan-European eID standards

The eGov Demonstration Centre in the Cloud

Deployment of the first **Cloud-based Electronic Government Demonstration Centre (GovTec)**. The Demonstration Centre includes and provides for:



- A cloud virtualisation infrastructure for managing and deploying large scale demonstrators
- Innovative technology scenaria gathering, analysis and showcasing to governmental officials
- Governments requirements analysis and sourcing towards industry and research
- Hands-on, electronic evaluation and interoperability testing / certification

Digital Centre for Samians Abroad

- Joint action with the Municipality of Samos for bringing together Samian emigrants that live in Greece and abroad
- Development of a standard website designed to implement innovative action plans and services for linking Samians around the world with the society and the daily life of the island of Samos
- An international good practice for interconnection, support and integration of expatriates in the local community

<http://www.samiotes.gr>



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PART III: What we can do together

Scenario I: EU funded Research Projects

- Joint participation in a European Research project, in the areas of Information and Communication Technologies (through a European, US-based or other legal entity)
- Typically EU funds 70- 100% of the research – the rest 50% is provided by the participants own efforts
- A typical project may have 5-15 partners, and a budget of 2-3 mil EUR for a duration of 2-3 years
- Approval for funding is a highly competitive process

Scenario II: Joint Research (co-investment)

- Joint development of a demonstrator for Governments or Enterprises.
- A Demonstrator can be:
 - An **application prototype**, addressing a real problem in an innovative way.
 - A new platform / application **usage scenario** that can be demonstrated to government officials.
 - A **new method or model**, that can be further applied in businesses or administrations
- Demonstrators (prototypes, platforms, cases) can then be further promoted by the Digital Governance Research Centre

Scenario III: Research Assignment

- Assignment of specialised studies or small research projects
- Such an assignment may relate to:
 - A new **platform or solution evaluation**
 - **Requirements** drafting for a specific market segment
 - Work on a **key customer, a new market, a specific country**, etc.
- Pre-requisite: the level of innovation / research should be significant (non-trivial issues).

Scenario IV: Academic Collaboration

- Development of PhD theses in subjects of common interest
- Internships and training positions in the Industry
- Invited lectures at the university
- Invited lectures at the industry / events
- Joint publications
- Gradual Development of a joint research agenda



University of the Aegean

Department of Information and Communication Systems Engineering



Information Systems Laboratory

www.icsd.aegean.gr/is-lab



info-islab@aegean.gr



Information
Systems
Laboratory



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



Aegean
Uni Is Lab



GEOD

University of Zagreb

Faculty of Geodesy

Dražen Tutić
dtutic@geof.hr

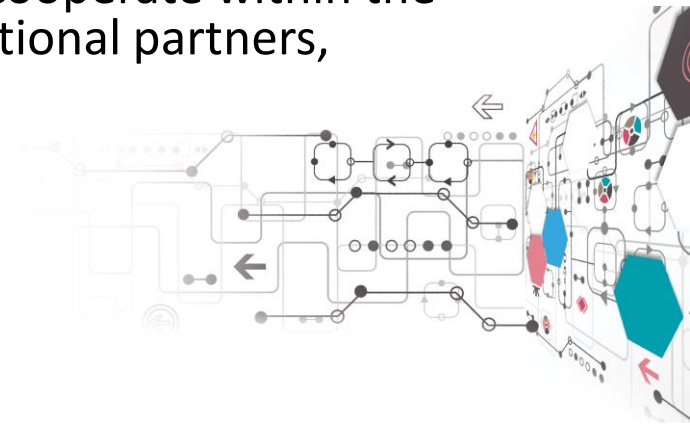


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda

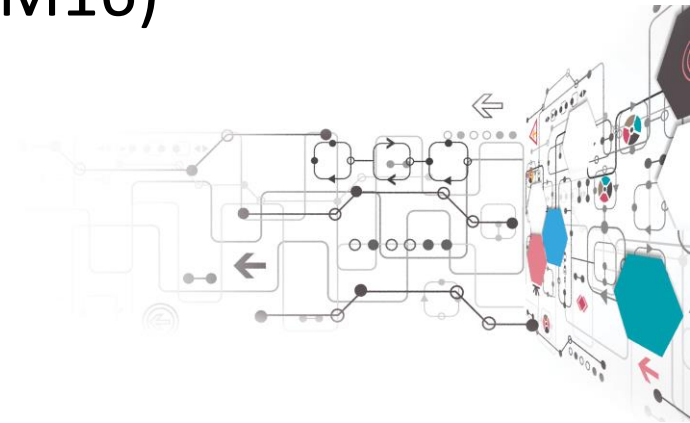


- introduction team
- which step of the open data life cycle does the research in the institute focus on:
 - Research with open data (using open data for your research)
 - Research on open data (e.g., assessment of ecosystem, laws to improve reuse, etc)
- research methodologies employed in general and for open data research specifically
- Status of open data in your domain/ discipline: results of OTP M3 assignment
- open data research challenges for the institute's domain/ discipline
- where does the institute see opportunities to cooperate within the project (both with UNIZG partners, the international partners, and/or the non-academic partners).
- other



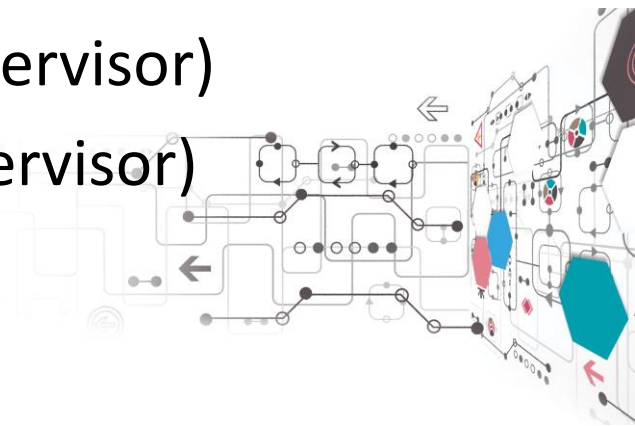
Team – part 1

- Dedicated TODO team
 - Assist. Prof. Dražen Tutić (out from M13)
 - Prof. **Željko Bačić**
 - Assist. Prof. **Vesna Poslončec-Petrić**
 - Dr. **Ana Kuveždić Divjak** (in from M13 as Assist. Prof. , coordinator)
 - Dr. **Marina Viličić** (back in from M16)
 - **Karlo Kević**, MSc (ESR)



Team – part 2

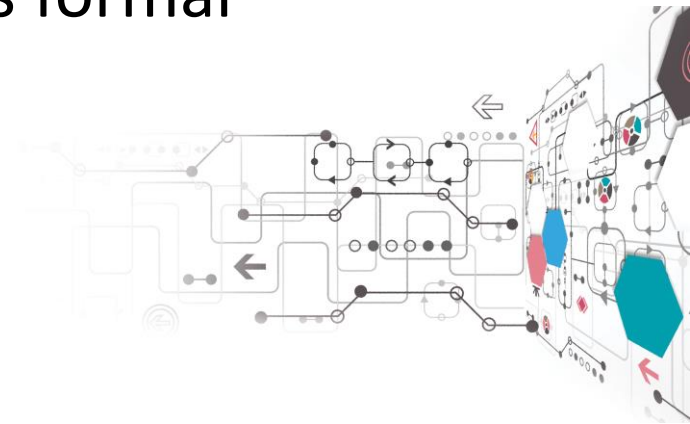
- Invited members of GEOFF TODO team
 - **Jelena Petrović**, MSc (ESR, Ministry of Defence)
 - **Josip Šiško**, MSc (ESR)
 - **Josip Križanović**, MSc (ESR)
 - **Doris Pivac**, MSc (ESR)
 - **Adam Vinković**, MSc (ESR)
 - Assist. Prof. **Hrvoje Tomić** (pot. supervisor)
 - Assist. Prof. **Andrija Krtalić** (pot. supervisor)
 - Assist. Prof. **Robert Župan** (pot. supervisor)





Team – part 3

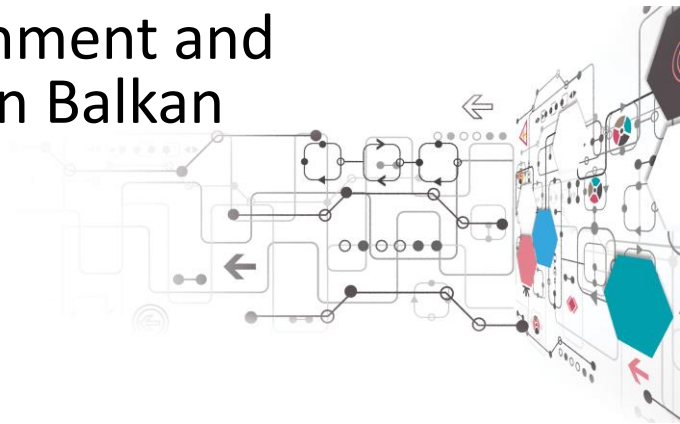
- **OSGL – Open Source Geospatial Lab**
 - Established in January 2014
 - Part of the network Geo4All (OSGeo)
 - Github page: <https://github.com/GEOF-OSGL>
 - Open for participation (researchers, students)
 - Activities declined in last few years, should be relived through TODO project as formal research unit of the project.



Open data research



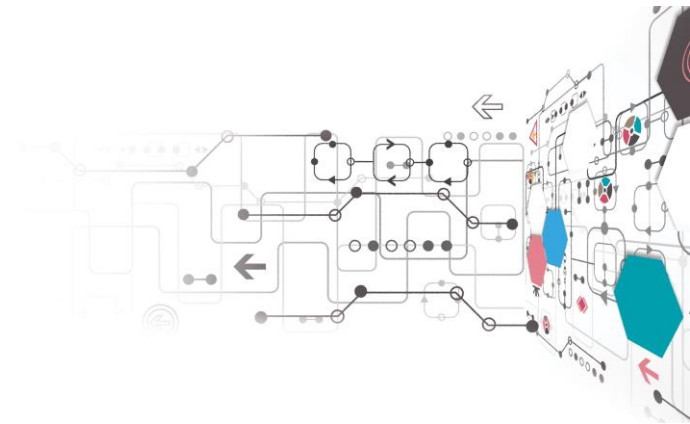
- Link to the OD life cycle – GEOD is mainly doing research with open data, sometimes we were/are participating in activities which are dealing with setup and running of open data ecosystem (mainly NSDI)
- Research with open data – depends on the group, remote sensing data are mostly used but not in TODO group, TODO group is doing research with SDI data, OSM and other more specific data
- Research on open data – NSDI establishment and studies for Croatia and in some Western Balkan countries





Research methodologies

- Problem identification
- Literature review
- Selection of research method:
 - **Observation / Participant Observation**
 - **Surveys**
 - Interviews
 - Focus Groups
 - Experiments
 - **Secondary Data Analysis / Archival Study (open data)**
 - **Mixed Methods (combination of some of the above)**
 - **Identification / establishment of results**
- Conduction of the research and analysis
- Results presentation (models, graphs...)
- Conclusions and recommendations
- Future work



Status of open data in Spatial Domain/Discipline Geodesy

State Geodetic Administration geoportal



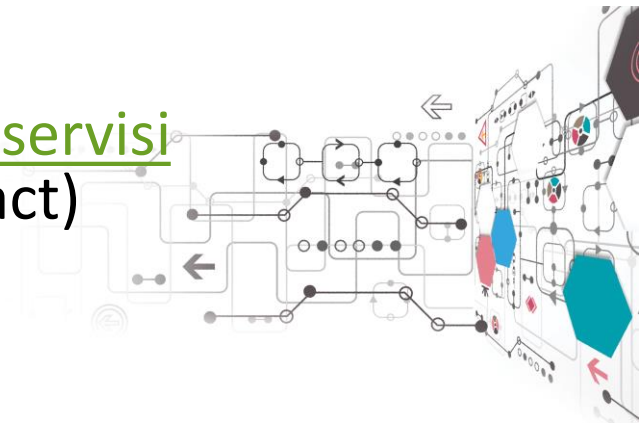
House numbers – personal use of view service, substantial fee for acquiring data

Topographic database – transport – personal use view service, for acquiring data contract is needed

Ortophoto and base maps are free for derived products (used also recently in OSM).

Status depends on data type -

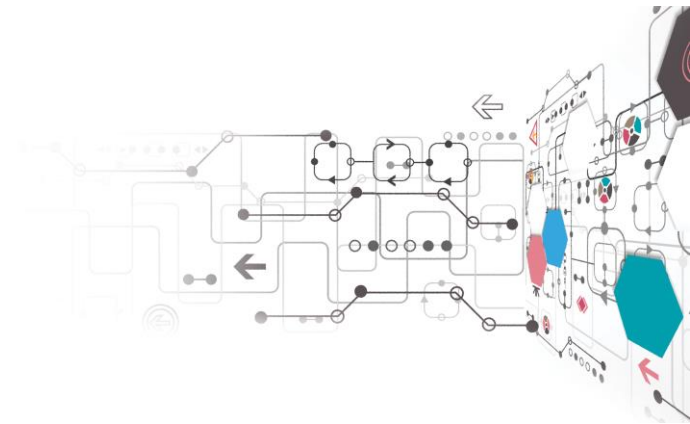
<https://geoportal.dgu.hr/#/menu/podaci-i-servisi>
(anonymous access, free registration, contract)



Open data research challenges in your domain/discipline



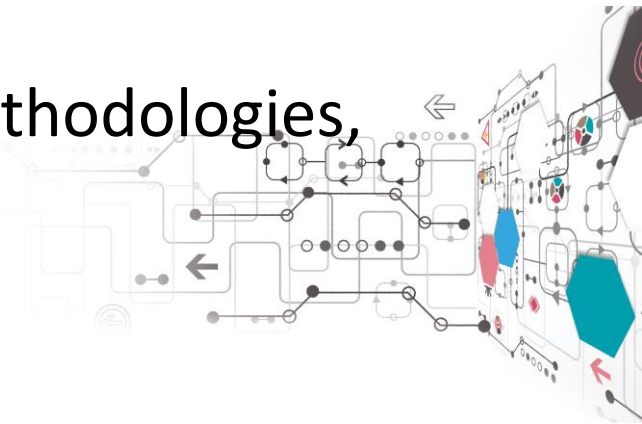
- Any applications of open geospatial data (Copernicus, NSDI, Data.Gov.Hr, OSM, ...)
- Quality assurance/Open participation
- Capacity building
- (Open) data collection, processing, transformation, analysis, visualization





Opportunities to cooperate in TODO

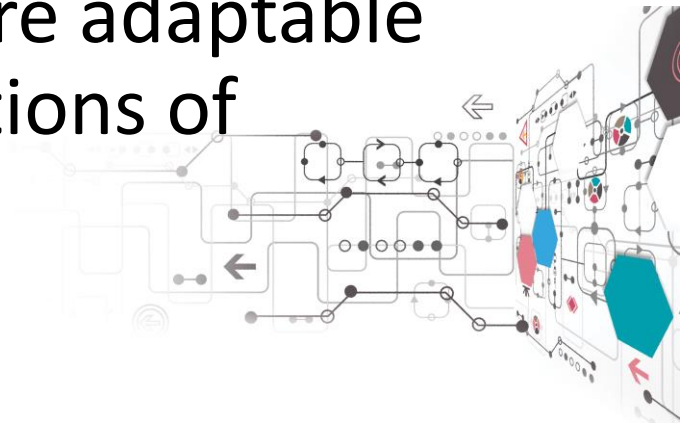
- **AGRI** – cadastre, environmental data, distribution/movement of species
- **FER** – ML and AI applied for spatial data
- **LAW** – policies, licences and private data connected with spatial data (e.g. cadastre, land book, governmental spatial data)
- **FOI** – open spatial data systems organization and economic value
- **TRANS** – spatial analysis of traffic and transport open data using GIS
- **TUDELFT** and **UAGEAN** – research methodologies, strategies and trends, joint use-cases





Other

- After phase of making spatial data available, interoperable, accessible, the need for user uptake is prominent (interdisciplinarity) and quality assurance (disciplinary).
- If quality is not improved and spatial data is not used the need for them will decrease. This leads also to new and more adaptable ways of collecting and applications of spatial data.





Open Data in/for Agriculture, Croatia

Dragica Šalamon, TODO team, IRG OD

dsalamon@agr.hr



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda



1

AGRI TODO Team and
IRG-OD team



2

AGRI Research methodologies



3

OD research at AGRI



4

Research on OD in AGRI



1 AGRI TODO Team



prof. Alen Džidić, PhD

- Biostatistics
- Automated milking production

- Genetic resources databases standards and metadata

assist. prof. Maja Ferenčaković, PhD



- animal, tissue, DNA collections
- animal inventory and location

assist. prof. Dragica Šalamon, PhD



- plant databases and portals
- Filip Varga, Mag.Biol.Exp.**

Faculty of Agriculture, UNIZG



- Art, economics, biotechnology, biomedicine...

1



- Natural resources data (*genetics, farm resources, biodiversity, invasive species...*)
- Earth and Environment data (*meteorological, elevation, hydrology, soil...*)
- Policy and administration data (*government, agricultural land, official records, gov. finance, rural development...*)
- Socio-economic data (*infrastructure, market, land use, productivity, value chain*)
- Agronomy (*pest*)
- Agricultural technology (*Disease management, Production advice*)

1 Interdisciplinary research group focusing on open data



- 1st IRD-OD meeting, 3rd July 2020.

assist. prof. Hrvoje Kutnjak, PhD
- land use, desertification, carst



prof. Ivica Ljubičić, PhD
-agricultural
botanics



assist. prof. Igor Bogunović, PhD
- soil sciences



assist. prof. Marina Ninčević, PhD
- mathematics, adapting to
production optimisation



assist. prof. Dubravka Mandušić, PhD
- digital agriculture



assist. prof. Petra Posedel Šimović
- business statistics





2

Research methodologies

Quantitative data

- Ranked
- Measured
- Categorised
- Derived(genomic)

Qualitative data

- Genomic sequence
- Habitats

Mixed method

- Genomic
- Bioinformatic

MetaAnalysis

Patterns
Relationships
Generalisations

Patterns
Relationships
Generalisations

Patterns
Relationships
Generalisations

Observational
Experimental
Bioinformatics tool development
Imputed
Projected
Case study
Open data

Documents screening
Open data

3 Open data research at AGRI



- Link to the OD life cycle:
 - Primarily OD users
 - OD providers
 - project and/or researcher based,
 - raw and modified data,
 - should provide OD for food production
- Research with open data
 - Research OD: mostly
 - food production sector data: somewhat
- Research on open data
 - beginning with TODO

4 Open data in agriculture in Croatia



Šalamon D. (2019): Overview of open data in Croatia available for use in the sector of agriculture. In: *Book of Abstracts of the International Conference Innovations: Guarantee for Future of Agribusiness in Croatia*. Svržnjak, K. (Ed.), Zagreb: Croatian society of agricultural economists, 31-32.

The screenshot shows the data.gov.hr portal. At the top, there is a search bar with the text 'Pretražite podatke...' and a 'Prijava' button. Below the search bar, there is a red navigation bar with links: 'Podaci', 'Aplikacije', 'Dodatni sadržaji', and 'Kontakti'. Below the red bar, there is a grey bar with links: 'Skupovi podataka', 'Prijedlozi za objavu', and 'Izdavači'. The main content area shows search results for '30 Rezultata'. On the left, there is a sidebar with filters: 'TEMA' (Poljoprivreda, šumarstvo i ribarstvo), 'FORMATI RESURSA' (aspx (29), HTML (28), XLS (2)), 'IZDAVAČ' (Državni zavod za statistiku (29), Agencija za plaćanja u poljoprivredi, ribarstvu i ruralnom razvoju (1)), and 'OTVORENOST REZULTATA (BETA)' (★★★★ (2), ★★★★★ (28)). The main results list includes: 'Bilanca vina' (Poljoprivreda, šumarstvo i ribarstvo), 'Broj ekoloških jaja za konzumaciju' (Poljoprivreda, šumarstvo i ribarstvo), 'Broj ekoloških poljoprivrednih subjekata' (Poljoprivreda, šumarstvo i ribarstvo), and 'Broj goveda' (Poljoprivreda, šumarstvo i ribarstvo). Each result has a brief description and a 'Pretražite podatke...' button.



Podaci Aplikacije Dodatni sadržaji Kontakti

Skupovi podataka **Prijedlozi za objavu** Izdavači

🏠 / Prijedlozi za objavu / Posljednji prijedlozi za objavu

Prijedlozi za objavu

Ukoliko želite podnijeti prijedlog za objavu možete to učiniti nakon prijave. Da biste se prijavili u sustav morate posjedovati elektroničku vjerodajnicu za korištenje usluga u sustavu e-Građani. [🔗](#)

Prijava>

Dodatne informacije o tome kako možete postati e-Građanin saznajte [ovdje](#) [🔗](#).

U nastavku možete pronaći popis prijedloga za objavu:

Registar iz

21.03.2017. Teme:

Opis:

Registar izvješća o provedenim energetske pregledima zgrade i izdanim energetskim certifikatima koji sukladno članku 25. Pravilnika o energetske pregledu zgrade i energetske certificiranju (NN 048/2014) ustrojava i vodi Ministarstvo...

Registar izvješća o provedenim energetske pregledima zgrade i izdanim...

21.03.2017. Teme: Energija

Opis:

Registar izvješća o provedenim energetske pregledima zgrade i izdanim energetskim certifikatima koji sukladno članku 25. Pravilnika o energetske pregledu zgrade i energetske certificiranju (NN 048/2014) ustrojava i vodi Ministarstvo...

Registar izvješća o provedenim energetske pregledima zgrade i izdanim...

21.03.2017. Teme: Okoliš

Opis:

Registar izvješća o provedenim energetske pregledima zgrade i izdanim energetskim certifikatima koji sukladno članku 25. Pravilnika o energetske pregledu zgrade i energetske certificiranju (NN 048/2014) ustrojava i vodi Ministarstvo...

KATALOŠKA PROCJENA VOZILA

2017?



4 Open data in agriculture in Croatia



Šalamon D. (2019): Overview of open data in Croatia available for use in the sector of agriculture. In: *Book of Abstracts of the International Conference Innovations: Guarantee for Future of Agribusiness in Croatia*. Svržnjak, K. (Ed.), Zagreb: Croatian society of agricultural economists, 31-32.

Open data portal of the Republic of Croatia (fall 2019 to fall 2020)

- The only sector with reducing number of open data sets



4 Open data in agriculture in Croatia



AGENCIJA ZA
PLAĆANJA U
POLJOPRIVREDI,
RIBARSTVU I
RURALNOM
RAZVOJU

**Paying Agency for Agriculture,
Fisheries and Rural Development
(PAAFRD)**

APPRRR ▾ ZAJEDNIČKA POLJOPRIVREDNA POLITIKA ▾ RIBARSTVO ▾ UPISNICI I REGISTRI ▾ KONTAKT



AGRONET



Upisnik poljoprivrednika

ARKOD

Registri

Agronet

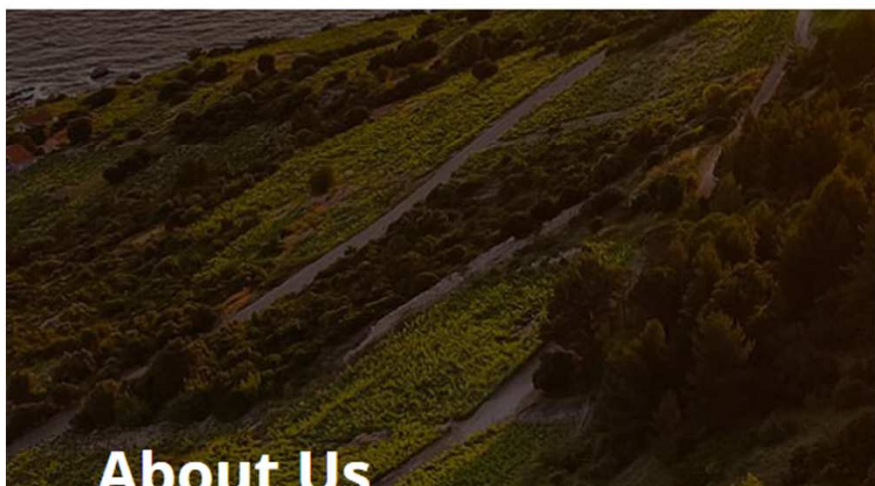
Prostorni podaci i servisi

Evidencija korisnika potpora u ruralnom razvoju i ribarstvu

Portal ponuda

Baza korisnika potpora

Otkupljivači mlijeka



About Us

4 Open data in agriculture in Croatia



REPUBLIKA HRVATSKA
Ministarstvo
poljoprivrede

Pretražite stranice



Vijesti O Ministarstvu Dokumenti Istaknute teme Pristup informacijama Kontakti Statistika

SLUŽBENO MJESTO ZA

VIRUS.HR
FORMACIJE O KORONAVIRUSU

EU
2020
HR
Hrvatsko predsjedanje
Croatian Presidency of the
European Council
Council of the European Union

is important to the resor ministry

Zakoni i propisi



- Poljoprivreda
- Poljoprivredna politika
- Ruralni razvoj
- Poljoprivredno zemljište
- Ribarstvo
- Veterinarstvo
- Hrana
- Doniranje hrane
- Fitosanitarna politika
- Šumarstvo
- Lovstvo
- Drvena industrija
- Pravo na pristup informacijama
- Ratarstvo EU
- Javna nabava
- Unutarnja revizija

4 Open data in agriculture in Croatia



Hrvatska agencija za
poljoprivredu i hranu

Croatian Agency for
Agriculture and Food

L'Agence Croate pour
l'Agriculture et l'Alimentation

Pretraži...

Početna

O nama

Propisi

Dokumenti

Obrasci

Publikacije

EFSA Focal Point

Javna nabava

Potrošački kutak

Kontakt

eHAPIH

Početna » eHAPIH

Centar za sigurnost hrane

Nacionalna mreža
institucija u području
sigurnosti hrane i
hrane za životinje

Centar za stočarstvo

HAGRIS

Aplikacija za
posljednike

Centar za kontrolu kvalitete stočarskih proizvoda

Pregled analiza
uzorske mlijeka

Centar za vinogradarstvo, vinarstvo i uljarstvo

e-Centar za
vinogradarstvo,
vinarstvo i uljarstvo

Centra za sjemenarstvo i rasadničarstvo

Baza podataka biljnih
genetskih izvora
Republike Hrvatske
(CPGRD)

Zbornik predavanja – 15. Savjetovanje uzgajivača goveda u Republici Hrvatskoj PDF

Kalendar stočarskih izložbi za 2019 Word

Uzgoj goveda br. 1 siječanj 2019. PDF

Uzgoj goveda br. 2 svibanj 2019. PDF

Zbornik sa savjetovanja uzgajivača goveda PDF

Zbornik sa savjetovanja uzgajivača konja 2019. PDF

Zbornik radova – 21. savjetovanje uzgajivača ovaca i koza u RH PDF

CS_govedarstvo_godišnje_izvješće_2019 PDF

CS_kopitari_godišnje_izvješće_2019 PDF

CS_ovčarstvo_kozarstvo_male životinje_godišnje_izvješće_2019 PDF

CS_svinjogojstvo_godišnje_izvješće_2019 PDF

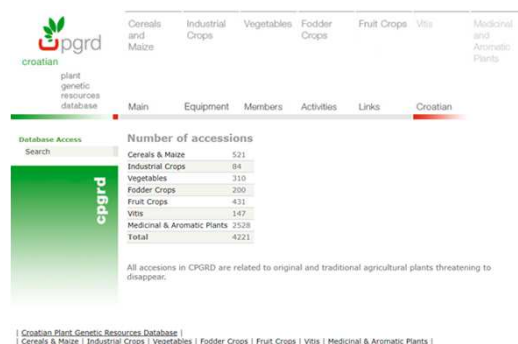
4

Research on open data



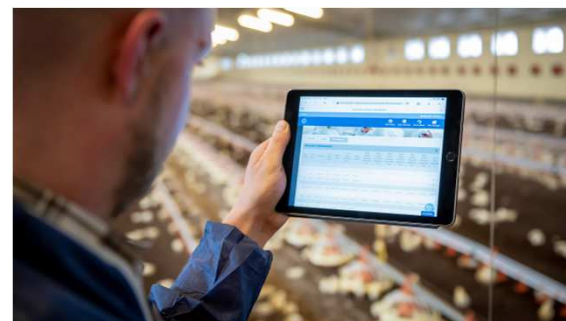
Filip Varga

Web portal and CPGRD database assessment



Alen Džidić

Animal biostatistic open data collections overview



Dragica Šalamon

Biological databases in Croatia



Genetic resources databases standards and metadata

Maja Ferenčaković



Using Genome

4

Research on open data



Filip Varga
Portal and database
FLORA CROATICA
assessment



Filip Varga
Opening database and portal
on dogs infrastructure in ZG



Dragica Šalamon
Open data on species spatio-
temporal distribution availability
assesment



Biologer je jednostavan i slobodan softver osmišljen za prikupljanje podataka o biološkoj raznolikosti. Zajednica „Biologer.hr“ broji 85 korisnika, koji su prikupili 31743 nalaza.



Alen Džidić

Automated milking production
and research data



Readiness of Croatian
database on bull breeding
values

Maja Ferenčaković

Uzgojne vrijednosti bikova

Uzgojne vrijednosti bikova čije DS sjeme imamo na raspolaganju

Prognoza testirani bikovi

Ime	Zb	GZW	MW	FW	FIT	Okvir	Miličav	Noge	Vime	Telenja
WILLE	DE 0813516428	138	129	101	119	112	102	118	111	100
GS RUMGO	AT 168213272	138	123	105	127	104	93	103	104	135
MANTON	DE 0942405989	134	124	103	124	100	110	112	118	114
VANSTEIN	DE 0934586859	130	120	116	112	100	105	95	112	105
WARBERG	DE 0940324027	128	115	129	111	103	108	97	113	123
HULKOR	DE 0939373401	124	112	127	109	97	110	108	112	102
WATNOX	DE 0938662295	124	115	111	113	99	112	110	106	114
IMPOSIMUM	DE 0935904510	124	123	96	107	94	99	95	102	104
ROMARKT	DE 0941645948	124	118	94	117	97	110	109	103	109
RAIGRAS	DE 0940600199	123	123	100	106	102	93	102	98	115
HUPSQL	DE 0937793170	123	101	112	134	100	103	100	125	94
IMIND	DE 0942405989	123	113	109	114	107	113	119	96	87

Dataset evaluation results



CPGRD datasets	G	A	P	I
	No formal Not specified	Free and open Not really findable	Not machine readable	No impact tracked
	Not applicable ...	Not aproachable Not downloadable	Versions not open, not tracked	

Open data research challenges in agriculture

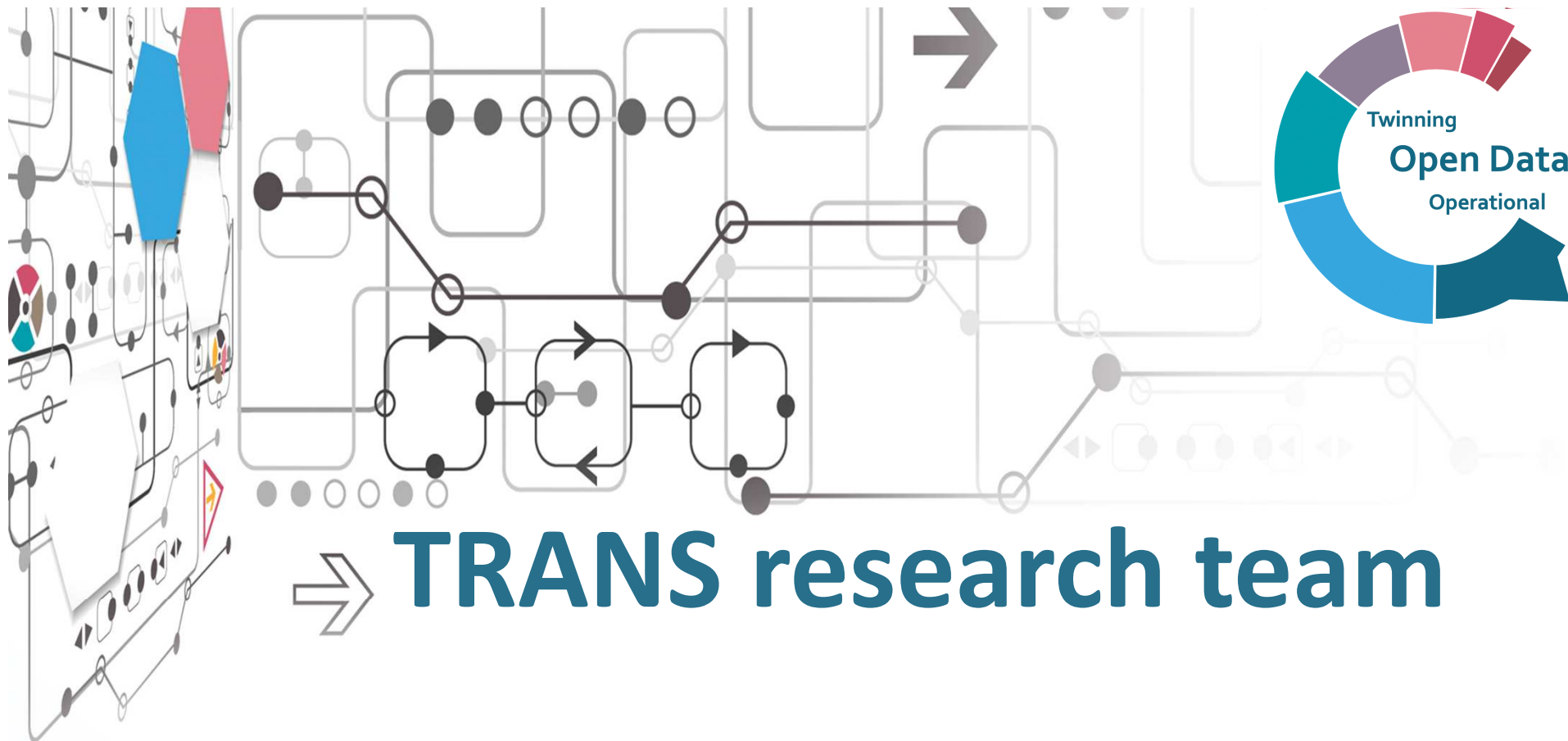


- Diversity in agriculture- **real need for interdisciplinary approach**
- Scattered OD **bits and pieces**
- Approaching the Ministry of agriculture directly and the producers from the bottom-up approach
- Introducing **OD as part of IT literacy** throughout the agriculture education
- Lot of **PR including impact assessments**

Opportunities to cooperate in TODO



- Deficitary in:
 - Infrastructure,
 - Law,
 - OD research, government data
- Open for all suggestions on all ideas presented today (and beyond 😊)
- Working on collaboration with
 - *ALL? AGRI Sector evaluation (FOI: Marina Tomicic Furjan?), Nature observation sector evaluation*
 - *FER: Ivana Bosnić - Genetic res. databases standards and metadata*
 - *LAW: Anamarija Musa – Opening NGO animal observation data*
 - *GEOD: Dražen Tutić and Ana Kuveždić Divjak – ICARUS- global monitoring with animals*



⇒ **TRANS research team**

Miroslav Vujić, Sadko Mandžuka,
Martin Gregurić, Bia Mandžuka,
Martina Erdelić, Maja Tonec Vrančić,
Luka Dedić



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Team



Assist. prof. Miroslav Vujić, PhD



Prof. Sadko Mandžuka, PhD



Martin Gregurić, PhD



Bia Mandžuka



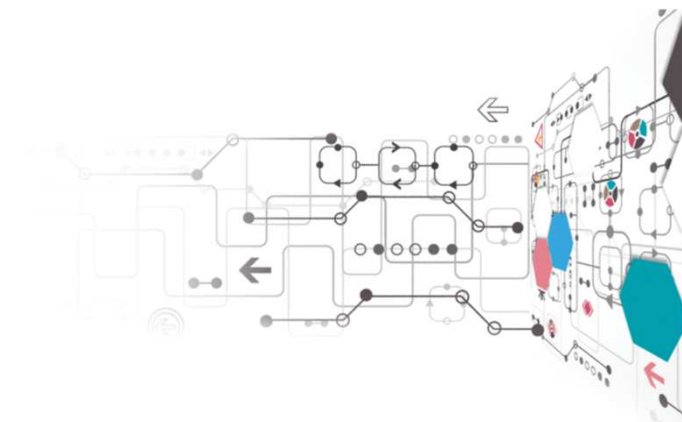
Martina Erdelić



Maja Tonec Vrančić



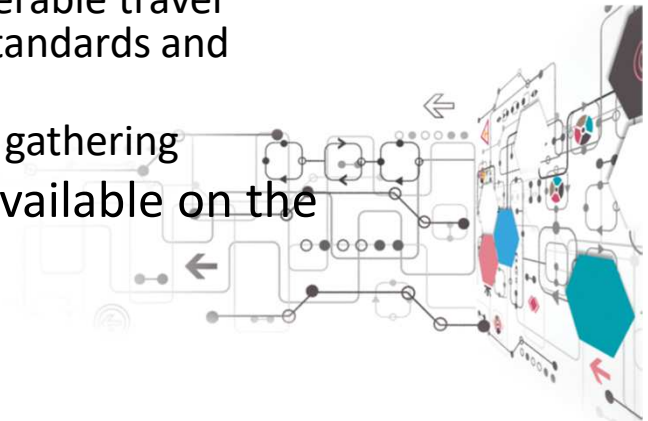
Luka Dedić



Open data research



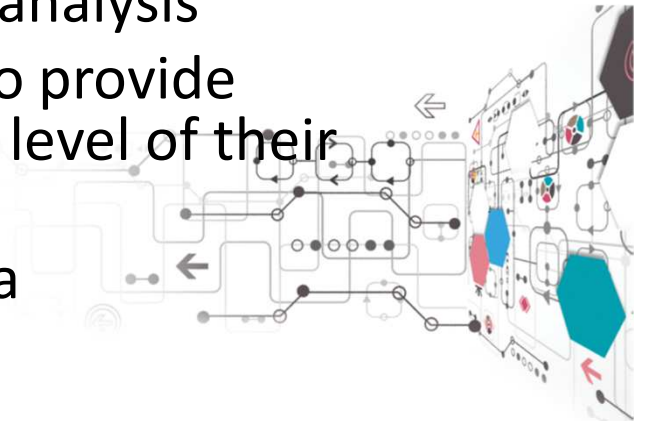
- Link to the OD life cycle
 - Lab for data science in traffic and logistics
 - Founded in collaboration with Ericsson Nikola Tesla
 - Development of standards and UI for mobility pattern analysis based on mobile user's data
 - Anonymization of raw mobile user's data in order to meet all legislation standards to be published as OD
 - Collaboration with several traffic companies and operators
 - Usage of truck GPS trails to optimize delivery process
 - Aggregated data in the form of speed profiles will be shared as OD via web portal
 - Involvement in Study for providing multimodal traffic information
 - The study provide the basis for collecting interoperable travel information and services, based on the existing standards and technologies
 - Model of center for centralized multi-modal data gathering
 - Establishing Web portal for traffic-based OD available on the Faculty of Transportation and Traffic Sciences



Open data research



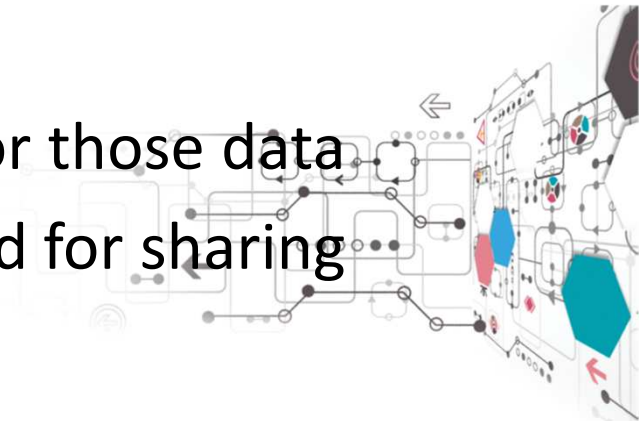
- Research with open data
 - Developing an algorithm for speed profile distribution based on GPS trails
 - Advanced visualization of mobile user's migration patterns
 - Design of OD matrices based on mobile user's data
 - Clustering of the Anomalous Spatiotemporal Traffic Patterns Using Tensor Decomposition Method
- Research on open data
 - Creating the OD framework to bridge different data types and standards in mobility pattern analysis
 - Motivation of traffic data *stakeholders* to provide information about their data and assess level of their traffic data (5 star approach)
 - Building traffic data ecosystem in Croatia



Research methodologies



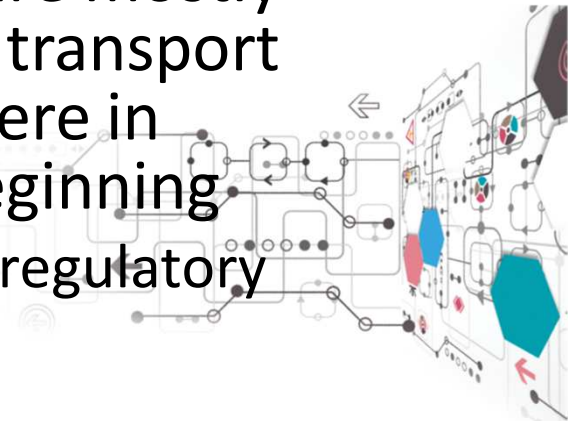
- Building concept of OD repository with correlation results between metrological data and traffic intersection data (City of Skopje)
- Surveys for mapping all currently available traffic data in Croatia within each traffic mode
 - Assessing their digitalization and OD degree
 - *Identify key employees among traffic data owners dedicated for data handling*
 - Development of appropriate KPI's for those data
 - Business model should be developed for sharing those data



Status of open data in Traffic and Transport domain in Croatia



- A large amount of data is generated in traffic
 - there is a growing need for open data from all traffic and transport modes
- Present situation regarding availability of traffic open data is minimal
 - i.e.: urban traffic data (vehicle travel times, stop-and-go actions, average vehicle speed, etc.) must be collected for each research separately
 - and if they exist, providers don't want to share
- Members of this TODO research group are mostly based on the research within intelligent transport systems, urban traffic networks, etc. where in Croatia concept of open data is at it's beginning
 - Foundation for OD ecosystem in Croatian regulatory authority for network industries



Status of open data for mobility pattern analysis



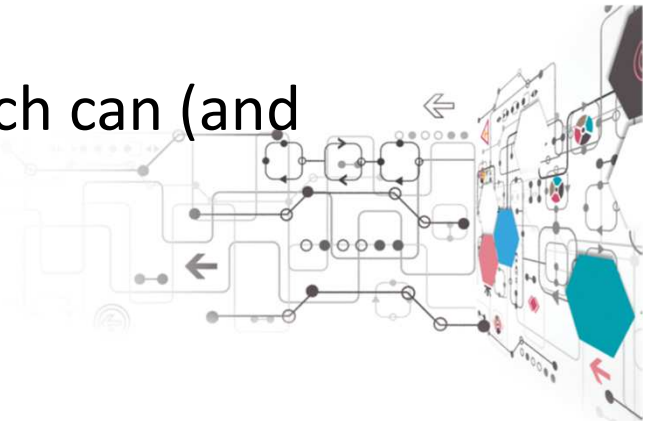
- Raw truck GPS trials data are open only for the research members of TRANS
 - Available for entire Croatia
 - Web interface for data visualization exist, but it is available only within TRANS domain
- Mobile user's data
 - Historic data are available only for the western part of Croatia in form of OD (origin destination) matrices for few weeks
 - Currently there is no way to access raw data
 - Problem with GDPR, and data service providers
 - Data is located on remote server (Ericsson)
 - Web interface for data visualization exist but it is available only for several IP addresses



Status of open data in Traffic and Transport domain in Croatia – cont.



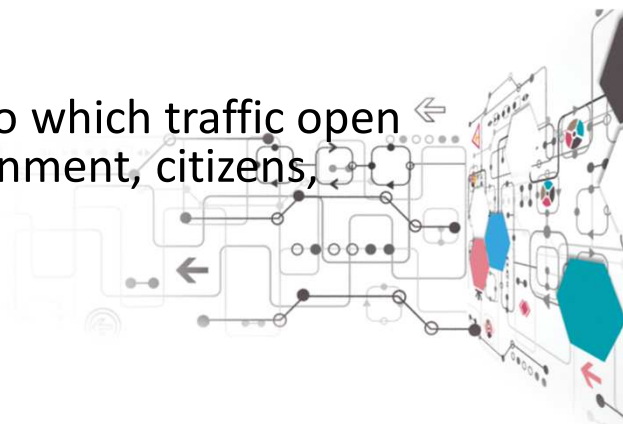
- HAKOM - Croatian regulatory authority for network industries provides two OD datasets:
 - List of primary numbering assignments of electronic communications operators
 - List of electronic communications operators
- Defined data is:
 - available to everyone (free of charge)
 - listed in Open data portal
 - updated when changes appear
- Economical and societal impact studies are not conducted (as far as we know)
- Needs upgrade with additional data which can (and probably is) collected and archived



Open data research challenges for mobility pattern analysis



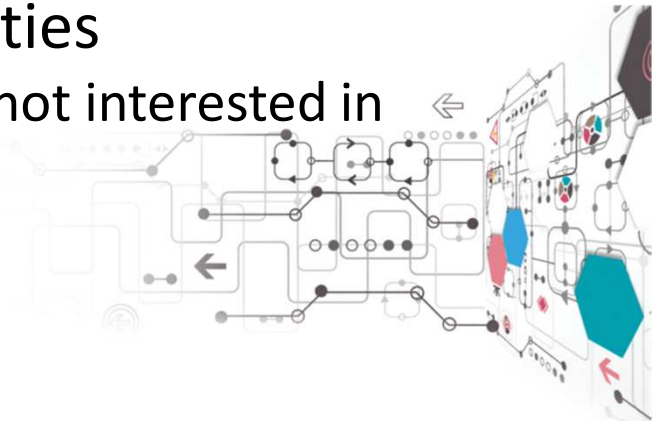
- Solution: data fusion and aggregation
- Idea is to develop centralized OD web site which integrate truck GPS trails and mobile user's data
 - Development of objective KPI's for each region in Croatia with the respect of those two data sources
 - **Implementation of data assessments** (the main scope)
 - Impact assessments explore the extent to which traffic open data initiatives lead to benefits for government, citizens, businesses, and society in general
 - **Impact assessments**
 - Impact assessments explore the extent to which traffic open data initiatives lead to benefits for government, citizens, businesses, and society in general



Open data research challenges for mobility pattern analysis – cont.



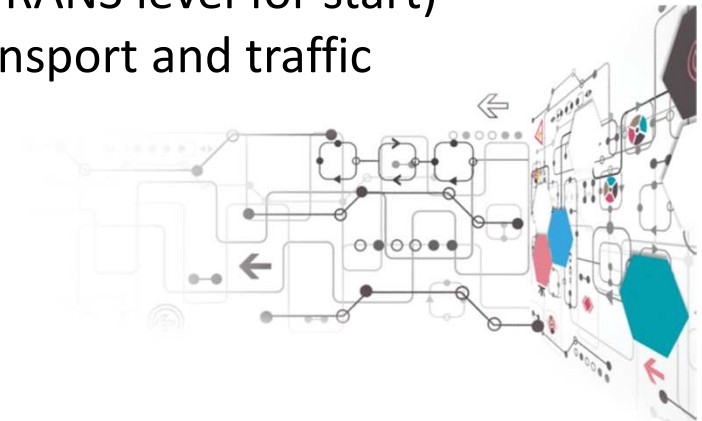
- Problem
 - GDPR constraints
 - *Stakeholders* who own mobile user's data want to put a noise in them
 - Even anonymized mobile user's data with respect to legislation is problematic to set as OD in raw format
 - Raw truck GPS traces are owned by private company
 - Poor cooperation with road authorities
 - Data exist „somewhere”, but they are not interested in sharing
 - Data is aggregated on yearly basis



Open data research challenges in traffic and transport



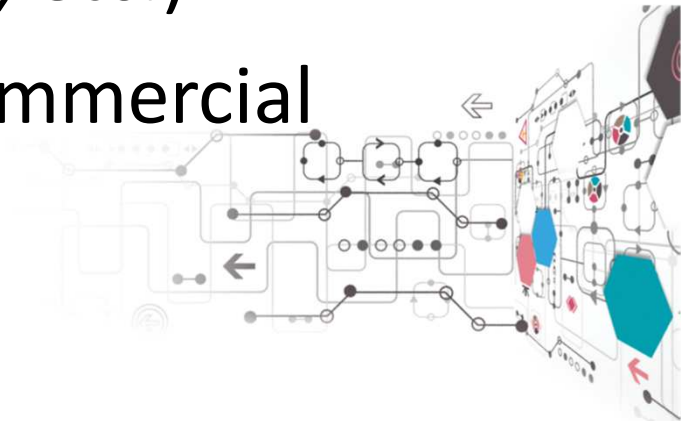
- PRESENT
 - traffic data is collected and processed separately according to specific user needs
 - in most cases same data is collected multiple times (not knowing that already exists!!)
 - some providers don't want to share even basic traffic datasets although they are collected
 - vast amount of „paper collected“ data without the desire to digitalization
- FUTURE
 - to encourage the usage of OD concept
 - to establish the open data traffic portal (at TRANS level for start)
 - to point to the benefits of OD concept in transport and traffic data collection and processing

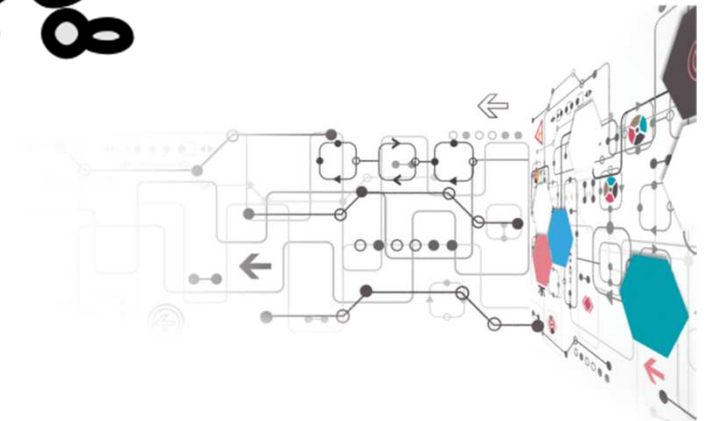
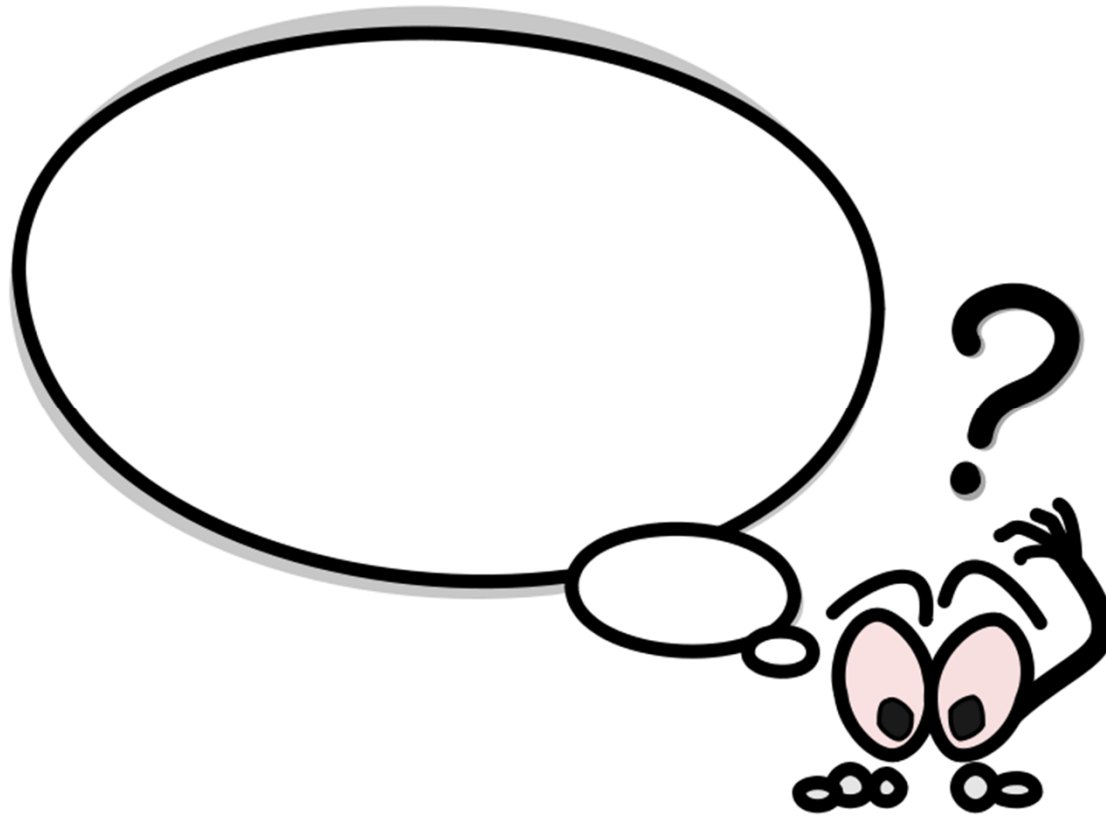


Opportunities to cooperate in TODO



- Joint papers publication
 - Vujić, Dedić, Tomičić Furjan, Pihir: The Benefits of Open Data in Urban Traffic Network – paper accepted on EAI MMS 2020 conference
- Exchanging knowledge with other TODO partners (through Summer school, TODO national conference, site visits, etc.)
- Ideas for new scientific and commercial joint projects







⇒ **TODO Interdisciplinary Assessment Framework (IAF) 2.0**

Bastiaan van Loenen & Martina
Tomičić Furjan



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



Open data ecosystems assessed by TODO

In this questionnaire, we want to assess the Open Data Ecosystem using the Key Performance Indicators (KPIs) identified in Module 2. You can select any Open Data Ecosystem to research, e.g. a national or local government open data portal, a domain-specific portal, e.g. environmental information portal or an institutional open data portal, e.g. a university.

* Required

1. Provide the name and (if available) the URL of the Open Data ecosystem that you will assess *

Open Data Governance:
Policies and strategies

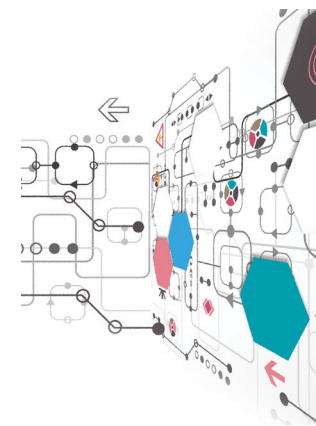
the questions in this section relate to the governance of open data in your country, and if open data policies and strategies are in place.

2. Question G1: is there a formal Open Data (OD) policy covering the open data ecosystem assessed by you? *

This question assesses whether there is a formal open data policy covering the open data ecosystem in your country, domain or organisation. If you assess an Open Data Ecosystem on domain level, you may have to check if there are formal open data policies as a result of international conventions / EU directives, e.g. environmental information, geodata, traffic information. If you assess an Open Data Ecosystem on organisational level, you may have to check if there are open data policies as a result of specific directives of e.g. government ministers or international directives (e.g. open science directives).

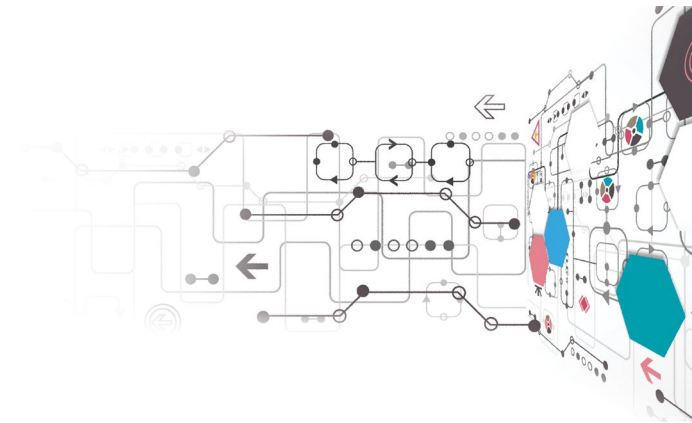
Mark only one oval.

- ☐ yes, but the OD policy is only applicable to national government departments / agencies
- ☐ yes, but the OD policy is only applicable to local government organisations
- ☐ yes, and the OD policy is applicable to all levels of government organisations
- ☐ yes, although the OD policy is applicable to all government organisations, a number of (semi) government organisations, e.g. universities, are specifically exempted
- ☐ yes, and the open data policy also applies to non-government organisations, e.g. universities
- ☐ no formal OD policy but there are directives from e.g. ministers to ensure specific datasets are available as



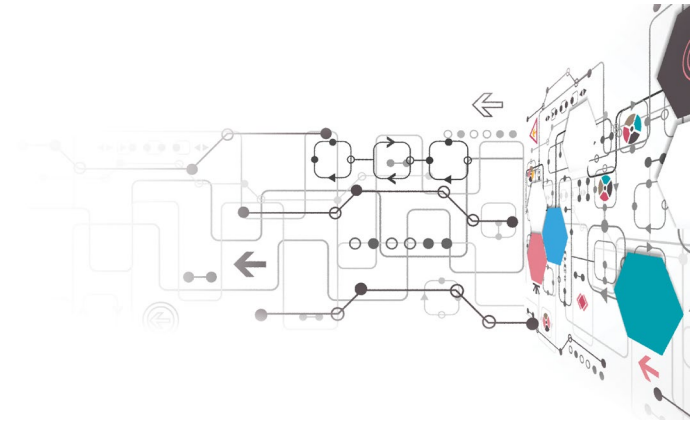
Four categories

1. Governance
2. Availability
3. Portals
4. Impact





Apply IAF 1.0 to a domain/disciplinary open data ecosystem



TODO assessment framework



TODO Open data ecosystem



All changes saved in Drive



Questions

Responses

Section 1 of 5

Open data ecosystems assessed by TODO



Background

Provide the name of the Open Data ecosystem that you will assess

Short answer text

After section 1 Continue to next section

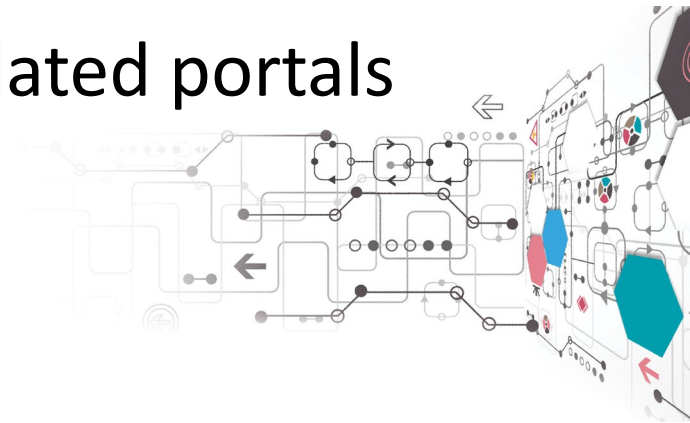
Section 2 of 5



Status of open data domain – source of analysis



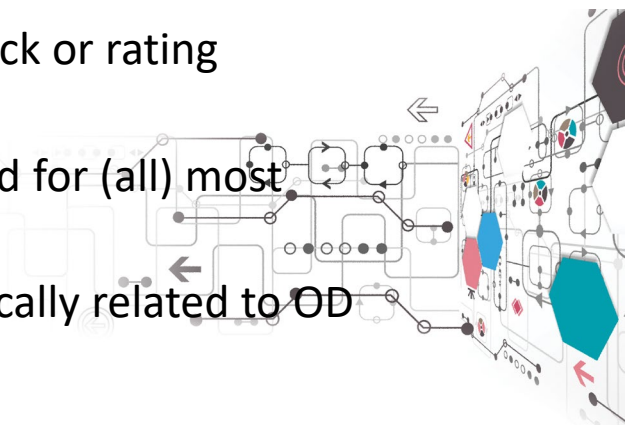
- FOI - local portals Ri, Zg, Vž
- LAW - national open data portal
- FER – higher education (portal ISVU & co)
- GEOD – State Geodetic Administration geoportal
- AGRI - botanical portals
- TRANS – transport and traffic related portals
- TUDELFT – geo data in NL





Status of open data - CRO

- Small number of published datasets overall
- Poor on versioning
- Some datasets are not downloadable, or downloadable in wrong format (ISVU – pdf – Ivana 😊)
- Metadata are mostly published in national language
- Datasets are not published frequently and those that are published are not updated frequently or at all
- Status of availability sometimes depends on data type
- No action plan for policy (on government level)
- In some portals data is published under organisational OD Policy, no OD strategy
- In general there is low level of user inclusion and feedback or rating mechanisms are not implemented
- Economical and societal impact studies are not conducted for (all) most available
- Some promotional events organized annually, not specifically related to OD



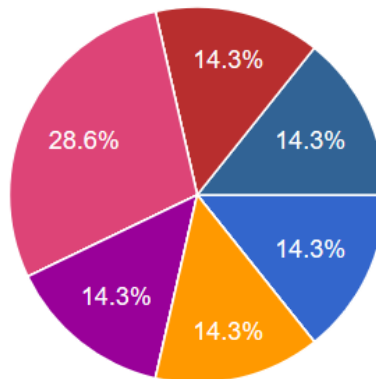
Governance



Open Data Governance: Policies and strategies

Question G1: is there a formal Open Data (OD) policy covering the open data ecosystem assessed by you?

7 responses



- yes, but the OD policy is only applicab...
- yes, but the OD policy is only applicab...
- yes, and the OD policy is applicable to...
- yes, although the OD policy is applica...
- yes, and the open data policy also ap...
- no formal OD policy but there are dire...
- no formal OD policy but there is a wid...
- no formal or informal OD at all

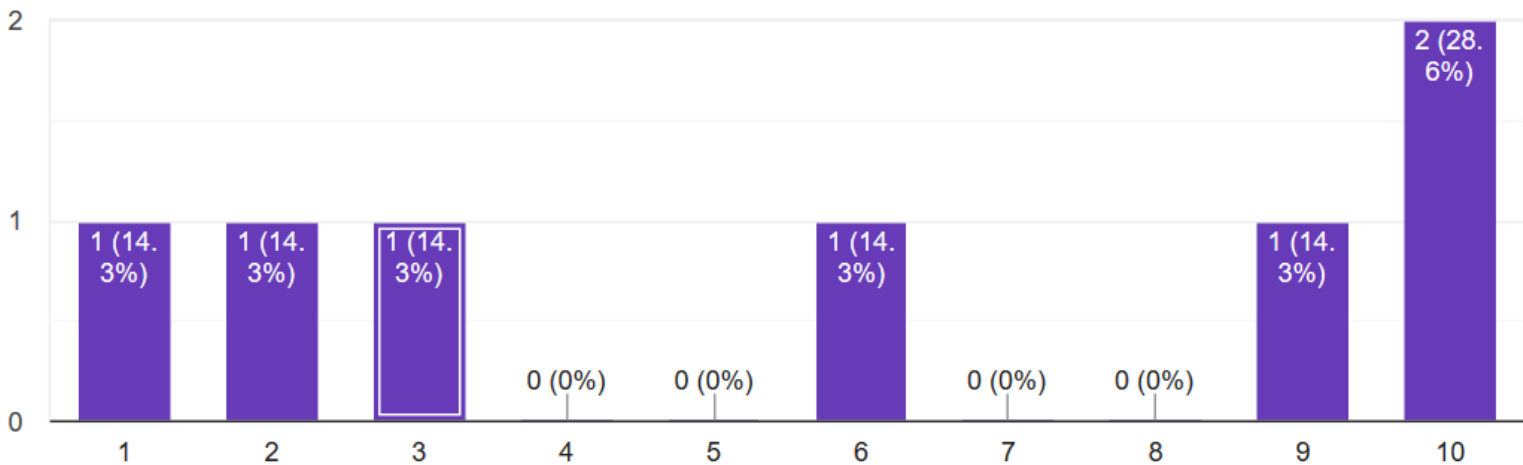
▲ 1/2 ▼

Availability



Question A6a: How would you rate the findability of your first dataset in your researched country?

7 responses

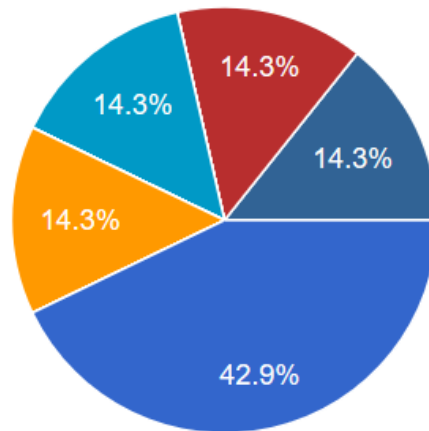


Portal



Question P1: at which star level of deployment according to Tim Berners-Lee are datasets published on the open data platform

7 responses

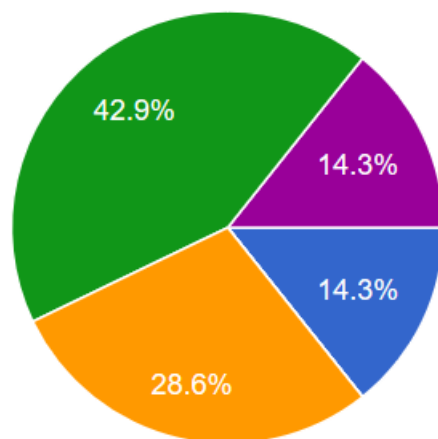


- One *: datasets are available on the in...
- Two **: datasets are published as stru...
- Three ***: datasets are published as s...
- Four ****: datasets comply to 3 stars i...
- Five *****: datasets comply to 4 **** a...
- a mix of star levels, mostly 1 to 2 stars
- a mix of star levels, mostly 2 to 3 stars
- a mix of star levels, mostly 3 to 4 stars

▲ 1/2 ▼

Question P10: Is it clear from what the actuality / update frequency of datasets are?

7 responses



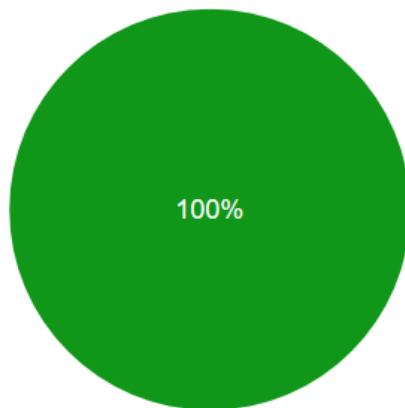
- yes, but only actual version according to update date is listed in metadata / doc...
- yes, but only update frequency is listed in metadata / documentation
- yes, both are listed in metadata / documentation
- no, lacking in metadata / documentation which version is published nor what th...
- yes, but only actual version is listed in metadata / documentation

Impact



Question I 1: Are there scientific studies / reports published showing (potential) economic benefits of your Open Data ecosystem?

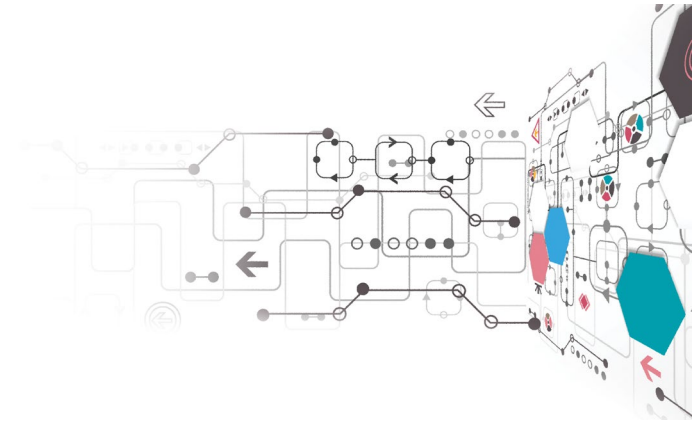
7 responses



- yes, only published in national language
- yes, only published in a foreign language
- yes, published in national language and a foreign language
- no such reports / studies not to my knowledge



TODO Interdisciplinary Assessment Framework 2.0



Towards IAF 2.0



Four KPI categories

1. Governance
2. Availability
3. Portals
4. Impact

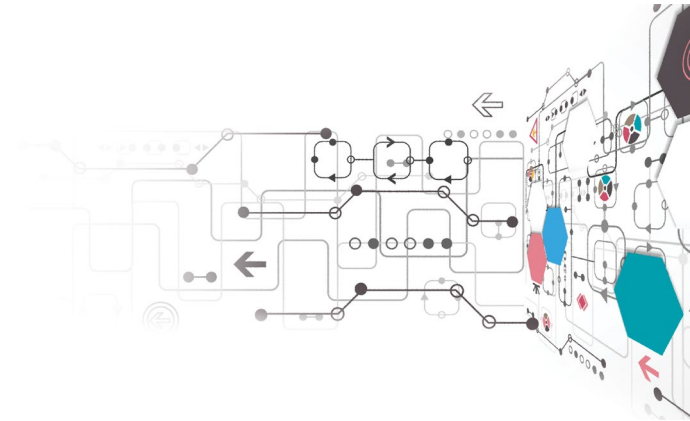
Four groups: each group will focus on **one** KPI category

Group 1: Governance

Group 2: Availability

Group 3: Portals

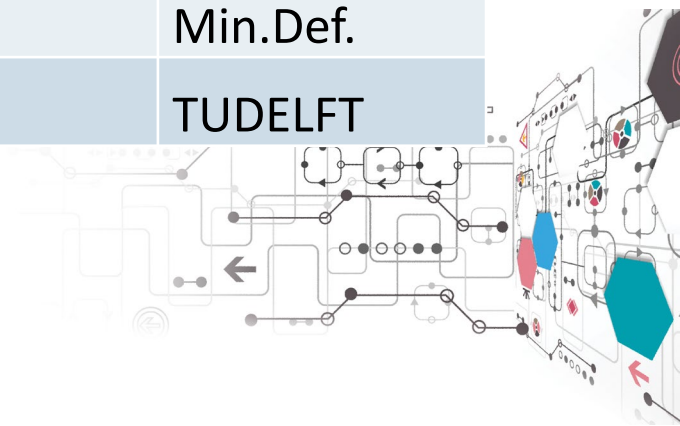
Group 4: Impact



Group 1: Governance



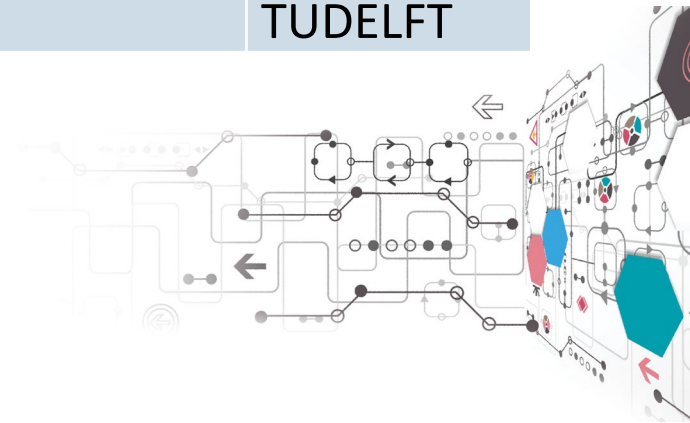
Team no.	First name	Surname	Faculty
1	Filip	Varga	AGRI
1	Igor	Čavrak	FER
1	Nikolina	Žajdela Hrustek	FOI
1	Ana	Kutnjak	FOI
1	Josip	Šiško	GEOF
1	Dražen	Tutić	GEOF
1	Marko	Juric	LAW
1	Jelena	Petrović	Min.Def.
1	Warakan	Supinajaroen	TUDELFT



Group 2: Availability



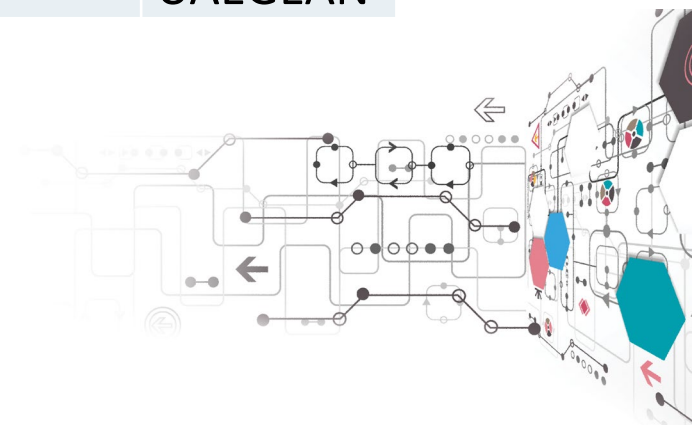
	First Name	Surname	Faculty
2	Dragica	Šalamon	AGRI
2	Emanuel	Guberovic	FER
2	Renata	Mekovec	FOI
2	Larisa	Hrustek	FOI
2	Barbara	Slibar	FOI
2	Ana	Kuvezdic Divjak	GEOF
2	Petra	Đurman	LAW
2	Bia	Mandzuka	TRANS
2	Agung	Indrajit	TUDELFT



Group 3: Portals



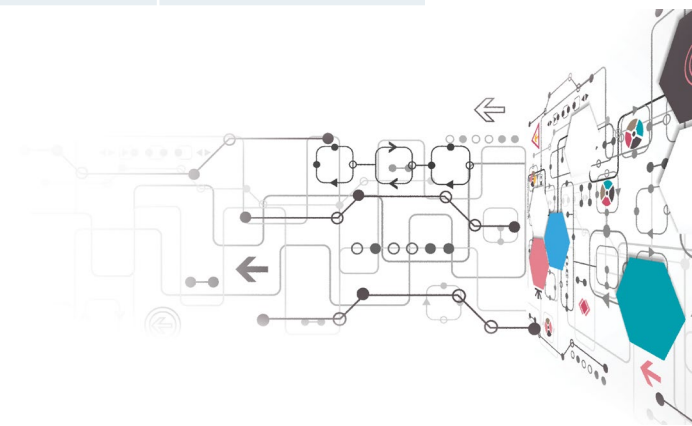
	First name	Surname	Faculty
3	Alen	Dzidic	AGRI
3	Igor	Pihir	FOI
3	Jura	Kapustić	FOI
3	Željko	Bačić	GEOF
3	Margareta	Habazin	LAW
3	Tihomir	Katulić	LAW
3	Martin	Gregurić	TRANS
3	Vaggelis	Pikis	UAEGEAN



Group 4: Impact



	First name	Surname	Faculty
4	Ivana	Bosnić	FER
4	Neven	Vrcek	FOI
4	Martina	Tomičić Furjan	FOI
4	Adam	Vinković	GEOF
4	Vesna	Poslončec-Petrić	GEOF
4	Tereza	Rogić Lugarić	LAW
4	Anamarija	Musa	LAW
4	Miroslav	Vujic	TRANS

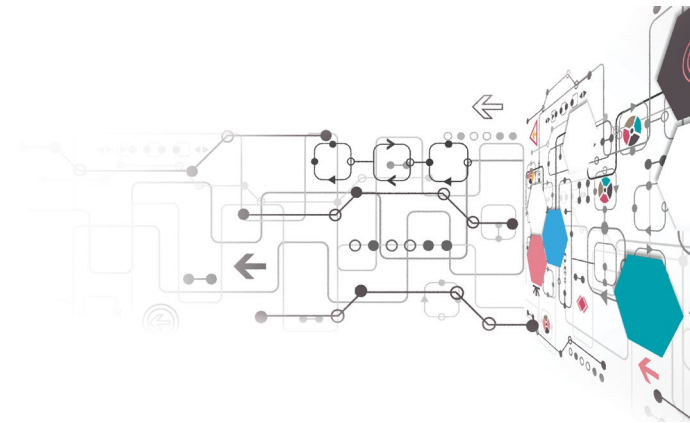




Assignment A.1

For your KPI category:

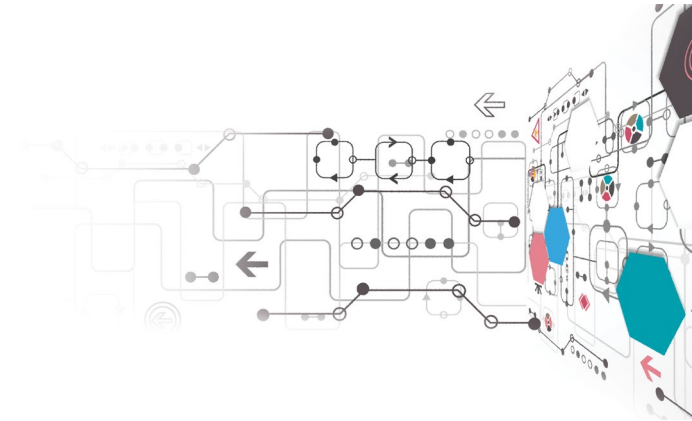
- Based on your experiences: select the most appropriate KPIs of the IAF 1.0 and remove the non relevant ones
- If applicable, propose a new KPI that you missed in the IAF 1.0





Assignment A.2

1. Develop for each selected KPI in the KPI category assigned to your group **4** levels of maturity
2. Indicate for each KPI the stage of maturity the Croatia Open Data Ecosystem



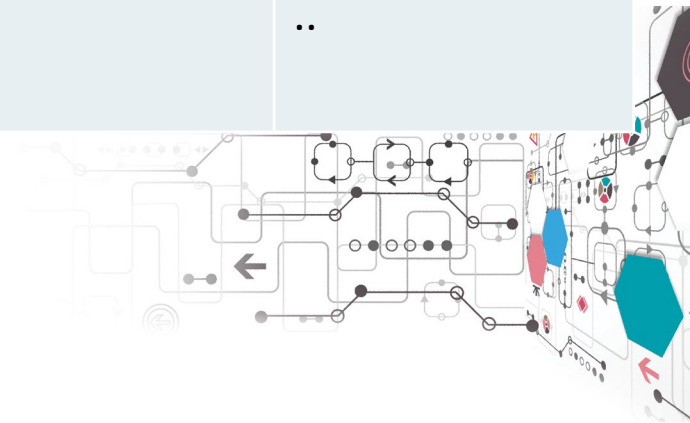


Example KPI category Governance

A.1 KPI1: Formal open data policy

A.2 Levels of maturity

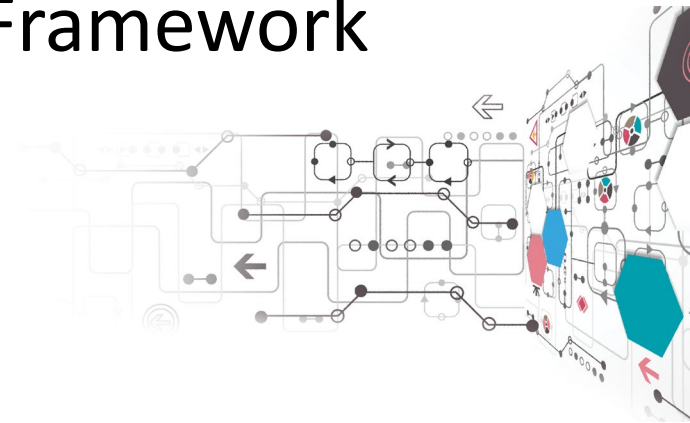
KPI/ Level	0	1	2	3
Formal open data policy	No policy	Informal OD policy	Formal policy for parts of the ODE	Formal policy exists covering entire ODE
KPI2





Assignment A.3

- Present your findings to the group
- 5 minutes presentation
- **Use the template available in Moodle**
 - > Summer School
 - > Day 3
 - > Interdisciplinary Assessment Framework
 - > Template



IAF assignment in Moodle



Course: Summer School | My Drive - Google Drive | TODO Open data ecosystem | TODO Open data ecosystem | BigBlueButton

science.geof.unizg.hr/todo-platform/course/view.php?id=3

TODO English (en)

SUM

- Participants
- Badges
- Competencies
- Grades
- General
- Virtual room of the Summer school
- Day 1: Introduction and recap
- Day 2: Research methodologies and challenges in open data life cycle

Interdisciplinary assessment framework of TODO!

- Survey question Interdisciplinary Assessment Framework 1.0
- Template IAF KPI group Governance
- Template IAF KPI group Availability
- Template IAF KPI group Portals
- Template IAF KPI group Impact
- Interdisciplinary teams for group work on IAF

Here you can find the lists of all participants grouped for IAF!

- Virtual room for Team 1!
- Virtual room for Team 2!
- Virtual room for Team 3!
- Virtual room for Team 4!

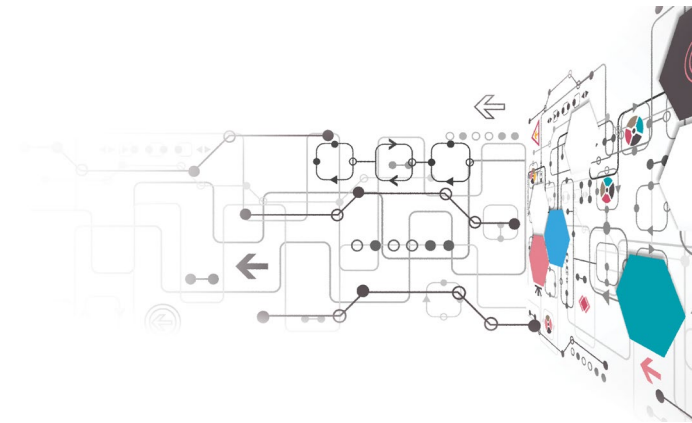
Day 4: Towards an interdisciplinary research agenda

Meeting with faculty management and staff at FOI!

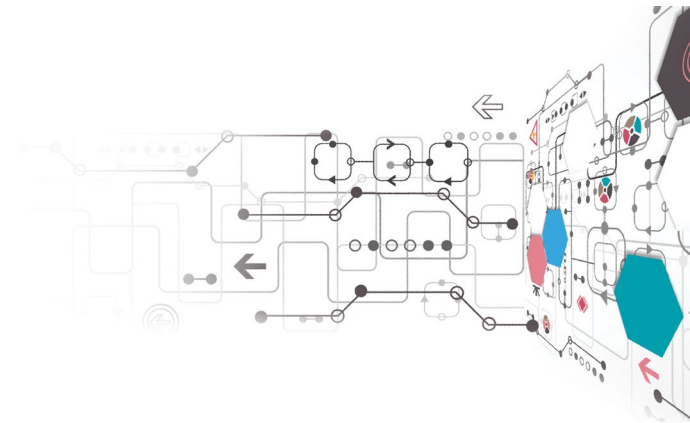
14:28 9-9-2020

Time slots

- Selecting KPIs of the KPI category assigned to your group: 3:10pm-3:40pm
- Creating 4 levels of maturity per KPI: 3:40-4:10pm
- Prepare presentation: 4:10-4:25pm
- Presenting findings: 4:30-4:50pm
- Closing: 4:50-5pm

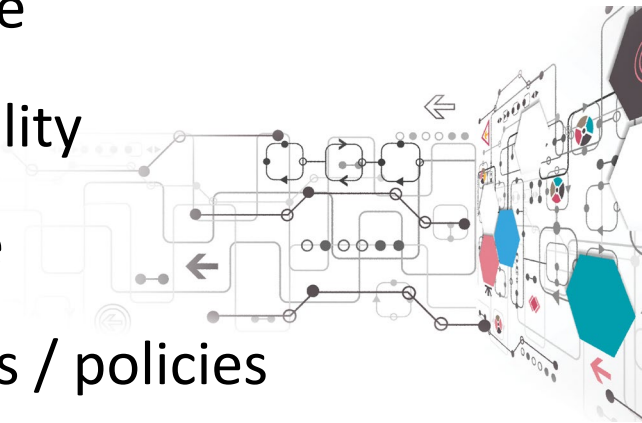


Link to practice

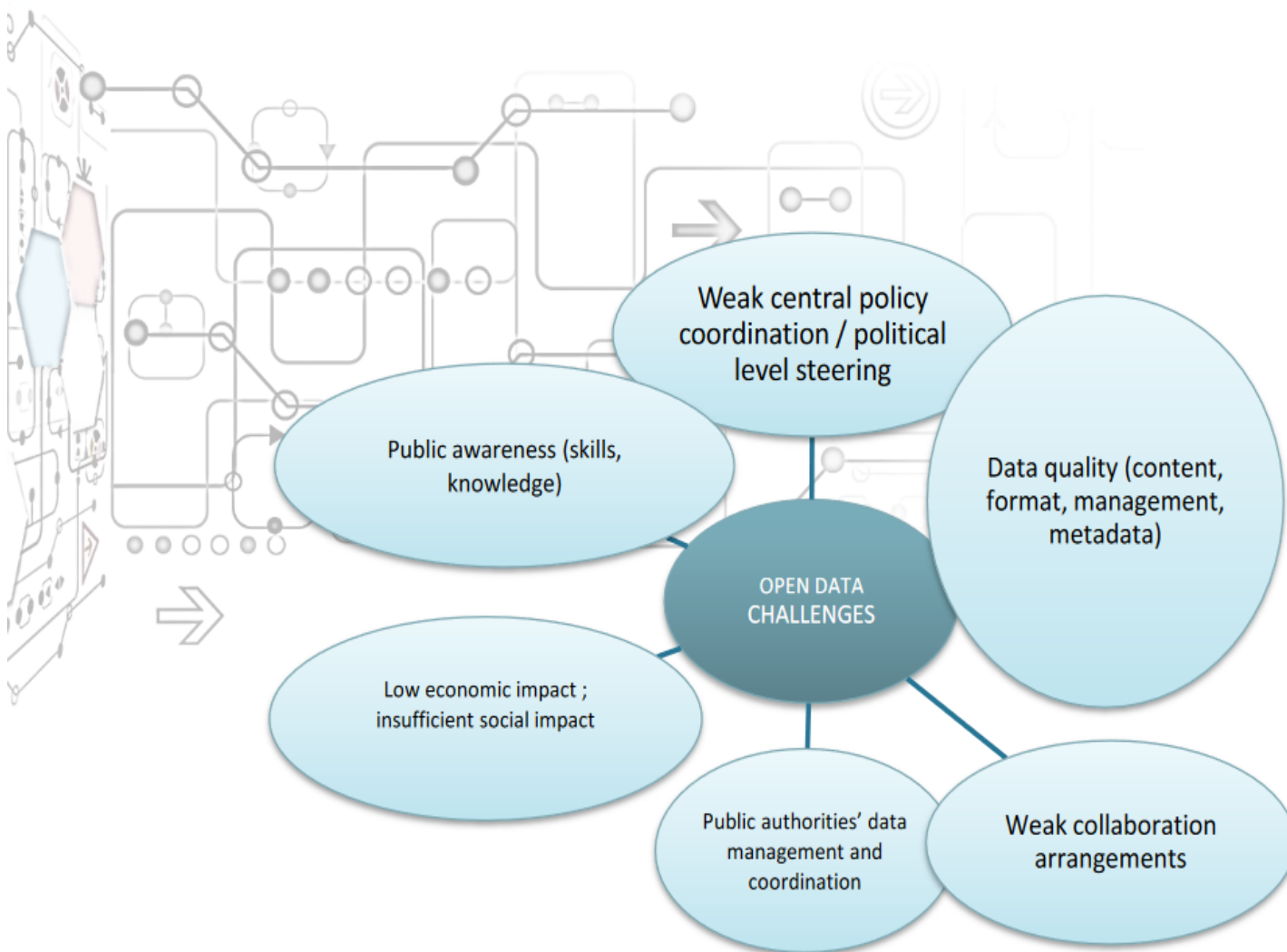


Open data research challenges ALL

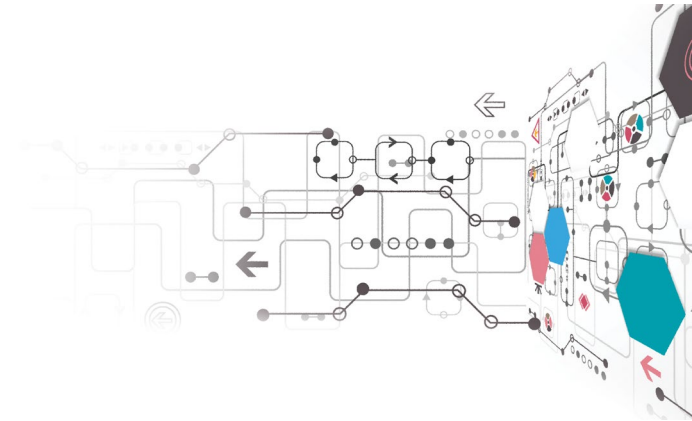
- Technical
 - Interoperability
 - Scalability
 - Adaptability
 - Portability
 - Versioning
 - Accuracy
 - Feedback mechanisms
- Socio-Economic
 - Raise of awareness among researchers
 - Impact assessments
 - Ethical issues
 - Usefulness
 - User centrality / participation
 - Relevance
 - Applicability
 - Coverage
 - Strategies / policies



Key challenges of the OD ecosystem in Croatia



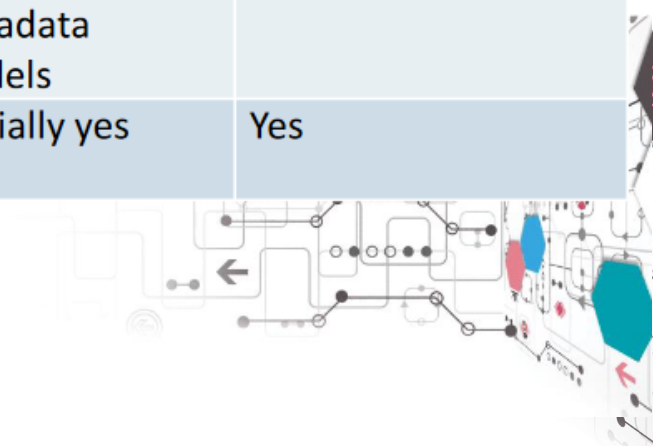
Link to theory



Maturity Identification: Stage Model



		Traditional OGD Infrastructures		Advanced OGD Infrastructures	
Time		Point Zero	1 st Generation	2 nd Generation	3 rd Generation
Information Quality	Thematic perspective	N/A	Statistical, economical, census	Law, Transportation, GIS	All categories with proper data modelling
	Format	.xls, .pdf	html, .xls, .pdf	+ .csv + URLs	+ Linked data
	Metadata	Metadata Ignorance or Closed flat Metadata	Metadata Ignorance or Closed flat Metadata	Open Metadata for Humans or Open Reusable Metadata + contextual or detailed metadata models	Linked Open Metadata 3-layer metadata model (flat, contextual, detailed)
	RDF-compliance	No	No	Partially yes	Yes



Maturity Identification: Stage Model

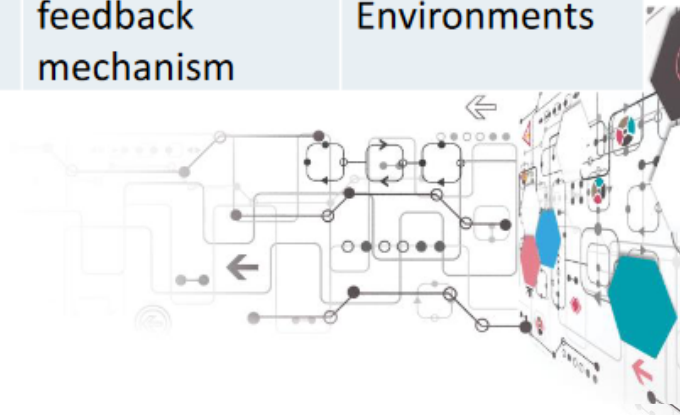


		Traditional OGD Infrastructures		Advanced OGD Infrastructures	
	Time	Point Zero	1 st Generation	2 nd Generation	3 rd Generation
General	Internet presence	OGD existence in silos accessed by application	OGD web presence	OGD web presence	OGD web presence
	Users	Distinction between Data Providers and Data Users	Distinction between Data Providers and Data Users	Data Procumers	Data Procumers
	Open Government level	Initial: Information broadcasting	Data Transparency: processes and performance	Open participation: Data quality, Public feedback, conversation, voting, Interactive communications, Crowd-sourcing	Open Collaboration: Interagency and with the public, Co-creating value-added services
	Value	N/A	Transparency & Accountability	Participation	Efficiency & Innovation

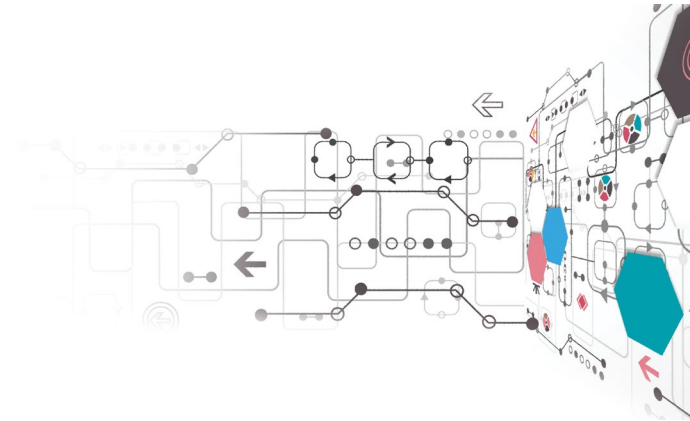
Maturity Identification: Stage Model



		Traditional OGD Infrastructures		Advanced OGD Infrastructures	
	Time	Point Zero	1 st Generation	2 nd Generation	3 rd Generation
System Quality	Functionality	N/A	Basic Web 1.0	Advanced Web 2.0	Supporting value creation
	Type	N/A	OGD direct provision portals	OGD direct provision & OGD aggregators	Collaboration Spaces
	Technology	N/A	Custom technologies	Open source	Open Source
Service Quality	License	N/A	Custom or N/A	CC share-alike	CC share-alike
	Quality Rating and Feedback Mechanisms	N/A	Web forms	+ Rating and feedback mechanism	+ Collaboration Environments



To be continued..





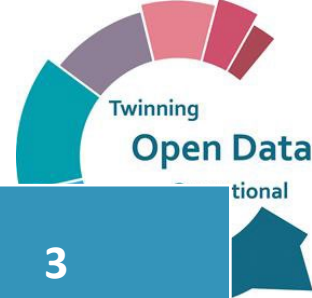
⇒ **TODO Interdisciplinary Assessment Framework 2.0**

Summary of the work of participants



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Governance KPIs

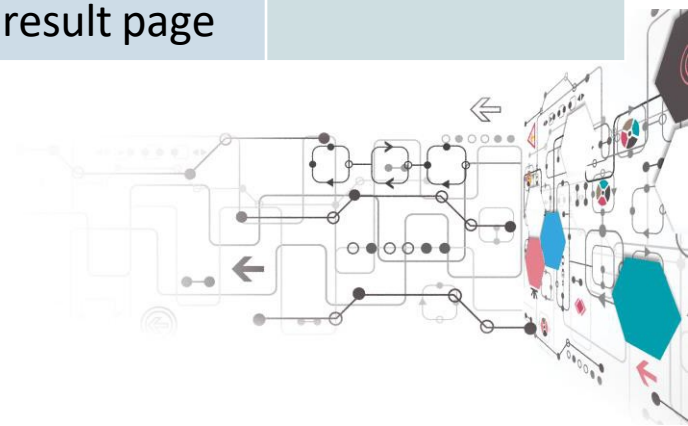


KPI/ Level	0	1	2	3
Open data policy	No policy	Informal OD policy	Formal policy for parts of the ODE	Formal policy exists covering entire ODE
Scope OD policy	Not specified in OD policy	Only for one specific domain	For several domains	For all domains
OD action plan	No action plan	Action plan in place	Action plan in place and enforced	Action plan with enforcement and evaluation
Open data strategy	No OD strategy	Informal OD strategy	Formal strategy for parts of the ODE	Formal strategy for entire ODE
Participation model	Only the data provider	Same level of government	Multiple levels of government	Open participation

Availability KPIs



KPI/ Level	0	1	2	3
KPI9 - Findability datasets	Not findable/too many irrelevant results	Findable using specific search terms	Findable using specific search terms but not within the first 15 results on the result page	Findable using generic search terms within the first results



Availability KPIs

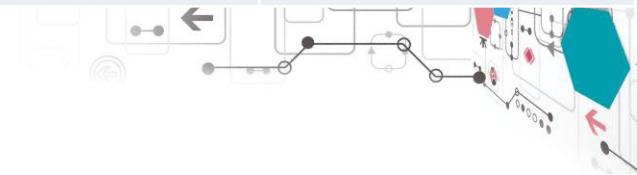


KPI/ Level	0	1	2	3
KPI10-Dataset findable through an open data catalogue / discovery service	not findable	yes, via the data provider's platform/via a domain-specific discovery service	yes, via the national open data service	yes, via a non-government platform or international platform
KPI12-Dataset accessible without prior registration	no, anyone needs to register to access the dataset	no, data are only accessible within the public sector	yes, anyone in the assessed country can access the dataset without prior registration but not from outside the country	yes, anyone can access the dataset without prior registration
KPI13-Dataset available free of charge	any information for this dataset is charge to be pay	a part of the dataset is free, to access the remainder of the dataset a free is	manipulation costs for extracting data from this dataset is charged	yes, entire dataset is free of charge

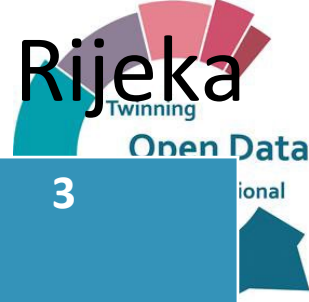
Availability KPIs



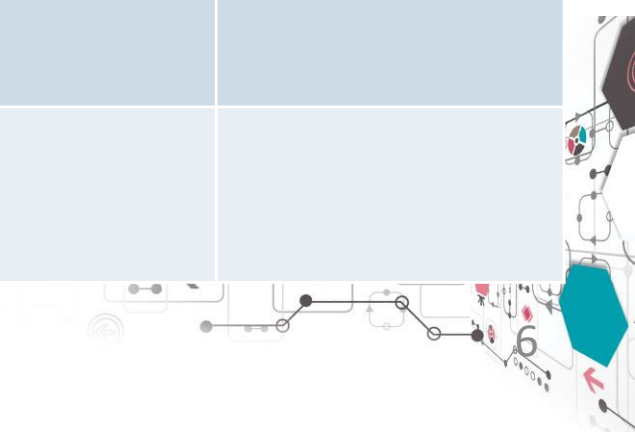
KPI/ Level	0	1	2	3
KPI14-Type of licence Is the first dataset published	licence is unknown / could not be found	an open data licence drawn up by data provider / not an internationally recognised open data licence/another internationally recognised open data licence, e.g. ODbL	another CC licence prohibiting commercial (re)use (CC-NC...)/another CC licence allowing commercial (re)use but imposing other restrictions	a CC-BY licence or a CC-Zero (CC-0) declaration
KPI15-Rate the findability of your first dataset	1 (very poor)	2	3	4 (very good)



Portal KPIs – The OD Portal of the City of Rijeka



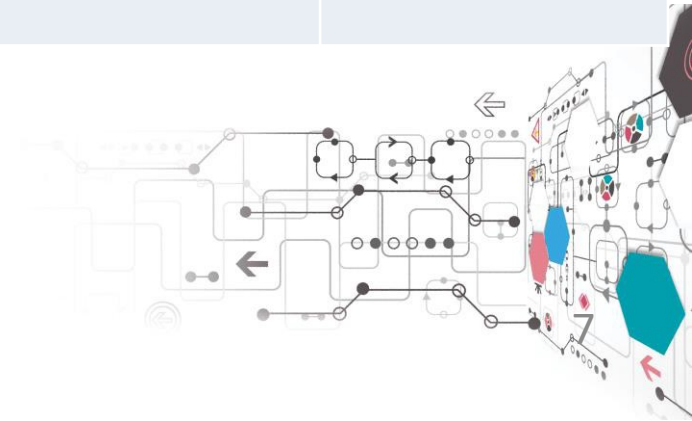
KPI/ Level	0	1	2	3
Search functions	link to a list of datasets of City of Rijeka			
Types of services		via download service via an API		
Download options		I can select file format, e.g. open format and proprietary format		
Metadata documentation			yes, metadata is documented adhering to a metadata standard (e.g. ISO 19115, DCAT)	
Actuality of the data published		Last version only historical data		
Showcases published?	No showcases			



Portal KPIs



KPI/ Level	0	1	2	3
Feedback options		Link to social media		
Upload option		yes, but not directly; only after a request has been submitted		
Web statistics	total number of published datasets; total number of organizations; total number of them			
User friendliness	From 1 to 10 score is = 2			



Impact KPIs



KPI/ Level	0	1	2	3
Reports published economic benefits of Open Data ecosystem	No such reports	Reports exist, but are not published	Yes, reports are published occasionally	Yes, periodically
Type of publication	Not known	Business report	Scientific report	Scientific report initiated and used by the government
Type of result	Theoretical background and ideas	Presenting best practices and users statistics	Presenting analysis and application	Evidence of use and benefits acquired

Impact KPIs



KPI/ Level	0	1	2	3
Reports published societal benefits of Open Data ecosystem	No such reports	Reports exist, but are not published	Yes, reports are published occasionally	Yes, periodically
Type of publication	Not known	Business report	Scientific report	Scientific report initiated and used by the government
Type of result	Theoretical background and ideas	Presenting best practices and users statistics	Presenting analysis and application	Evidence of use and benefits acquired

KPI/ Level	0	1	2	3
Events organised to actively promote open data (re)use (Type)	No events organized	Only one type (conference, workshop, hackathon, UG meeting...)	At least two types	At least three types organized by at least two different stakeholders (government, companies, etc...
Frequency of events	Never	Only once	Occasionally (less than once a year)	Regularly (at least once a year)
Surveys among potential users	Not to my knowledge	Yes, but only within public sector	Yes, but only within known groups /upon invitation	Yes, with an open invitation
User needs assessments	No user assessment was made	outcomes are only available upon request	yes, outcomes are publicly available but not promoted	yes, outcomes are publicly available and actively promoted

4.4 Day 4: Towards an interdisciplinary research agenda

On Day 4, we discussed interdisciplinary research approaches and applied the outcomes of our discussions to 10 Early Stage Researcher (ESR) open data projects.

Time	Program		Moderator / teacher		Mode
10:00-10:30	Meeting with faculty management and staff at FOI		Martina Tomičić Furjan Igor Pihir		In person + Live + PPT BBB TODO Summer School
10:30-10:45	Wrap up of the previous day		Frederika Welle Donker ESRs (7-9)		In person + Live + PPT BBB TODO Summer School
10:45-11:45	Assignment 2: exploring interdisciplinary approaches in using COVID-19 data		Anneke Zuiderwijk		In person + Live + PPT BBB TODO Summer School
11:45-12:15	BREAK				
12:15-12:30	Introduction to assignment 3: making ESR research more interdisciplinary		Frederika Welle Donker		In person + Live + PPT BBB TODO Summer School
12:30-13:30	ESR discussion session A	Project activities - next steps discussion	TUDELFT UAEGEAN ESRs	Other participants	In person + Live + PPT BBB TODO Summer School
13:30-15:00	LUNCH BREAK				
15:00-16:00	ESR discussion session B	Project activities - next steps discussion	TUDELFT UAEGEAN ESRs	Other participants	In person + Live + PPT BBB TODO Summer School
16:00-17:00	Wrap up of the day: ESRs briefly present their findings and plenary discussion		All participants		In person + Live + PPT BBB TODO Summer School
19:00	Social event				



TODO

Summer school

Day 4



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



⇒ **Recap Day 3:** **Understanding disciplinary research methodologies**

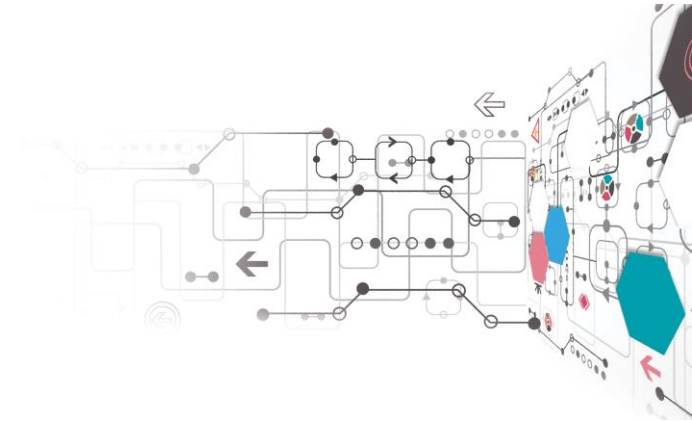
Warakan, Agung, and Vaggelis



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda

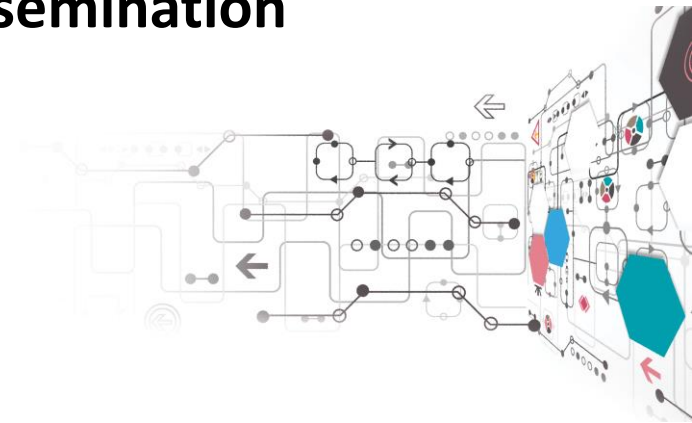
- Interdisciplinary research
- TODO diversity
- Interdisciplinary assessment framework





Interdisciplinary Research

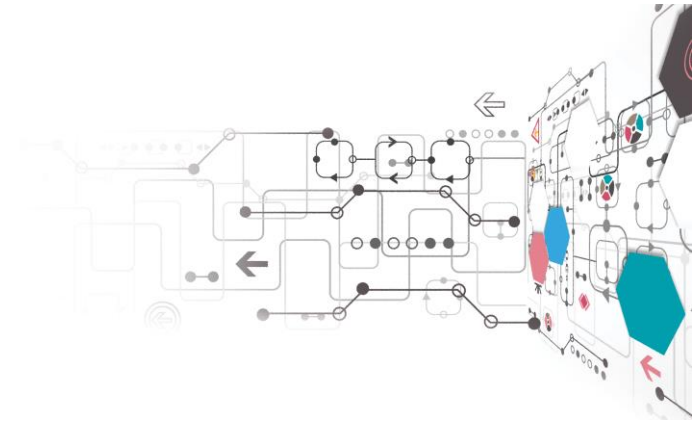
- In achieving TODO goals
- Open Data and interdisciplinary research
 - Open Data research goes beyond a single discipline
 - two or more disciplines/body of knowledge/methodologies are required
- Multidisciplinary vs Interdisciplinary
 - Multidisciplinary: connecting
 - Interdisciplinary: integrating
- TODO interdisciplinary steps
 - ESR/ activities /research groups /**dissemination**





TODO diversity

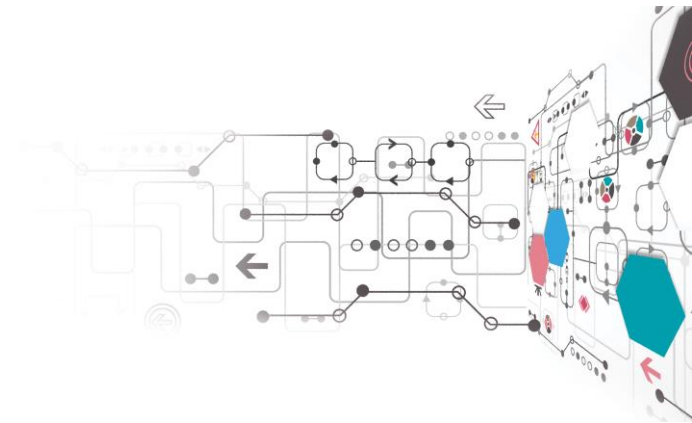
- TRANS, FOI, LAW, GEOD, AGRI, FER and TUDelft
- expertise, strengths and gaps
- Facing open data challenges
 - As open data researchers/users/providers
- Various disciplines/domains should not be only connected but also integrated.



TRANS research team



- Traffic information ecosystem
 - Collect, process/analyse, visualise, predict data in supporting traffic data ecosystem
 - Produce to utilise
- Challenges
 - Privacy
 - Cross sector collaboration
 - Data availability
- Cooperation
 - Publication
 - Knowledge exchange
 - Business model





AGRI, FER, TU DELFT

TEAM 2



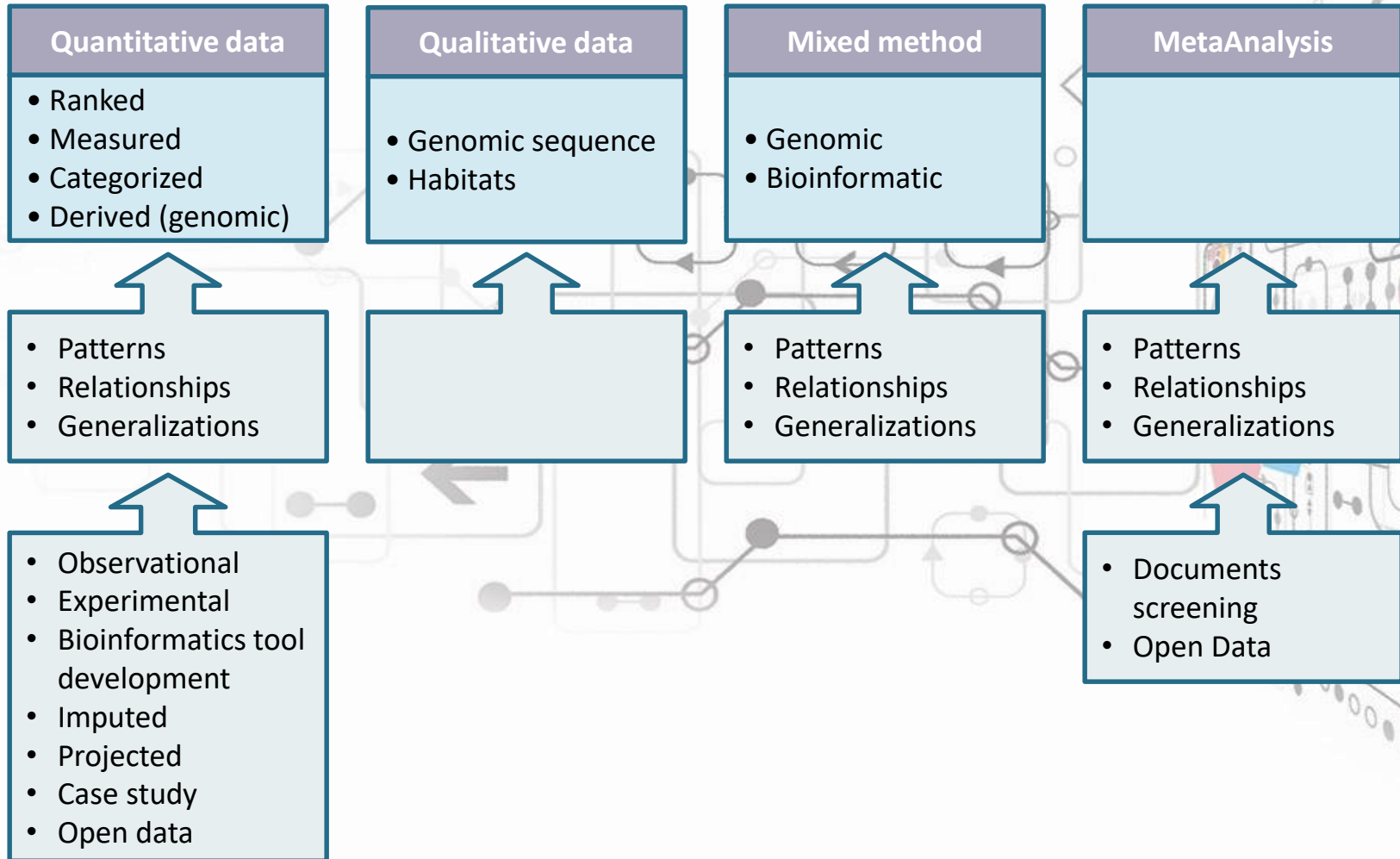
This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



UNIVERSITY OF ZAGREB

AGRICULTURE

Research Methodologies



Faculty of Agriculture

Scope of Research

- Natural resources data (*genetics, farm resources, biodiversity, invasive species...*)
- Earth and Environment data
- Policy and administration data
- Socio-economic data
- Agronomy
- Agricultural technology





Open Data Research at AGRI

- Link to the OD life cycle: **Primarily OD users & OD providers**
- **Project and/or research based,**
- Raw and modified data,
- Should provide **OD for food production**
- Research with open data: Research OD & Food production sector data



Open Data Research at AGRI

- Diversity in agriculture- real need for interdisciplinary approach
- Scattered OD bits and pieces
- Approaching the Ministry of agriculture directly and the producers from the bottom-up approach
- Introducing OD as part of IT literacy throughout the agriculture education
- Lot of PR including impact assessments

Opportunities to Cooperate in TODO



- Deficit in: Infrastructure, Law, OD research, and Government data
- Working on collaboration with
- FOI: *Marina Tomicic Furjan?*), *Nature observation sector evaluation*
- FER: *Ivana Bosnić - Genetic res. databases standards and metadata*
- LAW: *Anamarija Musa – Opening NGO animal observation data*
- GEOD: *Dražen Tutić and Ana Kuveždić Divjak – ICARUS-global*
- *monitoring with animals*

Open Data in Agriculture in Croatia



Paying Agency for Agriculture, Fisheries and Rural Development
(PAAFRD)





UNIVERSITY OF ZAGREB

ELECTRICAL ENGINEERING AND COMPUTING

Open Data Research

Scope of Research

- Link to the OD life cycle
- – *More focused on demand side: (find), integrate, reuse*
- Research with open data
 - Using open data sets: Complex networks, ML datasets,
- Educational domain (Software engineering)
 - Case studies & Longitudinal studies
- Computer science/engineering domain: Models & Experiments



Croatian Higher Education

Status of open data

- Organization: SRCE - University Computing Centre (University of Zagreb)
- Data published:
 - under organizational OD Policy,
 - no OD strategy
- Croatian OGP does not mention higher education
- Two datasets assessed:
 - 1. Higher education data - demography, enrolments, exams, etc...
 - 2. Higher education study programmes



Croatian Higher Education

Findability & Accessibility

- Both easily findable, accessible and free
- Data published:
 - dset1 (specific license, static, versioned)
 - dset2 – no license (strictly speaking not a dataset, requires
 - scraping – but SHOULD BE a dataset)
 - Many interesting data available over non-public API
Croatian OGP does not mention higher education
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 - 1. Higher education data - demography, enrolments, exams, etc...
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Croatian Higher Education

Findability & Accessibility

- Both easily findable, accessible and free
- Data published:
 - dset1 (specific license, static, versioned)
 - dset2 – no license (strictly speaking not a dataset, requires
 - scraping – but SHOULD BE a dataset)
 - Many interesting data available over non-public API
- Croatian OGP does not mention higher education
- Portal functionality: rudimentary, no feedback, no dataset usage statistics
- Metadata exists: not adhering to standards and complete



Croatian Higher Education

Usage and Promotion



- Some involvement from open community (https://codeforcroatia.org/projects/isvu_dashboard)
- Lack of studies showing potential economic, social benefits ...
- Some promotional events organized annually, not specifically related to OD

Open data research challenges



- Education
 - educational open data is scarce
 - the benefits of opening the educational data
 - better metadata and interoperability
 - using open data for education
- Open Computer Systems (overarching concept)
 - Interoperability
 - Scalability
 - Adaptability
 - Portability



TU DELFT
KCOD

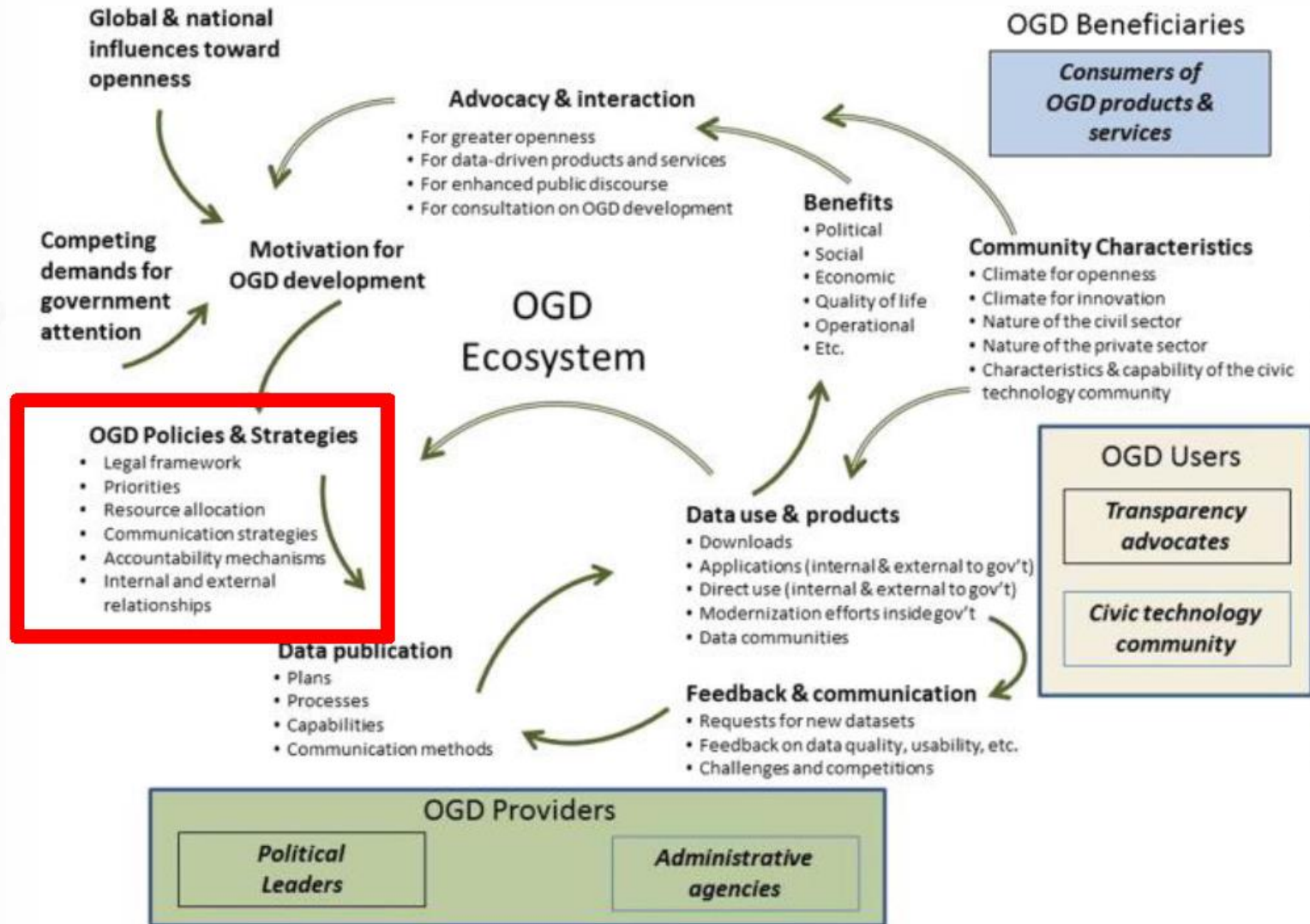
Open Data Research

Scope of Research

- Focuses on the governance of open data, its impact, legal and financial conditions for implementing and adopting open data policies.
 - Governance of open data
 - Legal aspects of open data
 - Open data business models
 - Assessment of open data infrastructures
 - Use and users of open data
 - Scope:
 - Spatial data and
 - The Built Environment



Open Data Ecosystem

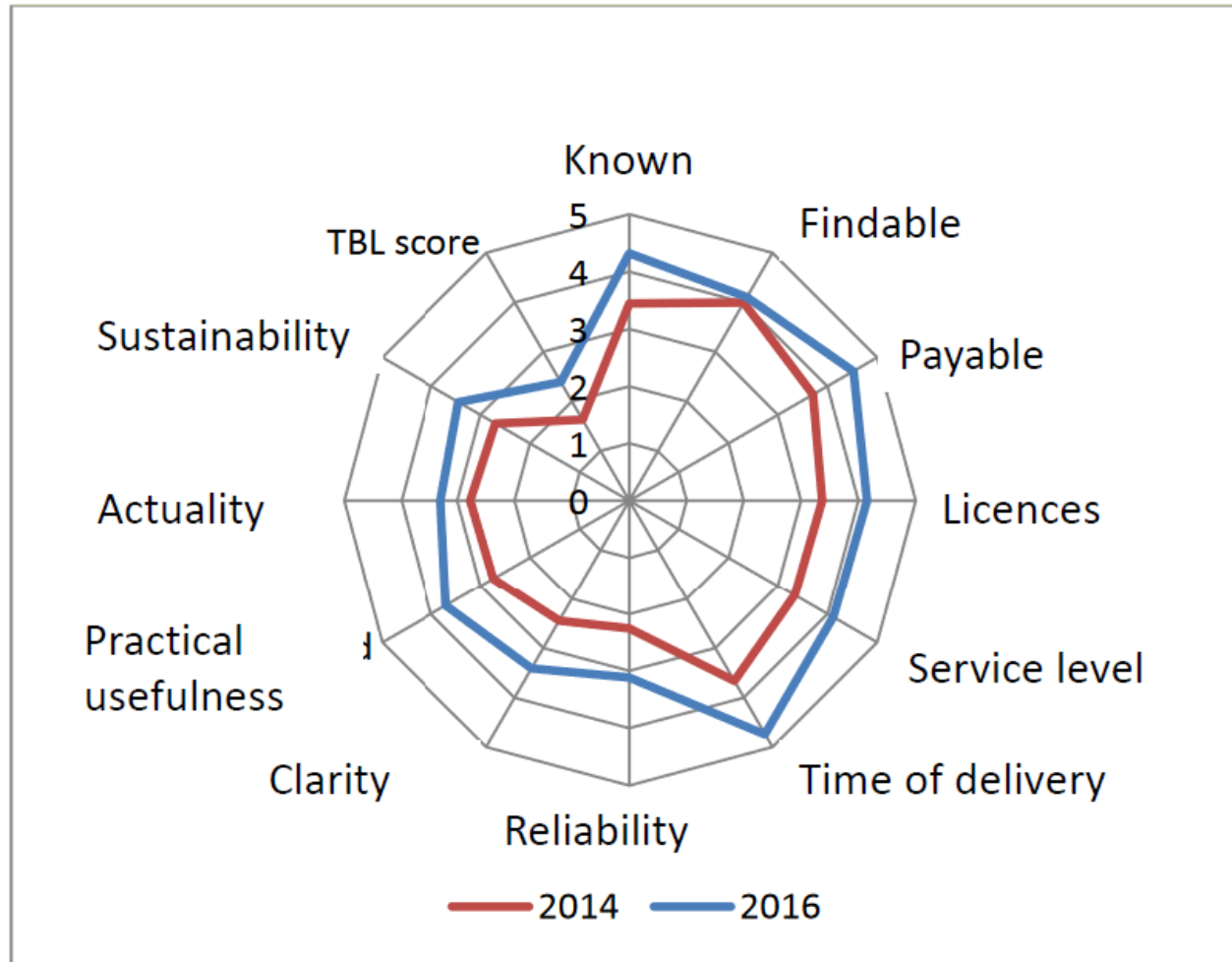




- •Qualitative research:
 - Case studies
- •Quantitative research:
 - Surveys
 - Cost benefit analyses

Netherlands

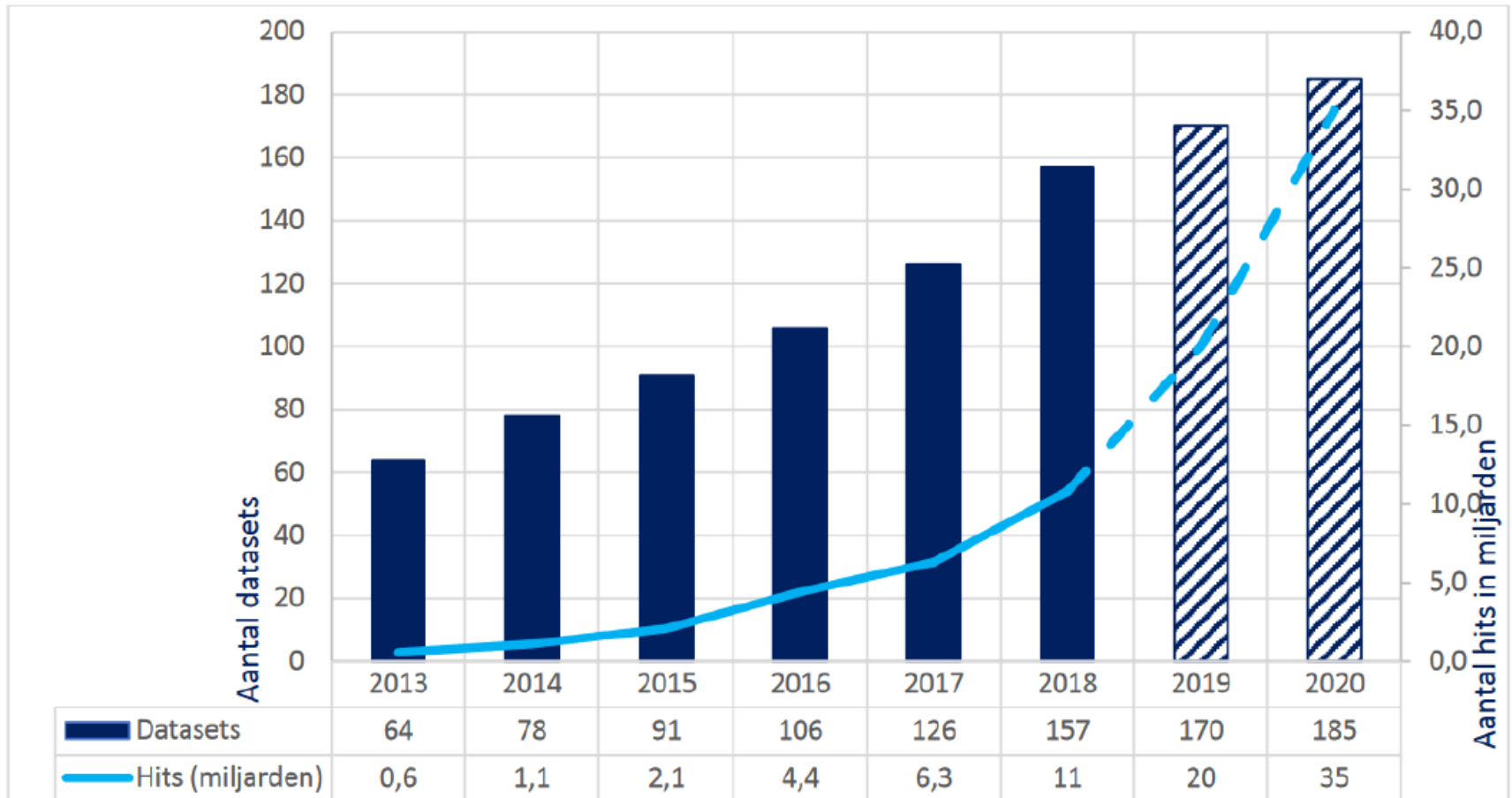
Domain GEO

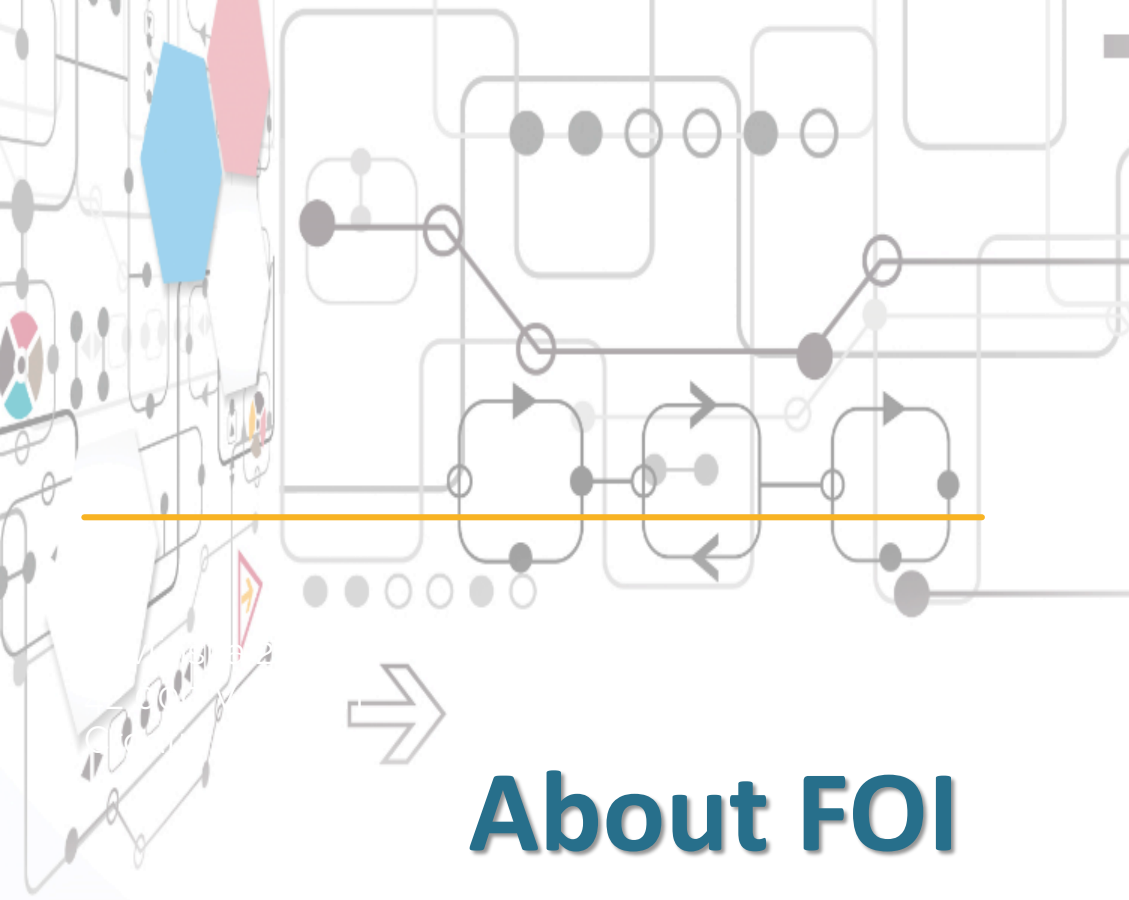


Figuur 26: Geaggregeerde score van de 2014 en 2016 Top 20

Netherlands

Domain GEO





About FOI

Martina Tomičić Furjan, FOI

Igor Pihir, FOI



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

UNIVERSITY OF ZAGREB

- UNIZG



1874
Became
State university

29
Faculties

3
Art
academies

3
University
centres

- SRCE- IT Centre
- University & National Library
- Student Centre


80 000
Students
(all study levels)


9 000
Teaching staff
(all study levels)

1669
Founded

The **oldest**
and the
largest
university in
Croatia



UNIVERSITY OF ZAGREB

- UNIZG

- This year UNIZG is celebrating 350 years!
- University building is recognizable for sculpture „History of Croats” located in front of it
- **Not a Campus University** - Faculty buildings are scattered around the city of Zagreb (and few in other cities – Varaždin 88 km)
- FOI became a **part of UNIZG in 1974**



527



Sveučilište u Zagrebu
University of Zagreb



The city of VARAŽDIN



- The city of baroque, **young people**, music, flowers and bicycles
- Relaxed city atmosphere – 50 000 inhabitants
- Simultaneously the regional cultural, educational and economic centre as well as a tourism hub of North-Western Croatia
- In 2014 New York Times listed the city of Varaždin among **53 places in the world that you have to visit!**



FACULTY OF ORGANIZATION AND INFORMATICS IN **VARAŽDIN**



- three-level model:
- 3-year undergraduate study
- 2-year graduate study
- 3-year doctoral study

2 900
STUDENTS

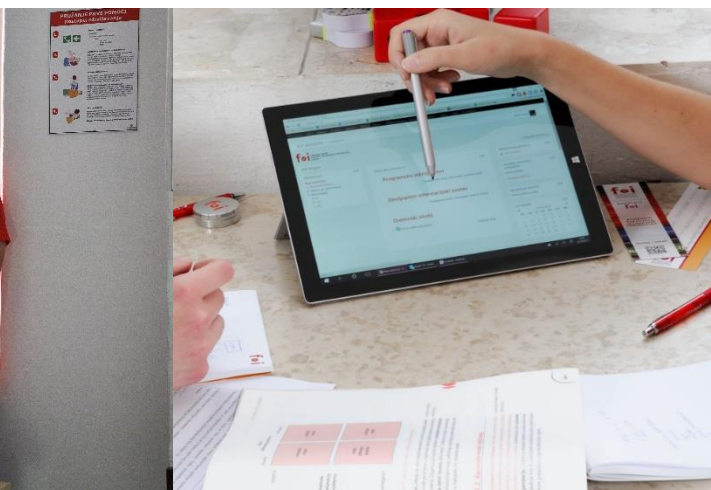


in 2 main study orientations:

INFORMATICS

ECONOMICS

More information: <https://www.foi.unizg.hr/en>

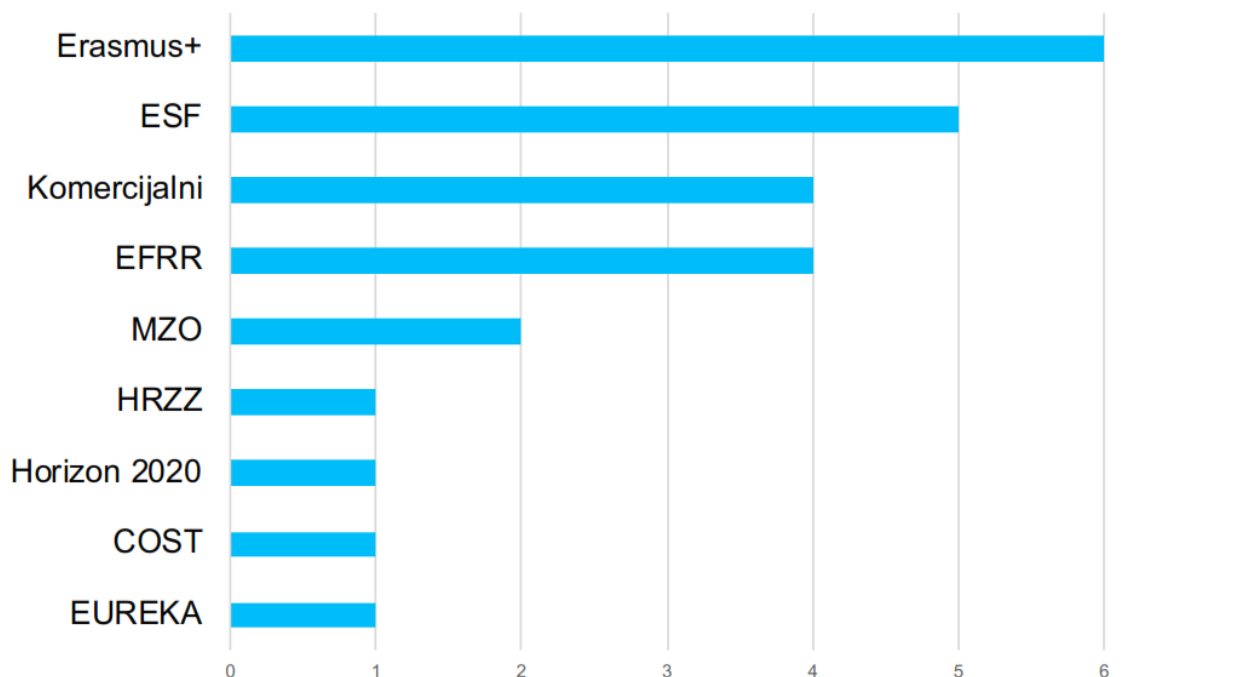


FOI projects selection /programmes of financing



25 active projects

Active projects in 2019/2020





Contacts:

martina.tomicic@foi.hr

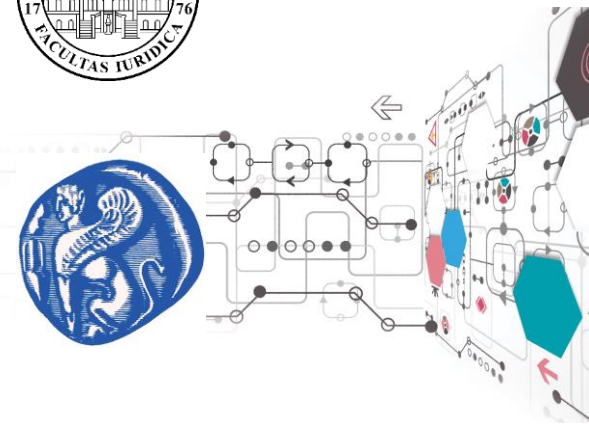
igor.pihir@foi.hr



foi



TU Delft





⇒ **Assignment 2: Exploring interdisciplinary approaches by using COVID-19 data**

10 September 2020

Anneke Zuiderwijk, TU Delft



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



Nice to meet you!

- Assistant Professor of Open Data
- Delft University of Technology (TU Delft)
 - Faculty of Technology, Policy and Management
 - Department of Engineering Systems and Services
- <http://www.tbm.tudelft.nl/AZuiderwijkvanEijk>
- <https://online-learning.tudelft.nl/>



@annekezuideryk



Introduction

- Taking an **interdisciplinary perspective** requires practicing → focus of this lecture
- **Assignment 2:** exploring interdisciplinary approaches in using COVID-19 data





Societal problem: COVID-19

- The use of COVID-19 data by default requires an **interdisciplinary approach**
- **COVID-19 data** is openly shared all over the world
- **Example:** data from ECDC

Example of COVID-19 data



European Centre for Disease Prevention and Control

An agency of the European Union



All topics: A to Z

News & events

Publications & data

Tools

About us



Home > All topics: A to Z > Coronavirus > Threats and outbreaks > COVID-19 > Situation updates on COVID-19 > COVID-19 data
> Download today's data on the geographic distribution of COVID-19 cases worldwide

< COVID-19 data

Download today's data on the geographic distribution of COVID-19 cases worldwide

Weekly data

Data collection

Sources - Worldwide data on COVID-19

Sources - EU/EEA and UK regional data on COVID-19

Interpretation of the data

Download today's data on the geographic distribution of COVID-19 cases worldwide

Table

27 Aug 2020



The downloadable data file is updated daily and contains the latest available public data on COVID-19. Each row/entry contains the number of new cases reported per day and per country. You may use the data in line with ECDC's copyright policy.

Source: <https://www.ecdc.europa.eu/en/publications-data/download-todays-data-geographic-distribution-covid-19-cases-worldwide>

Considerations for using open data (includes COVID-19 data)



- What data is available? From what disciplines / perspectives?
- What is the quality of this data? Reliability, accuracy?
- How do the conclusions drawn from this data compare to other datasets from different disciplines?
- How can the data be used? How should it be interpreted? What metadata is available and what metadata is needed?
- (How) can policy makers use the new insights obtained from this data in their decision-making processes? Conditions and constraints? What disciplines are involved?



Assignment 2



A

Explaining the assignment

Anneke – 5-10 minutes (10.50-11.00h)



B

Working on the assignment in interdisciplinary groups & preparing presentations

All – 25 minutes (11.00-11.25h)



C

Presentation of findings & plenary discussion

All – 20 minutes (11.25-11.45h)





Assignment 2

- Form interdisciplinary **groups** (divide participants, no more than 4 groups, 1 online, 3 offline)
- Look for one openly available **dataset** concerning COVID-19
- Possible **data sources**:
 - Governmental organization (e.g. governmental health agency)
 - Individual researcher / group of researchers (e.g. working at a university)
 - Research institute (e.g. The Netherlands Institute for Health Sciences)
 - Other



Assignment 2

- **Coverage:** dataset might cover one country or multiple countries / areas
- **Topics:** dataset might address, for example:
 - Characteristics of COVID-19 cases in a country or region
 - Predictions of numbers of infections over time
 - Effects of COVID-19 measurements implemented in a particular country
 - Citizen preferences for COVID-19 measurements

Assignment 2



- Create a **Powerpoint** presentation containing **4 slides**:
 1. **Description of the dataset:** title, URL, data provider, topic of the dataset
 2. **Main characteristics of the data:** what metadata is available? (e.g. about data sources, data manipulation, data interpretation and use)
 3. **Interdisciplinarity:** what disciplines (do you think) are involved in the collection, interpretation and use of the selected dataset?
 4. **Decision-making:** how can this data (possibly in combination with other data) be used to help governmental policy makers address interdisciplinary COVID-19-related problems? What are the conditions and constraints for policy makers to use this dataset? (e.g. legal, societal, political, economic)



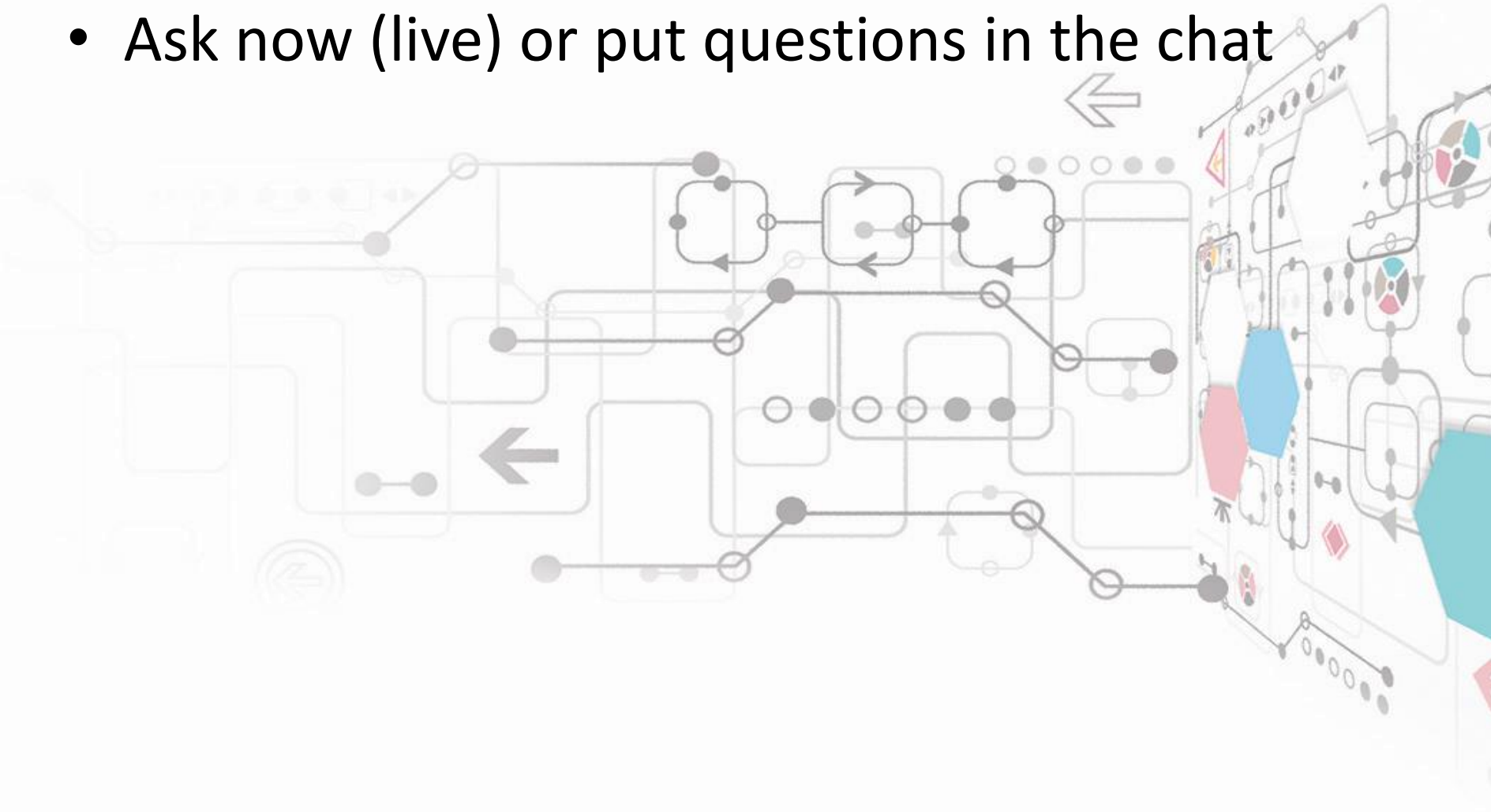
Assignment 2

- Each presentation should take no longer than 2,5 minutes + 2 minutes of feedback
- Teams are interdisciplinary, but can take a particular focus in defining the conditions and constraints on slide 4

Questions?



- Ask now (live) or put questions in the chat





**GOOD LUCK WITH ASSIGNMENT 2
AND ENJOY!**



ASSIGNMENT 2

GROUP 1



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



1. Description of the dataset

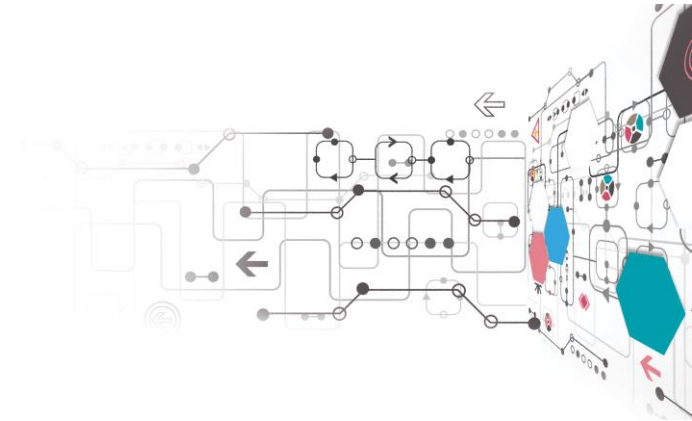
Title: covid-19 incidence by counties

https://www.koronavirus.hr/json/?action=po_osobama

Provider: Public health Institute

Incidence of Covid-19, epidemic report

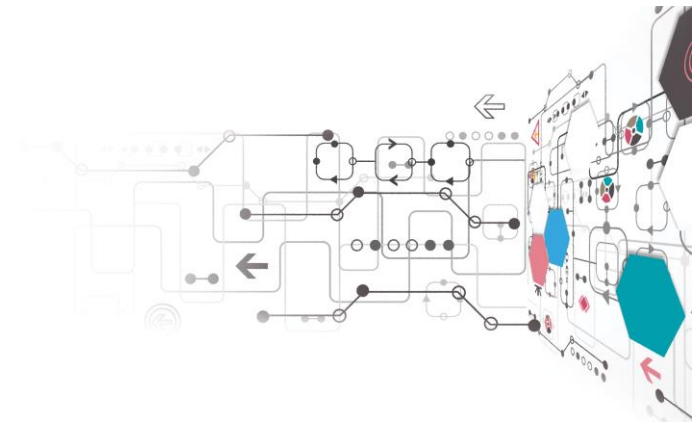
JSON dana format





Data in dataset: gender, age, date of contagion, county of origin

Basic metadata: data source, provider, no data manipulation and interpretation and use

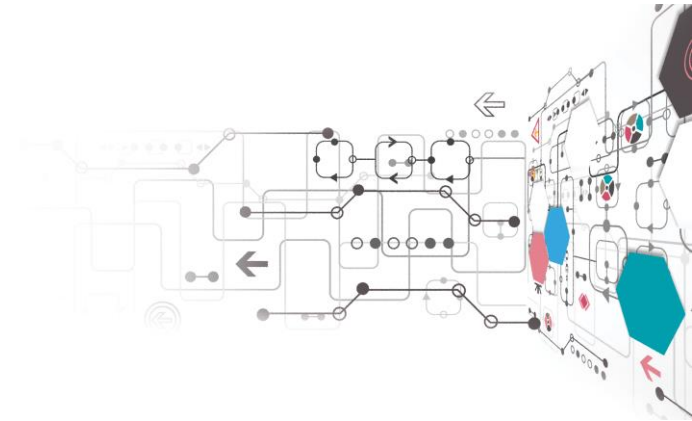




3. Interdisciplinarity

Health services (hierarchical) collected and interpretation the data (probably epidemiological service)

Local and national government, Ministry of education, Sector of tourism, Ministry of foreign and internal affairs





4. Decision-making

Help governments of other countries in coordinating their citizens movement restrictions

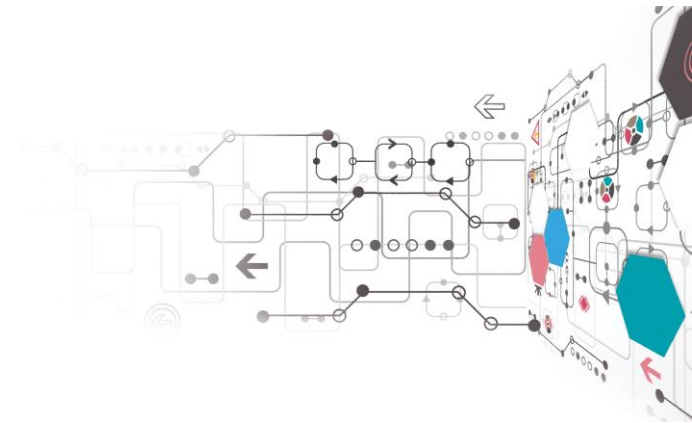
recommendations for education units on all levels

safety recommendations for travelers

Constraints:

Less detailed records

No metadata (details on collecting data)





⇒ **Assignment 2: Exploring interdisciplinary approaches by using COVID-19 data**

Group 2

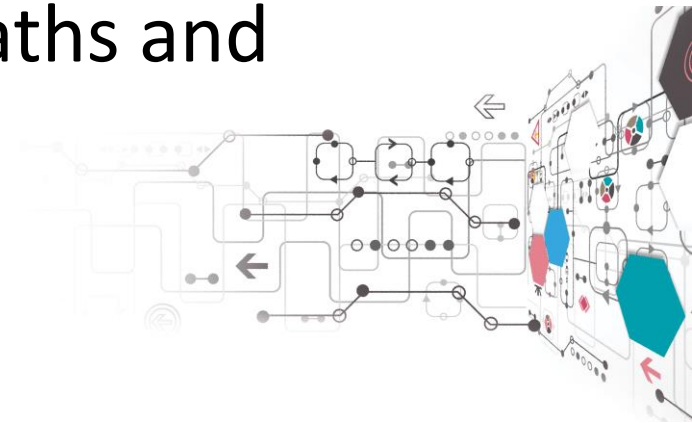


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



Description of the dataset

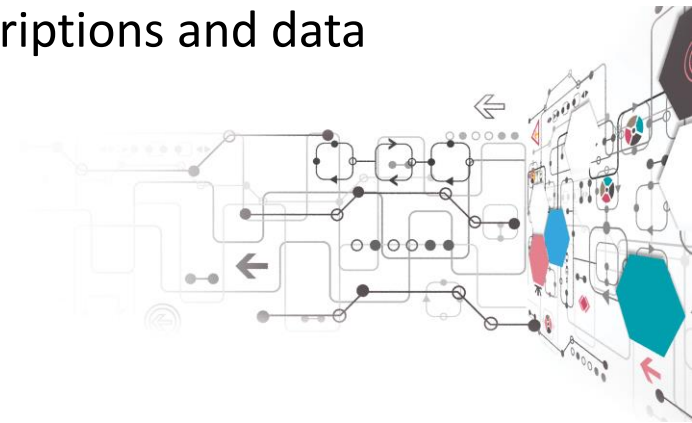
- Title: Novel Coronavirus 2019 time series data on cases - GitHub
- URL: <https://github.com/datasets/covid-19>
- Data provider: GitHub contributors based on worldwide datasets
- Topic of the dataset: time series listing confirmed cases, reported deaths and reported recoveries





Main characteristics of the data

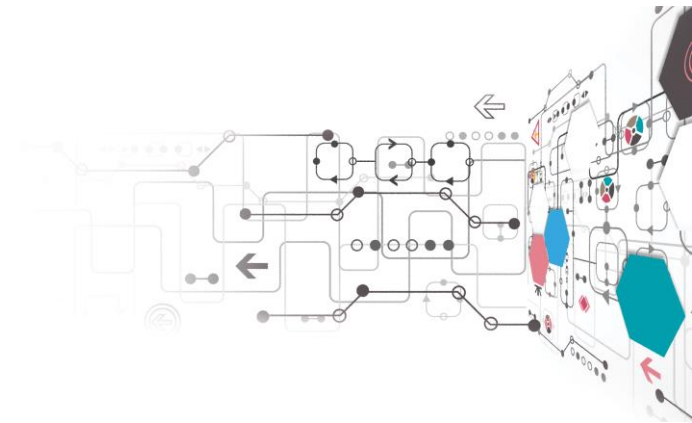
- what metadata is available?
- Data is in CSV format and updated daily. It is sourced from this upstream repository maintained by the amazing team at Johns Hopkins University Center for Systems Science and Engineering (CSSE) who have been doing a great public service from an early point by collating data from around the world.
- We have cleaned and normalized that data, for example tidying dates and consolidating several files into normalized time series. We have also added some metadata such as column descriptions and data packaged it.



Interdisciplinarity



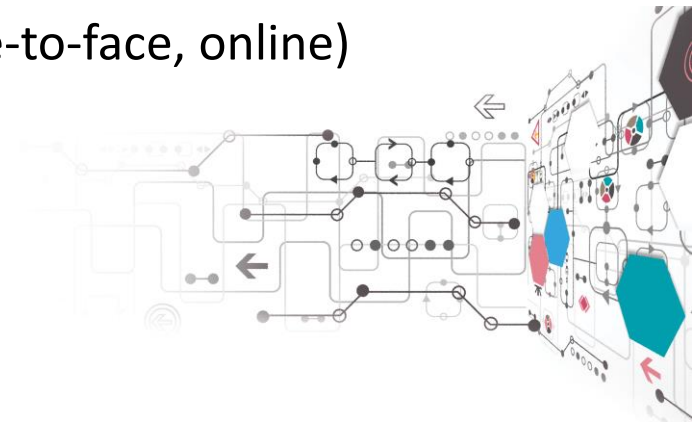
- what disciplines (do you think) are involved in the collection, interpretation and use of the selected dataset?
- Medical
- Government (Ministry of Health)
- Media





Decision-making

- how can this data (possibly in combination with other data) be used to help governmental policy makers address interdisciplinary COVID-19-related problems? What are the conditions and constraints for policy makers to use this dataset? (e.g. legal, societal, political, economic)
- Planning measures on people and goods traffic between counties and provinces
- Communication with public on COVID-19 country/province status
- Individual travel planning
- Event planners can plan the form of events (face-to-face, online)
- Public Domain and Dedication License





Assignment 2: Exploring interdisciplinary approaches by using COVID-19 data

Group 3



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



Description of the dataset

- Croatian coronavirus open dataset
- <https://data.gov.hr/dataset/koronavirus>
- Ministry of Health,
Croatian Institute of Public health
- Daily data by counties :-)



Main characteristics of the data

- **CC-BY** licence
- metadata dates, created, modified
- status: active / not active
- detailed **keywords**
- created by: user id, organization, publisher
- category, theme
- each resource has metadata
 - URL, date created, description, format
 - revision ID
- this dataset:
 - number of infected, died, active cases
- JSON format



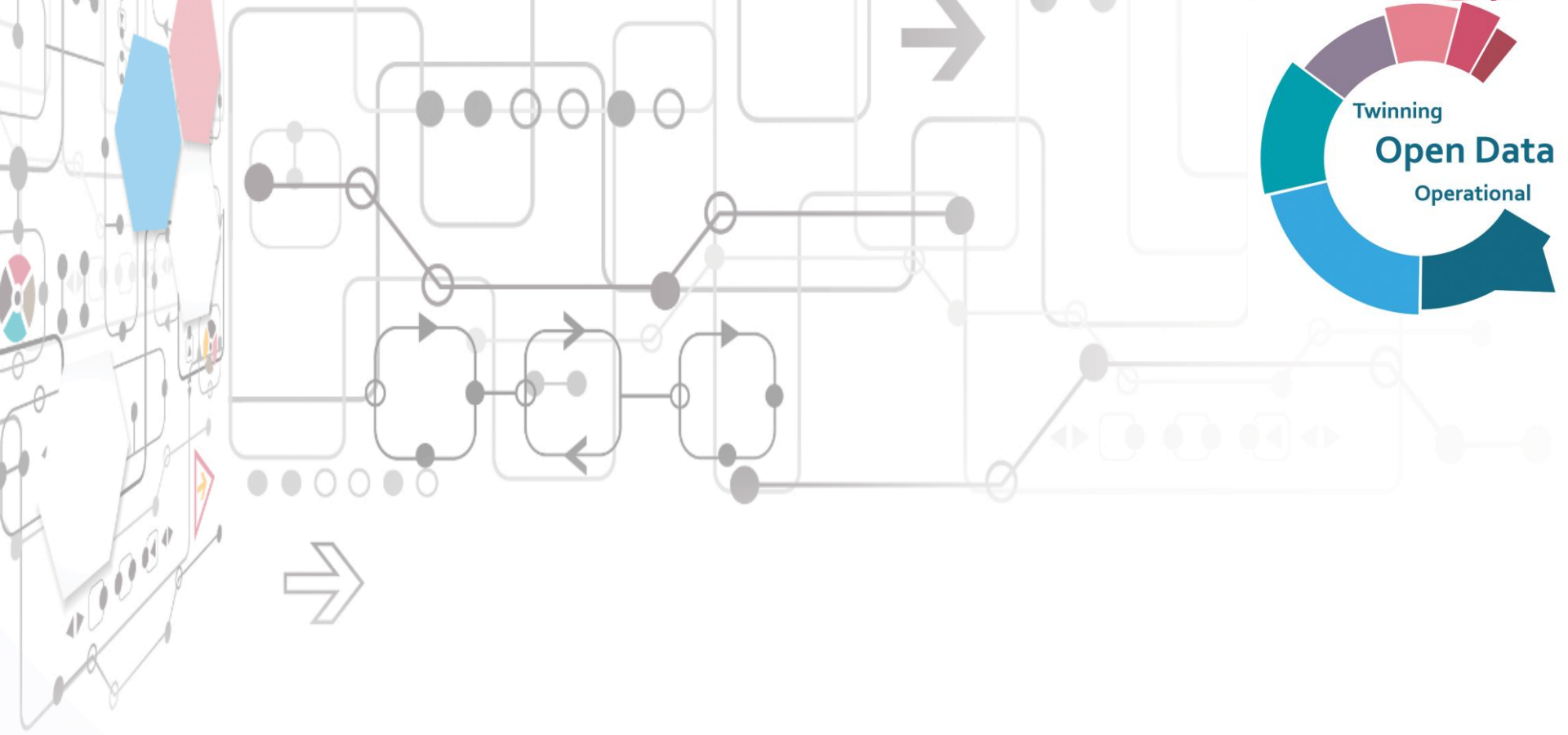
Interdisciplinarity

- Data analysis, warehousing, data mining
- Tourist decision-making
- Medical staff - epidemiologists...
- Civil authorities - police,



Decision-making

- measuring the effect of **tourist presence in Adriatic coast counties** during the summer
- aiding in decision making regarding epidemiologic measures
- Another datasets **used**: number of tourists registered in Croatia by countries
 - monthly data available (PDF, XLS)
 - daily data needed
- Another dataset **needed**: number of COVID-positive foreign tourists



Assignment 2 – group 4



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Description of dataset

- The title of the dataset – Nextstrain
- <https://nextstrain.org/sars-cov-2/>
- Data provider – GISAID
- Topic of the dataset - Genomic epidemiology of hCoV-19

Main characteristics of the data

- can be downloaded
- metadata - TSV files

Interdisciplinarity

- Involved disciplines - epidemiology, informatics, biology, informatics, medicine, bioinformatics



⇒ **TODO Summer School 2020: Introduction to Assignment 3**

10 September 2020



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda



A

Short quiz

To test your memory



B

Interdisciplinary research

Challenges and opportunities



C

ESR Discussion sessions

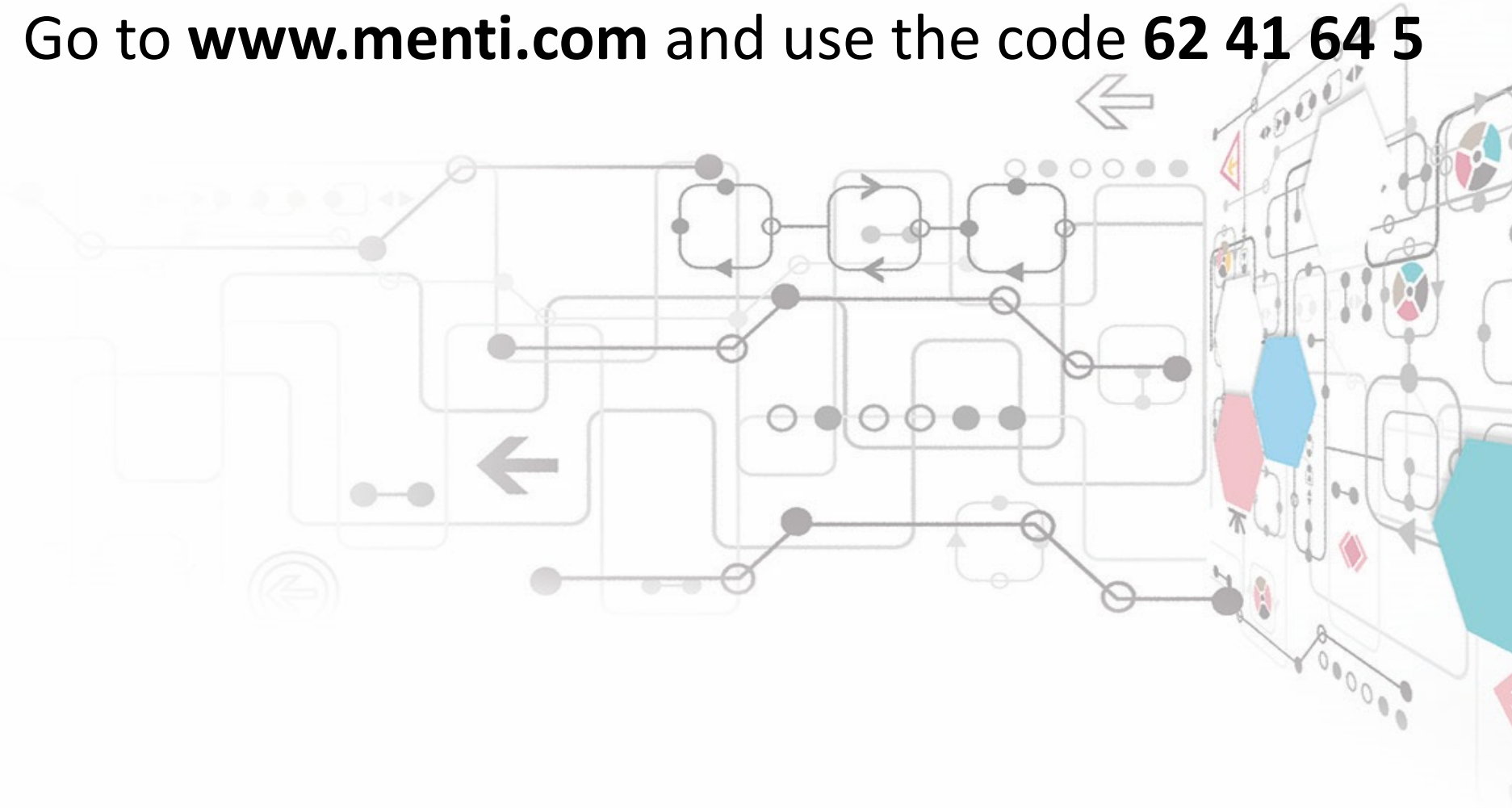
Easy to change colors, photos and Text.



Short Quiz



Go to **www.menti.com** and use the code **62 41 64 5**



Issues to consider for ESRs / researchers in Discussion Session



Interdisciplinary Research

Which opportunities for interdisciplinary research do you foresee in the short term (2020)?

Interdisciplinary Research

Which opportunities for interdisciplinary research do you foresee in the longer term (2021-2022)?

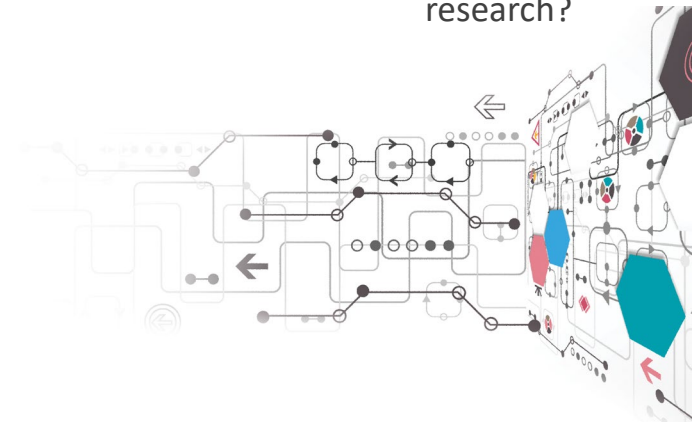


Interdisciplinary Research

Which challenges on organisational / faculty level to interdisciplinary research do you foresee for your own research?

Interdisciplinary Research

Which challenges on interorganisational level to interdisciplinary research do you foresee for your own research?



Interdisciplinary teams for Session A in 5 breakout rooms



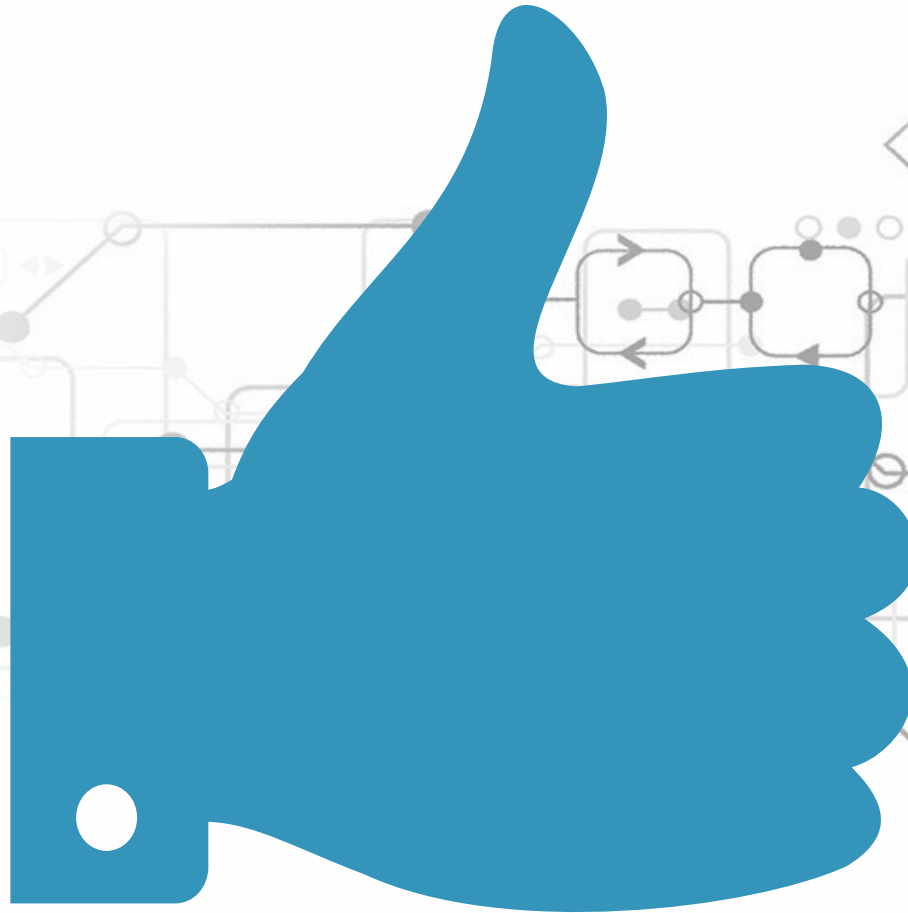
ESR	interdisciplinary mentors		External ESR	External mentor	Moderator	
1	Filip Varga	Željko Bačić	Ivana Bosnić	Margareta Hazabin	Frederika Welle Donker - TUDELFT	Igor Pihir
2	Emanuel Guberović	Marko Jurić	Vesna Poslončec-Petrić	Adam Vinković & Jura Kapustić	Anneke Zuiderwijk - TUDELFT	Barbara Šlibar
3	Larissa Hrustek	Dragica Šalamon	Anamarija Musa	Vaggelis Pikis	Bastiaan van Loenen - TUDELFT	Larisa Hrustek
4	Josip Šiško	Martina Tomičić Furjan	Tihomir Katulić	Agung Indrajit	Euripidis Loukis - UAEGEAN	Martina Tomičić Furjan
5	Warakan Supinajaroen	Drazen Tutić / Ana Kuvezdic Divjak	Tereza Rogić Lugarić	Bia Mandzukan	Charalampos Alexopoulos - UAEGEAN	Ana Kutnjak

Interdisciplinary teams for Session B in 5 breakout rooms



ESR	interdisciplinary mentors		External ESR	External mentor	Moderator	
1	Adam Vinković	Igor Čavrak	Vesna Poslončec-Petrić	Emanuel Guberović & Jura Kapustić	Bastiaan van Loenen - TUDELFT	Igor Pihir
2	Bia Mandzuka	Željko Bačić	Tihomir Katulić	Warakan Supinajaroen	Charalampos Alexopoulos - UAEGEAN	Barbara Šlibar
3	Vaggelis Pikis	Tereza Rogić Lugarić	Miroslav Vujić	Larissa Hrustek	Anneke Zuiderwijk - TUDELFT	Larisa Hrustek
4	Margareta Habazin	Marko Jurić	Martina Tomičić Furjan	Filip Varga	Frederika Welle Donker - TUDELFT	Martina Tomičić Furjan
5	Agung Indrajit	Hrvoje Tomić	Ivana Bosnić	Josip Šiško	Euripidis Loukis - UAEGEAN	Ana Kutnjak

Good Luck!



4.5 Day 5: Applying the interdisciplinary perspective to the open data ecosystem

On the final day, we discussed interdisciplinary open data challenges that will be further discussed in the TODO seminar I.

<i>Time</i>	<i>Program</i>	<i>Moderator / teacher</i>	<i>Mode</i>
10:00-10:30	Open data research challenges: presentation of cases from the TODO partners	Dražen Tutić	In person + Live + PPT BBB TODO Summer School
10:30-11:30	Assignment 4: Applying the IAF to cases 1, 2 and 3 (parallel sessions)	All participants	In person + Live + PPT BBB TODO Summer School
11:30-12:00	BREAK		
12:00-13:30	Reporting of the findings of assignment 4 (plenary session)	All participants	In person + Live + PPT BBB TODO Summer School
13:30-15:00	LUNCH BREAK		
15:00-17:00	Wrap up of the week and next steps (site visits)	Dražen Tutić All participants	In person + Live + PPT BBB TODO Summer School



This Summer school is part of a project that has received funding from the **European Union's Horizon 2020 research and innovation programme under grant agreement N°857592**



TODO

Summer school

Day 5



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO



Use cases for TODO

Dražen Tutić, GEOD
dtutic@geof.hr

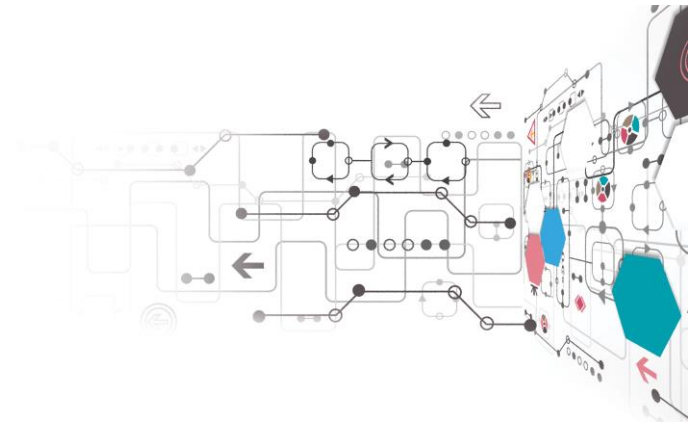


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

Agenda



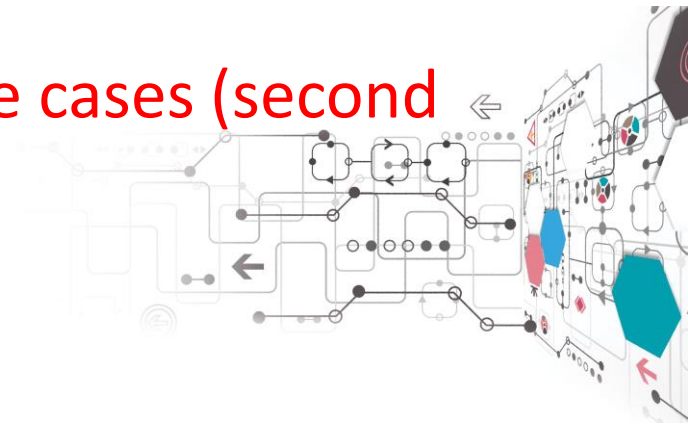
- Why we need use cases?
- Interdisciplinarity challenges
- Purpose of use cases
- Ideas for use cases
- Use case 1
- Use case 2
- Use case 3
- Towards research agenda of TODO





Why we need use cases?

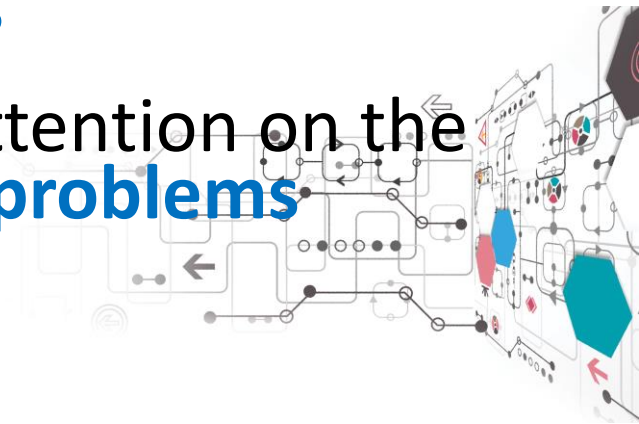
- **Summer School** training action
- **Promotion of TODO** use cases / best practices to maximise usage of open data (branding TODO)
- **Project plan** – define use cases in WP2 and use them in WP4 – **Collaboration and Knowledge Sharing**
- **ESRs PhD topics originating from use cases (second round of ESRs) ?!?**





Interdisciplinarity challenges

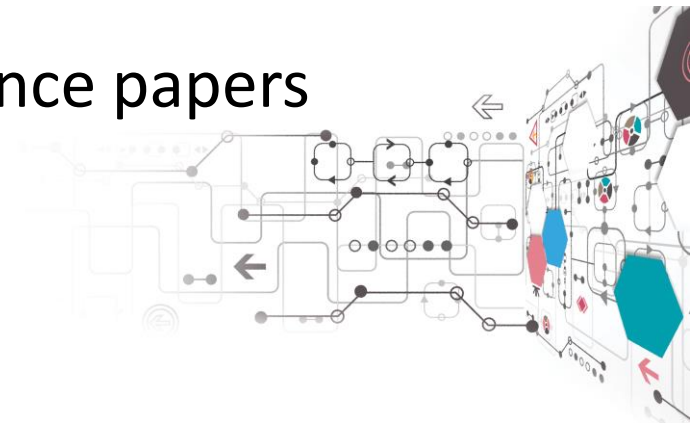
- Interdisciplinary research **does not occur automatically** by bringing the disciplines together
- **Extra effort** is needed to form a cohesive research team
- Overcoming **communication problems** is a key
- **Common knowledge and vocabulary**
- **Iterative and transparent process**
- External stakeholders can focus attention on the **need for relevance to real world problems**





Purpose of use cases (they should help us)

- **Formal obligation**
- Focusing and fostering interdisciplinary and multidomain research around **well defined topics and research questions**
- **Organization of research** around use cases
- Easier communication and **planning of future actions and outcomes**
- **Joint writing** of journal and conference papers
- ...





Ideas for use cases

1. Open agricultural data ecosystem

- AGRI, FOI, GEOD, TUDELFT

2. Open higher education data ecosystem

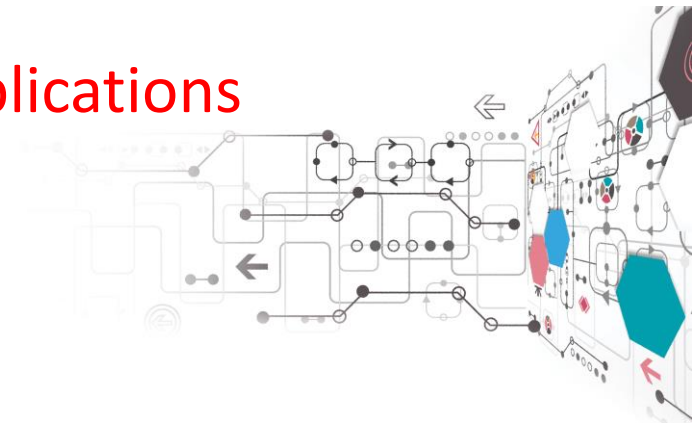
- FER, TRANS, LAW, UAEGEAN

3. Open legal data ecosystem

- ALL

1 and 2 will compete on number of publications

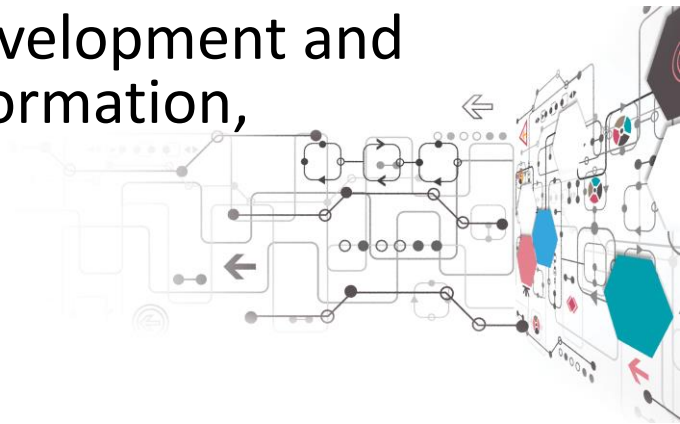
3 is for keeping all of us together





1. Open agricultural data ecosystem

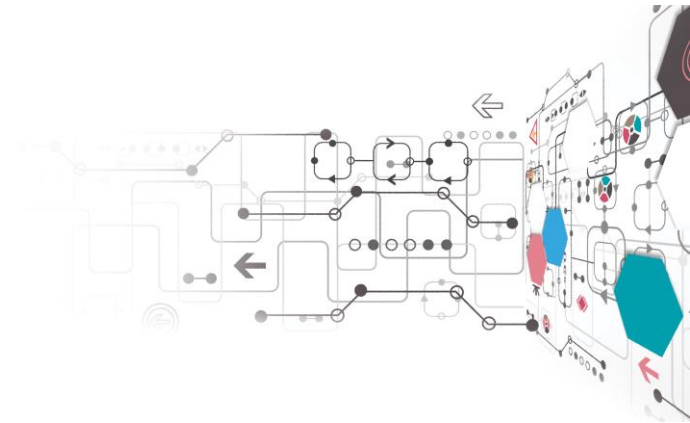
- How LPIS data can be merged with other data, e.g. financial data on subsidies, or food production data?
- Where the irrigation would give most economical benefits?
- Is data privacy ensured if we consider that private data is available on cadastral and land book datasets?
- How food production in Croatia can be increased/optimized/made more ecological etc.?
- What is impact of subsidies on rural development and agriculture (demography, digital transformation, ensuring sustainable resources)?
- ...





1. Open agricultural data ecosystem

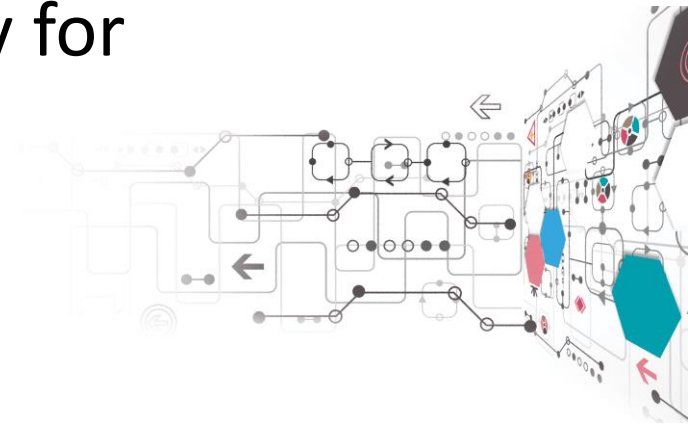
- ESRs directly connected with PhD topic
 - **Larisa Hrustek** (FOI)
 - Karlo Kević (GEOD)?
- Experienced researchers interested for this area?





2. Open higher education data ecosystem

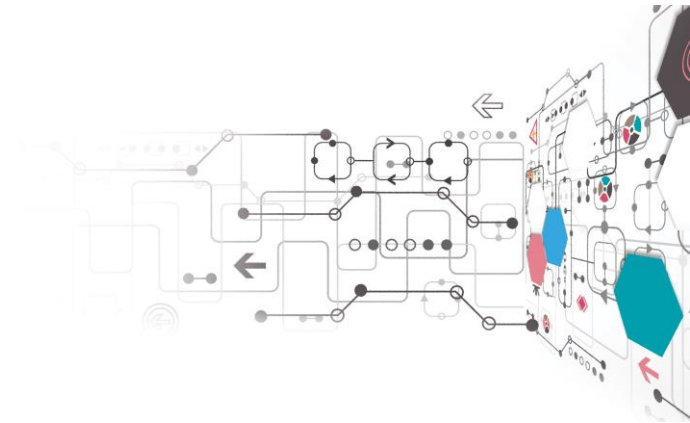
- Is high school education system preparing for successful university studying?
- What is societal cost/benefits of migrations during study time?
- How higher education offer is correlated with domestic/EU/world jobs market?
- What is impact of transport network on participation in studies (possibility for customised journeys)?
- ...





2. Open higher education data ecosystem

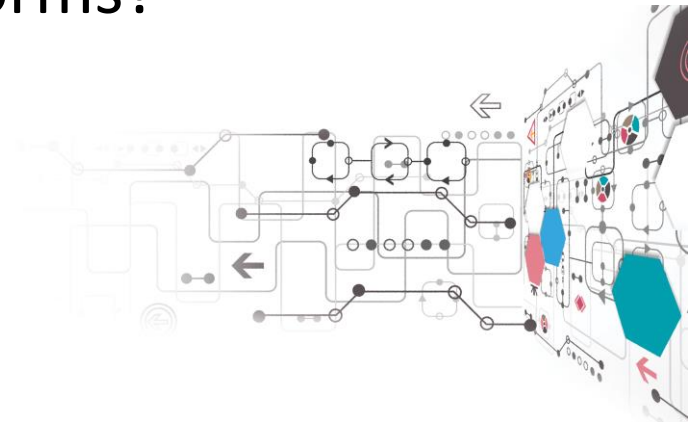
- ESRs directly connected with PhD topic
 - Emanuel Guberović (FER)?
 - Bia Mandžuka (TRANS)?
- Experienced researchers interested for this area?





3. Open legal data ecosystem

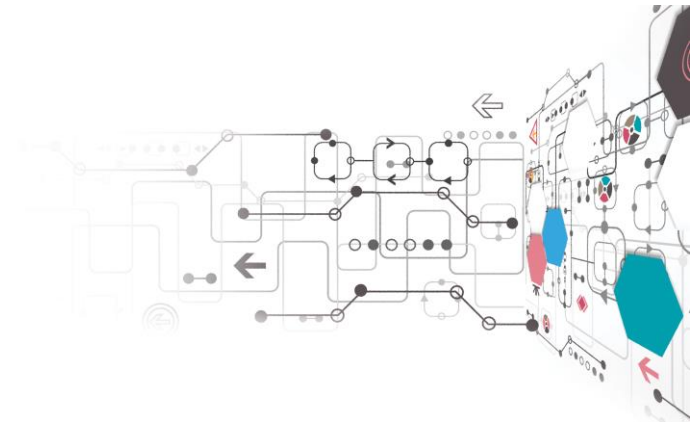
- Status of openness of legal data and services in certain discipline?
- What do stakeholders notice as the most common obstacle for using of legal information platforms?
- What do stakeholders perceive as desired features of legal information platforms?
- ...





3. Open legal data ecosystem

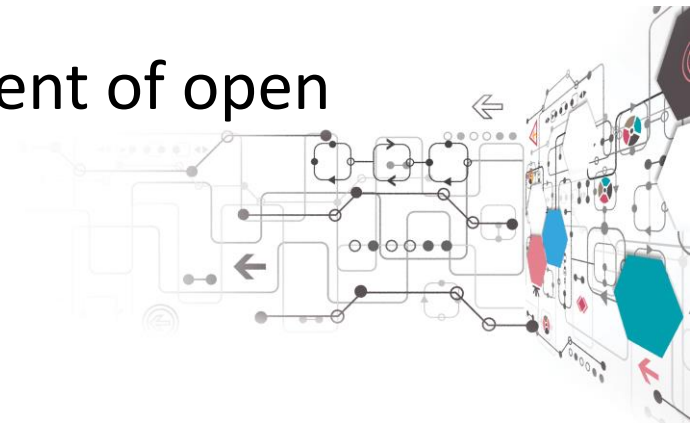
- ESRs directly connected with PhD topic
 - **Margareta Habazin** (LAW)
- Experienced researchers interested for this area?





Towards research agenda of TODO

- Creating an **inclusive research agenda** which allows flexible involvement of **other UNIZG faculties** and external stakeholders
- Gathering and involving more UNIZG faculties and external key stakeholders in future research.
- UNIZG – user side, creating capacities for future use of open data
- TUDELFT and UAEGEAN - development of open data ecosystem



Where the interdisciplinary research will happen?



- **TODO activities** – workshops, seminars, conferences, ESRs and staff exchanges
- **UNIZG – physical place(s) and time** where people will regularly meet (e.g. once a month)
- **ALL – online collaboration platform** on which everyone can start a discussion at any time and where activities will be tracked
- **Keep connections alive, free and creative !!!**

