Spatial Data Infrastructure and Earth Observation Education and Training for North Africa

Co-funded by the
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SEED4NA
Virtual Summer School

18-27th May 2021

www.seed4na.eu

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Spatial Data Infrastructures in academic education

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What should SDI-education offer?

Topic Spatial Data Infrastructures

Rather wide & comprehensive topic

Not a straightforward Concept

Multiple definitions/understandings

Multiple components

Multiple application domains

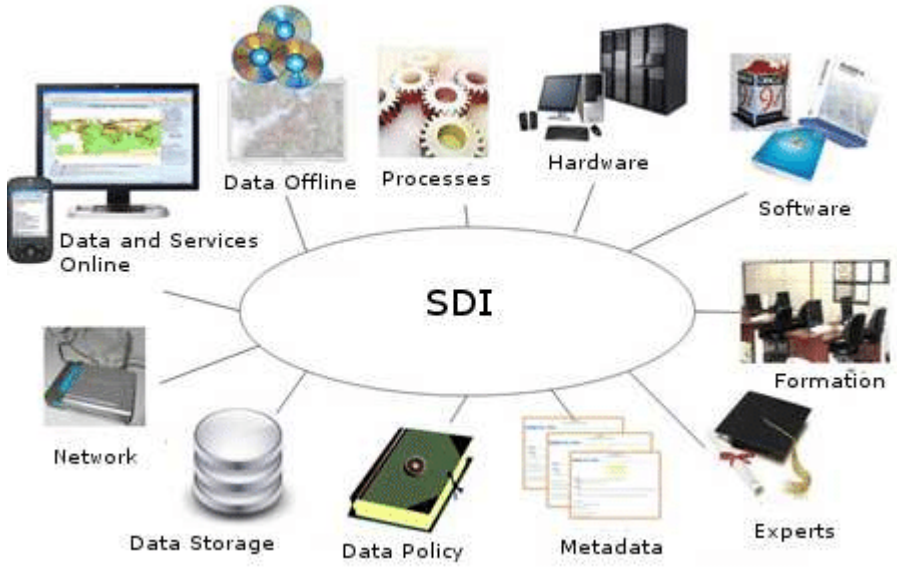
Multiple stakeholders

Multiple levels

Technical as well as Non-technical elements

Multiple relevant technologies

-> Complexity in SDI-Education



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Outline

Introduction

Existing academic education and initiatives

Existing academic education in North Africa

Online Open SDI Course

BESTSDI Academic – Business Cooperation in SDI-Context

Overall conclusions

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Existing academic education and initiatives

Bochum (DE): Spatial Data Infrastructues/GDI-DE & INSPIRE

Cranfield (UK): Spatial data infrastructure & management

Delft (TU Delft)(NL): Organisational and Legal Aspects of Geo-information / SDI

Dresden (TU Dresden)(NL): Geodateninfrastrukturen

Glasgow (UK): Geospatial Infrastructures and land administration

Helsinki (FI): Open GIS & Spatial Data Infrastructures

Jaén (ES): Infraestructuras de Datos Espaciales

Leuven (BE): Spatial Data Infrastructures, Geospatial information technologies

Lund (SW): GIS – Spatial Data Infrastructure

Madrid (UPM)(ES): Infraestructuras de Datos Espaciales

Melbourne (AU): Spatial Data Infrastructure

Munich (DE): Geodateninfrastruktur und Geodatenmanagement

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Existing academic education and initiatives

Novi Sad (SB): Geospatial Data Infrastructure

Norwegian University of Science and Technology (NO): Spatial Data Infrastructure

Sabaragumuwa uni. of Sri Lanka (SR): Spatial Data Infrastructure

Salzburg (AT): Spatial representations and spatial data infrastructures

Twente (NL): Geospatial data: concepts, acquisition and management

Valencia (UPV)(ES): Infraestructuras de Datos Espaciales y Geoportales

Vancouver Island (CA): Introduction to Spatial Data Infrastructure

Wageningen (NL): Spatial Data Infrastructure

Zagreb (HR): Geoinformation infrastructure

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Existing academic education and initiatives

Global Spatial Data Infrastructure association (GSFI) - Cookbook
Artic SDI Courses
BESTSDI – Curricula development Western Balkan
EO4GEO – Introduction to SDI Architecture and Components
EuroSDR: Open SDI
FGDC – Spatial data infrastructures and geospatial standards
ICA SDI & Standards
LINKVIT – Leveraging INSPIRE Knowledge into Vocational Training
Oceanwise – Data Management and Marine Spatial Data Infrastructure
SEED4NA – Curricula development in North-Africa
SPIDER - GIS/Spatial Data Infrastructure Course
UN-GGIM Academic Network
UN-GGIM Americas

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Existing academic education and initiatives

Numerous academic courses

Courses everywhere – in particular in Europe (Germany, Netherlands, Spain)

Not many courses in Asia, Africa and Latin America

Most courses at Master level

Technical focus

Numerous academic initiatives

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Existing academic education in North Africa

Alexandria University

- Spatial Modelling and Applications for SDI (New)
- Web GIS and Geoportals for SDI (new)
- Introduction to GIS for SDI (updated)
- Database Management Systems for SDI (Updated)

Fayoum University

- GIS (updated)
- Programming & modelling (updated)
- Spatial web applications (updated)

Ibn Zohr University

- GIS and its application ((updated)

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Existing academic education in North Africa

Hassan II Institute of Agronomy & Veterinary Medicine

- Spatial Big Data Management (New)
- Geospatial technologies for Smart Cities (New)

Carthage University

- GIS (Updated)
- GIS2 (Updated)

University of Jendouba

- GIS (Updated)
- GIS: Spatial analysis (Updated)

Université des science et la technologie Houari Boumediene

- GIS and applications (New)
- 3D Mapping Techniques

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Existing courses in North Africa

SEED4NA Final Report Task 1.1 Current status at partner universities

Most focus on Master level

Not many courses fully dedicated to Spatial Data Infrastructures

More technical focus

More focus on GIS

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Spatial Data Infrastructure and Earth Observation Education and Training for North Africa

Course EduServ
Open SDI

EuroSDR – European Spatial Data Reseach

A network organisation linking national mapping and cadastral agencies (NMCAs) with research institutes/ universities and companies across Europe for the purpose of applied research in spatial data provision, management and delivery.

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EuroSDR – European Spatial Data Reseach

- Non-profit organization since 1953
- Provides a pan-European network
- Brings together NMCAs, academia + Private sector
- Purposes
  - jointly perform applied research
  - secure timely, research-based knowledge
  - provide educational activities ensuring the dissemination of the research-based knowledge gained
- Keep NMCAs updated on technology developments
- 20 member countries
- Members are NMCAs & Research / Academic institutes
- Several companies as associate members

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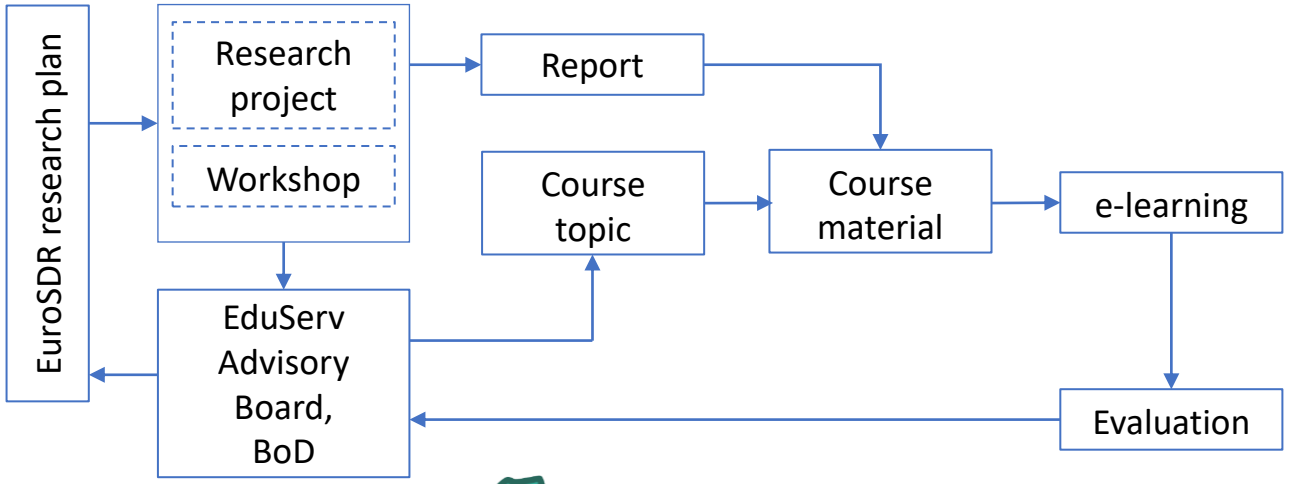
EduServ - Educational Service of EuroSDR

- EduServ - motivation
  - Transfer of results coming from research projects and workshops by means of EuroSDR publications **is not sufficient** to address the 'user domain' and to have impact on production and/or development at NMCAs
  - Need for continuing professional development at NMCAs
- Started in 2002, 19th series in 2021!



adapted from Höhle (2008)

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EduServ structure

Pre-course seminar

- Introduction Introduction to the learning management system (LMS)
- Meeting the tutors and fellow students ⇒ building networks

- Participation is not obligatory in order to continue with e-learning

Evaluation

Issuing **certificates** of successful completion of the EduServ courses

Feedback from participants

e-learning

Student:

- familiarization with LMS
- study of course materials (presentations, literature)
- use of learning programs and provided software
- self-tests (Quiz)
- solving of tasks and submission of assignments
- discussion forum
- collaborative work

Teacher:

- response to queries within 24 hours!

based on Höhle (2008)

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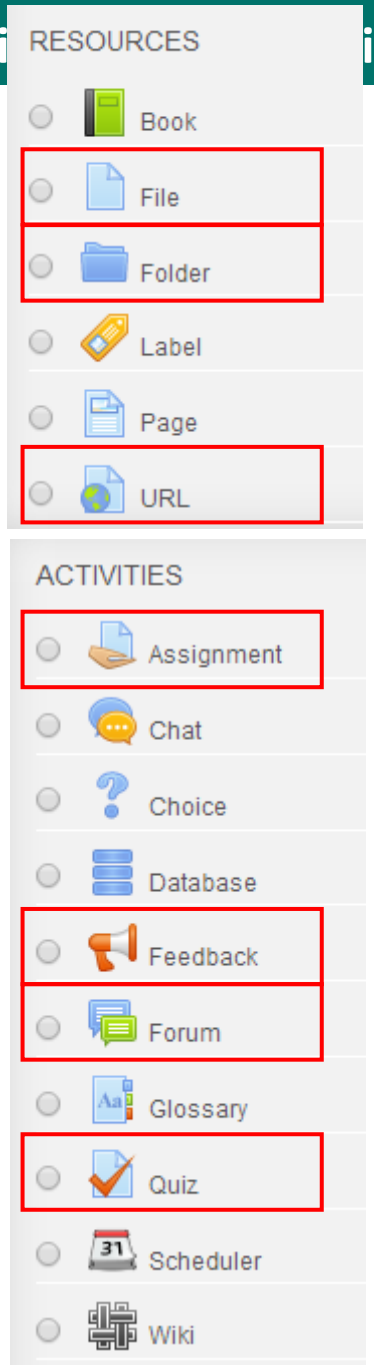
e-learning phase

- moodle learning management system
  - suitable for creating personalised learning environments,
  - Open Source software under the GNU General Public License,
  - web-based, easily accessible and consistent across different web browsers and devices
- Each course divided to several modules containing different study materials (resources) and activities
  - Forum: tool for interaction between the tutors and participants
  - Assignments
- Teachers' response to questions in 24 hours, feedback to assignments in two days



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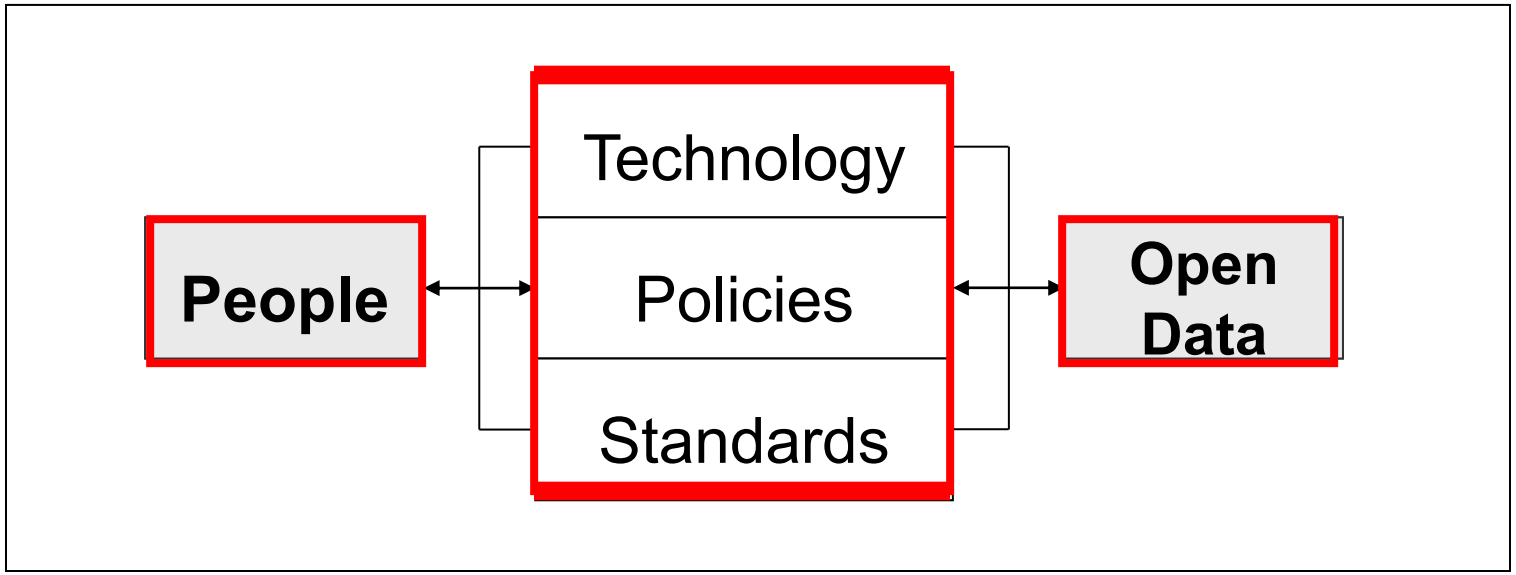
Components of Open Spatial Data Infrastructures



Rajabifard et al., 2002

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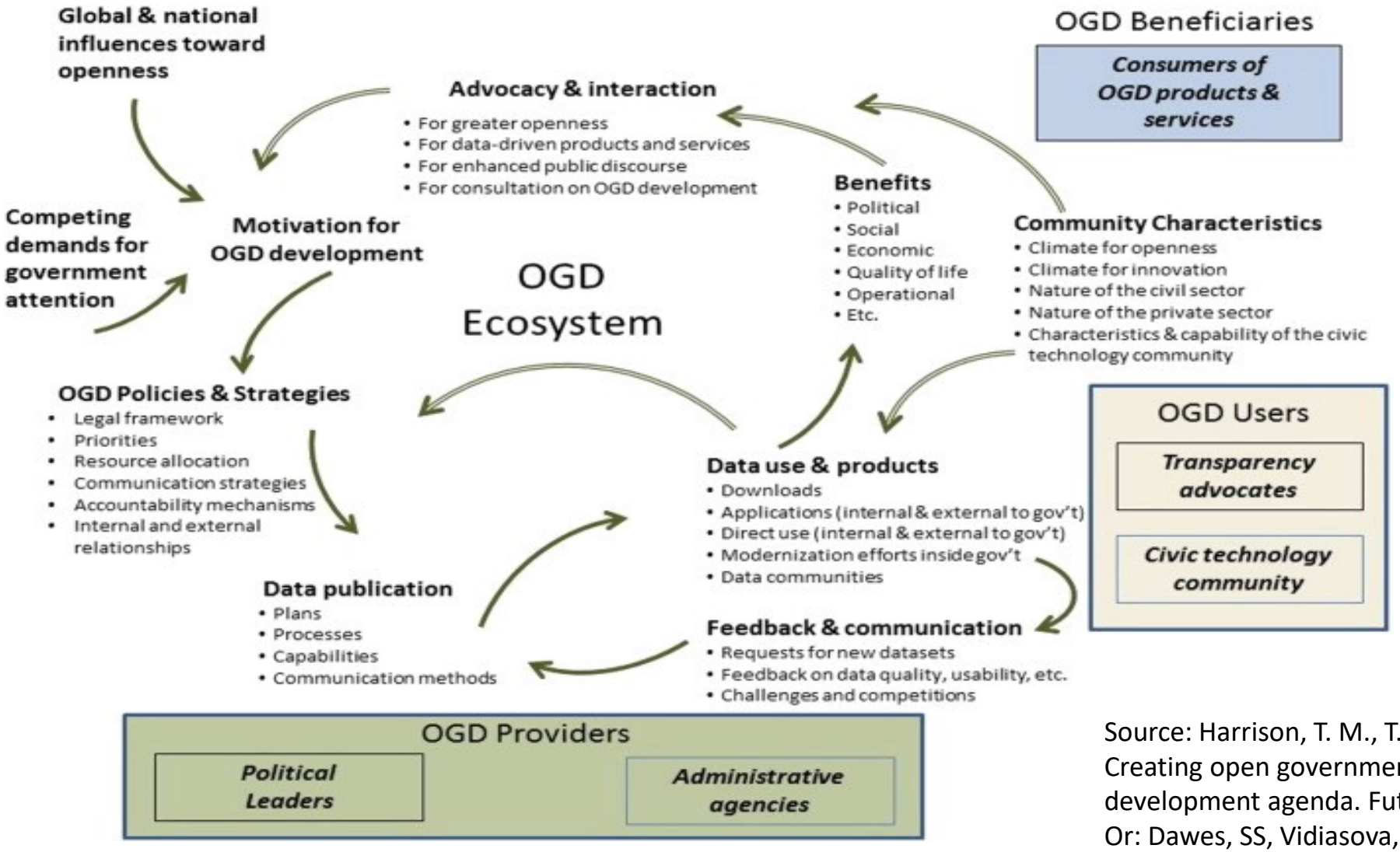

Source: Harrison, T. M., T. A. Pardo, and M. Cook. 2012. Creating open government ecosystems: A research and development agenda. Future Internet 4(4):900–928. Or: Dawes, SS, Vidiasova, L, and Parkhimovich, O. (2016). Planning and designing open government data programs: an ecosystem approach, Government Information Quarterly.

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Course introduction

Course Objectives

- Provision of a comprehensive overview on the state-of-the art in Open SDI and its key components
- Introduction to underlying principles of Open SDI
- Experience hands-on what it means to establish and maintain an Open SDI

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Course topics

- Spatial data infrastructures
- Open data principles
- Key standards
- Network architectures
- (Network) services
- EU-regulations and policies
- Governance strategies
- Key institutions.

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Course modules

Module 1: Introduction to Open SDI — 1 Week

Basic concepts – principles – of Open SDI

Contexts, Trends, Objectives, Components, Practices

Module 2: Non-technological aspects of Open SDI — 1 Week

Non-technological aspects of SDI including key legislation, policies, governance strategies, business models, and assessment approaches

Module 3: Technological aspects of Open SDI — 1 Week

Technological aspects of Open SDI including key standards, networks, architectures, and geo-information services.

Module 4: Overall scope to Open SDI — 1 Week

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Examples of Assignments

List the most important Open SDI strategies around the world + Explain why these are the most important ones

List the latest technological developments

Present the main strengths, weaknesses, opportunities and threats of Open SDI

Set up a road map for opening Geodata taking into account governance (roles, structures, task allocations / responsibilities), legislation, finances, technology, education/ capacity building, outreach, risk management)

List the Key Performance Indicators for Open (Geo)Data

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Academic – Business Cooperation in SDI-context

BESTSDI Survey Academic – Business Cooperation

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Questionnaire:

- Sent to potential stakeholders in Western Balkan and European Union
- Prepared and distributed in Albanian, Croatian, English, Macedonian, and Serbian languages
- Situation June 2019
- 19 questions
- 6 parts
    1. Your organization
    2. Knowledge and skills provided by academic institutions in field of SDI
    3. Academia-Business cooperation and its influence on labor market
    4. Future of SDI
    5. Hampering factors
    6. Conclusion
- 134 responses – mainly from Western Balkan

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BESTSDI Survey Conclusions

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Conclusions

- SDI-competences necessary (in particular basic SDI knowledge)
- Academia – Business cooperation is (very) important
- Academic SDI-education is (very) relevant for labor market – but better alignment with technological developments
- Academic SDI-education is (very) relevant for business companies (by workshops, collaboration, experiences exchange, better communication, joint projects)
- Necessities + Relevance(s) significant higher for Western Balkan
- Hampering factors for past and future (Lack of qualified personnel)
- Positive attitude about future development of SDI, but without clear picture in which direction

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Overall conclusions

Overall Conclusions

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Complexity of SDI-Education

Numerous academic courses Worldwide

Courses everywhere – in particular in Europe (Germany, Netherlands)

Not many courses in Asia, Africa and Latin America

Most courses at Master level

Technical focus

Numerous academic initiatives

North-AFRICAot many courses fully dedicated to Spatial Data Infrastructures

Strong need for SDI Competences (Labor marklet)

Lack of qualified teachers

Academia – Business cooperation is (very) important

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Thank you for your attention!

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