FIG WORKING WEEK 2019
22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"

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Geo-Information Education in the Era of Big (GEO) Data

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Session TS05B: Innovation in Surveying Pedagogy and Curriculum

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Introduction

- Senior lecturer, Course Geo Media & Design, HAS University of Applied Sciences

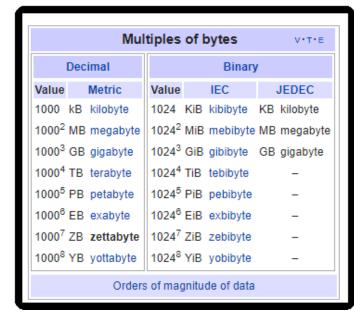- Programmanager Datalab Agrifood, GrowCampus

- Audience?

Why this topic? Some developments

- \> 50 years LandSat
  - Number of satellites and increase in resolution
- Increase in sensors (IOT)
  - Types, numbers and location
  - Drones
- Connected "everywhere" → mobile
- Connection with Data Science
- 33 zettabytes (2018) → 175 zettabytes (2025)
  - DataAge 2025 https://www.seagate.com/gb/en/our-story/data-age-2025/

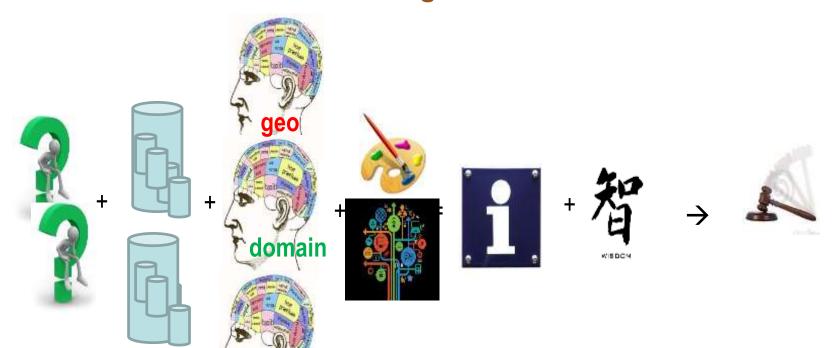| Multiples of bytes					v · T · E
Decimal		**Binary**			
Value	Metric	Value	IEC		JEDEC
1000	kB kilobyte	1024	KiB kibibyte	KB	kilobyte
1000^2	MB megabyte	1024^2	MiB mebibyte	MB	megabyte
1000^3	GB gigabyte	1024^3	GiB gibibyte	GB	gigabyte
1000^4	TB terabyte	1024^4	TiB tebibyte	–	
1000^5	PB petabyte	1024^5	PiB pebibyte	–	
1000^6	EB exabyte	1024^6	EiB exbibyte	–	
1000^7	ZB **zettabyte**	1024^7	ZiB zebibyte	–	
1000^8	YB yottabyte	1024^8	YiB yobibyte	–	
Orders of magnitude of data					

Vision +: Geo Media & Design

New Curriculum (under development)

	term 1	term 2	term 3	term 4
year 1	mapping natural hazards	urban in sight	climate chances	dynamic landscape
	coaching			
year 2	orientation internship	data driven farming ⭐	smart regions ⭐	eco-geo
			geo-trends ⭐	
	coaching			
year 3	2 project internships one abroad, one in the Netherlands			minor (free choice)
	coaching			
year 4	Specialisation: Analyst, Designer or Engineer ⭐		Graduation Assignment (multidisciplinary) ⭐	
	Business & Consultancy			
	coaching			

increase ⭐
with data science

Change in Competencies

- Knowledge → relation with data-science

- Skills → machine learning

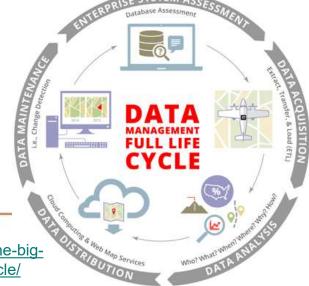- Attitude → continous learning, curious

- → (big) data wise

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Source: https://datawise.gse.harvard.edu/

Effect on (geo) spatial process

- Data collection → integration physical and virtual/digital reality
- Data management → real time data and monitoring, archiving, BIM
- Analysis → other techniques and cooperation with Data Science
- Visualisation → business intelligence

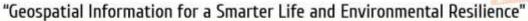- From individual and one step to team and integration

Source: https://www.sanborn.com/the-big-geospatial-data-management-lifecycle/

Conclusion

- Students should think over the whole process
    - Outside data collection with a view to always changing use of data
- New techniques from Data Science should be included in the curricula
- Working (and studying!) in a team of
    - Data collectors
    - Data engineers (management, maintenance and share)
    - Data analysts and data-scientists
    - End-users
- Learn to understand each language and contributions

Discussion

- How do you integrate data scien...
- What is more important?
    - Bring Data scientists towards Geo professionals (spatial awareness)
    - Or
    - Inoculate Geo professionals with data science

Smart Surveyors for Land and Water Management