Project sustainability & data Literacy

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Outline

1. Sustainability
   - Carpentries
   - CodeRefinery
   - Humanities Programming
2. Data Literacy
   - a need for human informatics
   - mininmal requirements
3. Visualization
   - value of visualization
   - limitation
4. Challenges to data literacy

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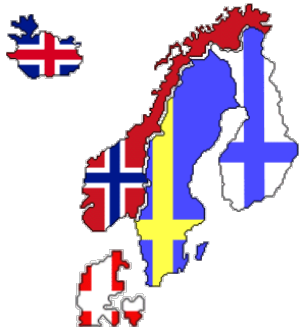

sustainability of competency development $\sim$ organizational resilience

– **diversity**, we need to adapt to multiple research environments
– **openness**, we must be inclusive towards the humanities
– **modularity**, we should support a high level of independence
– **slack resources**, we have to allow for "wasteful" development
– **matching cycles**, we should not be focused on rapid growth

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goals

– "builds global capacity in essential data and computational skills for conducting efficient, open, and reproducible research."

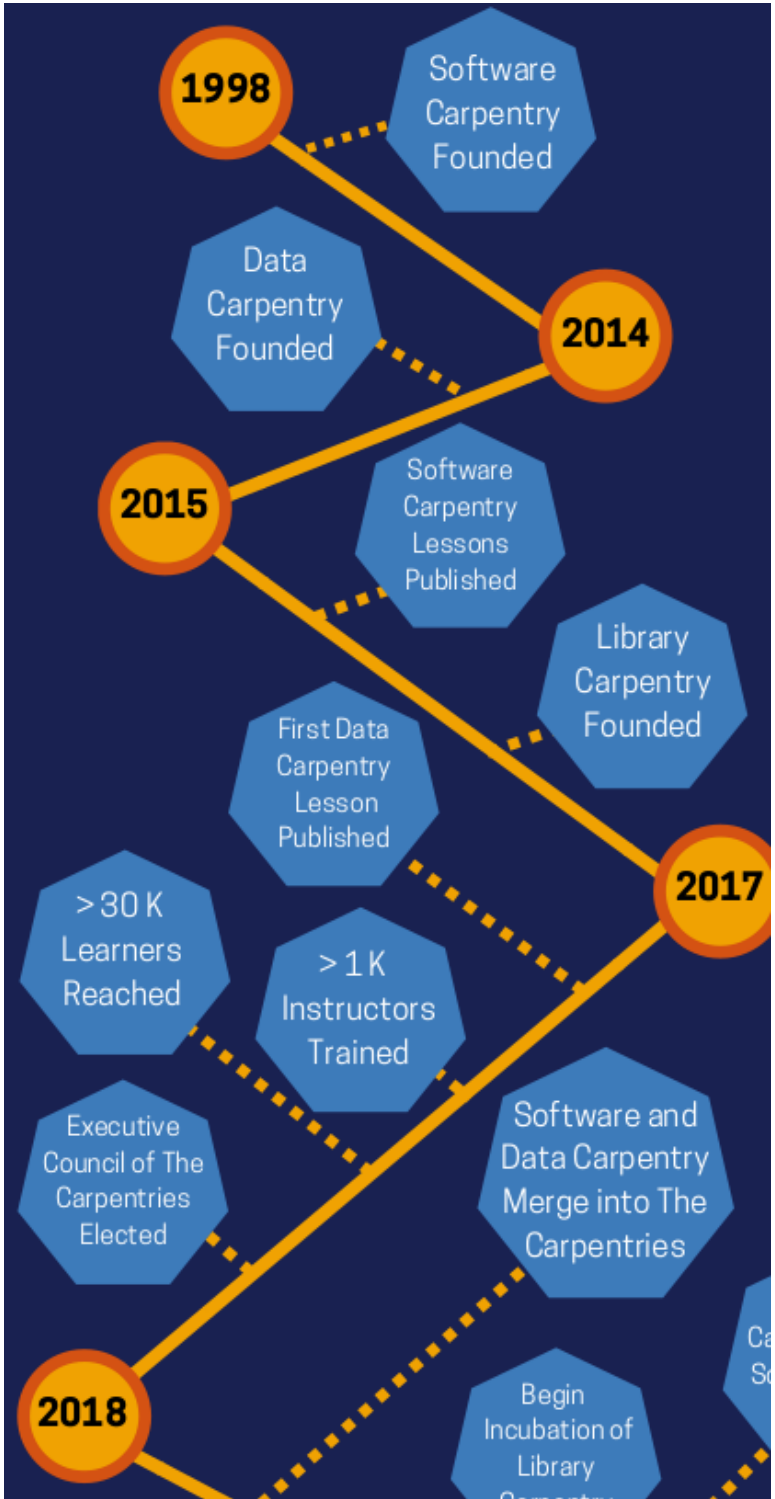
– teaching basic *scientific computing*

model

– strong brand, crowd-sourced development

– peer-to-peer, collaborative learning and knowledge transfer, train-the-trainer program

– external funding and membership tiers



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goals

– increased competence in software development

– better science through reproducibility and reusable code

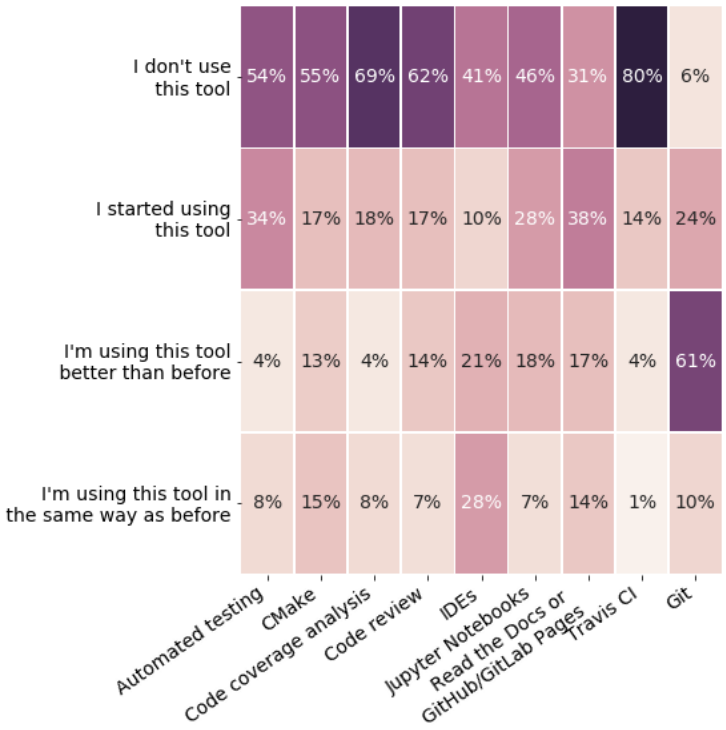
– strengthening Nordic communities

model

– peer-to-peer, collaborative learning and knowledge transfer, train-the-trainer program

– phase 1 and phase 2 have been supported by NeIC

– future is either partnership model or embedded in the Carpentries



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– dissatisfaction with "example mapping" exercises, we started designing state-of-the-art programming for humanities

– redefining decomposition, pattern recognition, and algorithmic design

– debate physical and visual programming

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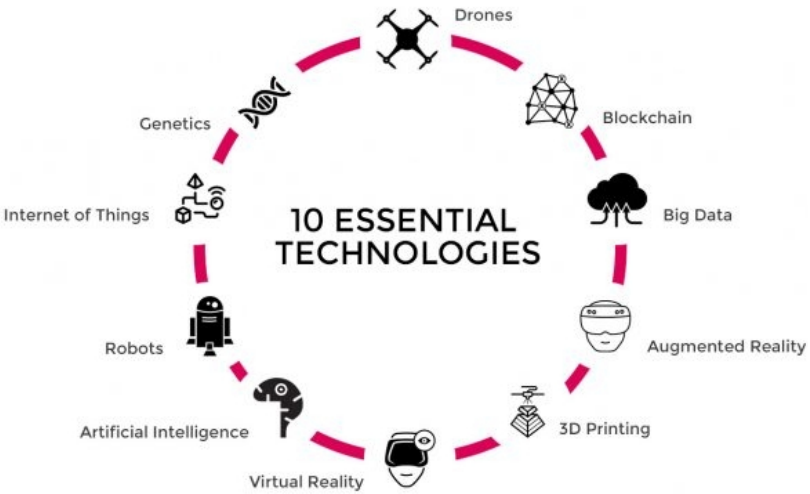
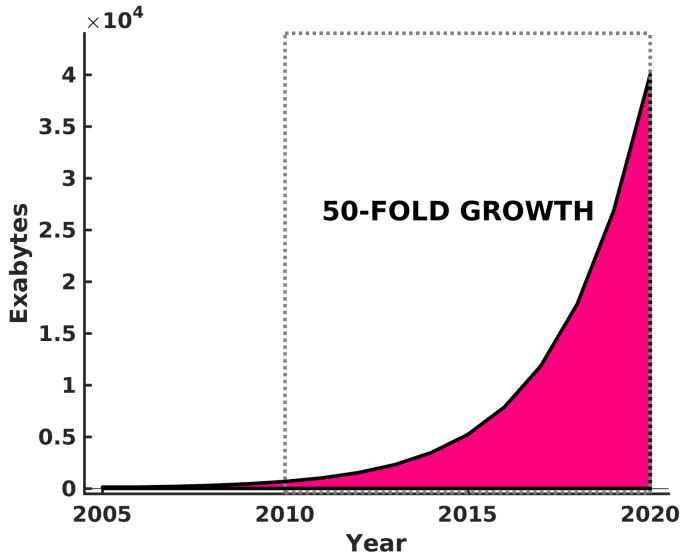
A need for human informatics





the data deluge is transforming knowledge discovery and understanding in every domain of human inquiry

a large part of these data are soft and unstructured $\Rightarrow$ to get value from these data, humanities (and social sciences) must utilize automation

human informatics - automatic information processing in the humanities

K. Steinbuch (1957) Informatik: Automatische Informationsverarbeitung [Berlin: SEG-Nachrichten]

minimal requirements

digital literacy
- knowledge of research and methods in the humanities that rely heavily on digital technology

computational literacy
- basic practice understanding and implementation of algorithmic problem solving (, & ...)

data literacy
- basic practice understanding and implementation of statistical analysis and visualization (, & ...)

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	Set A		Set B		Set C		Set D	
	X	Y	X	Y	X	Y	X	Y
0	10	8.04	10	9.14	10	7.46	8	6.58
1	8	6.95	8	8.14	8	6.77	8	5.76
2	13	7.58	13	8.74	13	12.74	8	7.71
3	9	8.81	9	8.77	9	7.11	8	8.84
4	11	8.33	11	9.26	11	7.81	8	8.47
5	14	9.96	14	8.10	14	8.84	8	7.04
6	6	7.24	6	6.13	6	6.08	8	5.25
7	4	4.26	4	3.10	4	5.39	19	12.50
8	12	10.84	12	9.13	12	8.15	8	5.56
9	7	4.82	7	7.26	7	6.42	8	7.91
10	5	5.68	5	4.74	5	5.73	8	6.89
mean	9.00	7.50	9.00	7.50	9.00	7.50	9.00	7.50
std	3.32	2.03	3.32	2.03	3.32	2.03	3.32	2.03
corr	0.82		0.82		0.82		0.82	
lin. reg.	$y = 3.00 + 0.500x$		$y = 3.00 + 0.500x$		$y = 3.00 + 0.500x$		$y = 3.00 + 0.500x$	

"visualizations are great, it means I have to read less"

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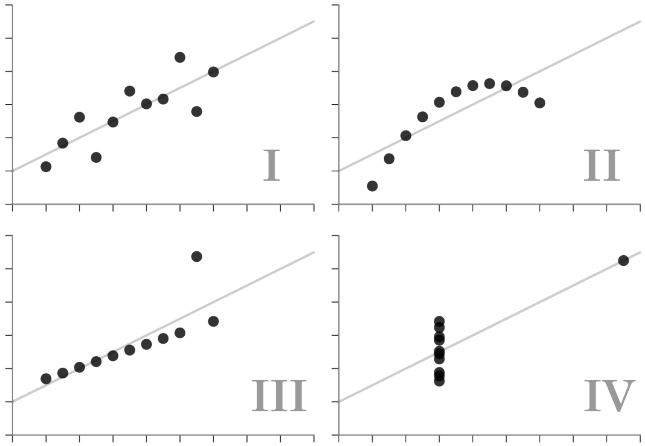
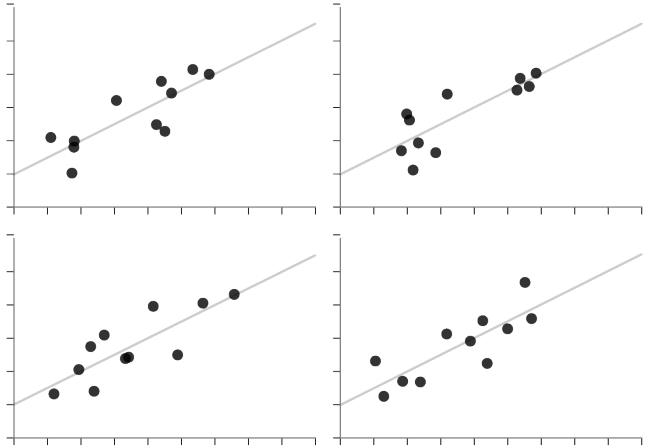
✔ Anscombe's Quartet

Each dataset has the same summary statistics (mean, standard deviation, correlation), and the datasets are *clearly different*, and *visually distinct*.



✖ Unstructured Quartet

Each dataset here also has the same summary statistics. However, they are not *clearly different* or *visually distinct*.



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challenges to data literacy

example
- DL2018 at Aarhus University combines group training with peer-to-peer and centralized support

challenges

- design principles and standards (e.g., Carpentries)
- implementation
- retain the "soft human core"
- cost of facilitating creativity

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THANK YOU

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slides: http://knielbo.github.io/files/kln_neic_dhl.pdf

& credits to

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