

Electronic Lab Notebooks and eLabFTW: 101 – An Introduction

Simon Bekemeier

¹Bundesanstalt für Materialforschung und –prüfung (BAM)

²Bielefeld Institute for Applied Materials Research (BifAM)

Platform MaterialDigital

Now and Then: Telephony vs. Lab Notebooks



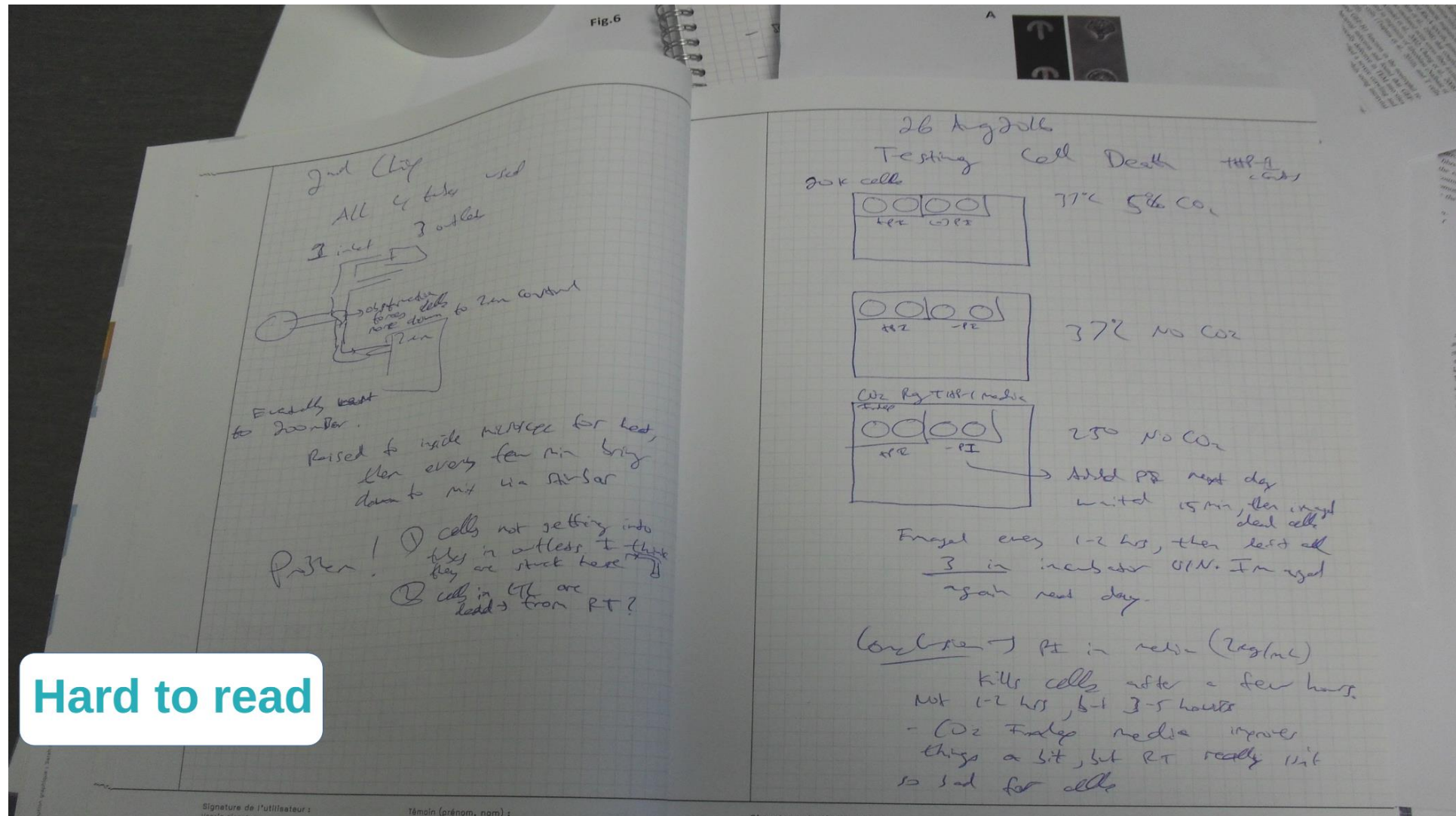
About 100 years

Dirnagl U and Przesdzing I. A pocket guide to electronic laboratory notebooks in the academic life sciences [version 1]. F1000Research 2016, 5:2 (doi: 10.12688/f1000research.7628.1)

Can you always read your writing?

- or your colleague?
- or your successor?
- or your predecessor's?
- once you left?
- Do you keep it?
- What about fading ink?
- Humidity?

→ Knowledge drain
in some way or an other



Hard to read

Weaknesses of Analog Lab Notebooks

- Bad handwriting
 - Hard to copy at scale
 - By the way, that means:
No backup!
 - Unlinked information
 - Unlinked information
 - Unlinked information
- (Non-exhaustiv list)*

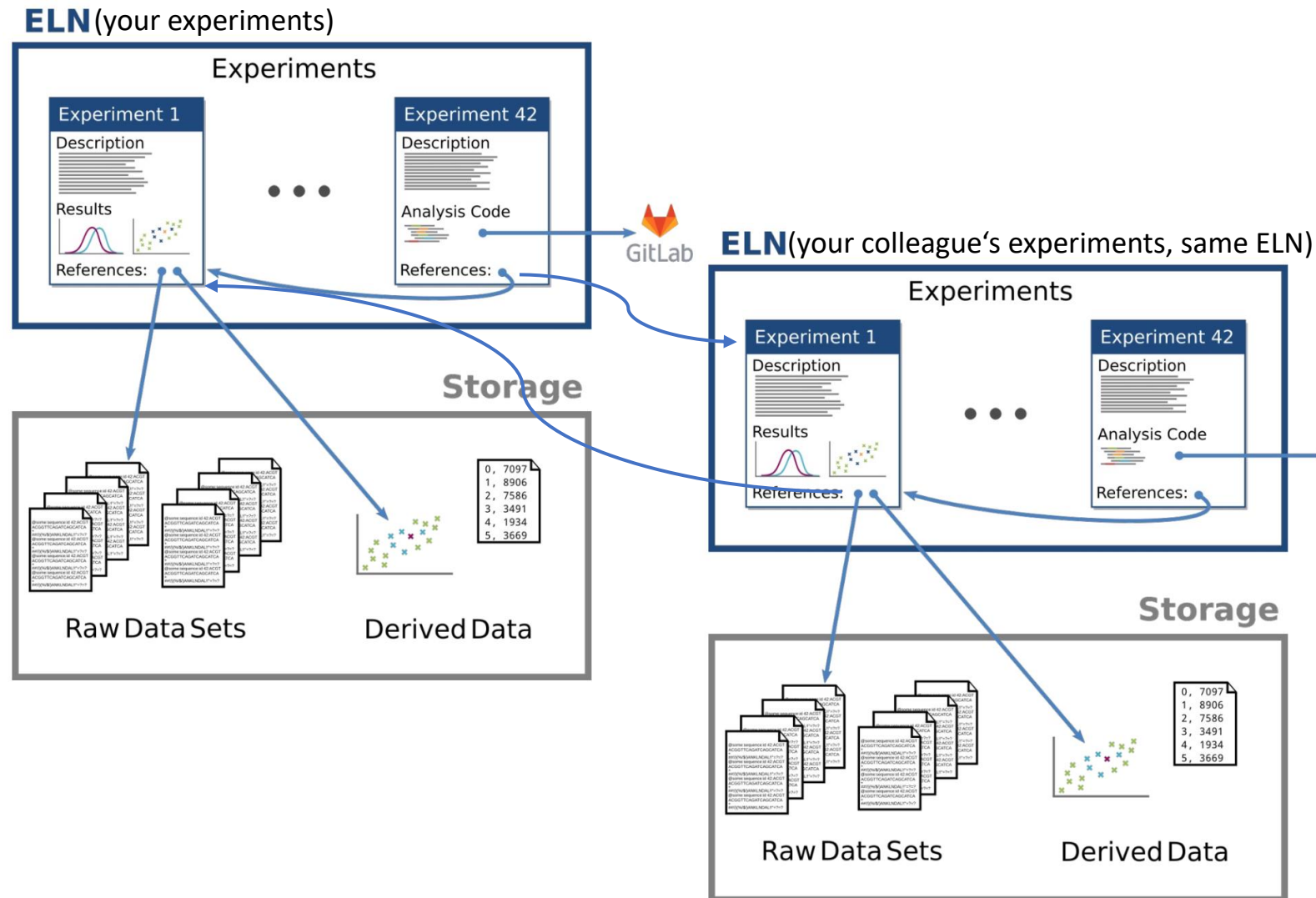
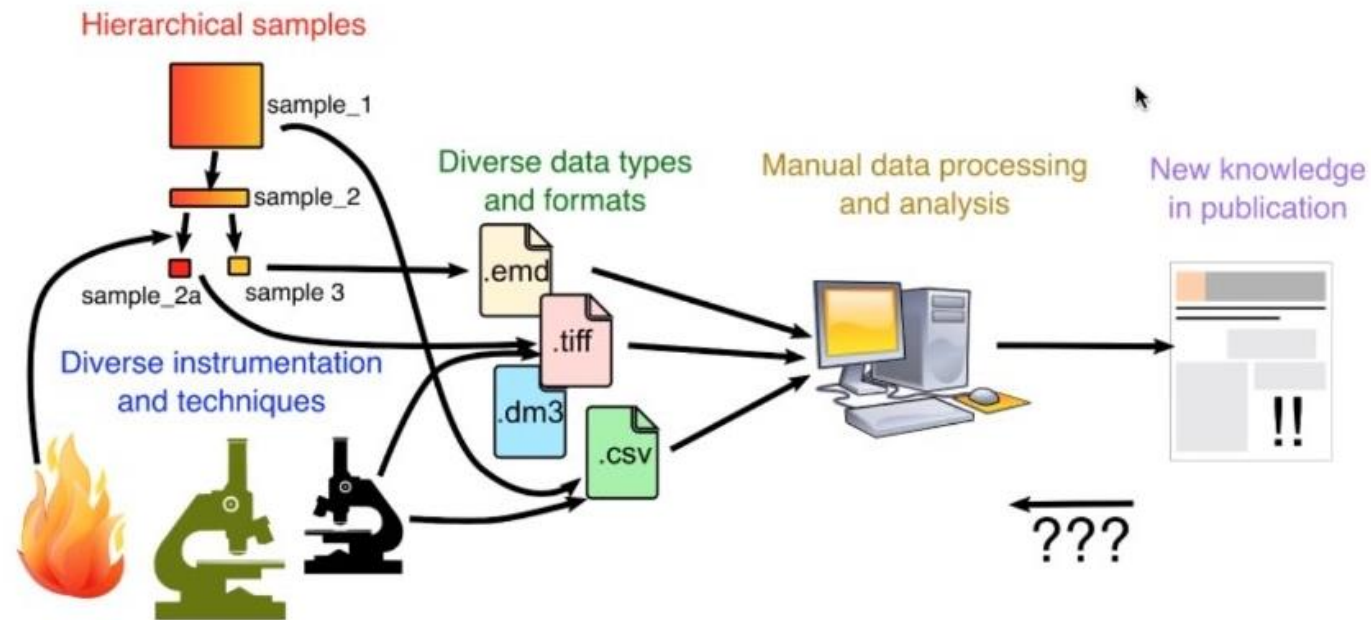


Fig. adapted from: https://duepublico2.uni-due.de/servlets/MCRFileNodeServlet/duepublico_derivate_00075892/eLabFTW_Hands-On.pdf
Simon Bekemeier, BAM, HSBI, Platform MaterialDigital


How do you link all of those easily, accessibly, indexed, searchable, bi-directionally, ...?

Reproducibility of experimental results



ELNs are part of the solution

Advantages & Disadvantages of ELNs



Advantages	Disadvantages / Challenges
Efficient organisation and use of data	Required training
Time saving and automatization	Customization to individual needs
Collaboration	Dependence on technology
Data security and integrity	Security and privacy concerns
Reduced paper useage	Infrastructure costs

Bold claim: You stay able to apply for funding – (but maybe not so bold after all)



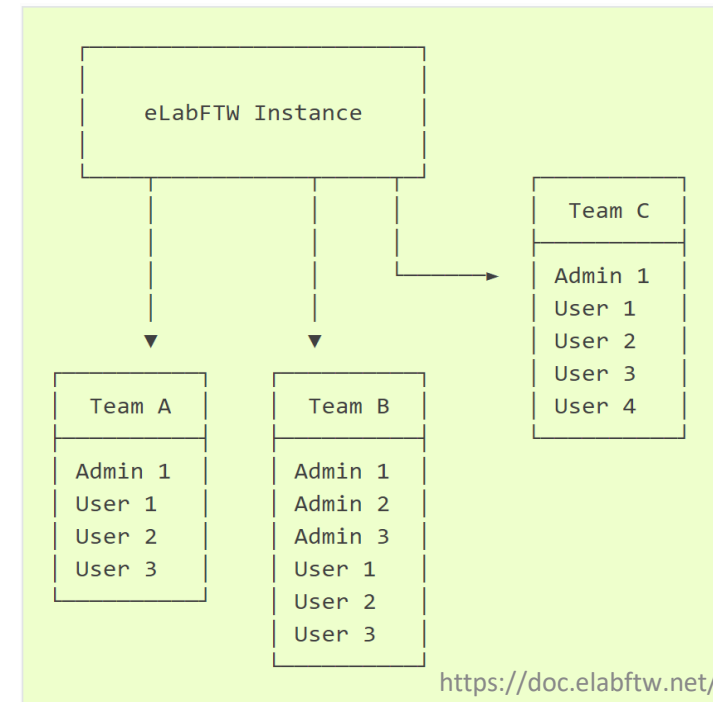
Table adopted from: Hüseyin Uzun, Goethe Universität Frankfurt a.M.

Image: <https://github.com/elabftw/elabpdf/blob/master/elabftw-presentation.pdf> (latest commit: 24331a6)



Designed by researchers, for researchers, with usability in mind. <https://elabftw.net/>

- Generic – topic-agnostic
- Browser-based
- Open source
- Main developer comes from research
– started for his own needs
- Active community
- Active development
- New features based on community feedback



Disclaimer: I am in contact with Nicolas Carpi / Deltablot (but came from the user perspective first)



Designed by researchers, for researchers, with usability in mind. <https://elabftw.net/>

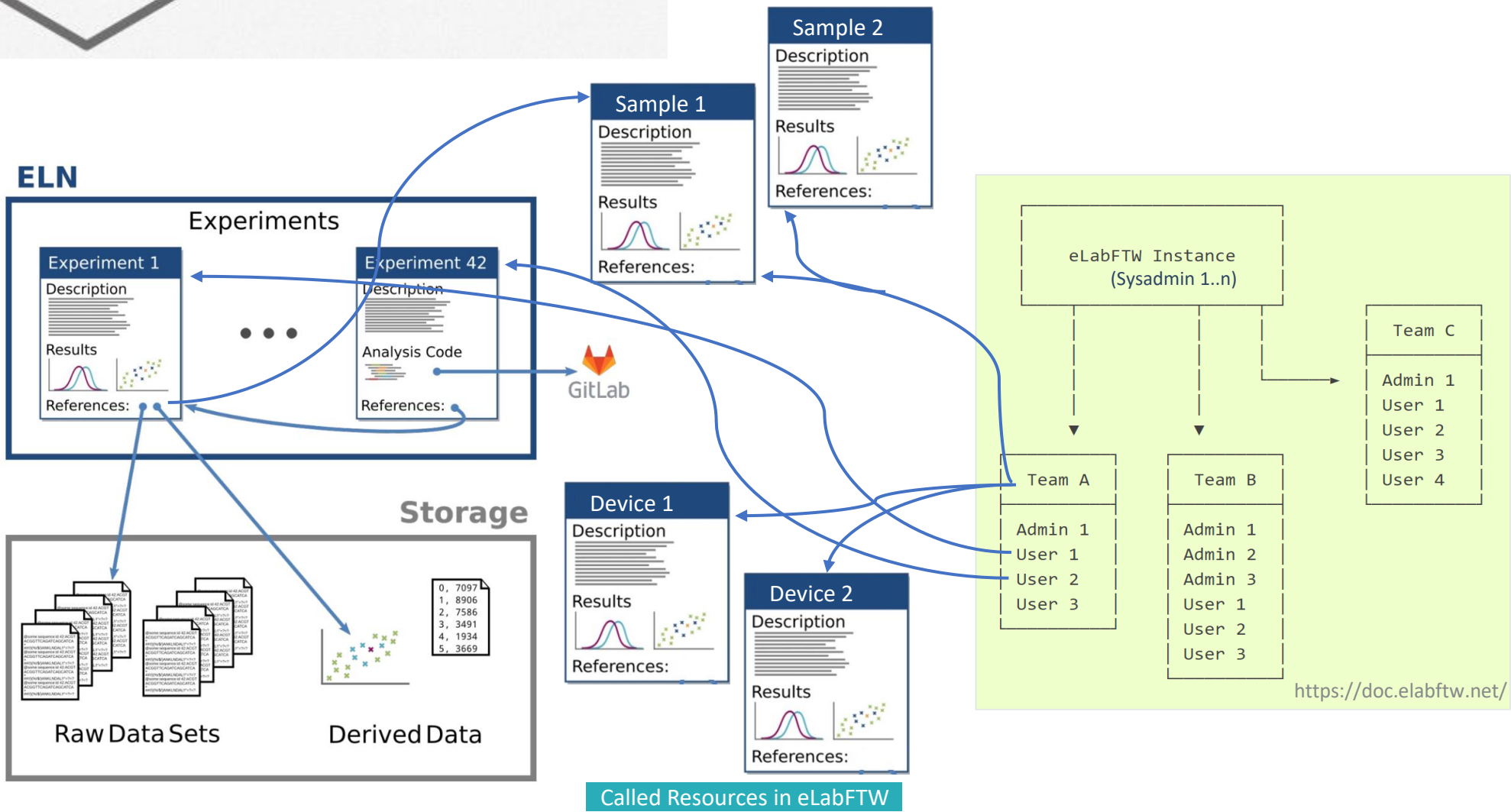


Fig. (left) adapted from: https://duepublico2.uni-due.de/servlets/MCRFileNodeServlet/duepublico_derivate_00075892/eLabFTW_Hands-On.pdf

Digitalization doesn't stop there! - A sneak peak



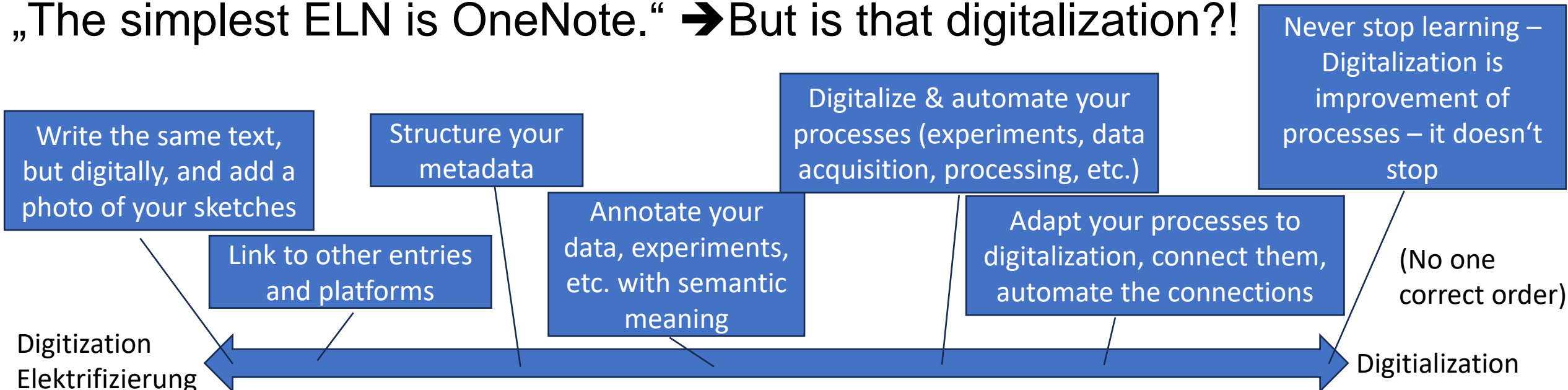
digitization vs digitalization



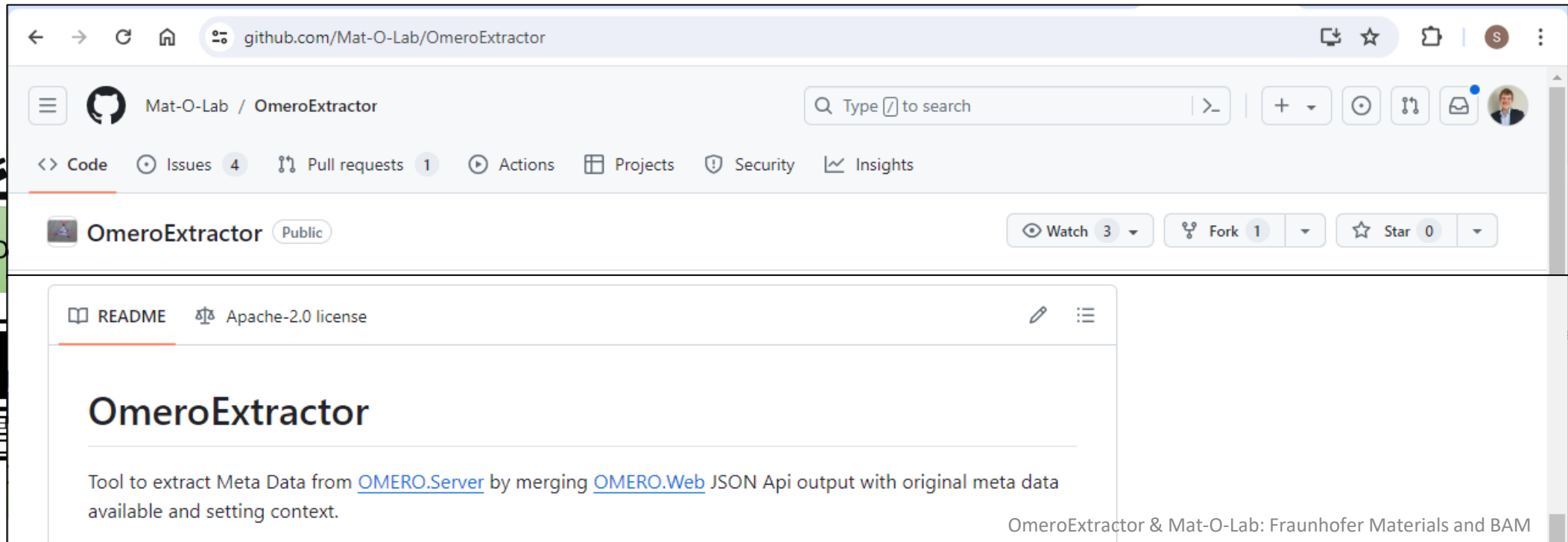
Alle Bilder Videos News Bücher : Mehr

While digitization focuses on converting and recording data, digitalization is all about developing processes and changing workflows to improve manual systems. An example of this would be using digitized customer data from different sources to automatically generate insights from their behaviour.

„The simplest ELN is OneNote.“ → But is that digitalization?!



Digitalization doesn't stop there! - A sneak peak



github.com/Mat-O-Lab/OmeroExtractor

Mat-O-Lab / OmeroExtractor

Code Issues 4 Pull requests 1 Actions Projects Security Insights

OmeroExtractor Public Watch 3 Fork 1 Star 0

README Apache-2.0 license

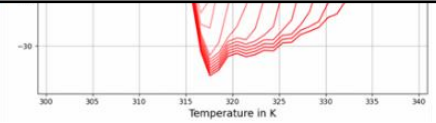
OmeroExtractor

Tool to extract Meta Data from [OMERO.Server](#) by merging [OMERO.Web](#) JSON Api output with original meta data available and setting context.

OmeroExtractor & Mat-O-Lab: Fraunhofer Materials and BAM



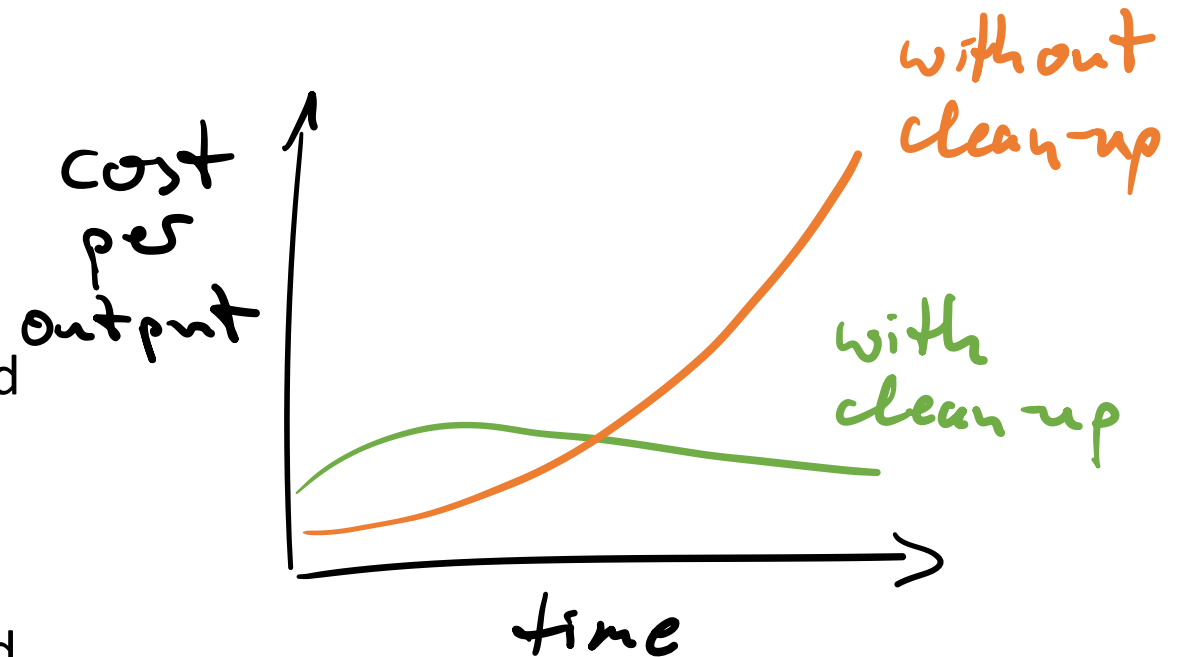
```
response = experiments_api.post_experiment_with_http_info(  
id=filter_experiment_number(response)  
experiments_api.patch_experiment(experiment_id, body={"title": title})  
uploads_api.post_upload('experiments', experiment_id, file=meas_file_title,
```



Bekemeier et al. / DiProMag team, publication in prep. + accepted at MSE 2024
pyiron: <https://pyiron.org>

ELN, eLabFTW and Digitalization

- Advantages:
 - Be efficient:
do research, not data shuffling
- Challenges:
 - Be willing to adopt new processes and adapt yours to new tools
(think of it like an investment)
- To consider while introducing:
 - As a researcher: Speak to your trusted IT / Data Management / Data Steward person
 - As „the institution“: Speak to your researchers
 - ➔ Digitalization is no one-way process
 - „Share your journey“ (sci. publications)
=> benefits for you and everyone else



Simon Bekemeier

BAM, BifAM,
Platform MaterialDigital

simon.bekemeier@bam.de

simon@belveka.email