

Research Data Management 101

Workshop #1: Introduction to RDM

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LIFESPAN Research Centre, Singapore

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Data and Research Data

What is data?

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Data = Datums = Values of attributes

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- Singular/scalar
 - Symbols
 - Numbers
 - Characters
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- Singular/scalar
 - Symbols
 - Numbers
 - Characters
 - ...
- Composite data
 - Data table
 - Word list
 - Images/videos
 - ...

Research Data

- Experiment data (surveys, measurements, images, videos, etc.)

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- Reviewed articles in literature review

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- **Metadata**
- ...

RDM in workflow

Main aspects

- Organising: storing and retrieving
- Versioning: tracking changes
- Archiving: storing data of finished tasks

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Storage

- Physical copies
 - Survey forms
 - Consent forms
 - Hard drives that store digital data
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RDM in workflow

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- Organising: storing and retrieving
- Versioning: tracking changes
- Archiving: storing data of finished tasks

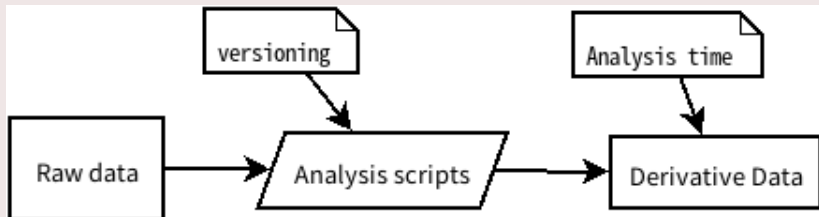
Storage

- Physical copies
 - Survey forms
 - Consent forms
 - Hard drives that store digital data
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- Digital copies
 - Files (also digitalised version of physical copies)
 - Folder (i.e. structure)

Analysis and Versioning

- Raw data (do not edit, archive immediately)
- Derivative data

Derivative data



Backup, or else . . .

FOR MY LOST LAPTOP

I am a Rutgers Chemistry 5th year PhD student. On April 19th afternoon, my LENOVO THINKPAD T420S laptop was stolen from room 203 of Wright-Rieman building. If you stole my laptop and now you are reading this letter, I would like to say that you can keep the computer and I would like to pay you money for my data under D drive. The data is my FIVE-YEAR work. I really need the data under the D drive, there is a folder named RESEARCH, under RESEARCH folder, there is a THESIS folder. I only need that folder for my thesis defense, which is coming very soon. I would like to pay you \$1000 and use whatever way you offer to send you the money. The price is negotiable. My laptop password is 850713zd, my email address is [REDACTED] and phone number is [REDACTED]. PLEASE contact me and I would appreciate it so much!!!

Versioning, or else ...

A STORY TOLD IN FILE NAMES:

Location: C:\user\research\data

Filename	Date Modified	Size	Type
data_2010.05.28_test.dat	3:37 PM 5/28/2010	420 KB	DAT file
data_2010.05.28_re-test.dat	4:29 PM 5/28/2010	421 KB	DAT file
data_2010.05.28_re-re-test.dat	5:43 PM 5/28/2010	420 KB	DAT file
data_2010.05.28_calibrate.dat	7:17 PM 5/28/2010	1,256 KB	DAT file
data_2010.05.28_huh??.dat	7:20 PM 5/28/2010	30 KB	DAT file
data_2010.05.28_WTF.dat	9:58 PM 5/28/2010	30 KB	DAT file
data_2010.05.29_aaarrngh.dat	12:37 AM 5/29/2010	30 KB	DAT file
data_2010.05.29_#\$_@*&!!_dat	2:40 AM 5/29/2010	0 KB	DAT file
data_2010.05.29_crap.dat	3:22 AM 5/29/2010	437 KB	DAT file
data_2010.05.29_notbad.dat	4:16 AM 5/29/2010	670 KB	DAT file
data_2010.05.29_woohoo!.dat	4:47 AM 5/29/2010	1,349 KB	DAT file
data_2010.05.29_USETHISONE.dat	5:08 AM 5/29/2010	2,894 KB	DAT file
analysis_graphs.xls	7:13 AM 5/29/2010	455 KB	XLS file
ThesisOutline!.doc	7:26 AM 5/29/2010	38 KB	DOC file
Notes_Meeting_with_ProfSmith.txt	11:38 AM 5/29/2010	1,673 KB	TXT file
JUNK...	2:45 PM 5/29/2010		Folder
data_2010.05.30_startingover.dat	8:37 AM 5/30/2010	420 KB	DAT file

Type: Ph.D Thesis Modified: too many times Copyright: Jorge Cham www.phdcomics.com

Versioning, or else . . .



File Types

Binary files A sequence of bytes, can be edited using a *Hex editor* (e.g. Hex Fiend for Mac OS, Notepad++/Hex plugin for Windows, GHex for Linux, etc.)

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- Text files** Stored using a particular encoding (UTF-8), can be edited using a *text editor* (VS Code, Notepad++, Sublime, Atom, Emacs, Geany, etc.)

File Types

Common research-related data

Source code text files

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Experiment data Mixed

- Data tables
- Images
- Audio
- Video

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Documentation Research journal, metadata, and articles, etc.:
mixed

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Security Password-protected archives on secure machines,
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Version control track your changes, *at integration level*

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Backup Regularly, **HERE-NEAR-FAR**

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Naming convention

topic_description_YYYYMMDD_LTA_v0001.tar.gz

Topic : 30 characters

Description : 1-3 words

Timestamp : YYYYMMDD format

Initial : 2-4 characters

Versioning : v0001 format

Hand-on tasks

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- Creating a research workspace in your home folder
- Create a research project structure
- Create raw data: 12 word files
- Copy some images
- Create metadata file in markdown

To awesome people!

Thank you