Tales from a Data Management Survivalist: Skills Honed in the Wilderness

Karen L. Hanson  
New York University School of Medicine, karen.hanson@med.nyu.edu

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Tales from a data management survivalist: Skills honed in the wilderness

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Karen Hanson
Knowledge Systems Librarian
karen.hanson@med.nyu.edu
Sorry

(I’m a medical librarian)
Something that inspires and scares me

“Don’t assume that people care about libraries. People care about streamlining the processes that support research and learning.”

http://www.ala.org/acrl/issues/value/changingroles
Data services: where to start?
Naked and afraid in the data wilderness
Library’s data strengths (2011)

- Resources: 2
- Knowledge: 3
- Stamina: 8
• Naked and Afraid
• **Dropped in the jungle**
• Honing our survival skills
• Paddling down the river
• Lessons learned
Environmental scan

- Complex environment
- Lots of small isolated services
- Lots of gaps / opportunities
A starting point: Education  (Sept 2011)

• First step to building a résumé
• Learn about what people need
• Demonstrate our understanding
• Test the water!
Creating an opportunity

• Contacted postdoctoral program director

• 90 minute class:
  • Plant seeds of thought
  • Raise awareness
  • Give practical pointers for immediate improvements
**Class outline**

- Introduction
- Incentives (carrots & sticks)
- Standards for description & documentation
- Storage, archiving and sharing
- Data management planning
Class features: Scare tactics

Government mandates timeline

2003: NIH adopted a data sharing policy.

2008: NIH implements the Public Access Policy

(still no teeth, but young yet)

Government mandates timeline

2011: NSF made data management plans a requirement

2013: NIH Public Access Policy... now with teeth
“There were 60 children in the study. Ages were by accident duplicated between the upper and lower halves of the database. Thus, ages for the first 30 children in the data set were identical and in the same order with the ages for the second set of 30 children... The files with the original data are not available any more, making it impossible to reconstruct a valid data set for reanalysis.”

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3320558/
Class features: Real world examples

- 1 rat heart
- 100s of slices
- 100s of slides
- 1000s of image files
- 100s of huge images

5-7 experiments a week...

NYU Health Sciences Library

NYU School of Medicine
NYU Langone Medical Center
Class features: Postdoc survey

- ~2500 responses from 43 institutions analyzed
- 3 questions on data management

To what extent have you dealt with NIH data sharing regulations or NSF data management plans?

- 38% Not aware of policies
- 48% Aware but no involvement
- 39% Aware and involved

Introduction to Data Management
Pre-class Survey

1. Data management and sharing policies from federal funding agencies, such as NIH and NSF, have been implemented in order to ensure that research data is accessible to other investigators. To what extent have you dealt with NIH data sharing regulations or NSF data management plans? Check all that apply.
   - I have had to write a data sharing/management plan for a grant proposal
   - I have had to implement data sharing/management plan in my lab
   - I am aware of federal funding agency policies around data sharing/management, but have not had any involvement with them
   - I am not aware of federal funding agency policies around data sharing/management
Class features: Chilling tales from our own lives
Class features: Humor
**Class evaluation**

*Will you use the topics covered in your work?*

- **Definitely will**
- **Probably will**
- **Probably won't**
- **Definitely won't**

*Would you be interested in future classes that went into more detail?*

- **Yes**
- **No**
• Naked and Afraid
• Dropped in the jungle
• **Honing our survival skills**
• Paddling down the river
• Lessons learned
Researcher experience of data support at our institution?
Division of Knowledge Informatics (DKI)
Funding announcement

NLM Administrative Supplements for Informationist Services in NIH-funded Research Projects
The grant

“Clinical Management of Cochlear Implant Patients with Contralateral Hearing Aids”
Mario Svirsky & Arlene Neuman
The informationist supplement

- Data model / database
- Data entry tool
- Refine reporting queries
- Query tool

Informationists:
- Theodora: data modeling
- Me: database programming, application design
Domain knowledge
Subjects

Research Team

The Data

Principal Investigators

MS Access Database

MS Excel

MS Excel

MS Excel
The diagram illustrates the process involving various stakeholders and software tools in a research setting. The subjects of the research are connected to the research team, which in turn is connected to the principal investigators. The data is managed using Microsoft Access and Excel, with international researchers involved in the process.
October 2012: Hurricane Sandy
Before

server room
After
Taking one on the chin

Knowledge

Resources

Stamina
Naked and afraid
A glimmer of hope
Early 2013
• Naked and Afraid
• Dropped in the jungle
• Honing our survival skills
• Paddling down the river
• Lessons learned
A fork in the river

basic

clinical
Basic to clinical: Apples to oranges

**Basic scientists:**
- Much wider variety of data
- Data practices… the wild west
- Postdocs

**Clinical investigators:**
- Data more consistent
- Systems available (e.g. REDCap, Velos)
- Greater recognition of value in sharing
Basic scientists - strategy

1) Continue integration into postdoc programs
Basic scientists - strategy

2) Keep improving existing material

Metadata – general structure

- Dublin Core
  - Designed to be generic/flexible
  - Usually stored in XML
    - e.g. `<creator>Harison, Karen L.</creator>
  - 15 fields:
    - Contributor, Coverage, Creator, Date, Description...
Basic scientists - strategy

3) Seek out new opportunities through liaisons
Clinical investigators – strategy

1) Partner with existing expert
Clinical investigators – strategy

2) Create short modules for busy clinicians

**Module #0 - How to avoid a data management nightmare (teaser)**
Module #1 - Introduction to Data Management
Module #2 - Planning Data Collection
Module #3 - Data Structure and Naming Conventions
Module #4 - Form Design
Module #5 - Electronic Data Capture
Module #6 - Data integrity monitoring
Module #7 - Analysis
Module #8 - Privacy issues
Module #9 – FDA / FISMA
Module #10 – How to document your data (and why!)
Module #11 – Storage, Preservation
Module #12 – Sharing
Clinical investigators – strategy

3) Participate in new workgroup to develop education program for clinical investigators

How to avoid a data management nightmare

NYU Health Sciences Library
Karen Hanson | Kevin Read | Alisa Surkis
Meanwhile, the informationist project
Subjects

Research Team

The Data

New Database

Principal Investigators

International Researchers

MS Excel
Tool evaluation
Will we ever get this thing started?
Original data entry tool

DAT_Subject Form

Subject Data | Parent / Guardian | Left Implant | Right Implant | Hearing Aids | Test Scores | Other Info

Implant ID | 7 | Processor Detail
Ear | R
Implant Device | Tempo 40
Implant Date | 1/1/2011
No. of Electrode | 22
Stimulation Date | 1/1/2011
Active

Processor ID | 6
Processor Date | 1/1/2011

Show - Hide Strategy

Processor ID | 9
Strategy ID | 9
Strategy | ACE
Strategy Date | 1/1/2011
Active

Record: 1 of 1

Save - Exit
Save - Continue
Subject Browse
Single Subject Search
Tool evaluation

- REDCap
- Microsoft Access
- velos
- php MySQL
OK, we’re in it for the long haul
A unified model
Cleaner data entry

Auditory research tool

Visit details - Auditory Research
http://audstudies.med.nyu.edu

Manage subjects  Manage visit  Create reports  Configure lists  Configure users

Editing visit:
Marc Botton
12/01/2013

Visit details
Assign tests
Score tests

Visit details

General details

Subject
Marc Botton

Visit date
12/01/2013
Calculated age
36.123

Communication mode
Oral/Cued

Site
Select site

Cochlear implant details

Left ear has CI

Implant device
Nucleus 22

Implant date
12/01/2013

# electrodes
22

Stimulation type
Select stimulation type

Stimulation date
12/01/2013

Insertion angle
22

Insert technique
Select insertion technique

Right ear has CI

Select implant device

Select stimulation type

Select enlargement technique
Validation, autocomplete, audit
Built-in and custom reporting
Informationist supplement – take aways

- Available tools
- Researcher workflows
- Contacts in Research IT
- Valuable, but select projects carefully
• Naked and Afraid
• Dropped in the jungle
• Working on our skills
• Paddling down the river
• Lessons learned
Post-evaluation of skills

- **Knowledge**
- **Resources**
- **Stamina**

The graph shows a comparison of scores for different categories. The x-axis represents the score range from 0 to 10, and the bars indicate the level of performance.
Challenges: Outside of our comfort zone
Challenges: Time, effort, persistence
We had no idea where to start
Used library strengths

- Scholarly communication issues
-Repositories, data sharing
- Education
- Subject specialists / liaisons
- Metadata
- Finding answers
Used individual strengths
Forged partnerships

- Data needs are enormous!
- Partnerships make us stronger
- We can bring something to the table
Experienced pockets of success
To be continued…

You are here
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Thank you!

Karen Hanson
Knowledge Systems Librarian
karen.hanson@med.nyu.edu