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Digital Realities and Academic Research

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Outline & Learning Objectives

Objectives:

1. Examine and contemplate some of the challenges and strengths related to digital realities, data, and research
2. Consider how digital reality content types are being used as supplemental material
3. Learn what role libraries can play in this shift to support researchers
About Me

• BFA - Visual Culture Education
  Concentration in 3D Media

• Masters Library &
  Information Sciences

• Computer Sciences – JAVA, R, Data
  Analysis, Visualizations, Databases

• Archives, Museums, Cultural
  Libraries, Health Science Centers

• Gamification, Human Computer
  Interaction, and Cultural Identity
  Exploration
Terminology

Noteworthy phrases:

Virtual Reality
Augmented Reality
Mixed Reality
Digital Realities
To understand data’s role in the overall research process, and thus how to manage data better, we must start by breaking the research process down into the steps that make it up. (Briney, 2015)
Research data management (often seen as RDM) is a term that describes the organization, storage, preservation, and sharing of data collected and used in a research project.

Researchers need to be able to improve, enhance, and professionalize their research data management skills to meet the challenge of producing the highest quality shareable and reusable research outputs in a responsible and efficient way (Corti, 2014)

What is research data management?

- Organizing
- Structuring
- Storage
- Choosing technology
- Preservation
- Versioning
- Sharing
- Documenting
- Curation
- Security
Background of NNLM

The mission of the NNLM is to advance the progress of medicine and improve the public health by providing all U.S. health professionals with equal access to biomedical information and improving the public's access to information to enable them to make informed decisions about their health.
**New England Region (NER)**

NER proudly serves: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. The New England Region is based in Worcester, MA, at the University of Massachusetts Medical School.
Empathy Learned Through an Extended Medical Education Virtual Reality

University of New England
College of Osteopathic Medicine

Innovative learning modules are utilized to augment medical students’ learning about empathy in relation to older adult health care.
Libraries Future Roles for Supporting Researchers

What could our future look like?

- Evolving data storage, communications, and computer security technologies
- Methods for generation, formalization, management, and sharing of knowledge resources
- Balance of basic and applied research in NLM’s research support portfolio
- Training for data scientists, data-informed investigators, data librarians
- Standards and policy development in the promotion of open science
- Partnership with other NIH components and agencies promoting best practices for data storage, access, discovery, and analysis.

What the library was, which was a stable repository of knowledge, is no longer possible, now the big action is moving upstream to the data. The dynamic interplay of knowledge and medicine is where we’re going and where we want to be. (Brennan, 2017)
Libraries Future Roles for Supporting Researchers

- Growing extramural research
- Online Data Management Resources
- Direct deposit of data to support open data movements
- Training for data scientists, researchers, and librarians
- Policy development to promote open access
- Increasing understood value and use of big data
A positive note in relating digital realities to the data cycle of “Data Creation” is there seems to be more possibilities to easily collect data. Considering how HMDs and simulation gear can track a variety of user actions: eye-tracking, head movement, general body language, the time that it takes users to make specific motions, etc.

IDENTIFYING ANXIETY THROUGH TRACKED HEAD MOVEMENTS IN A VIRTUAL CLASSROOM
Challenge – Collecting Data

On the other hand, there is also a challenge that has risen in the same sphere of thought. When considering digital reality technologies and the stage of “Data Creation” it is also easier to draw on data from multiple sources, and run into interoperability issues between data sets.

IDENTIFYING ANXIETY THROUGH TRACKED HEAD MOVEMENTS IN A VIRTUAL CLASSROOM
Another researcher data challenge is related to the highly relevant data stage and management strategies revolving around “Data Security.” This data will ideally be anonymized, kept in secure conditions, and types of sensitive data should be dealt with accordingly.

AUTOMATIC DETECTION OF NONVERBAL BEHAVIOR PREDICTS LEARNING IN DYADIC INTERACTIONS
The next challenge that is significant to both RDM and the data life cycle is that of new digital reality data storage. This issue isn’t necessarily new, but it’s progressing quickly and a concern for researchers and publishers alike.
In research and the industry, there are currently many unique definitions, taxonomies, and technologies for the different types of digital reality technologies. Some researchers even view these “technologies” (such as AR or VR) as academic concepts rather than types of technologies.

Mixed Reality, Augmented Virtuality, Augmented Virtual Reality, Transmogrified Reality, Dual Reality
One of the most interesting challenges in relation to digital reality technologies is that these different content types are treated as supplemental material when being published. In the data life cycle this could be categorized as a part of “Data Publication” and “Data Sharing”.

Some examples of supplemental material policies online: Oxford Academic, American Psychological Association, Society for Industrial and Applied Mathematics, Journal of Neuroscience
Strength – Data Visualizations

One of the most popular pros that I’ve seen for researchers is the idea of being able to share the research data with VR. This strength could be a part of the “Data Sharing” part of the data life cycle, or a couple other stages, depending on how it’s utilized.

Research


