Research and Data Management

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INTRODUCTION

Research is a diligent inquiry and careful search for new knowledge through systematic, scientific and analytical approach in any branch of knowledge. One can also define research as a scientific and systematic search for pertinent information on specific topical Impact; research is an art of scientific investigation. Research is an academic activity and as such the term should be used in a technical sense. The research comprises defining and redefining problems, formulating hypothesis or suggested solutions, collecting organizing and evaluating data, making deductions and reaching conclusions; and at least carefully testing the conclusions to determine whether they fit the formulating hypothesis. Constant search and re-search are the guiding factors of research, which helps to discover new facts. The search for new knowledge also helps to accept, reject or modify existing fact or knowledge. It is a systematic effort to gain knowledge, truth or broad principles in a verifiable and objective way. The purpose of this paper is to examine the growing importance of research data and research data management (RDM) in the research lifecycle. The research data looked at how all stakeholders in the research, researchers, research funders, research organizations and senior decision makers – to explore what their roles and responsibilities are in this fast-changing environment. Research data management (RDM) is about "the organization of data, from its entry to the research cycle through to the dissemination and archiving of valuable results" (White and Teds, 2011). It consists of a number of different activities and processes associated with the data lifecycle, involving the design and creation of data, storage, security, preservation, retrieval, sharing, and reuse, all taking into account technical capabilities, ethical considerations, legal issues and governance frameworks. The use of powerful computing technology across disciplines now means that an increasing number of researchers generate and use large datasets as part of the research process.

AIMS AND OBJECTIVES OF RESEARCH

The aims of research and scientific steps can be briefly listed as follows:

- Explore and understand human behavior
- Explore, analyze and conceptualize social life
- To extend, correct or verify knowledge
- To find explanations for unexplained social phenomena
- To clarify the doubtful and correct the misconceived facts of social life
- Provide new insights into organized society and its social structures

Understanding Research Data Management:
Data?
At a broad level, data are items of recorded information considered collectively for reference or analysis.
Data can occur in a variety of formats that include, but are not limited to
Notebooks, survey responses, software and code, measurements from laboratory or field equipment (such as IR spectra or hygrothermograph charts), images (such as photographs, films, scans, or autoradiogram), audio recordings ,physical samples

Research data management :
Research data management (or RDM) is a term that describes the organization, storage, preservation, and sharing of data collected and used in a research project. It involves the everyday management of research data during the lifetime of a research project (for example, using consistent file naming conventions). It also involves decisions about how data will be preserved and shared after the project is completed (for example,

depositing the data in a repository for long-term archiving and access.

There are a host of reasons why research data management is important:

- Data (especially digital data) is fragile and easily lost.
- There are growing research data requirements imposed by funders and publishers.
- Research data management saves time and resources in the long run.
- Good management helps to prevent errors and increases the quality of your analyses.
- Well-managed and accessible data allows others to validate and replicate findings.
- Research data management facilitates sharing of research data and, when shared, data can lead to valuable discoveries by others outside of the original research team.

Data management planning : things to consider
An important first step in managing your research data is planning. To get you started thinking about data management planning; here are some issues you need to consider:

- Your institution's and funding agency's expectations and policies
- Whether you collect new data or reuse existing data
- The kind of data collected and its format
- The quantity of data collected
- Whether versions of the data need to be tracked
- Storage of active data and backup policy and implementation.

WRITING DATA MANAGEMENT PLAN

Data management plan requirements:
Under are increasingly requiring grant applicants to submit data management plans (DMPs) with their grant proposals, in an effort to promote data sharing and responsible stewardship of data by researchers. Funder requirements have been compiled on a number of web pages:

- Data Management Policies and Guidelines (University of Pittsburgh Health Sciences Library System)
- DMP Requirements (DMP Tool)
- Managing Your Data - Funding Agency Guidelines (University of Minnesota Libraries)

For the National Science Foundation, note that each directorate has its own data management plan guidelines.
If your research is funded by a contract rather than a grant, consult with the contracting agency and refer to the terms of your contract to determine whether a data management plan is required.

Simple data management plan:
Sample data management plans can be viewed at:

- Data Management Sample Plans (The Odum Institute, UNC Chapel Hill - Data Archive)
- Sample NSF Data Management Plans (University of Michigan Library)
- Sample Data Management Plan for Depositing Data with ICPSR (Inter-university Consortium for Social and Political Research: Data Management and Curation)
- Data Management Plans - Biology, Chemistry (New England Collaborative Data Management Curriculum, Lamar Soutter Library, University of Massachusetts Medical School
- Data Management Sample Plans and Guidance (University of Pittsburgh, Pymatuning Laboratory of Ecology (PLE)),Data Management Planning -- Sample NSF Plans (Data One)

FINDING DATA

Locating existing data:

- Identifying and locating sources of existing data can be important for a variety of reasons, including asking new questions or providing a new analysis of the data, comparing results from various studies, replicating and validating previous results, developing or testing computational models, and extending a study across time, geography, or other variables by incorporating data from multiple datasets.
- The resources listed below can help you find relevant datasets for use in your research. Many also serve as repositories if you are interested in a place to deposit and share your own research data.
- The listings focus mostly on publicly available open access data sources, rather than commercial databases. However, some resources may require

subscriptions or involve other costs, and some may require registration or acceptance of data use agreements.

Data Directories
These online directories maintain lists of data sources and repositories across a wide range of disciplines.

Supporting Information
Also sometimes known as "supplementary" information, these files are posted in the journal with their associated article when it is published. Files can contain data that support the content of the article but are too extensive to include in the article itself or are not essential for every reader. Files may be in document form and not necessarily machine-readable. Although supporting information is often freely accessible even without a subscription to the journal, the publisher may still retain copyright in the files.

Data Journals Or "Data Paper" Journals:
These newer style "data journals" primarily publish articles that describe publicly available datasets and link to those datasets. They may also publish articles on data-related topics, such as describing or reviewing certain analytical or statistical methods. However, traditional research articles that actually analyze the data and draw conclusions from that analysis are generally outside the scope of these journals.

Citing Data:
If you're reusing a dataset to inform your own work, you'll want to make sure that you are providing proper recognition. Datasets are scholarly products and should be cited as such. If you are using a dataset that was deposited in a disciplinary data repository, you may find that the repository has a recommended citation standard.

ICPSR provides useful guidance on data citations and suggests that a citation for a dataset should include the following basic elements:
Title, Author, Date, Version, Persistent, identifier

For general information about citing a dataset, see the following resources:
Data Cite, Cite Your Data, DCC, How to Cite Datasets and Link to Publications Guide, Michigan State University, How to Cite Data: General Info, Purdue University Libraries, Citing Data Guide
There are efforts among researchers, librarians, archivists, funders, publishers and others to develop and communicate a set of best practices around data citation. See: Data Citation Synthesis Group: Joint Declaration of Data Citation Principles.

Finding and reusing your data Finding and reusing your data will be easier, both for you and for other researchers, if you give a little thought early in the process to how you will name your data files and what file formats you will use to store your data. If you are planning to archive or share your data, you will also want to consider best practices for describing your data.

About metadata for data:
Metadata is often defined as "data about data," a characterization that fails to capture why it is important and what it does. Metadata is, in short, a means by which largely meaningless data may be transformed into information, interpretable and reusable by those other than the creator of the data resource."
Metadata is structured information about an object, like a dataset, and has value to both the original creator and other users. Complete metadata allows researchers to locate data they created and recall the circumstances and context under which they created and analyzed the data. It allows researchers outside of the original research team to:

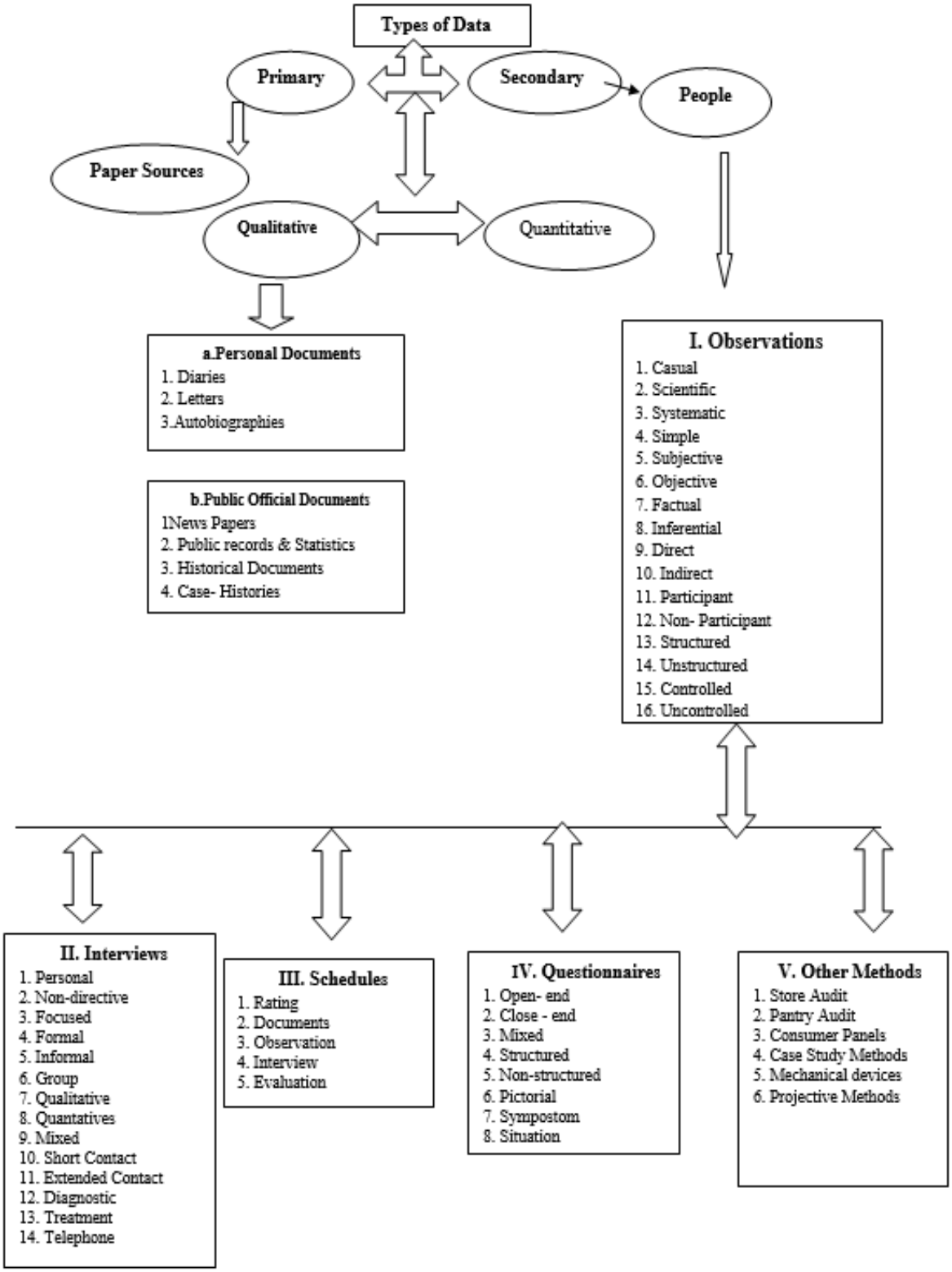
- Find the data
- Know who created the data or contributed to the creation of the data (i.e. a funder)
- Understand how the data was created and manipulated
- Know when the data was created
- Determine tools needed to view, manipulate, and use the data
- Understand rights and use conditions surrounding the data
- Connect to related information objects

DATA COLLECTION

The researcher must have some basic ideas as to the contexts in which data are to be collected, the types of

responses to be recorder and the possible settings for the collection of data, viz,

- Informal settings;
- Formal unstructured settings; and
- Formal structured settings.



CONCLUSION

Research has a growth dynamics of its own. It requires sizable long-term investments, without the expectations of immediate gains. Major contributions to research will not come from scholars working in isolation funds but from individual efforts in an intellectually challenging environment consisting of colleagues from applied disciplines.

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