RESEARCH TOOLS OR INSTRUMENTS

What will you use to actually collect the data…

a recording sheet,
a questionnaire,
a video or
audio tape?

What it is?

- *Anything that becomes a means of collecting information for the study*
  - *For example: observation forms, interview schedules, questionnaires, and interview guides*
- *Constructing the research tools is the first practical step in research process.*
  - *Need to decide "How the data will be collected?" Then will decide a research instrument for this.*
- The type of instrument used by the researcher depends on the data collection method selected.
  - "Instrument development requires a high degree of research expertise, as the instrument must be reliable and valid."

Research Software

- Research tool can also be identified as **Research Software**

- Research software enable researchers and modelers to construct theories and system models.

- Example of research software:

  - Qualitative Research: Top 15 software

    - To assist with qualitative research such as transcription analysis, coding and text interpretation, recursive abstraction, content analysis, discourse analysis and grounded theory methodology.

QDA Miner, ATLAS.ti, HyperRESEARCH, MAXQDA, NVivo, Qiqqa, XSight, Quirkos, Dedoose, webQDA, f4analyse, Annotations , Saturate, Raven's Eye, Focuss On.

Research Software

- Example of research software:
  - Quantitative Research:
    - To assist with quantitative research such as statistical and mathematical analysis and modeling.
    - An example of software:
      - SPSS
      - SAS
      - MATLAB
      - STATA
      - R

Research Tools: Reference Management Software

- Research tools is also used for reference management.
  - Called as Research Management Software or Citation Management Software or Personal Bibliographic Management Software
- These software packages normally consist:
  - database in which full bibliographic references can be entered
  - system for generating selective lists of articles in the different formats required by publishers and scholarly journals.

Cite

Copy and paste a formatted citation or use one of the links to import into a bibliography manager.

MLA   Boehm, Barry, Chris Abts, and Sunita Chulani. "Software development cost estimation approaches—A survey." *Annals of software engineering* 10.1-4 (2000): 177-205.

APA   Boehm, B., Abts, C., & Chulani, S. (2000). Software development cost estimation approaches—A survey. *Annals of software engineering*, *10*(1-4), 177-205.

Chicago   Boehm, Barry, Chris Abts, and Sunita Chulani. "Software development cost estimation approaches—A survey." *Annals of software engineering* 10, no. 1-4 (2000): 177-205.

Harvard   Boehm, B., Abts, C. and Chulani, S., 2000. Software development cost estimation approaches—A survey. *Annals of software engineering*, *10*(1-4), pp.177-205.

Vancouver   Boehm B, Abts C, Chulani S. Software development cost estimation approaches—A survey. Annals of software engineering. 2000 Nov 1;10(1-4):177-205.

Software	Developer	First public release	Latest stable release date	Latest stable version	Cost (USD)	Free software	License	Notes
Aigaion	Aigaion developers	2005-01	2013-05-08	2.2	Free	Yes	GNU GPL	web-based
Bebop	ALaRI Institute	2007-11-08	2009-11-10	1.1	Free	Yes	BSD	web-based BibTeX front-end
BibBase	Christian Fritz	2005	2013-07	v3	Free	No	Proprietary	centrally hosted website, intended for publication pages
BibDesk	BibDesk developers	2002-04	2015-11-30	1.6.5	Free	Yes	BSD	BibTeX front-end + repository
Biblioscape	CG Information	1997	2012-04-01	9.0.8.8	US$79-299[1]	No	Proprietary	ODBC; web access in Pro ed; optional client/server
BibSonomy	University of Kassel	2006-01	2016-03-09	3.5.0	Free	Yes	AGPL, GPL, LGPL[2]	centrally hosted website
Bibus	Bibus developers	2004-06-03	2009–10	1.5.0	Free	Yes	GNU GPL	
Bookends	Sonny Software	1988 (Mac) / 1983 (Apple II+)	2016-01-30	12.6.5 [3]	US$80[1]	No	Proprietary	integrated web search, pdf download, auto-completion
Citavi	Swiss Academic Software	2006-02-13	2016-05-03	5.3.1	US$70-949 / Free for projects up to 100 references[4]	No	Proprietary	data can be saved locally, or, for team access, in an intranet Microsoft SQL Server, or on Windows Azure;[5] search databases from interface[6]
CiteULike	Oversity Limited	2004-11	?		Free	No	proprietary[7]	centrally hosted website
colwiz	colwiz Ltd	2011	2014-05		Free / Online storage free up to 3 GB / Additional storage space available	No	Proprietary	Desktop (Win, Mac, Linux) & Web components, iOS and Android
Docear	Otto-von-Guericke University Magdeburg and University of California, Berkeley	2009-05-11	2015-12-02	1.2	Free	Yes	GNU GPL	Java BibTeX manager that integrates Mind mapping software
EndNote	Thomson Reuters	1988	2015-08-11	X7.4	US$299.95[1]	No	Proprietary	The web version EndNote basic (formerly, EndNote Web) is free of charge
F1000Workspace	F1000/Science Navigation Group	2015-05	Continually updated online		Institutional access – varies with size of institute / Personal subscription $9.99/month / Free Trial Version	No	Proprietary	Web-based, Microsoft Word plug-in (Win, Mac), Google Docs add-on, browser extension(s) Chrome, Firefox, Safari, Opera, Internet Explorer 11
JabRef	JabRef developers	2003-11-29	2016-08-26	3.6	Free	Yes	GNU GPL	Java BibTeX and BibLaTeX manager
KBibTeX	KBibTeX developers	2005-08	2015-08-09	0.6	Free	Yes	GNU GPL	BibTeX front-end, using the KDE Software Compilation
Mendeley	Elsevier	2008-08	2016	1.16.1	Free / Online storage free up to 2 GB / Additional storage space available	No	proprietary (OS API clients exist)	Account required, Desktop & Web components, Windows, Linux, OS X, iPhone & iPad, Android
Paperpile	Stefan Washietl, Gregorgy Jordan, Andreas Gruber	2013	Continually updated online		US$2.99/month for academics, 9.99/month otherwise	No	Proprietary	web-application, integrates with Google Docs, collaboration & sharing features, currently only on Google Chrome
Papers	Labtiva	2007	2014-10-13	3.2.3	US$79[1]	No	Proprietary	search repositories from interface; supports plug-ins, Universal iOS app
Pybliographer	pybliographer developers	1998-10-30 (0.2)	2014-11-30		Free	Yes	GNU GPL	Python/GTK2
Qiqqa	Qiqqa	2010-04	2014-08	v65	Free and Premium versions	No	Proprietary	Desktop; Tablet; Web; Intranet

ReadCube	Labtiva	2011-10	2014-05	v2.0.10805	Free desktop & mobile app / Cloud Storage $5/month, $55/year	No	Proprietary	Desktop (Mac/PC) & Web components, personalized recommendations, private group sharing, integrated web search, enhanced PDF reader, iOS App, Android
refbase	refbase developers	2003-06-03	2014-02-28	0.9.6	Free	Yes	GNU GPL	web-based for institutional repositories/self-archiving[8]
RefDB	refdb developers	2001-04-25	2007-11-05	0.9.9	Free	Yes	GNU GPL	network-transparent; XML/SGML bibliographies
RefME	RefME	2014	Continually updated online		Free	No	Proprietary	Web, iOS and Android; Chrome and Safari Extensions available
Reference Manager	Thomson Reuters	1984	2010	12.0.3	Not for sale anymore, sales ceased December 31, 2015	No	Proprietary	network version available; built-in web publishing tool; discontinued, support ends 2016-12-31
Referencer	Referencer developers	?	2014-02-27	1.2.2	Free	Yes	GNU GPL	BibTeX front-end
RefWorks	RefWorks / ProQuest	2001	2013		US$100 per year	No	Proprietary	web-based, browser-accessed, centrally hosted program
SciRef	Scientific Programs	2012	2012-11-20	1.0	US$38.90 / Free trial version	No	Proprietary	
Sente	Third Street Software, Inc.	2004	2015	6.7.9	US$60–80[1] / Free for libraries up to 100 refs	No	Proprietary	Desktop and iPad, centralized backup/synching
Wikindx	Mark Grimshaw	2004-02	2013-08	4.2.2	Free	Yes	GNU GPL	web-based
WizFolio	WizPatent	2008-06	2011-01	Avatara	US$25 / Free Basic version	No	Proprietary	centrally hosted website
Zotero	Roy Rosenzweig Center for History and New Media at GMU	2006-10-05	2016-03-17	4.0.29.6 [9]	Free / Online storage free up to 300 MB / Additional storage space available	Yes	AGPL	Firefox extension or stand-alone with connectors for Chrome and Safari. Web-based access to reference library also available.

https://en.wikipedia.org/wiki/Comparison_of_reference_management_software

Research Instrument

- Before collecting the data, the researcher needs to design the research instrument (the tools they will use to collect the data).

  1. Interview or focus group
     - need to design an **interview** schedule or topic guide.

  2. Survey
     - need to design a questionnaire either or both online survey or paper survey
     - Need to identify the schedule

  3. Photograph, Drawing or Video
     - need to specify the activity for research participants.
     - For example: the group might want primary school children to take up to five photographs showing the things they like most about school, or to draw a picture of how they feel when they a) come to school, b) are on lunchbreak, and c) are doing their homework.

  4. Computer simulation/modelling/prototype
     - Need to design the simulation/model
     - Identify the scenario/test to collect the data

TIMING

When Will Data be Collected?

- Before and after the program
- At one time
- At various times during the course of the program
- Continuously through the program
- Over time - longitudinally

Research Instrument will be discussed further following the scientific methodology:

Quantitative methodology

Qualitative methodology

Mix Method methodology

THANK YOU