

Paradigm shift in Information Gathering and Research Methodology with Digitalization

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ABSTRACT: *The scope of this paper is to discuss about digitalization of research methodologies of library sciences and other humanities related Studies and their availability. In library science, information seeking behavior of the user is the key aspect to improve the library facilities & accessibility. Majority of research related to library science is being done on understanding and analyzing information seeking behavior of variety of resources by different kinds of users. Digitalizing methods of research will help to enhance the accuracy of analysis, to reduce time to gather information & to reach targeted audience easily. Availability/Suitability of various digital methods/tools for the research methods available for gathering information seeking behavior and analysis has been depicted. Critical analysis of these methods and their Pros & cons in various scenarios/according to research method were discussed.*

Key Words: *Information, information gathering, digitization, research methods.*

1. Introduction:

Information seeking behavior changing vastly from the beginning of 20th century. Various new fields are emerging, and changes in other fields rapidly impacting User behavior. Availability of various resources for seeking information also grown exponential. To cater the changing needs of user, Librarians/Information Scientists have to continuously struggle to gather, monitor, analyze and understand user information seeking behavior. In this scenario digitization of research methodologies used to do research on these aspects of information seeking behavior will help to cope up with the trends in timely manner.

Collection of information is the key step for any analysis. Majority of the research on behavior analysis follow the methodologies of Questionnaire or Observation or Interview or documentary techniques etc. Usually to collect data researchers meet targeted set of people physically. The main constraint of this method is that meeting people personally will always be limited by time, place and their personal availability. Gathering historical information from the same user is also a tedious task especially when the research targeted for a specific groups like University/College/Community specific etc. The conversion of manual data into information and gathering insights will be cumbersome, more prone to errors and always has a possibility of misinterpretation information/data.

Digitalization of data gathering according to research methods will help to avoid these problems as the researcher can get information from multiple targeted users at their convenient timing & place. As gathered data will be in digital form even descriptive information can be analyzed to understand more about the user needs.

2. Research Methods

Research is an endeavor to discover, develop and verify knowledge. The Webster's Third New International Dictionary defines research as "care-ful or critical inquiry or examination in seeking facts or principles; a diligent investigation to ascertain something". The following research methods are commonly used in Library and Information Science.

2.1 Historical method: Historical research or historiography, "attempts to systematically recapture the complex nuances, the people, meanings, events, and even ideas of the past that have influenced and shaped the present". (Berg & Lure, 2012, p. 305). History of library science is the continuous methodical recounting of past events pertaining to the establishment, maintenance and utilization of systematically arranged collection of recorded information. The historical method employs the systematic study of historical facts to explain human political and social behavior. This method uses comparison to recapture details, personalities, and ideas.

2.2 Descriptive / Survey Method: Survey research has been widely used in social and behavioral Sciences. It deals mainly with collection, analysis and presentation of data relating the present time, reflecting the present state of affairs in social, economic and political activities. The library survey may be defined as a systematic collection of data concerning a library, its activities, operations, personnel working in the library and its users. The purpose of library survey is to make a specialized type of investigation to improve library services. Library surveys are conducted either to assess an existing situation or to check library system or to evaluate the area of librarianship in order to remove shortcomings or inadequacies and to plan further.

2.3 Case study method: Case study is a technique in which an individual or group, institution or phenomenon is recognized as a unit of study and various aspects of the unit are studied deeply. Unit of study may be an individual, a family, an institution, a culture group or an entire community.

2.4 Delphi Method: The Delphi process is an iterative process where data from one wave informs data from the next. The participants in a Delphi study do not get to see the responses from the other participants until later in the process (or not at all) so that the voice of influential or powerful participants does not influence the thinking or views of another. Responses are never linked to people by name when they are fed back to participants in later stages of the study.

3. Conventional Methods and Their Major observations on conducting research:

Majority of the researchers follow manual methods to conduct research. Based on the research methodology chosen researchers need to meet participants to do the data collection. For example if researchers chose Survey Method questionnaires needs to be distributed to targeted audience. If it is Delphi Method multiple users need to be interviewed etc., yet in many cases, a realistic, well-founded consensus must be reached despite initial disagreement between the people taking part in the discussion. If you have ever received two diverging expert opinions on an issue, one can find it very difficult, as a proletarian to finalize objectively which expert's opinion is closer to reality.

Traditional approaches to resolve the conflicts and come up with an amicable solutions they offer very indifferent possibilities for dealing with these situations, each with its pros and cons:

- **Face-to-face meeting:** F2F is the primary form of research and most versatile. One of the fastest means and specific to issue based concerns rightly elevated. The fastest way to compare opinions is to call the experts together. Each expert then expresses his or her point of view in front of the others. Largely constraints remains the choosing the right personalities. Those with stronger personalities or vociferous voices may superimpose their point beyond facts. Subjective factors, like personal appearance or way of speaking, can also skew appreciations.
- **Phone:** Conference calls are similar in terms of pros and cons to face-to-face meetings. Gathering opinions individually by phone allows an interviewer to probe during a conversation to clarify or add to information, without interference from others. An expert may however be wary about releasing such information, especially if he or she does not know which other experts are involved and what their opinions are. Rushed or multi-tasking experts may not always give phone conversations their undivided attention, either.
- **Mail or email:** Inviting people to express their opinions via mail or email is often cost-efficient, i.e. it costs relatively little per response received. On the other hand, response rates may be low, and experts cannot be probed easily. The major problem comes during analysis of the collected data which can also be constrained by the hypothesis/data interested by the researcher & time. Multifaceted analysis cannot be done easily. To summarize the conventional survey methods above, the main obstacles to overcome are the unjustified weight given to some opinions in real-time, collective survey situations, and the difficulty of probing, clarifying or converging opinions in the other cases.

4. Tools for Digitization

Irrespective of research methodology data collection/information gathering and analysis of collected data are the two crucial and common steps. In the current digital world there are many tools available to support data collection and data analysis without much prior knowledge about computers. Tools are available specific to research method as well generic tools for data collection and analysis.

Research Methods	Traditional/Manual methodology	Digital /Online Tools	Advantages
Delphi Method	<ol style="list-style-type: none"> 1. The manual Delphi method is a costly affair. With respect to funds and time in between consensus. 2. Constraints of time and commitment of participants 3. Drop-outs, response rates 	<ol style="list-style-type: none"> 1. Delphi Decision Aid 2. Real Time Delphi by calibrum. 3. Online Delphi – Mesydel 	<ol style="list-style-type: none"> 1. Survey answers and comments are fed back to participants immediately, without waiting for cycles involving the whole panel to complete. 2. Technology driven solutions that can be scalable and location independent.
Survey/Case Study	<ol style="list-style-type: none"> 1. Tedious manual data entry of data or corresponding scanned documents of paper questionnaires 2. Costs of the project is very high 3. Size of Samples: Broad limitation of size of Interviewers and participants considering size vis-a vis of the quality. Maintenance of infrastructure for repetitive queries with the participants till the conclusions to be costly. 4. Human errors in data correlation and approximation. 	<ol style="list-style-type: none"> 1. Survey Monkey 2. Typeform 3. Google Forms 4. Client Heartbeat 5. Zoho Survey 6. Survey Gizmo 7. Survey Planet etc., 	<ol style="list-style-type: none"> 1. Information Gathering become more covenant with the help of using these online tools. 2. On can expect bigger sample size and quick responses. 3. Cost effective: survey can be conducted only for targeted audiences and can reduce the costs involved. 4. Data Handling: Automatic storage of data with the help of data bases and smaller possibility of data errors. 5. Increase in Response Rates: Online survey provides the highest level of convenience for the respondents because they can answer the questionnaire according to their own pace, chosen time, and preferences. 6. Flexibility: Surveys of complex nature can be easily catered through these online mechanism and can arrange the pattern of question and answers in both progressive and regressive modes that can contest by targeted audience.
Historical Method	<ol style="list-style-type: none"> 1. Information collected from different sources is difficult to Correlate 2. data sanitization(80% of research time utilization) 3. Manual Presentation of fact to readable form involving problems of organization, composition, exposition and interpretation 	<ol style="list-style-type: none"> 1. Research tools and methods to web archiving 2. Use of databases or data warehouse 3. GIS web 2.0 tools 	<ol style="list-style-type: none"> 1. Process large amounts of data and effective sanitization of data that reduces the research time significantly. 2. This textual focus of the digital tools and methods is enabling new ways of exploring old sources, and the formulation of different questions, difficult to think of and/or resolve in an efficient way in a recent past

5. Conclusion

Digitalization of research methods will speed up the research process by automating the data gathering and increases the reachability to targeted user groups. Digitally gathered data can be easily used

to do multifaceted analysis and rather than predetermined hypothesis researcher can observe multiple combinations to identify trends/patterns in user information seeking behavior.

Researcher can change the questionnaire on real time basis based on observed trends to get better insights. Researcher can spend more time in analysis rather than gathering data physically from targeted users, which intern can enhance the research quality.

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