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NVivo

In: Encyclopedia of Research Design

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Book Title: Encyclopedia of Research Design
Chapter Title: "NVivo"
Pub. Date: 2012
Access Date: May 20, 2020
Publishing Company: SAGE Publications, Inc.
City: Thousand Oaks
Print ISBN: 9781412961271
Online ISBN: 9781412961288
DOI: https://dx.doi.org/10.4135/9781412961288
Print pages: 945-948

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NVivo provides software tools to assist a researcher from the time of conceptualization of a project through to its completion. Although NVivo is software that is designed primarily for researchers undertaking analysis of qualitative (text and multimedia) data, its usefulness extends to researchers engaged in any kind of research. The tools provided by NVivo assist in the following:

- Tracking and management of data sources and information about these sources
- Tracking and linking ideas associated with or derived from data sources
- Searching for terms or concepts
- Indexing or coding text or multimedia information for easy retrieval
- Organizing codes to provide a conceptual framework for a study
- Querying relationships between concepts, themes, or categories
- Building and drawing visual models with links to data

Particular and unique strengths of NVivo lie in its ability to facilitate work involving complex data sources in a variety of formats, in the range of the query tools it offers, and in its ability to link quantitative with qualitative data.

The consideration of NVivo is relevant to the practical task of research design in two senses: Its tools are useful when designing or preparing for a research project, and if it is to be used also for the analysis of qualitative or mixed methods data, then consideration needs to be given to designing and planning for its use.

Designing with NVivo

NVivo can assist in the research design process in (at least) three ways, regardless of the methodological approach to be adopted in the research: keeping a research journal, working with literature, and building conceptual models.

Keeping a Journal

Keeping a record of decisions made when planning and conducting a research project, tracking events occurring during the project (foreseen and unforeseen), or even recording random thoughts about the project, will assist an investigator to prepare an accurate record of the methods adopted for the project and the rationale for those methods. Journaling serves also to simulate thinking, to prevent loss of ideas that might be worthy of follow-up, and to provide an audit trail of development in thinking toward final conclusions.

NVivo can work with text that has been recorded using Microsoft Word, or a journal can be recorded progressively within NVivo. Some researchers keep all their notes in a single document, whereas others prefer to make several documents perhaps to separate methodological from substantive issues. The critical contribution that NVivo can make here is to assist the researcher in keeping track of their ideas through

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coding the content of the journal. A coding system in NVivo works rather like an index but with a bonus. The text in the document is highlighted and tagged with a code (a label that the researcher devises). Codes might be theoretically based and designed a priori, or they can be created or modified (renamed, rearranged, split, combined, or content recoded) in an emergent way as the project proceeds. The bonus of using codes in NVivo is that all materials that have been coded in a particular way can be retrieved together, and if needed for clarification, any coded segment can be shown within its original context. A research journal is a notoriously messy document, comprising random thoughts, notes of conversations, ideas from reading, and perhaps even carefully considered strategies that entered in no particular sequence. By coding their journal, researchers can find instantly any thoughts or information they have on any particular aspect of their project, regardless of how messy the original document was. This different view of what has been written not only brings order out of chaos and retrieves long-forgotten thoughts but also prompts deeper thinking and perhaps reconceptualization of that topic after visualizing all the material on one topic together.

Working with Literature

NVivo's coding system can be used also to index, retrieve, and synthesize what is learned from reading across the substantive, theoretical, or methodological literature during the design phase of a project. In the same way that a journal can be coded, either notes derived from reading or the text of published articles can be coded for retrieval and reconsideration according to either an a priori or emergent system (or a combination thereof). Thus, the researcher can locate and bring together all their material from any of their references on, for example, the concept of equity, debates about the use of R2, or the role of antioxidants in preventing cancer. With appropriate setting up, the author/s and year of publication for any segment of coded text can be retrieved alongside the text, which facilitates the preparation of a written review of the literature. The database created in NVivo becomes available for this and many more projects, and it serves as an ongoing database for designing, conducting, and writing up future projects.

A preliminary review of the literature can be extended into a more thorough analysis by drawing on NVivo's tools for recording and using information about sources (referred to as attributes) in comparative analyses or by examining the relationship between, say, perspectives on one topic and what is said about another. Recorded information about each reference could be used, for example, to review changes over time in perspectives on a particular concept or perhaps to compare the key concerns of North American versus European writers. The associations between codes, or between attributes and codes, could be used to review the relationship between an author's theoretical perspective and his or her understanding of the likely impact of a planned intervention.

Searching text in NVivo provides a useful supplement to coding. One could search the reports of a group of related studies, for example, for the alternative words “extraneous OR incidental OR unintended” to find anything written about the potential impact of extraneous variables on the kind of experiment being planned.

Building Conceptual Models

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Researchers often find it useful at the start of a project to “map” their ideas about their experimental design or about what they are expecting to find from their data gathering. Doing so can help to identify all the factors that will possibly impinge on the research process and to clarify the pathways by which different elements will impact on the process and its outcomes. As a conceptual or process model is drawn, fresh awareness of sampling or validity issues might be prompted and solutions sought. NVivo provides a modeling tool in which items and their links can be shown. A variety of shapes can be used in designing the model. Project items such as codes, cases, or attributes can be added to the model, and where coding is present, these codes provide a direct link back to the data they represent. Labels can be added to links (which might be associative, unidirectional, or bidirectional), and styles (e.g., color, fill, and font) can be used to emphasize the significance of different items or links. The items can be grouped so that they can be turned on or off in the display. The models can be archived, allowing the researcher to continue to modify their model as their understanding grows while keeping a historical record of their developing ideas.

Designing for Analysis with NVivo

Where the intention is to use NVivo for analysis of qualitative or mixed-methods data, there are several points to be aware of at the design stage of the project and again when preparing data to facilitate the effective (and efficient) use of NVivo's coding and query tools.

NVivo's data management system is based on the notion of the “case,” with the case being best thought of as the unit of analysis for the current study. Most often, this is an individual; alternatively, the case might be a workgroup, a document, a site, or a message. The information gathered for a case might come from a single document, such as an interview or response to a survey. It might be across several documents, such as repeat interviews in a longitudinal study, or when data about the case come through multiple sources or methods; the information might come from several parts of a document, such as for a member of a focus group. All the information for a case is held together, along with attribute data relating to that case, in a node (NVivo's name for the “buckets” that hold coding)—one for each case. Additionally, sources (and nodes) can be organized in sets. Thus, for example, in a study of children with attention-deficit/hyperactivity disorder (ADHD), one might interview the children, their parents, their teachers and their doctors, observe the families in interaction, and record a number of demographic and scaled measures about each child. All the information relating to each child would be referenced in a case node for that child, allowing for within-case and cross-case analysis, but as well, one could create a set of child interviews, a set of teacher interviews, and so on. Once the content of the various data sources has also been coded for concepts and themes, the flexibility of this data management system allows for a wide range of analysis strategies.

As well as recording notes, verbatim text, or multimedia data, the astute researcher will plan for recording demographic and other categorical or scaled information when designing data collection. This information will be entered into NVivo as attributes of cases and used for comparative analyses—a valuable tool not only for comparing patterns of differences across subgroups but also for revealing subtleties within the text. Attribute

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data can be entered interactively within the software, or it can be entered in a spreadsheet or database as case-by-variable data and imported using a text file format.

Data Preparation

Most often, data imported into NVivo are documents prepared in Word, although it is also possible to import and code video, audio and image data, and .pdf documents. There is no spell-check function in NVivo, so careful editing of the file before import is recommended (this is especially so if someone other than the interviewer has done the transcription).

Where each file to be imported represents unstructured or semistructured material for a single case, detailed preparation for importing is not necessary. Where, however, Word files each contain information for several cases, such as from a focus group or a series of internet messages, or if the individual's responses are to a series of structured questions (such as from a survey), there is much to be gained by a careful preparation of the file. Specifically, the application of styled headings which identify each case (i.e., who was speaking or whose response this was) or each question will allow for the use of an automatic coding tool to assign passages of text to individual cases, to code responses for the questions being answered, or both.

Video and audio data can be imported and coded without transcription. Alternatively, the transcription can be imported along with the multimedia file, or it can be transcribed within NVivo.

Designing for Integration of Qualitative and Quantitative Data and Analyses

If the intention is to link quantitative and qualitative data for each case, it is critical to have a common identifier for both sources of data, so that it can be matched within NVivo. Quantitative data are most commonly used as a basis for subgroup comparisons of open responses, or these data can be used to define subsets of the data as the basis for specific or repeated analyses.

To go beyond simply retrieving coded text, NVivo's query function facilitates asking relational questions of the data. These include comparative and pattern analyses that are typically presented in matrix format (a qualitative cross-tabulation with both numbers and text available); questions about associations between, say, conditions and actions; questions to explore negative cases; and questions that arise as a consequence of asking other questions (so that results from one question are fed into another). Queries can be saved so that they can be run again, with more data or with a different subset of data. Relevant text is retrieved for review and drawing inferences; patterns of coding reflected in numbers of sources, cases, or words are available in numeric form or as charts. All coding information, including results from queries, can be exported in numeric form for subsequent statistical analysis if appropriate—but always with the supporting text readily available in the NVivo database to give substance to the numbers.

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http://dx.doi.org/10.4135/9781412961288.n282

See also

- Demographics
- Focus Group
- Interviewing
- Literature Review
- Mixed Methods Design
- Mixed Model Design
- Observations
- Planning Research
- Qualitative Research

Further Readings

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