

**Qualifying Examination
Part III
Questions from Dr. L. Browning**

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16 January 2004
Revised

Approved by the Examining Committee
February 27, 2004
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Question 1

Please write out a listing of the things that are important principles for qualitative research. Do this by simply listing 10 commandments of qualitative research and offer as many sentences of justification and explanation as possible given the time constraints.

Response 1

These “Ten Commandments” are the important principles that, in my opinion, should be included in a research program using qualitative methods as a guiding philosophy and observation or interview as a specific method. Although some of the basic principles reflected in these commandments may apply to other forms of qualitative research—e.g. “analytic induction, content analysis, semiotics, hermeneutics, elite interviewing, the study of life histories, and certain archival, computer, and statistical manipulations” (Kirk & Miller, 1986, p. 10)—observation and interview are their primary focus. But while recognizing that focus, I have written them with the interview methodology at the top of my mind since that is the principle tool I plan to expect to use in my research. These commandments are not exhaustive, but are the result of my limited field experience, University of Texas class discussion, and class readings¹. The commandments are listed by general programmatic chronology rather than by importance. Although their specific importance for individual research programs may vary, ignoring even the least important has the potential of causing major distress to the researcher and the program. The following pages describe the ten commandments listed below.

¹ The class discussions are documented in my 55 pages of notes from the University of Texas at Austin Qualitative Research Methods course of Dr. Larry Browning, CMS 386N.2, spring 2003; the readings are from the same course plus additional reading on qualitative research since that course.

- I. Decide if a qualitative method is appropriate for the research.
- II. Seek originality first, procedures second.
- III. Plan and submit IRB and other paperwork early.
- IV. Do not forget logistics.
- V. Gather data from the participant's view.
- VI. Transcribe field notes and recordings as soon as practical.
- VII. Preserve data and context through systematic methods and accounting.
- VIII. Let your data determine your analysis.
- IX. Use consistent terminology.
- X. Make maximum use of data.

I - Decide if a Qualitative Method is Appropriate for the Research

Before beginning research, one must select the best methodology for the research (Class Notes, Jan. 14, 2003, p. 13). The researcher should make this decision based on the goal of the research. If the nature is such that there are specific hypotheses that a researcher needed to measure “the degree to which some feature is present,” (Kirk & Miller, 1986, p. 9), then most likely a qualitative method is not appropriate. If, on the other hand, the researcher wants to learn about a phenomenon—to improve understanding of it “by encountering it first hand and making sense out of it” (Agar, 1986, p. 12), then a qualitative method may be the best choice.

A related consideration is that of differences. If the goal of the research is to find the statistical similarity between members of a population, then the quantitative approach of random samples and structured surveys or interviews would likely be most appropriate. On the other hand, if the goal is to find out about the differences or breakdowns that appear between members of a community, then a qualitative approach of observation or unstructured interviews may be best (Agar, 1986, p. 20).

Another factor of practical consideration is access to data. This should be considered before the concepts to be evaluated (Class Notes, Jan. 14, 2003, p. 13). If concepts were determined first, considerable planning effort could be wasted if it were later determined that the data from specific participants needed for concept evaluation were not available within the specific time frame allowed for the research. If participants were not available within the time frame available to the researcher, or if there was insufficient time to conduct interviews or observations, other methods of gathering data might be better. For example, if a large sample was available for a structured survey and a smaller selection of participants for an interview or observation was not, quantitative methods might be more appropriate than qualitative.

II - Seek Originality First, Procedures Second

One of the main purposes of qualitative research is to find something new. As discussed in the first commandment, quantitative research is an excellent method for validating a concept or hypotheses through experimentation. It is not very good for discovering new concepts. “For any observation (or measurement) to yield discovery, it must generate data that are (a) not already known and (b) identifiable as ‘new’ by the theory already in place” (Kirk & Miller, 1986, p. 17). By its very nature, most quantitative research “is aimed at preventing discovery” (p. 17). Often the rigorous procedures screen out data that would help us see new concepts.

Thus, qualitative researchers should first seek originality and then develop their procedures (Class Notes, Jan. 14, 2003, p. 13). By concentrating on the most important aspect of the research, we are less likely to develop counterproductive procedures. We should design procedures so that we highlight data that might change our understanding of the topic; that might

show something not found in our literature search; and that might change the concepts of our discipline or field (p. 13).

To build our data set, we should select participants that would yield diverse data. When we perform analysis, we should look for variation and differences in data rather than conformity (Class Notes, Jan. 16, 2003, p. 14). We should compare these differences to existing concepts and theory to adjust theoretical boundaries and perhaps even invalidate exiting concepts.

When we develop our methodology, we automatically establish a methodological framework within which we conduct our research. We need to establish procedures that allow our results to violate our framework (Class Notes, Jan. 30, 2003, p. 27). For example, we should guard against letting the common chronological arrangement of data analysis restrict our ability to see patterns that are not chronological (Class Notes, Jan. 30, 2003, p. 29).

III - Plan and Submit IRB and Other Paperwork Early

Many researchers, myself included, have found that delays exceed their expectations. In the research methods class previously mentioned, I began the observations the between the first and second day of class, submitted the Internal Review Board (IRB) requests within the first couple of weeks of class, and began interviews the day after approval was received.

Nevertheless, to complete the research project within the three months timeframe of the course, I had to reduce the number of interviews planned by more than 60 percent and work on the final report until the evening before it was due. Any delay in planning or paperwork submission would have resulted in requests for extension or possible project failure. This experience validates the commandment to plan and submit IRB and other paperwork early, (Class Notes, May 1, 2003, pp. 52, 55).

Completing local paperwork is not the only process that researchers need to start early. In some research, accesses to private or public employees and facilities requires letters of approval,² equipment such as video cameras, recording tape, transcribing machines, and batteries need to be purchased, rented, or reserved. Without advanced consideration, equipment might not be available and data gathering might be delayed.

Careful planning should not become an end in itself, however. The researcher should always keep in mind that the goal of the research can only be accomplished if the plan is effectively executed—data is gathered, data is analyzed, and results are published. Wherever possible, researchers should try to execute their plans ahead of schedule to allow for the inevitable unexpected delay near the end of the project.

IV - Do Not Forget Logistics

Logistics encompasses all those physical things that should be accomplished during research, in order for it to be successful. Logistics includes scheduling a meeting room for interviews, having copies of the Informed Consent form available for signature, and obtaining equipment needed to record observations of interviews. Logistics problems can cause the failure of part or all of a program (Class Notes, Jan 30, 2003, p. 27).

When considering logistics, researchers should always plan for the worst (Class Notes, May 1, 2003, pp. 53, 55). An example of specific problems that might cause failure of part of data gathering effort is that of interviews I conducted last spring. I had set up two tape recorders for the interviews and had back up batteries in case power failure. In one interview, a tape was defective and would not rewind properly. In another case, a recorder stopped in the middle of the

² Schwartzman reported a delay of six months to gain access for one of her studies (1993, p. 50).

interview without indication to the researcher. In each of these cases, I would have lost part of the interview there were not two recorders.

Another aspect of logistics is time management—the need for the interviewer to be on time (Class Notes, Jan 30, 2003, p. 27). Some respondents, particularly those who might be looking for a reason not to interview, would not wait for a researcher. The interview in this case most likely would be lost.³ Respondents should not be scheduled so closely together so that interviews become rushed.

One additional aspect of the logistics process is getting accurate data from observations or interviews. Video and audio recording are important for this (Class Notes, Jan 30, 2003, p. 27). I am convinced that without a recorder it would be nearly impossible for someone to conduct a 45-minute interview and document the results accurately while thinking of appropriate follow-up questions.

V – Gather data from the Participant’s View

A key element in qualitative research is “Watching people in their own territory and interacting with them in their own language on their own terms” (Kirk & Miller, 1986, p. 9). “Qualitative methods are most useful and powerful when they are used to discover how the respondent sees the world”(McCracken, 1988, p. 21). J. Spradley wrote, “The first task of an organizational ethnographer is to try to understand what cultural knowledge, behavior and artifacts participants share and use to interpret their experiences” (as cited in Schwartzman, 1993, p. 52). Hunt wrote, “Field work involves a process of learning or secondary socialization is

³ The importance of the above was driven home to me during some interviews in the spring of 2003. I was returning from a class five minutes before a scheduled interview in my office. I met the respondent at the elevator. She had been to my office already and assumed since I was not there that I had changed my mind and the interview was not required. She kindly agreed to return to my office for the interview.

which researchers become sufficiently acquainted with the world of subjects to understand their modes of discourse, communicate in their language, and demonstrate culturally appropriate behaviors” (Hunt, 1989, p. 13). From these and class discussions, it is clearly important that qualitative researchers gather data from the participant’s view (Class Notes, Jan. 16, 2003, p. 14.)

To accomplish this, interviewers should use open-ended questions and follow up with specifics, (Class Notes, Jan 30, Feb 13, pp. 27, 31, 32). In my experience, most respondents to well designed general questions will provide responses that cover the area of the researcher’s interest, particularly if the interviewer gives respondents permission not to be rational, (Class Notes, Jan. 30, 2003, p. 27). However, in some instances, where responses wander away from the topic, follow up questions are necessary to help the respondent focus on the original question. The interviewer should use caution that the questions are not so specific that the respondent perceives that the interviewer wants a specific answer. In such a case, respondents may provide the expected answer to please the interviewer even though they do not believe in it. The easiest way to avoid this is to seek stories in interviews and observations that may later be used in the research report, (Class Notes, Jan 16, Feb 13, pp. 14, 32). In my own experience, the questions are best left very general to allow the respondent to describe what they think is important. In this way new ideas may be discovered that would be lost in a more structured interview.

VI - Transcribe Field Notes and Recordings as Soon as Practical

Dr. Larry D. Browning’s, Guidelines for Observational Research, stated that a researcher should “never sleep on field notes before writing them up”(Class Notes, Jan 30, p. 27). It is quite clear that a researcher will lose data by delaying the transcription of field notes. But to test this idea, I transcribed field notes, created from an hour of observation of passengers in a bus, in two

sections—half of the notes nine hours after the observation and the other half two days after the observation. The first transcription was clearly richer than the second. Although both transcriptions included detail and interpersonal relationships not in the field notes, there was a higher level of detail in the first transcription than the second.

Audiotapes capture the redundant and superficial words normal with common speech. For most studies, these words degrade the clarity of transcript and should not be included. I found it best to edit out these words while transcribing. However, as with the transcription of field notes, I found my ability to edit accurately and capture nuances and visual cues in the transcription degraded over time, although the time delay was not as critical as when transcribing field notes. Early transcription, within three days was successful, whereas, details suffered a week after the interview. In addition, intervening interviews reduced my ability to remember nuances and visual cues during transcription.⁴

Such loss of data may not be important for some interviews. It has been suggested that the presence of a tape recorder might hinder some respondent responses. I have not found that to be the case; but I can see how in some situations it might be. If the intent of the interview is to gather background information—such as to experience the context in which a historical figure lived—it may be sufficient to take notes during or immediately after informal interviews.

My conclusion is: field notes from observation should normally be transcribed the same day as the observation; audio tapes from interviews should be transcribed within three days and earlier if there are intervening interviews.

⁴ Transcribing services automatically produce degraded results, since the transcriber has none of the benefit of visual cues from the interview. However, prompt return of transcriptions would allow the interviewer to insert corrections to improve the transcription accuracy. Unfortunately, in some research efforts there is insufficient time for any review and analysts must use the transcripts as they are.

VII - Preserve Data and Context through Systematic Management and Accounting

Data from qualitative research consists of: video tapes, audio tapes, information in other media, and field notes of interviews, observations, and other data gathered from contacts with people; transcribed or computerized results; tables, charts, computer printouts, and databases resulting from analysis; and revisions of the above data. It covers the conversion of data to information. Data management processes, in the context of the information life cycle, are: accounting, origination, collection, organization, storage, retrieval, analysis, interpretation, transmission, transformation, and use of data and its products (Borko, 1968, p. 3).⁵ Accounting is the specific process that tracks the data through the other process that convert it to information. Through accounting, we can determine what happened to a piece of data and what specific data forms the basis for a research conclusion.

Weller and Romney shared many other scholars' sentiments when they wrote,

The social and behavioral sciences, like all sciences, depend on experimental and observational data as the "raw material" for increased understanding. Such understanding, the ultimate goal of all sciences, requires the careful analysis of observations to assess their relationship to currently accepted knowledge. Major advances in our understanding usually require systemic observation, classification, interpretation, and study over a period of time (Weller & Romney, 1988, p. 7).

Although the Weller and Romney focused on data from structural interviews and observations, their concepts have broader applicability. Data management processes should provide a clear chain of "ownership" from the results of the research back to the individuals from which the results came. We must preserve data and context through systematic methods and accounting throughout the research (Class Notes, Jan. 16, Feb. 6, 2003, pp. 14, 29). In some cases, this management can be done through the use of spreadsheets and databases. In larger research efforts, databases often provide the help to manage and track research data.

⁵ Borko used most of these processes in the definition of information science but they seem to apply equally well to data management.

VIII - Let Your Data Determine Your Analysis

As I sit in my office up to my eyeballs in data I am once again impressed with the enormity of the problem of analyzing qualitative data. I have audiotapes, floppy disks, and written documents. I have my field notes and some of my student's field notes. I have copies of reports and minutes of meetings. I have between 10,000 and 20,000 pieces or electronic mail messages. (Feldman, 1995, p. 1)

Thus began Martha Feldman's monograph on interpreting qualitative data. In this book, Feldman discussed interpretation from four theoretical approaches: ethnomethodology, semiotics, dramaturgy, and deconstruction. She then let her data itself dictate the specific analysis within the framework of each of these approaches. The benefit of the combination of approaches was beneficial. "When all four perspectives are combined, the aspects are interrelated in a way that makes the result a rich and textured interpretation of the context" (1995, p. 3).

Not only was I, as a result, able to develop new interpretations concerning the relations of phenomena within [semiotic analysis] columns, but I also am able to use this new understanding for future interpretations. That is, when I listen to a taped discussion or read my field notes, I have a new stock of knowledge about what people might be saying (1995, p. 39).

"The exact manner in which the investigator will travel the path from data to observation, conclusions, and scholarly assertions cannot and should not be fully specified" (McCracken, 1988, p. 41). In my experience, categorizing interview responses works best if done during the transcription process. The transcriber adds new categories without the concern of bias from a preconceived set. At the end of transcription of all interviews, the researcher as analyst may then group similar categories reviewing the transcriptions for validation. The analyst may also regroup them in a different structure to see if the results are different. At the end of this process, the analyst compares the categories with those of previous research and looks for differences. Then the analyst compares the differences with the transcripts to validate the results.

In Middle Range Theory—data informs the theory and theory informs the data (Class Notes, Mar. 6, May 1, 2003, pp. 33, 53, 55). This is the next step beyond analysis; but it cannot be taken until the data determines the analysis and the analysis informs the data.

IX - Use consistent Terminology

In order to communicate, researchers must use words to represent the concepts and results of their studies. For effective communication, the researcher and readers must understand these words in the same way—researchers and readers must have common definitions for the terms used in the research report. Carl Hempel wrote,

Definitions are used for one or the other of two quite different purposes, namely: (a) to state or describe the accepted meaning, or meanings, of a term already in use; (b) to assign, by stipulation, a special meaning to a given term. (Hempel, 1966, p. 85).

Hempel called definitions, for the first purpose, *descriptive* or *analytical* definitions. They “purport to analyze the accepted meaning of a term and to describe it with the help of other terms—whose meaning must be antecedently understood if the definition is to serve its purpose” (p. 86). Definitions of the second type are *stipulative* definitions. They “serve to introduce an expression that is to be used in some specific sense in the context or a discussion” (p. 86). Earl Babbie added that it is a definition “assigned to a term without any claim that the definition represents a ‘real’ entity” (Babbie, 2001, p. 125).

Some scholars use stipulative definition to avoid having to integrate their concepts with familiar terms and theory in ordinary language. This is a particular problem in social research where many terms have nebulous meaning. Earl Babbie commented “Trying to specify the ‘real’ meaning of concepts only leads to a quagmire: it mistakes constructs for a real entity” (2001, p.

124). Nevertheless, he later concedes that most stipulative definition “represent some consensus or convention about how a particular term is to be used” (p. 125).

Thus, to avoid confusion, use of terms in our report should be consistent with conventional use in the outside world. Terms also must be consistent within the report—a term used in the literature search must mean the same thing as the same term used in the discussion section. In both cases, we must use consistent terminology, (Class Notes, Jan. 16, 2003, p. 15).

X – Make Maximum Use of Data

Gathering qualitative data is expensive. If one considers the loaded time of a researcher, transcriber, respondent, research administration (IRB approval, etc.), and other costs, the cost of a one-hour interview is approximately \$500. A set of 30 interviews on a topic may cost \$15,000. With this high cost, maximum use should be made of the data. The data set from a group of carefully constructed interviews is normally rich in information—there is usually much more data than is necessary for a single research project. Several studies would thus be possible from a single data set.

In order for the results of research to contribute to the general body of knowledge, it is important that research reports be available, complete, and understandable. Availability implies publication; time limits of publication often affect how complete a report can be; and complexity often dictates how understandable a report is. Simplicity—concentration on a single topic—is, in my opinion, the best way to reduce complexity, reduce the time necessary to complete a report, and increase its chances for publication. Ideally, a researcher should not try to include too much in one report (Class Notes, May 1, 2003, pp. 53, 55). Rather, the report should concentrate on a single topic, address it completely, and make use only of data necessary to support the topic.

To keep unused information remaining in the data set from being wasted, researchers should plan several studies from the same data set. These studies should look at various aspects of the data and report on a variety of topics that the data set may support. Each report, in turn, should be available, complete, and understandable. Ideally, a set of reports will together exhaust the data set. However, new theory or other research may show additional ways the data may be used. Thus, researchers should plan to use as much of a data set as practical and then save the data for possible future use.

Question 2

Given your research interest, please list specifically why qualitative methods are useful in the development of a contribution to knowledge.

Response 2

The first Commandment of the response to the last question indicates the importance of a correct choice in choosing a research method. The most important aspect of my proposed research is to determine what concepts database designers use in determining the basic class structures they use in their database designs.

I have asked this question in conversations with data base designers.⁶ The response was that they hadn't thought about it, or that they followed decisions their company or other companies made in the past. They accepted the work that others had done. In my own observations in past databases design, colleagues have made decisions on using intuition and other unstructured approaches.

⁶ Dr. Lawrence Rafsky, Chief Technology Officer, Acquire Media, Roseland NJ; Dr, Susan Cisco, Records Consultant, Iron Mountain, Austin Texas; Rosemary Ashton, Taxonomies & Languages, LexisNexis, Miamisburg, OH.

However, my interviews were unstructured and informal. Sample selection was not methodical. Although it may be the case that no one considers such design carefully, I do not think this would be so. Rather, I think that there might be some designers who have to make decisions based on some set of concepts or concrete approach. Either way, I expect that more complete information from designers about how they do their jobs would be enlightening. Getting that information and understanding what database designers do is the purpose of my research.

Based on my course studies of quantitative and qualitative methods, it appears that qualitative methods would be more appropriate for gathering this information. Williams, Rice, and Rogers in their discussion of research perspectives, provided a set of criteria for choosing among research designs and methods (1988, pp. 46-47). Applications of these criteria indicate that this research should be qualitative in nature:

1. The purpose of the research is that of exploration and description rather than explanation.
2. The phenomenon of interest does not lend itself to study independently from its context.
3. The phenomena under study are not amenable to quantification.

As Kirk and Miller stated, qualitative research “fundamentally depends on watching people in their own territory and interacting with them in their own language, on their own terms” (1986, p. 9). This is directly applicable to my research. Presuming that a qualitative approach is more appropriate, I think that interviews would be an appropriate tool to use. McCracken has written interviews are “one of the most powerful methods in the qualitative armory. . . . The method can take us into the mental world of the individual, to glimpse the

categories and logic by which he or she sees the world” (1988, p. 9). Fontana and Frey confirm this suggestion, “interviewing is one of the most common and most powerful ways to try to understand our fellow human beings” (1998, p. 47). But, in order to capture the concepts or approach, I believe that interviews need to delve deeper into the subject than the informal discussions and observations I have had. I believe that interviewing designers in their workplace, considering my ability to talk database design language, would meet the Kirk and Miller’s fundamentals.

Assuming that most database designers use some sort of conceptual approach to database design, the results of the interviews will document those concepts and make them available to others. This will contribute to the knowledge of database design by providing future researchers and practitioners a collection of concepts used and other insight that they might be able to use in their own design and research. On the other hand, if there are no concepts used and all design is done by ad-hoc approaches, then that revelation will perhaps provide incentive for practitioners, scholars, and researchers to develop a better way design database structures, educate students and conduct future research.

Question 3

Please address the problems and that must be overcome with the application of the qualitative paradigm to your research question.

Response 3

Although, much work must be done before my formal proposal is complete, my preliminary thoughts are that the most important potential problems that might have to be overcome are obtaining an adequate sample, bias in the interview design, and bias in data interpretation.

Adequate Sample

In order to understand the conceptual designs that database designers use to develop their structures at the basic level, one must find an adequate number of database designers who develop structures at the basic level and who may be interviewed.

Finding database designers, although not trivial, is perhaps the easiest part of the task. Almost all business and non-profit organizations have databases that they use for managing their corporate information and knowledge. In most cases, but not always, such databases will be computerized. Each of those databases has had one or more designers who have organized the data in them—be that organization formal or informal. Thus, potentially there is a population of hundreds of candidate designers who could be interviewed.

Based on the results of the three informal interviews mentioned earlier, some of these designers (perhaps most) will have copied their design of their basic structure from somewhere else and thus will not have been involved in design at the basic level. Determining this will not be trivial in many cases. The designer might state that all is from somewhere else, but delving deeper might reveal that the designer has modified the structure and thus employed some conceptual thinking in so doing. I believe this determination will have to be made through the interview methodology.

The most difficult sample problem will most likely be getting organizations to commit their employee's time to the interview. This might be mitigated somewhat in Austin since most organizations understand that doing research here is not unusual. Some organizations will most likely still have to be convinced to allow their employees time to be interviewed. In addition, some organizations might be concerned about the potential for disclosure of proprietary information. This concern might have to be dealt with using confidentiality agreements.

Bias in Interview Design

“Bias refers to any property of questions that encourages respondents to answer in a particular way” (Babbie, 2001, p. 244) (see also Leedy, 1997, pp. 219-220). In this particular research it is important that the research questions be designed so that my past experiences and what I expect to find do not bias the results toward those expectations. Many scholars, such as Babbie and Leedy have noted the problem and suggested ways to reduce the potential of bias through the use of open ended questions and other unstructured techniques. One such technique is triangulation—collecting data with multiple data collection methods, such as surveys and interviews (Babbie, 2001, p. 113). The comparison of results of these methods can provide insight into not only biases but also into the overall validity of the data.

Data Interpretation

Another potential source of bias is in the data interpretation stage. Almost any form of data analysis will require putting the data in categories. The design of those categories can potentially bias the results toward the researcher’s expectations. Bowker and Starr provide many examples of serious consequences of bias resulting from classification of data in particular ways (Bowker & Starr, 1999). One technique that may be used is to classify the data according to several classification schemes and determine the sensitivity of the results to different organizations. If the results show high sensitivity, then use of alternative data reduction techniques may be appropriate.

Other Problems

There are many other potential problems that may impact my research. Some of these have been experienced, are anticipated, and have been addressed in the above list of commandments. Other problems will have to be dealt with as they arise.

Question 4

Offer a single hypothetical example of a finding on your topic given this method and analyze it enough that the reader can see what might be possible with your research.

Response 4

One of the possible results of my research is that there is a clear connection between the research dealing with basic classes (Eleanor Rosch, Brent Berlin, and others) and the identification of the basic classes for database design at the basic level.

Consider, hypothetically, that the database to be designed is like an elephant and the users of the database are like blind men surrounding the elephant, each with a different perception of what the elephant looks like. The task of the designer would be to construct a single model that reflects the elephant itself. The basic level of design—the basic classes in the database architecture—are like the bones of the elephant upon which the muscle and flesh may be built. If the designer constructs the elephant without a good bone structure—one that could support all the users—then portions or perhaps all of the elephant would collapse. If the bone structure is haphazard or disconnected, parts of the elephant would collapse.

To support this metaphor, a hypothetical finding might be that some designers have a process in place for determining the basic levels of their database design. They might call meetings or conduct studies with their users in order to identify the common views of the entities they are modeling in their database structure. Each of the users would contribute their understanding of the entities they deal with on a day to day basis. In more technical terms, each of the users would share their ontology entity subset or the view they have of their part of the universe of entities and relationships. The finding might also show that the designer would call a meeting with her colleagues to combine the ontologies or the users into a global ontology and

then determine what basic classes would be useful to construct the foundation of the database design.

So in this hypothetical finding the organization has a process for adequate identification of the basic class at the beginning of the design effort. They would spend more time in preparation to reduce the risk of spending a lot of time redesigning the database structure later.

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