# Home Work - 4

**1)**

**b)**

## i) What is qualitative evaluation?

- Qualitative inquiry targets on providing an efficient understanding when holistic approaches are considered for the interactions between the factors that influence visualizations, their development, and their use.
- The approaches of qualitative evaluation work well in real world scenario and can incorporated in various research studies.
- These studies include the design process, in field studies, and use of observational studies to produce designs from observed data.
- The potential for improved interpretation of existing practices, analyzing environments, and cognitive task constraints as they occur in realistic settings is offered by these types of studies.
- Focus should be on the approaches to include the design application of qualitative evaluation and a wide range of methods should be accepted.

## ii) What are qualitative evaluation methods?

- The important part of qualitative methods is the skill and sensitivity by which the data is gathered. The records of the data gathered as field notes, artefacts, video tapes, audio tapes, computer records and logs.
- Two primary methods for gathering data in qualitative approaches are: Observations and Interviews**.**
- The records of observation and interview records are kept continuous.
- Artifacts such as documents, drawings, sketches, diagrams, and other objects of are collected when appropriate.
- The communities we are observing are often technology users, technology-based records can also include logs, traces, screen captures, etc.
- Observation and interviewing are skills developed with practice and can be learnt.

- **Observation Techniques:**

- Include in observations the setting, a description of the physical setup, the time, who is present, etc.
- Both the overt and covert activities and communications are included
- Frustrations and difficulties should be observed well which can be extremely important in developing a full understanding.
- Many hours may be wasted by searching for important note that is on the back of another note. So this should be avoided
- Be concrete whenever possible.
- Every word should be distinguished that has been paraphrased or remembered.

- **Interview Techniques:**

- It is important to listen actively to the candidate.
- The inclination to talk should be limited.
- Leading questions should be avoided.
- Open ended questions should be asked.
- Memories can be triggered by asking concrete details

**Types of Qualitative Methodologies:**

An overview of some methods is discussed which are divided into three sections:

i. **Combination of qualitative methodologies and quantitative methodologies:**

- The qualitative methods are not commonplace, the value of inclusion of the methods is well recognized.
- For example, if the opinions of candidates are in match with the quantitative measures i.e. if the fastest techniques is being preferred the most. This confirms the prediction that the fastest technique is the right one to select. But if the fastest techniques is not being preferred, then in such a contrast, questions are raised regarding the interpretation that fastest is always best.
- This helps in providing insight, explanations and new set of questions which help in confirming results.

**ii. Inspection Evaluation Methods:**

- For improving the quality of information visualizations, Heuristics is an important tool as indicated by information visualization specific research.
- Evaluators applied heuristics in a two pass method by.
- First pass - an overview is achieved. Second pass- with each heuristic, more details are assessed for each interface component.
- The subsequent use of heuristics for web site analysis appears to sometimes need more evaluators.

**iii. Primary qualitative methods:**

- Methods such as action research and focus groups are included.
- These methods have the potential to lessen the task and data comprehension divide between ourselves as visualization experts and the domain experts for whom we are creating visualizations.
- It is possible for us to become analysts, doctors, or linguists but we can gain a deeper understanding of how they work and think.
- These methods can open-up the design space, revealing new possibilities for information visualizations, as well as additional criteria on which to measure success.

## iii) What are the challenges of qualitative evaluation?

The challenges for qualitative methods are as follows:

**Sample Sizes*:***

- The sample sizes are determined differently for qualitative and quantitative research.
- The sample sizes in qualitative research are less than required for quantitative research.
- Sample sizes depend on the scope of the research problem but also the experience of the investigator.

- A novice investigator may take more time to find a theoretical saturation than an experienced investigator.

**Subjectivity:**

- Experimenter subjectivity can be considered as asset.
- Based on the experience of the investigator, the quality of the information collected and analysis can be determined.
- But the process of collecting data must also be linked with achieving the representative data.
- It includes if the observer has heard fully or not and if these observations are recorded efficiently.

**Analyzing Qualitative Data:**

- Qualitative or quantitative or a combination of both methods are used.
- A qualitative phase and a quantitative phase are included in the overall research study.
- The assessment is initiated from observations and themes are sensed through review of the data and is coded at the end where the qualitative analysis methods are classified.

## iv) How to analyze qualitative data?

- Qualitative/quantitative or a combination of both methods are used to analyze the qualitative data.
- These methods include a qualitative phase and a quantitative phase in the overall research study.
- In order to triangulate results from different methods, to complement results from one method with another, or to increase the breadth and range of inquiry by using different methods
- Thematic analysis types where the assessment is initiated from observations and themes are sensed through review of the data and is coded at the end.
- In coding, the raw data is subdivided and labeled and then it reintegrates the gathered codes to develop a theory.
- This process of moving the raw data into themes and a code set may requires the utilization of any of these three methods:

a) **Data-driven Analysis**: It is commonly called as open coding where the themes and a code set are directly taken from the data and from nothing else.

b) **Motivated by previous research analysis:** From the previous research, the questions and codes can be utilized on the new data to check, extend or contrast with the other compared previous results.

c) **Theory-driven coding:** Theories such as grounded theory, or ethno-methodology can be used as a lens through which one can think and through which the data can be viewed.

## v) Summary about the paper:

- Qualitative evaluations can be utilized throughout the life cycle of development. Observational studies are evaluated to be guidance for informing design.
- However, these methods are not utilized well in the information visualization literature.
- Broader approaches to evaluation should be considered when complicated problems like insight, discovery, confidence and collaboration need to be analyzed.
- Two primary methods for gathering data in qualitative approaches are: observations and interviews.
- The records of observation and interview records are kept continuous.

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**Benefits of Qualitative Evaluation:**

- It is powerful methodology by which one can capture salient aspects of a problem that may provide useful design and evaluation criteria.
- Quantitative evaluation is naturally precision-oriented, but a shift from high precision to high fidelity may be made with the addition of qualitative evaluations.
- It is especially useful for informing design.

- Qualitative research techniques may help in resolving complex issues of evaluation questions.

**2)**

**C**)

**i) Effectiveness: Score 4:**

This visualization at http://textvis.gsu.edu:8080/Tennis/html/tournment.html is on par with other live blogging sites such as Wimbledon.org, Usopen.org etc. Though these two websites are the official websites of these grand slams none of them are as effective as the one at textvis. This visualization has its pros and cons though the pros outweigh the cons.

**ii) Efficiency: Score 5:**

Firstly, I would want to mention about the detailing of the visualization where it covers each and every point shared between Nadal and Federer. You could see from the visualization that a viewer gets information of the deuce, advantage, game and set won by the player. All the games are aligned neatly over the X-axis and the viewer would easily be able to distinguish between different sets. While the line graph is effective enough to describe each point won by the player, and the outline colors of blue and red makes it easy for the user to distinguish games that are won by Federer and Nadal.

**iii) Usability: Score 5:**

Shading of each game gives us an understanding about which player has won the game. Apart from the direct visualization, additional information that can be retrieved from the queries is impressive as well. The fact that the viewer could make out the shot that landed him the point is impressive. The user can also retrieve information about the points that were won in each individual set by simply checking the option. Additional option such as the query slot is add on. While most of the information would be shown by other sites they might not be as effective as this one. The other websites would cover some additional information such as the serve speed,

the maximum serve speed, return shots and rally shots in the form of a table and it too gives a fair idea about the match stats.

While most of the pros hold in favor of this visualization, there are some that hold against. The main error in this Visualization is the timeline. The red and blue shading should imply the time duration of each game. While it is accurate for most part, there are some errors as well.

**iv) Usefulness: Score 4:**

By observing the first three games of Set 1, the first game shading is bigger than the second game but the duration of the second game is shorter than the first game. This must be because of the rally shots that held a point longer. The line dot graph here command the shading region. You could see that in the first game, there was lot of exchange of deuce and advantage between the two players there by leading to an extended graph and it decides the shaded region of a game and it doesn't imply the duration. This in particular would confuse the viewers and it has to change. The other con is the visualization though covers major part, leaves out some of the other aspects of the game such as the serve speed etc.

**v) Improvement:**

The data here though incomplete gives a complete picture of the game it is hard for any data visualization to be a supplement of the live streaming. There are aspects of the visualization such as the game duration that needs some attention, the visualization is expected to cover some other aspects mentioned above. In particular, the viewers would love to know the present score and it should be easier if displayed in a table format and all the other details are secondary. I personally like the visualization and it would be better with the suggested changes.