Gathering Data *week 9*

Quantitative data looks at the magnitude, size, or amount of something, e.g. average incomes, ages, or percentage of a population. It works with large user groups as its data analysis is relatively quick but requires statistical knowledge. It allows us to gather structured feedback from people and is focused on a specific topic.

Closed questions are easy to answer, have easy-to-analyse responses, limit the number of possible responses, need to have all answers anticipated, and usually have a higher response rate, e.g. binary choice, multiple choice, ranking, semantic differential scales, combination of previous and a short answer.

Open questions can be difficult to answer, have costly-to-analyse responses, may give too many alternative answers, allows users to give any answer they want, and usually have a lower response rate. The common approach is to rely mostly on closed questions, with a few open questions as well.

Three main rules of question design: the participate should be able to comprehend, capable of answering, and willing to answer the question. Questions should be brief and relevant.

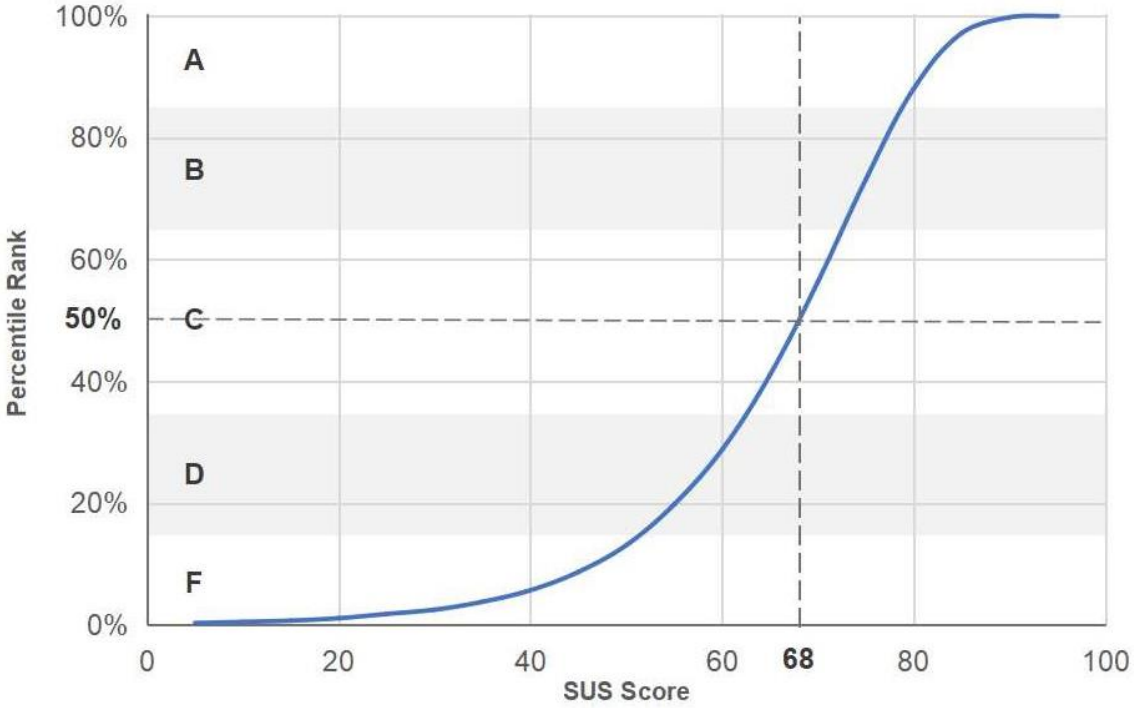
Common questionnaire errors: ranges should not overlap, don't ask double-barrelled questions, make sure scales are ordinal, give frame of reference - don't use relative terms, anticipate all possible answers (e.g. 'other'), avoid making assumptions about the participant, don't ask the participants to agree or disagree with someone.

The NASA-TLX questionnaire captures six subscales: mental demand, physical demand, temporal demand, performance, effort, and frustration.

The System Usability Scale has ten questions with a five-point Likert scale.

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I thought the system was easy to use.
4. I think that I would need the support of a technical person to be able to use this system.
5. I found the various functions in this system were well integrated.
6. I thought there was too much inconsistency in this system.
7. I would imagine that most people would learn to use this system very quickly.
8. I found the system very cumbersome to use.
9. I felt very confident using the system.
10. I needed to learn a lot of things before I could get going with this system.

One is taken from odd-numbered questions' answers while even-numbered questions' answers are taken from five. The sum of these new scores is multiplied by two and a half, giving the final score.



The Player Experience Inventory (PXI) captures twelve subscales: enjoyment, mastery, curiosity, meaning, immersion, autonomy, feedback, challenge, audio-visual appeal, ease of control, and clarity of goals.

Observing users is another way of measuring the quality of their experience, e.g. monitoring their facial expressions, verbal comments, how they perform a gesture on a tablet, or how they interact with a motion-based interface. Observing a person while they interact takes less time but requires you to know what you're looking for in advance. Watching a recording on a user takes more time but allows you to explore recordings first.

Automated observation can be used to improve the scale and reliability of detection, e.g. natural language processing, computer vision, eye-tracking, and accelerometers.

Physiological data can also be used to get very accurate and objective measurements of a user's physical data, e.g. GSR (galvanic skin response), heartbeat, brain activity, and body temperature.

Performance metrics offer objective insights into how users interact with a system, e.g. time taken to complete tasks, number of errors made. They are simple to present and analyse, but do not provide a good enough insight if they are used as a sole measure. They are, however, a good way of backing up other results.