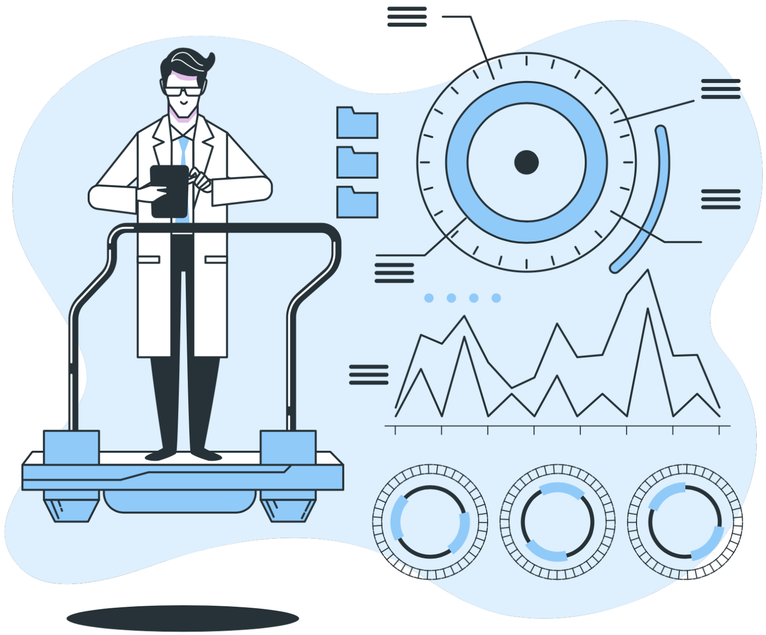
Usability Measurements

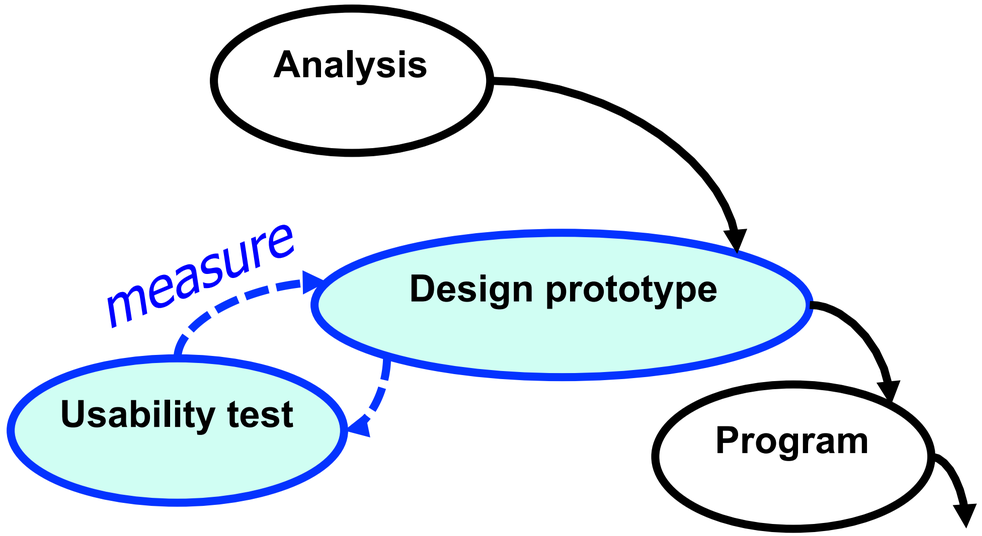
Chapter 10



Usability (revision)

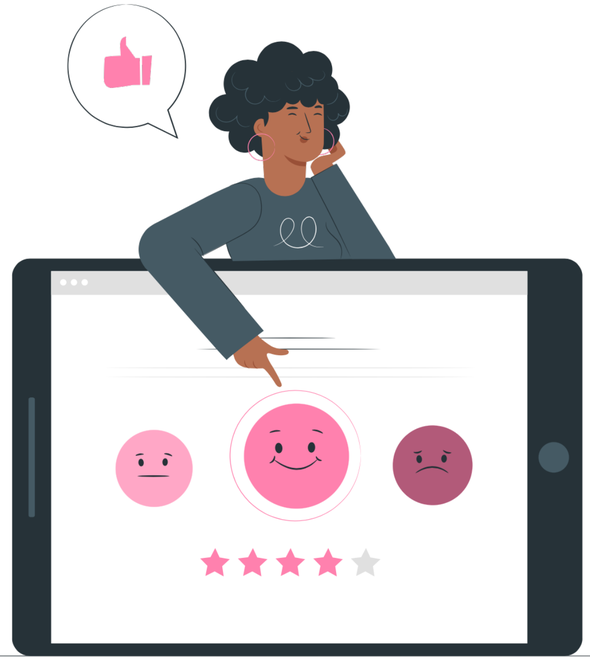
The ISO 9241-11 standard defines usability as :

“the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”.



Usability:

- Effectiveness: The accuracy and completeness with which users achieve specified goals
- Efficiency: The resources expended in relation to the accuracy and completeness with which users achieve goals.
- Satisfaction: The comfort and acceptability of use.



Why We Need Usability Metrics?

According to Nielsen (2001) usability elements help you:

- Track progress between releases. (prototype ver.)
- Assess your competitive position.
- Are you better or worse than other companies?
- Where are you better or worse?
- Make a Stop/Go decision before launching your system. (Is the design good enough to release?)

How to measure ?

Example:
How to measure ease of use?

We use measurable things as indicators e.g. task time, problems /error counts ,keystrokes counts, opinions poll (questionnaire), the average of users who could successfully do a task, etc….

Task Time : Record how long it takes a user to complete a task in seconds and or minutes.

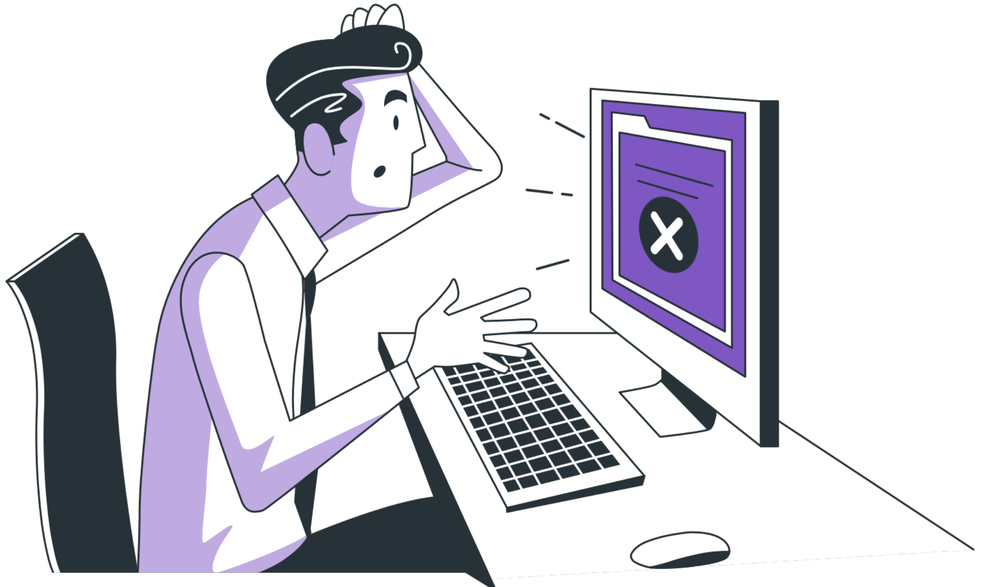
- Start task times when users finish reading task scenarios and end the time when users have finished all actions.
- Measure of efficiency and productivity.

	Original Design	Redesign
Task 1	12 sec.	6 sec.
Task 2	75 sec.	15 sec.
Task 3	9 sec.	8 sec.
Task 4	140 sec.	40 sec.

Errors: Record any unintended action, slip, mistake a user makes while attempting a task.

- By reviewing the recording, record each instance of an error along with a description. For example, “user entered last name in the first name field”,later classify them into categories. (examples:”navigation error,” “selection error,” “interpretation error,”)

- Errors provide excellent diagnostic information and usually to be mapped to UI problems.



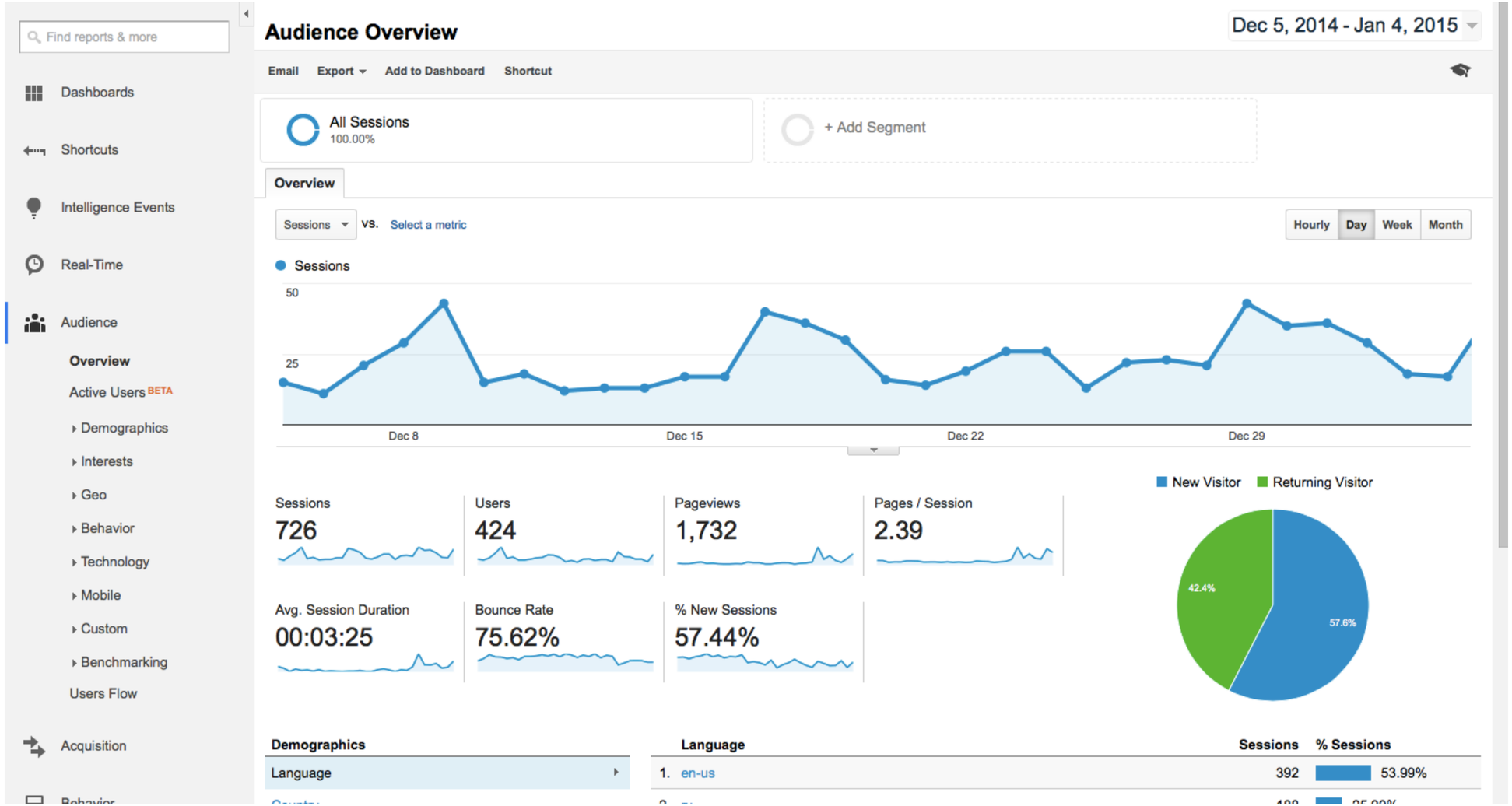
Completion Rates/Task sucess: completion rates/task sucess are a simple measure of usability. It's typically recorded as binary metric (1=Task Success and 0= Task failure). If users cannot accomplish their goals, not much else matters.

- you should define the success criteria for each task prior to the data collection. If you don't predefine the criteria, you run the risk of constructing a poorly worded task and not collecting clean success data. example:

a)Find the current price for a share of Google stock (clear)

b)Research ways to save for your retirement (not clear)

Page Views/Clicks: Fundamental tracking metrics for websites and web-applications. Example, Google Analytics.

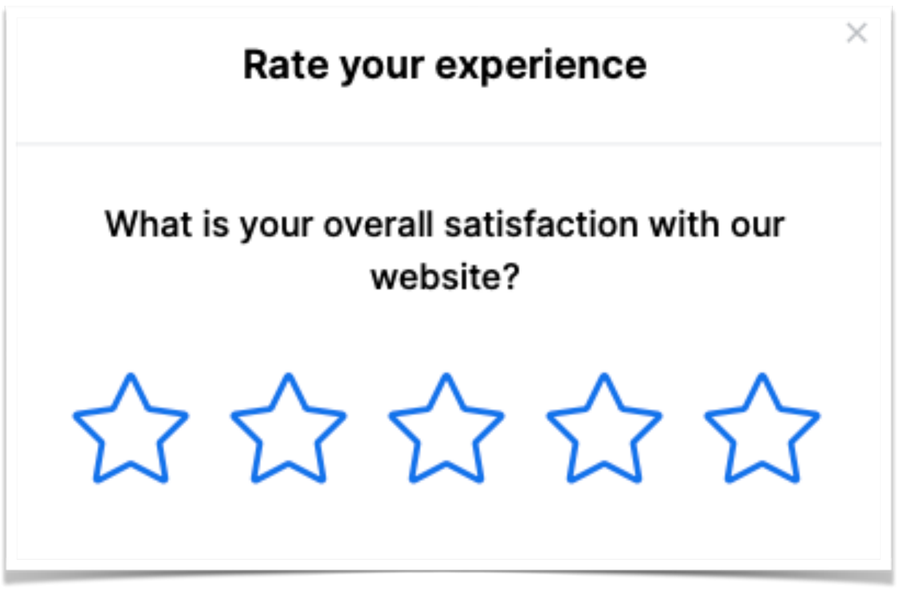


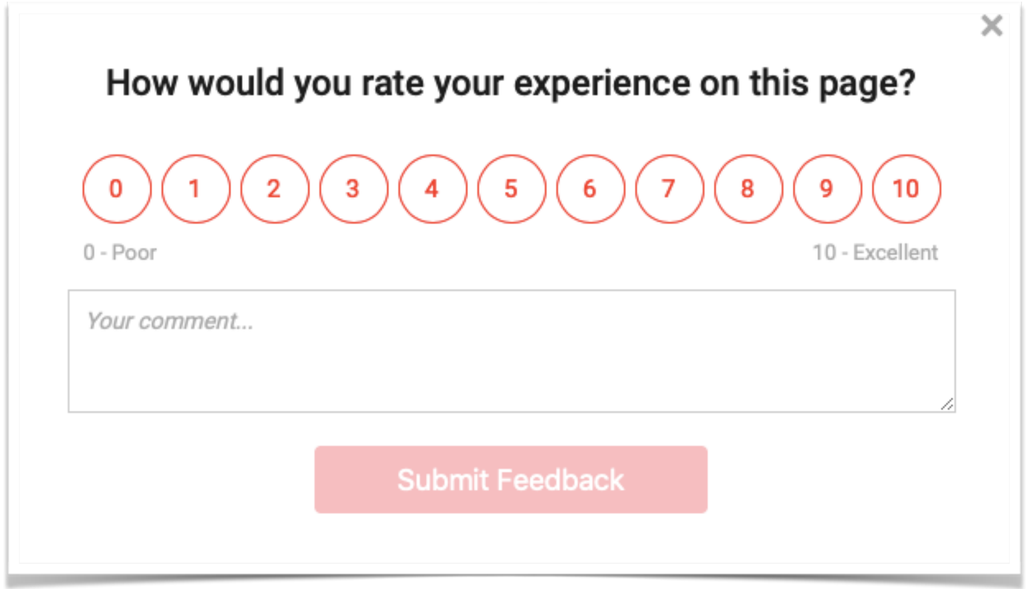
Conversion Rate :Measuring whether users can sign-up or purchase a product.

- Conversion rates are a special kind of completion rate and are the essential metric in eCommerce.
- Conversion rates are also binary measures (1=converted, 0=not converted) and can be captured at all phases of the sales process from landing page, registration, checkout and purchase.
- It is often the combination of usability problems, errors and time that lead to lower conversion rates in shopping carts. (A/B test)

Test Level Satisfaction: Measuring users' satisfaction.

- Interview, questionnaire (like System Usability Scale(SUS), SUPR-Q, etc), Net Promoter Score (NPS).
- Others (future)…





Net Promoter Score

Example of Measuring Usability

Efficiency

Efficiency refers to the amount of effort (mental/cognitive or physical) users need to put in to achieve their goals.

- Time taken on first attempt.
- Time to perform a particular task.
- Number of actions or steps that participants took in performing each task (more actions = more effort)

Efficiency measures can be used to compare the efficiency of:

• Two or more similar products, or versions of a product, when used by the same user groups for the same tasks in the same environments

• Two or more types of users when using the same product for the same tasks in the same environment

• Two or more tasks when carried out by the same users on the same product in the same environment.

Example of Measuring Usability

Effectiveness

Effectiveness refers to the accuracy and completeness with which users can achieve their goals

- Accuracy :Number of errors per unit of time.
- Completeness rate : Percent of users able to successfully complete the task. (1=complete, 0=failed)

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$$Effectiveness = \frac{\text{Number of tasks completed successfully}}{\text{Total number of tasks undertaken}} \times 100\%$$

Example:

Goal: to transcribe a 2-pages of written document into a pdf format with your new system.

- Accuracy could be measured by the number of spelling mistakes

- Completeness could be measured by the number of words of the document transcribed divided by the number of words in the source document.

Example of Measuring Usability

Satisfaction

Satisfaction is composed of comfort and acceptability of use.

- Comfort : overall physiological or emotional responses to use of the system (user feels good, warm, pleased, uncomfortable, etc.).
- Acceptability: overall attitude towards the system, such as
  - whether the user feels that the system supports the way they carry out their tasks.
  - Do they feel in command of the system?
  - Is the system helpful and easy to learn?

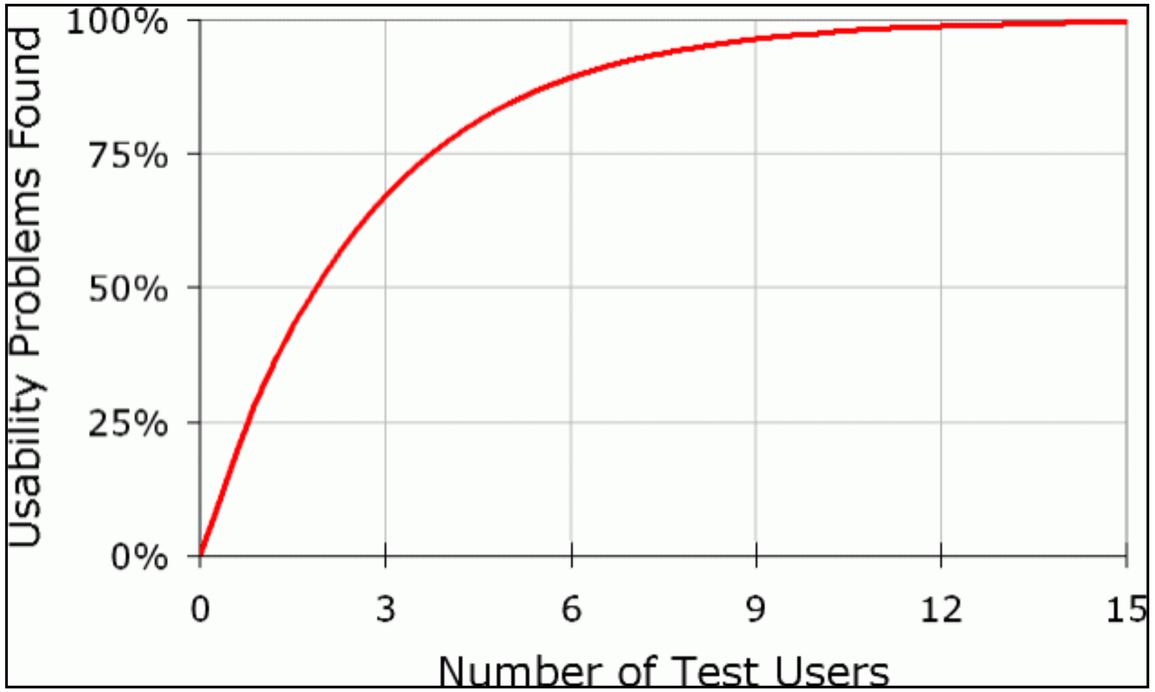
Measured by:

- Percentage of customers who would recommend it to a friend after two hours' use/ Net Promoter Score (NPS)
- Percentage of customers that rate the product as "more satisfying" than a previous product.
- Software Usability Measurement Inventory (SUMI) Questionnaire : an internationally standardised 50-item questionnaire. SUMI provides an overall assessment in 5 sub-scales: Affect, Efficiency, Helpfulness, Control, and Learnability.

How Many Users ?

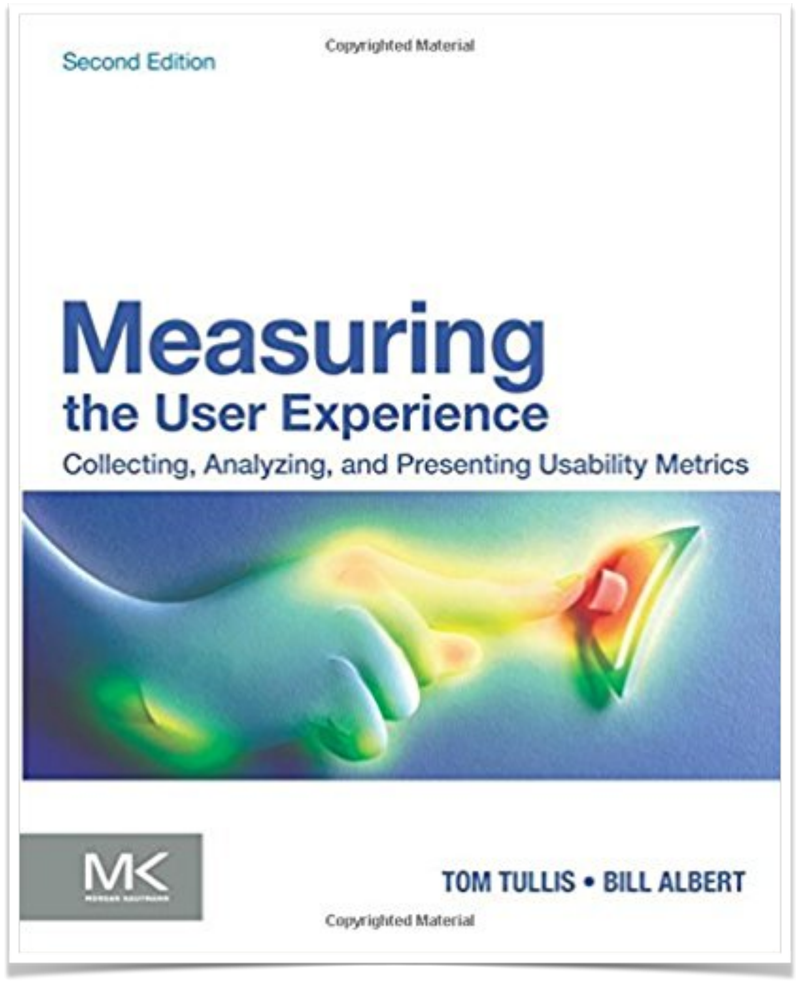
According to Nielsen (2001),

- **<u>Qualitative user testing:</u>** 2-5 users.
- Having 5 users is enough for you to have the users insight on your system.



More detail: https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/

- **BUT** you need more than 5 users, when you're doing quantitative usability studies (collecting time, errors counts, etc)
- In order to get a high confidence interval on the results, Nielsen(2001) recommend testing 20 users for each design.



Measuring the user experience : collecting, analyzing, and presenting usability metrics / Tom Tullis, Bill Albert

Thank you