THINK- ALOUD

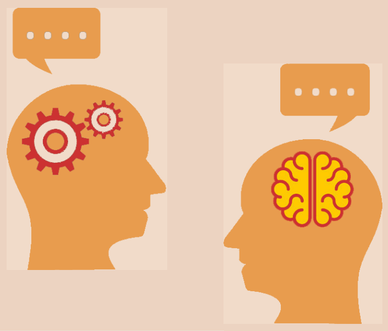
IMPLEMENTATION

DECO7250 45396553 Zhuoran Li

"In a thinking aloud test, you ask test participants to use the system while continuously thinking out loud — that is, simply verbalizing their thoughts as they move through the user interface." (Jakob Nielsen 2012, January 16)

In our team's project, think aloud was conducted both for the project "Jester" and a experimental prototype which was used to find out more perspectives of design alternative.

- German psychologist karl dunker first one put forward think-aloud in 1945 (Duncker 1972)
- Herbert A. Simon & Allen Newell Using think-aloud for simulate human thinking on computers. (Newell, Shaw et al. 1958)



Why using think aloud?

While think-aloud allows users to verbalize, designers can also obtain better understanding about the cognitive processes of users. It helps prevent errors caused by differences between users' mental model and system's interaction model. These thoughts can address how to improve the interface and tool from users' perspective.(Joe, Chaudhuri et al. 2015)

How to implement think aloud?

Introduce the application/system

Give user the tasks

Let user operate and the designers should observe their operation and record what users say, especially their confuse, frustration and hesitations.

Interview the user after finishing the tasks.

Advantages (Jakob Nielsen 2012, January 16)

Robust: Unless the tester puts words in to users' mouth, the feedback can be reasonably even it comes from a poorly run study.

Flexible: It is suitable for any type of prototype and playform. Can be used at any stage of the development lifecycle.

Convincing: Results from think aloud makes the team member easier to be convenced as they are directly from users' perspective.

Disadvantages(Jakob Nielsen 2012, January 16)

Unnatural situation: Normally, people would not sit and talk to themselves all day. Thus, it would be hard to keep the participants being active.

Users always become quiet when doing the test. One of the participants barely saying nothing when doing the test. Instead of verbalizing, she gave words like "this one?", "Finished." It is not wrong that she needed to finish the tasks. However, this time, task became barriers and she focused on "finish the task" rather than how to finish it.

Filtered statements: Users might try to analyze their thinkings before saying out. This can be the obstacle of getting users' raw stream of thought.

Biasing user behavior: Sometime designers have to clarify or give prompts which might change the users behavior.

Think-aloud practice

Microsoft has using think-aloud as a primary method for obtaining data from users. It fits in well with Microsoft corporate culture and efficiently obtain qualitative data. (Denning, Hoiem et al. 1990)

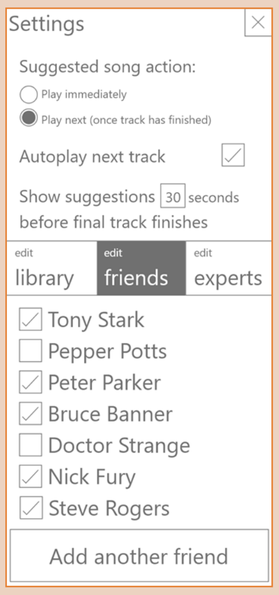
What's more, together with video analysis, think-aloud has been used to test prototype clinical computer systems. Clinicians do think-aloud while interact with a prototype information system. The result provide a efficient way to determine what information to display and problems when using the system. (Jaspers, Steen et al. 2004)

Moreover, think-aloud is also used in education. It shows teachers' cognitive processes of reading, critical thinking, etc. while students can learn from it.(Silva 2012)

Conduct think aloud

Think aloud was conducted both for Jester and the experimental prototype. For Jester, as it is a traditional music player but focus more on recommendation, the interface is design to be similar to the existed software to reduce users cognitive loan. The purpose is to confirm whether the user has a similar conceptual model as the designer. Tasks are designed mainly focus on the recommendation function.

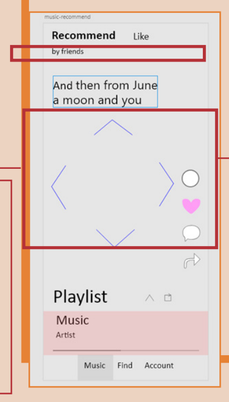
- Look at friend recommendations ("find out what Peter Parker recommends")
- Hide friend recommendations ("hide Peter Parker from friends")

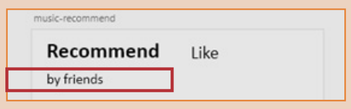


When conducted think aloud for the experimental prototype, as the interface is significantly different from the tradition music applications. The purpose of this is to figure out whether the application is acceptable and whether the users would be confused about the functions and navigation system.

- Pause the music and select other playlist from a critic.
- View the playlist.

Limitations found from test





Inside our group, the outcome of think aloud was quickly admitted by all the members, even it is not what we expected to get. There is nothing more powerful than the words directly from users' mouths once we can distinguish which words are users' valuable thing process.

In the test of experimental prototype, user's thing process stated that they were struggling figuring out the logical link between "slide to different direction" and "go to different resources of music". We expected that they would read the tips on each page. But in the thinking process, reading was always the last step they took, which make the function become a barrier of navigating as the cognition time has increased.

Subjective:
During the test, users can be quite subjective. Their attitude towards the software is significantly relied on own experience and emotion. From what Bruce, a former designer of Apple, wrote in 1989, the subjects consistency said that the keyboarding is faster than mousing while the stopwatch shows mousing is fasterv which can show users bias during the test. (Tognazzini 1991)

Not related:
Users feedback are always about their confusion and likable or dislikable. When doing think-aloud, almost all the users leave some comments about the icon of recommendation.

Skip process:
Usually, feedbacks are not comprehensive or detailed. When describing their thinking, users like to escape some process they think is obvious. When going to the setting page, they just looking at the screen for a second and open it without saying anything.

Difficult analysis
The result is hard to analyze. It is important to distinguish whether the raw data is useful or not. Sometimes, the problem given by users is not actually a problem. For example, some participants complain about the size of the icons.

Review the test

To better conduct think aloud test in the future, some tips might be useful to avoid or reduce the problem.

- Before the test: have some time for warming up. Let users getting to familiar not only the product but also our tester. They can verbalize better when they feel comfort. What's more, it is crucial to tell the users that it is the application that being tested, not the users. Try best to reduce users' tension.
- During the test: When users become quiet or when users focus on the appearance rather than the functions, remind them kindly. Encourage them to verbalize and using some questions like "how do you achieve doing that? Could you tell me the steps you take?"
- After the test: Treat the raw data carefully and pay more attention to how they achieve the task which reflect the mental process.

Reference

- Denning, S., et al. (1990). "The Value of Thinking-Aloud Protocols in Industry: A Case Study at Microsoft Corporation." Proceedings of the Human Factors Society Annual Meeting 34(17): 1285-1289.
- Duncker, K. (1972). On problem-solving, Westport, Conn : Greenwood Press.
- Jakob Nielsen (2012, January 16). "Thinking Aloud: The #1 Usability Tool." from https://www.nngroup.com/articles/thinking-aloud-the-1-usability-tool/.
- Jaspers, M. W. M., et al. (2004). "The think aloud method: a guide to user interface design." International Journal of Medical Informatics 73(11): 781-795.
- Joe, J., et al. (2015). "The use of think-aloud and instant data analysis in evaluation research: Exemplar and lessons learned." Journal of Biomedical Informatics 56: 284-291.
- Newell, A., et al. (1958). "Elements of a theory of human problem solving." Psychological Review 65(3): 151-166.
- Silva, M. L. (2012). "Camtasia in the Classroom: Student Attitudes and Preferences for Video Commentary or Microsoft Word Comments During the Revision Process." Computers and Composition 29(1): 1-22.
- Tognazzini, B. (1991). Tog on interface, Reading, Mass. : Addison-Wesley.