

HCI Evaluation – I

- Evaluation is a **crucial part** of the user-centred development process – we want to ensure our software meets our users' requirements

- **Think Aloud technique** and **Heuristic Evaluation**

Why HCI Evaluation is important?

*Iterative design, with its repeating cycle of design and testing, is the only **validated** methodology in existence that will **consistently produce successful results**. If you don't have user-testing as an integral part of your design process you are going to throw buckets of money down the drain."*
(在迭代测试中实现用户测试-重要的组成部分)

Think Aloud优点

1. Cheap 便宜
2. Relatively easy 相对容易
3. It **provides insight** into people's experiences as they interact with your product 提供洞察力 | ↓适用于少量参与者
4. It can be carried out with **low numbers** of participants
5. Fits in with **most software development** processes 适用于大量软件开发过程

Think Aloud evaluation technique

1. Users are asked to **verbalize** what they are **thinking and doing** as they perform a task using your software 口头表达行为
2. The Think Aloud technique **provides insights into the user experience** of using your software 提供洞察用户体验
3. It can **identify issues** with the software e.g. navigation problems or content that can be improved 识别软件问题
4. It can be used **as part of the software** development process to iteratively improve software or used **with a finished product** 可在开发过程or开发结束后使用

Think Aloud缺点

1. it relies on people **verbalizing thoughts** and impressions, rather than objective measures 比较主观而非客观
2. Participants may say what they believe to be the **right answer** rather than what they really think (social desirability). This can distort your results and conclusions 说的是社会期望而不是真正想法

1. Planning a Think Aloud evaluation – 计划一个评估

1. Decide **what questions** you want your study to answer. For example, whether users can find **particular content or what their understanding** is of the information presented. 问题
2. Write down the **tasks** you **want the user to complete** while using your software 预期完成任务
3. Decide **how many participants** you want to recruit and **how long you want the sessions** to last (45 to 90 minutes works well) 决定人数&时长

3. Analyzing a Think Aloud evaluation – 分析评估

1. Put the written notes together from both observes in to **one document** 整理到文档
2. Organize the notes into **meaningful categories** e.g. what features helped users; what features led to problems; any additional features that users wanted. 分类有意义问题
- 2.1. You can make **your own meangingul categories**
3. **Count the number** of times users comment about different categories to identify the **biggest issues** 计数, 确定主要问题

2. Carrying out a Think Aloud evaluation – 进行评估

1. Have a **facilitator** to run the evaluation and one or two **observers** to take notes on what the user says. 主持人+ 1~2个观察员
2. **Explain** to the participants how a think aloud works: they should tell you their thoughts, reactions and emotions as they occur while they are performing the task 向参与者解释“Think Aloud”技术的工作方式
3. Explain that there is **no right answer** and it's fine to be **critical** 批判性思考
4. Ask the participants to **complete** the tasks you have planned. This should be **uninterrupted** as far as possible, although the facilitator will probably need to give some prompts. 完成任务&不受干扰
5. If the user goes **silent** then prompt them to verbalize their thoughts by saying “what are you thinking” 停止口头思考的话提醒他们出声

Heuristic evaluation – 启发式评估

<https://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/>

Nielsen Norman group

<http://www.nngroup.com/>

- The Nielsen Norman group is a UX research and consulting firm 尼尔森-诺曼集团是一家用户体验 (UX) 研究和咨询公司
- It was founded by two big figures in the HCI world:
 - **Don Norman** coined the term “**user experience**” and developed a set of **design heuristics**
 - **Jakob Nielsen** also developed a set of **usability heuristics** and was a pioneer(先驱者) of heuristic evaluation.

What is a heuristic?

- A rule of thumb 经验法则
 - Experienced-based strategies 基于经验的策略或准则
- E.g. if you're doing some **DIY** then ‘**measure twice, cut once**’ is a useful heuristic DIY的经验

Heuristic evaluation 1 – 启发式评估流程

- An evaluation technique conducted **without** users 无用户评估
- Also known as **expert** evaluation as it's sometimes carried out by external experts (sometimes by the development team) aka evaluators 专家评估
- It's a type of **analytical** evaluation, that is, **based on a set of principles or a model...** 分析性评估-一组模型
- ...rather than by observing users (which is known as **empirical** evaluation 经验性评估)
- It's an **inspection** method – it involves inspecting a design to find usability problems 检查方法
- This involves asking whether the design complies with **usability principles** (a set of heuristics) 包含是否设计符合可用性原则

Heuristic evaluation is widely used because...-广泛使用原因

- 1.It's **cheap** (only needs a small number of evaluators and no specialist equipment or labs) 便宜
- 2.Relatively **easy** to carry out (can do it after a few hours of training) 简单
- 3.**Instant gratification** – lists of problems are **available immediately** after the inspection 及时满足感
- 4.It **fits in** with most software development processes used in industry 适合大部分软件开发流程
- 5.It's a very **cost effective**: benefit-cost ratio of 48: cost of \$10,500; expected benefits \$500,000 (Nielsen 1994). 成本效益高

Where are the users?- 用户死哪去了?

- Heuristic evaluation is based on HCI researchers' extensive experience of designing and evaluating interfaces
- By focusing on users, HCI researchers learned what works and what doesn't
- Their experience is distilled into **usability principles** (a set of heuristics) 用户被提炼成这个可用性原则 ↑
- **The principles represent the findings from thousands of user studies**
- They have been used for over **30 years**

Nielsen's 10 principles of heuristic evaluation?

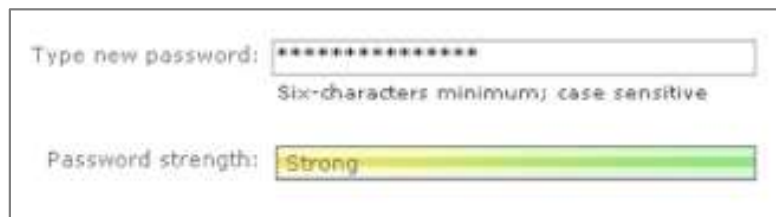
- visibility of system status 可见性
- match between system and real world 匹配现实
- user control and freedom 控制&自由
- consistency and standards 一致性和标准
- error prevention 错误预防
- recognition rather than recall 识别√ 记忆×
- flexibility and efficiency of use 灵活
- aesthetic and minimalist design 美学+极简主义
- help users recognize, diagnose and recover from errors 帮助用户识别、诊断和从错误中恢复
- help and documentation 帮助文档

Nielsen's 10 principles of heuristic evaluation-极简版

- | | |
|---------------------------|---------------------------------|
| • feedback | •flexible use |
| •metaphor | •minimal information |
| •user control and freedom | •error recognition and recovery |
| •consistency | •help |
| •error prevention | |
| •recognition not recall | |

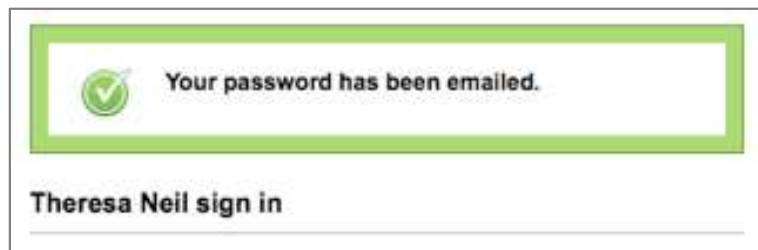
Visibility of system status – feedback 可见性-反馈

- Inform the user about what's going on:
- show **appropriate feedback and progress**当前进展 (✓)
- do not show **blank screens** 空白屏幕 (x)
- do not show **static “load” or progress messages** 静态加载界面 (x)



Microsoft Live

Password strength is **shown** as the password is entered. **Colors** are used to augment the message.



Tick : A **feedback message** is **displayed** when an action is performed

Match between system and real world – metaphor

- There must be a **match** between the system's interface controls and the real world与现实世界相匹配的界面控件
- The system should **speak the users' language**, with words, phrases and concepts **familiar** to the user, rather than system-oriented terms熟悉的语言
- **Follow real-world conventions**, making information appear in a natural and **logical order**遵循现实世界的惯例



iTunes

Organized as a library that contains your media library: music, movies, TV shows, audiobooks. Beneath the Library is the Store where you can buy more media to put in your Library.

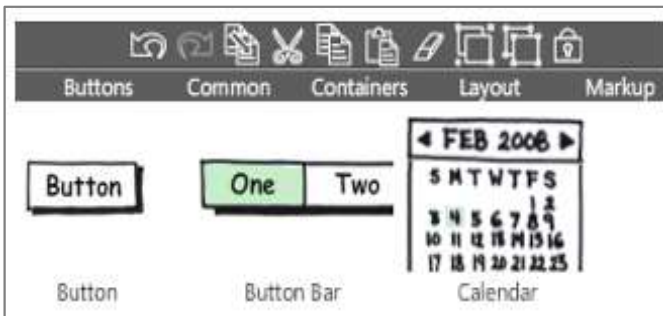
User control and freedom – navigation –导航

- Users often choose system functions by mistake and will need a clearly marked “**emergency exit**” to leave the unwanted state without having to go through an extended dialog.提供清晰标记的“紧急退出”
- Support **undo and redo** and a clear way to navigate.
- Provide **bread crumbs** to clearly show where the user is.面包屑-显示位置



Wufoo

Clearly **marks** where the **person is** and where they can go by showing the selection in each menu



Balsamiq

Undo and Redo buttons

are available in the toolbar, and can also be accessed with the standard keyboard shortcuts

Consistency and standards – 一致性和标准

- Users **should not have to wonder** whether different words, situations, or actions mean the same thing.
- Follow **platform conventions**.
避免混淆 & 遵循平台惯例



Gmail

When Gmail was designed, they based the **organizational folders** on the same ones used in other client email applications: Inbox, Drafts, Sent Mail.



Microsoft Office

Word, Excel, and PowerPoint all use the **same style toolbar** with the **same primary menu options**: Home, Insert, Page Layout.

Error prevention – 错误预防

- Even better than good error messages is a **careful design which prevents a problem** from occurring in the first place.
- Either **eliminate error-prone conditions 消除错误条件** or check for them and present users with a confirmation option before they commit to the action.

Yammer

Disables the update button after it is clicked, so the person cannot update the post twice by accident



Example from “Web form Design:Filling in the Blanks” by Luke W.

Make the primary action prominent with a larger click area. Cancel and other secondary actions are just shown as links



Recognition rather than recall 识别

-**Minimize** the user's memory **load**.

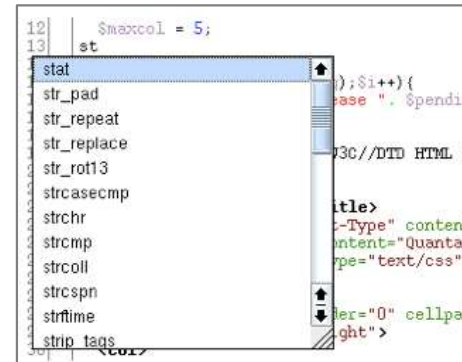
- Make objects, actions, and options **visible**.

-The user should **not have to remember information** from one part of the dialogue to another. 避免用户记忆信息

-**Instructions** for use of the system should be **visible or easily** retrievable whenever appropriate 可见用户说明

Quanta IDE

Auto completion for coding in a development environment



Keynote

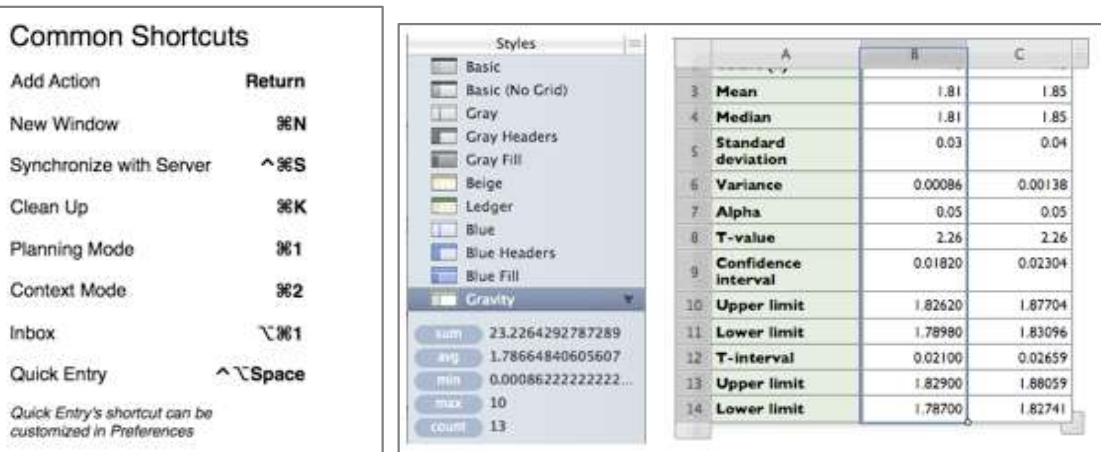
Previews the fonts you can pick from, instead of just the font name



Flexibility and efficiency of use 灵活&使用

Accelerators — unseen by the novice user — may often speed up the interaction for the expert user so that the system can cater to both inexperienced and experienced users 加速器

Allow users to tailor frequent actions 用户定制常规操作



OmniFocus

List of keyboard shortcuts and accelerators

Numbers by Apple

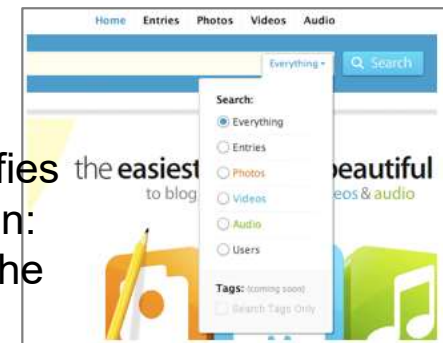
Previews common function **results on the left** when a column is selected, **more efficient** than clicking on an action in the toolbar

Aesthetic and minimalist design 美学&极简主义

- Dialogues **should not contain information** which is **irrelevant** or rarely needed 对话框不应包含不相关或很少需要的信息
- Every **extra unit of information** in a dialogue competes with the relevant units of information and **diminishes their relative visibility** 每个额外的信息单元都会与相关的信息单元竞争，并降低它们的相对可见性
- Visual layout should respect the principles of **contrast, repetition, alignment, and proximity**. 视觉布局应遵循对比、重复、对齐和接近性原则

Kontain's search menu exemplifies the four principles of visual design:

1. Contrast: bold text is used for the two labels in the search
2. Repetition: the orange, blue, and green text match the media types
3. Alignment : strong left alignment of text, right aligned drop down
4. Proximity: a light rule is used to separate tags from the other options



Help users recognise, diagnose and recover from errors

- Help users recognize, diagnose, and recover from errors. 诊断错误

- Error messages should be expressed in plain language (no jargon), precisely indicate the problem, and constructively suggest a solution 从中恢复

Or start a new account

Choose a username (no spaces)

bert

bert is already taken. Please choose a different username.

Choose a password

Passwords must be at least 6 characters and can only contain letters and numbers.

Retype password

Email address (must be real)

not an email

The email provided does not appear to be valid

☒ Send me occasional Digg updates.



Digg

Provides immediate feedback with specific instructions

Humorous 'Page Not Found' Error

Uses a funny image and text, but provides viable alternatives (article listings and blog link) and a course of action (report it)

Help and documentation 帮助文档

- Even though it is better if software can be used without documentation, it may be **necessary to provide help and documentation.**

- Any such information should be **contextual, easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.**



Picnik

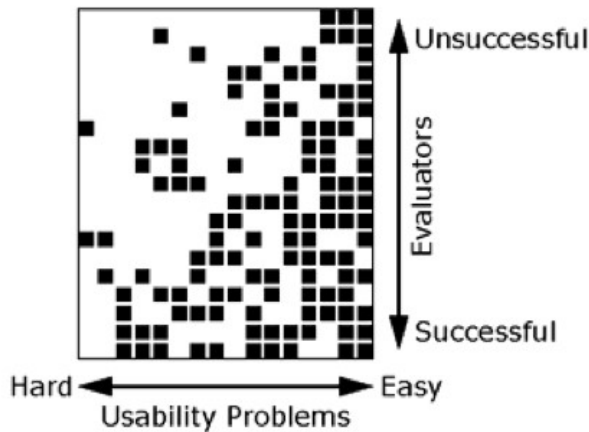
Contextual tips in Picnik are clear and easy to navigate

GoodBarry

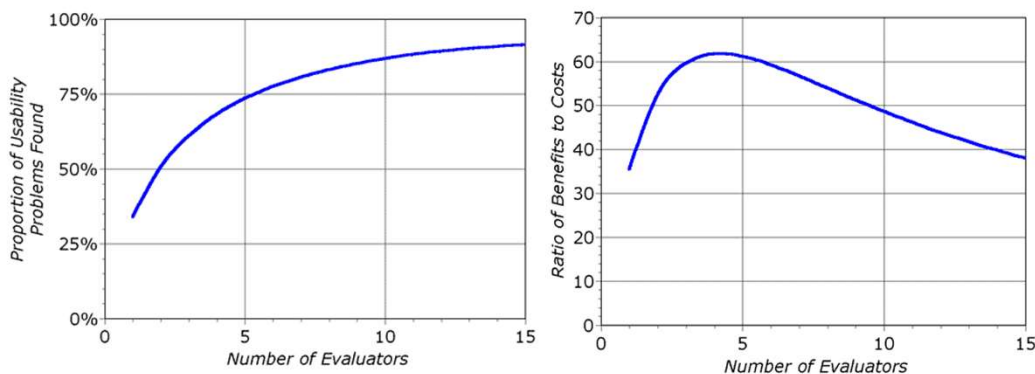
Embedded videos can be used to showcase features as well as get people started using the product



How many **evaluators** are needed for heuristic evaluation? 3~5 人



Practical considerations 实践考虑



How to run a heuristic evaluation 实践启发式评估

- Each of the **3 – 5** evaluators does a heuristic evaluation of an interface alone
- Sometimes a **facilitator can record** the evaluator's comments, sometimes the **evaluator does it**
- A facilitator **can** answer evaluators' questions, in contrast to traditional user testing, particularly if it's not a walk up and use system facilitator 可以回答评估员的问题，这与传统的用户测试不同
- Heuristic evaluation can be done **on paper** prototypes
Heuristic evaluations typically **last 1 – 2 hours**, but it does depend on the complexity of the software
- The expert goes through the interface several times – **first time to get a feel for the system**, second time to focus on **specific elements**
- Evaluators can be given **scenarios that describe typical usage scenarios** (built from a task analysis of users)
- Evaluators **produce a list of usability problems**: the usability principle and the design feature that **violated it**
列出违反可用性原则的列表

Benefits of heuristic evaluation 启发性评估优点

- Cheap
- Relatively easy
- Instant gratification lists of problems are available **immediately** after the inspection
- It can be carried out with **low numbers of participants**
- **Fits in with most software** development processes
- Cost effective

Drawbacks of heuristic evaluation 启发性评估缺点

- **Important issues** may get missed
- Might identify **false issues**
- Many **trivial issues** are often identified, making it seem overly critical
- Experts have **biases**

Review

What is HCI evaluation? 定义

HCI evaluation, or Human-Computer Interaction evaluation, is a process of assessing the usability, effectiveness, and user satisfaction of a computer system, software application, or interface design. The main goal of HCI evaluation is to ensure that the system or interface meets the needs and expectations of its users.

Why is it important 为何HCL重要?

Iterative design, with its repeating cycle of design and testing, is the only validated methodology in existence that will consistently produce successful results. If you don't have user-testing as an integral part of your design process you are going to throw buckets of money down the drain."

The **Think Aloud evaluation** technique - P1右上角, 一共5个步骤

Heuristic evaluation – P2右边