Data Gathering

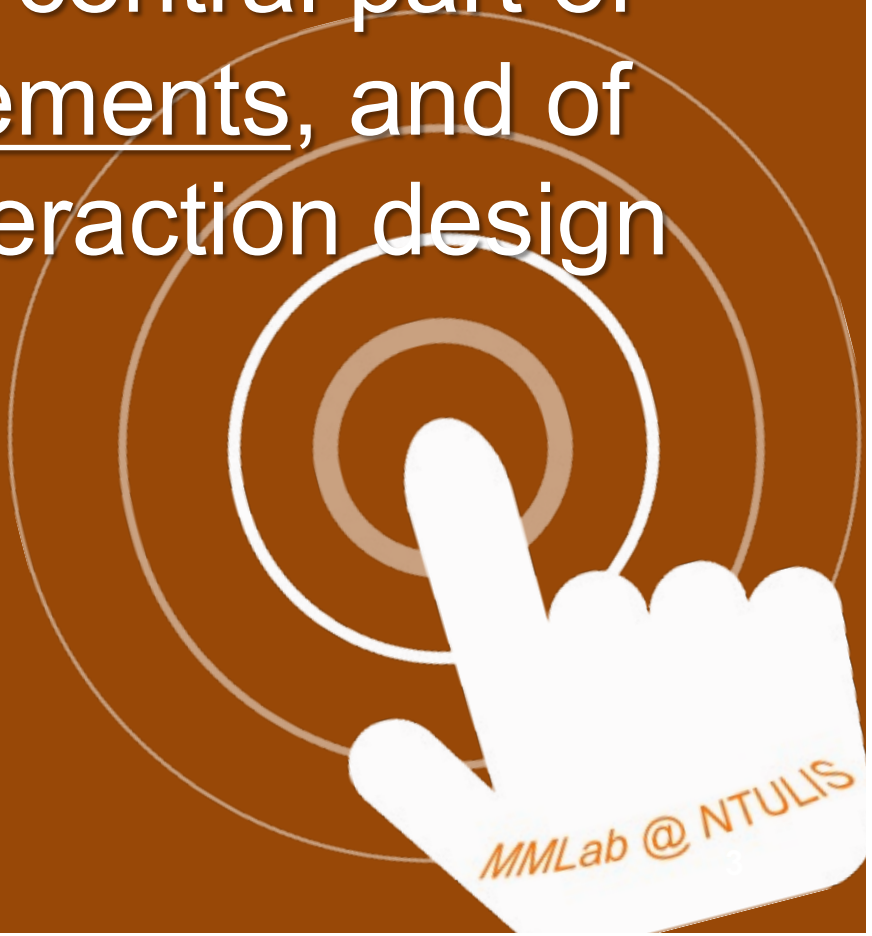
Inspiration

Data collection, analysis, interpretation and presentation

Aims

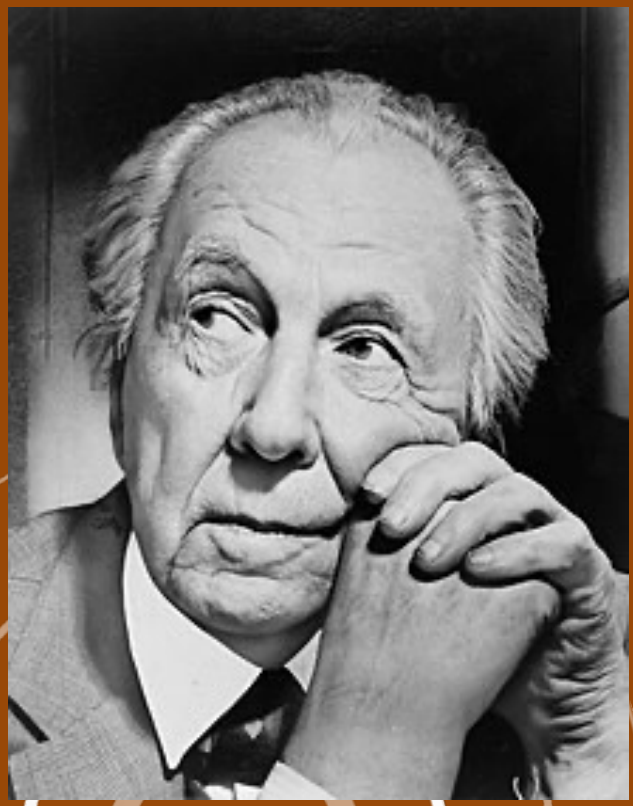
- Understand why data gathering is necessary – **Contextual Inquiry**
- Discuss how to **plan** and run a successful data gathering program.
  - Enables you to plan and run an **interview**.
  - Empowers you to design a simple **questionnaire**.
  - Enables you to plan and carry out an **observation**.

Data gathering is a central part of establishing requirements, and of evaluation in an interaction design project.

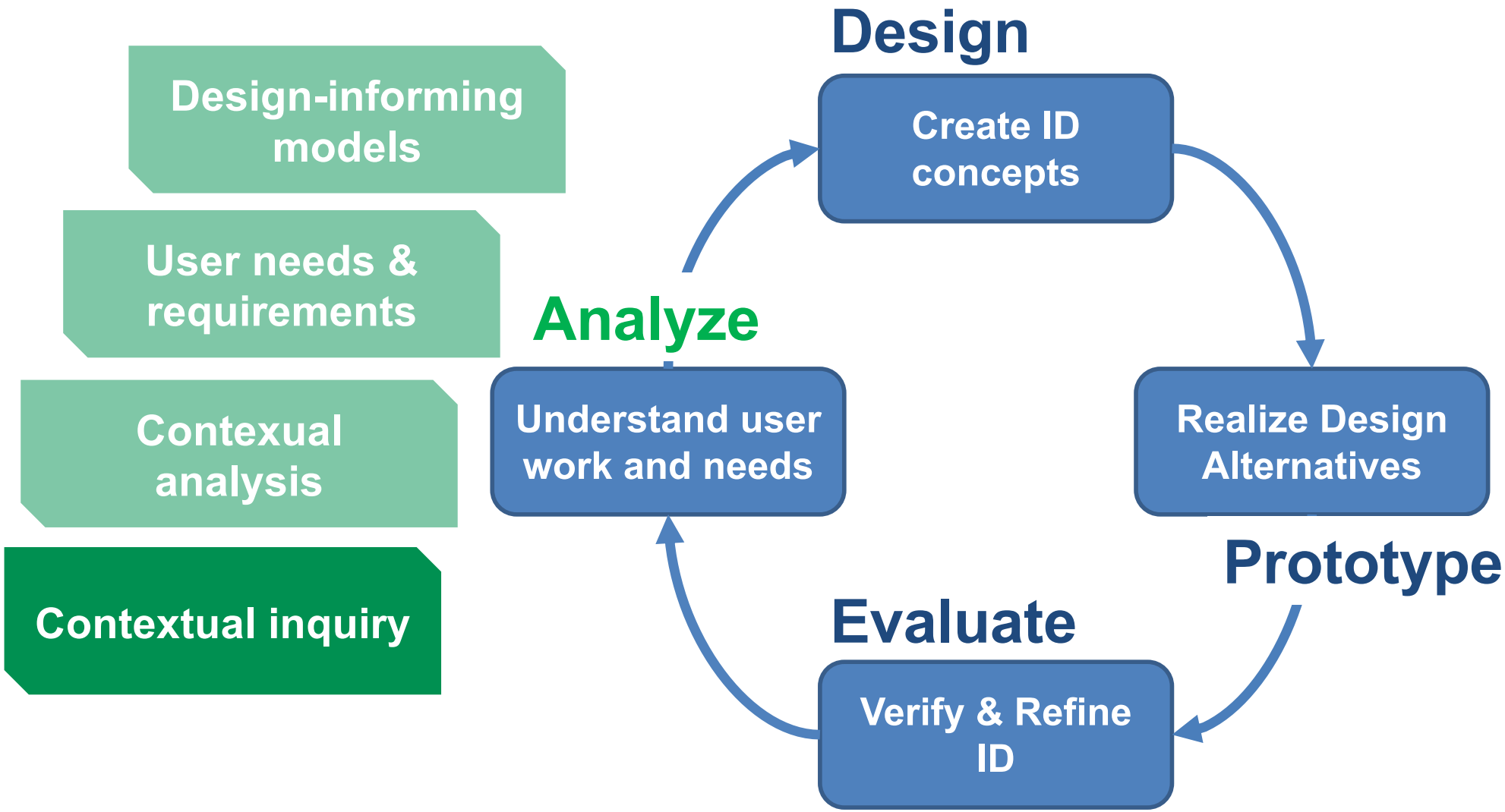


I don't build a house without predicting the end of the present social order. Every building is a missionary. It's their duty to understand, to appreciate, and conform insofar as possible to the idea of the house.

- Frank Lloyd Wright, 1938



ID Process

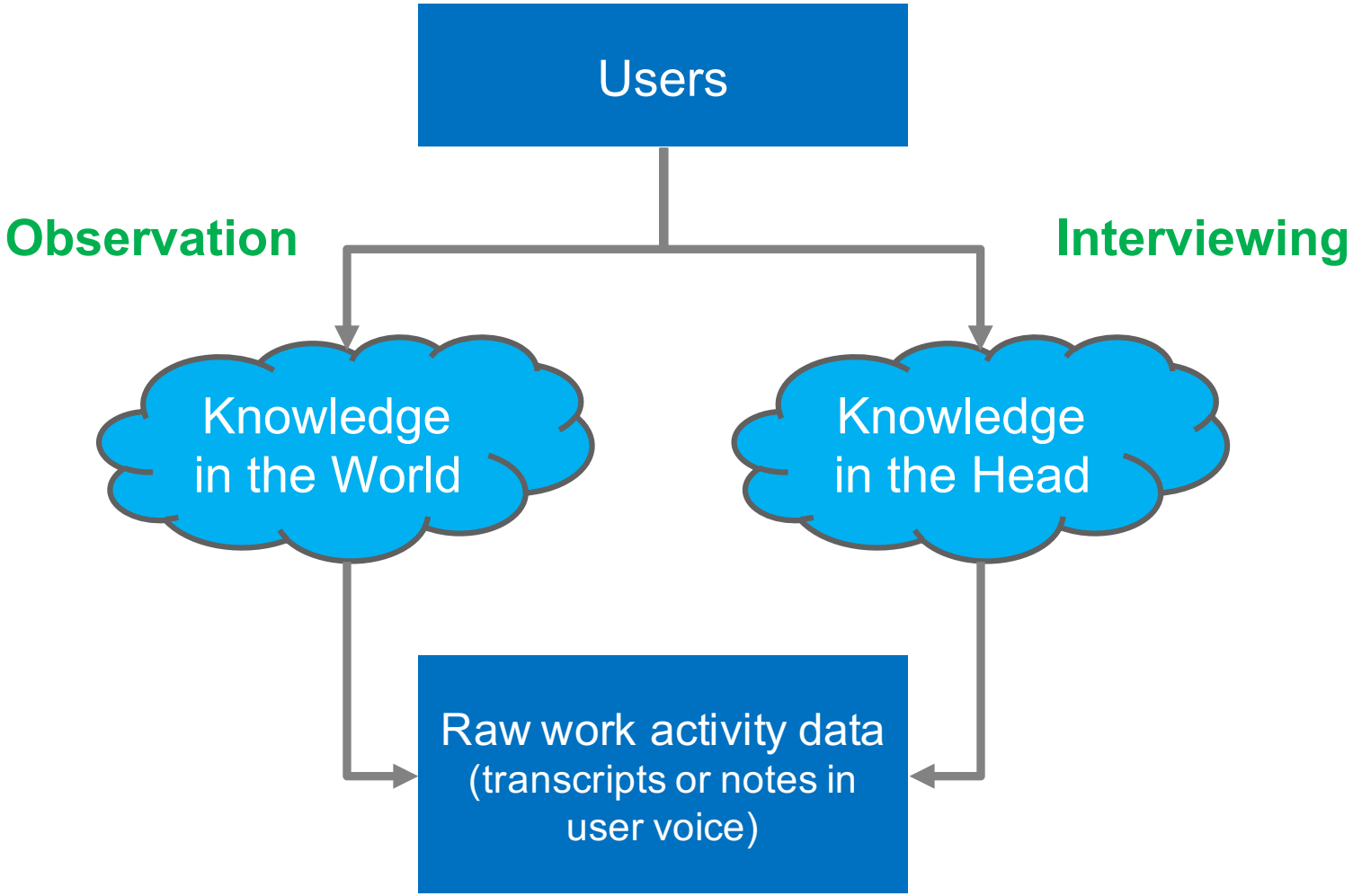

Design-informing models
User needs & requirements
Contexual analysis
Contextual inquiry
Design
Create ID concepts
Realize Design Alternatives
Prototype
Evaluate
Verify & Refine ID
Analyze
Understand user work and needs

脈絡訪查 Contextual Inquiry

- 設計歷程早期的資料蒐集：蒐集**看得見的活動**跟**看不見的背後的道理**
  Contextual inquiry is an **early** system or product UX lifecycle activity to **gather detailed descriptions of customer or user work practice** for the purpose of understanding work activities and underlying rationale.
- 目的是為了（提出）**改善工作表現**（的互動設計）The goal of contextual inquiry is to **improve work practice** and construct and/or improve system designs to support it.
- 包括**訪談**（場域獨立）跟**觀察**（場域依賴）Contextual inquiry includes both **interviews** of customers and users and **observations** of work practice occurring **in its real-world context**.

脈絡訪查 Contextual Inquiry

- 為什麼要到情境中去進行訪查？



觀察什麼 - Work Practice 工作實施（慣例）

- Work practice = 他現在**做什麼**事 (what)
  Work practice is the **pattern** of established actions, approaches, routines, conventions, and procedures followed and observed in the customary performance of a particular job to carry out the operations of an enterprise.
- 養成這個慣例的歷程(來自內外部的影響因子）
  Work practice often involves learned skills, decision making, and physical actions and can be based on tradition, ritualized and habituated

觀察項目 – Work Activity 工作活動(行為)

- Work activity = 他現在**怎麼做**這件事 (How)
  A work activity is comprised of **sensory, cognitive, and physical actions** made by users in the course of carrying out the work practice.

觀察項目（建議）

Structuring framework to guide observation (Robson, 2002)

項目	說明
Space 地	物理空間長什麼樣子、是如何安排配置的
Actors 人	相關的人員是誰（姓名、關係、相關資訊）
Activities 事	上面這些人在做什麼，為什麼這麼做
Objects 物	有哪些物件在現場？ 家具？設備？
Acts 事	特殊的個人的行動有哪些？
Events 事	正在觀察的這個場景，是日常還是特殊狀況？
Time 時	各個活動、事件的順序是怎麼樣的？
Goals 目標	這些人想要達成什麼？
Feelings 感覺	這個團體的情緒是怎麼樣的？ 這些個人的心情如何？

脈絡訪查執行步驟 User Activity Data Gathering

1. **準備與執行田野調查(field visits)：到用戶的使用環境，或是所設計的產品/系統/服務的使用情境中。**
   - 先對該環境相關的社會規範或文化有所認識
   - 認識使用者在該環境中會使用的語言（術語、流行語）
   - 瞭解是否存在人員或組織間的競爭
   - 不同階層的使用者可能會有截然不同的觀點
   - 先認識該環境中已經在使用或過去曾經使用過的相關產品/服務
   - 決定多少人去田野、每次哪些角色的成員去
   - 根據預算與時程，決定田野調查次數、每次參訪人員數量的上限
   - 規劃訪談與觀察策略（誰做什麼事）

脈絡訪查執行步驟 User Activity Data Gathering

2. 觀察與訪談工作/使用中的使用者

- 解釋說明田野調查的需求（我為什麼會想要來訪談或觀察你）
- 解釋田野調查的目的（為了要了解您的OO活動與行為表現）
- 說明脈絡訪查進行的方式（會觀察您在ＯＯ環境中的狀況）
- 取得使用者的許可或同意，才能觀察或訪談
- 建立和睦與彼此信任的關係（例如承諾資料匿名與資料用途）
- 時機的討論：什麼樣的使用者在什麼時間做什麼事
- 設定範圍：解釋說明想觀察的是廣泛的使用者與活動，但會聚焦在一些代表性的行為表現或任務上。
- 時程的預估與設定：一次去可以停留多少時間、多久去一次、每次訪談多少人等

脈絡訪查執行步驟
User Activity Data Gathering

3. **探索每個使用者的任務架構**
   - 直接用戶 Direct users
   - 間接用戶 Indirect users
4. **瞭解人們的行為表現/工作表現**
   - 佈置對的情境：訪談的環境、人員和情境，應該盡可能貼近平常的使用環境、使用狀況。

脈絡訪查執行步驟
User Activity Data Gathering

5. **記錄要大量且詳細，透過訪談與觀察，盡量完整收集使用者各種活動的原始資料**

- 準備你的資料箱/資料夾：記錄筆記編號分堆與管理入藏，方便之後各項記錄的對照。每一個資料箱可以對應不同的資料項目，或是脈絡訪查的主題（例如：以訪談、觀察、文書資料之資料項目區分；或以導入階段、實施前期、更新系統等脈絡訪查主題區分）

資料收集注意事項 How to Proceed

1. 捕捉使用者的使用資料是我們的工作，不要期待使用者必須告訴你，他們想要什麼或需要什麼，雖然在過程中使用者可能提供一些設計或功能的建議，但不應期待使用者來做設計。
2. 脈絡訪查是有關使用者如何使用以及他們的經驗與感受。設計團隊在完成脈絡訪查，對使用者經驗更深入具體的了解之後，再來解析需求。

資料收集注意事項 How to Proceed

2. **脈絡訪查是有關使用者如何使用以及他們的經驗與感受。設計團隊在完成脈絡訪查，對使用者經驗更深入具體的了解之後，再來解析需求。**

- 當一個好聽眾：在大部分的狀況下，不要一直說你自己覺得使用者可能需要什麼
- 不要引導使用者，或介紹你自己的觀點
- 不要期待每個使用者對於工作有相同的觀點：針對不同點深入追問，藉由交叉的徵集參照，找到共通的事實
- 立刻記錄：觀察到任何細節，在那個當下就記錄下來，不要等到事後回憶。
- 做一個好的資料偵探：跟著使用者，發現、萃取、挖掘與收集各種線索。隨時能夠調適、修正、探索與聯想。

Data Gathering

- **Interview**
- **Observation**
- **Questionnaire**

Purpose of Data Gathering

- To collect data for establishing requirements
  - **充分 Sufficient** (for your design idea)
  - **正確 Accurate** / Precise / Real
  - **相關 Relevant** (to your design idea)
- To capture data for evaluation (To what extent does the design meet the requirements)
  - **Users' reactions 反應**
  - **Users' performance 表現**

Five key issues of Data Collection

1. Setting **Goals**
   - Decide how to analyze data once collected
2. Identifying **Participants**
   - *Population* and *Sampling*
   - Decide from whom to gather data
3. Relationship with participants
   - Clear and professional
   - Informed consent when appropriate
4. **Triangulation**
   - Look at data from more than one perspective
   - Collect more than one type of data (quant / quali)
5. **Pilot** studies
   - Small trial of main study

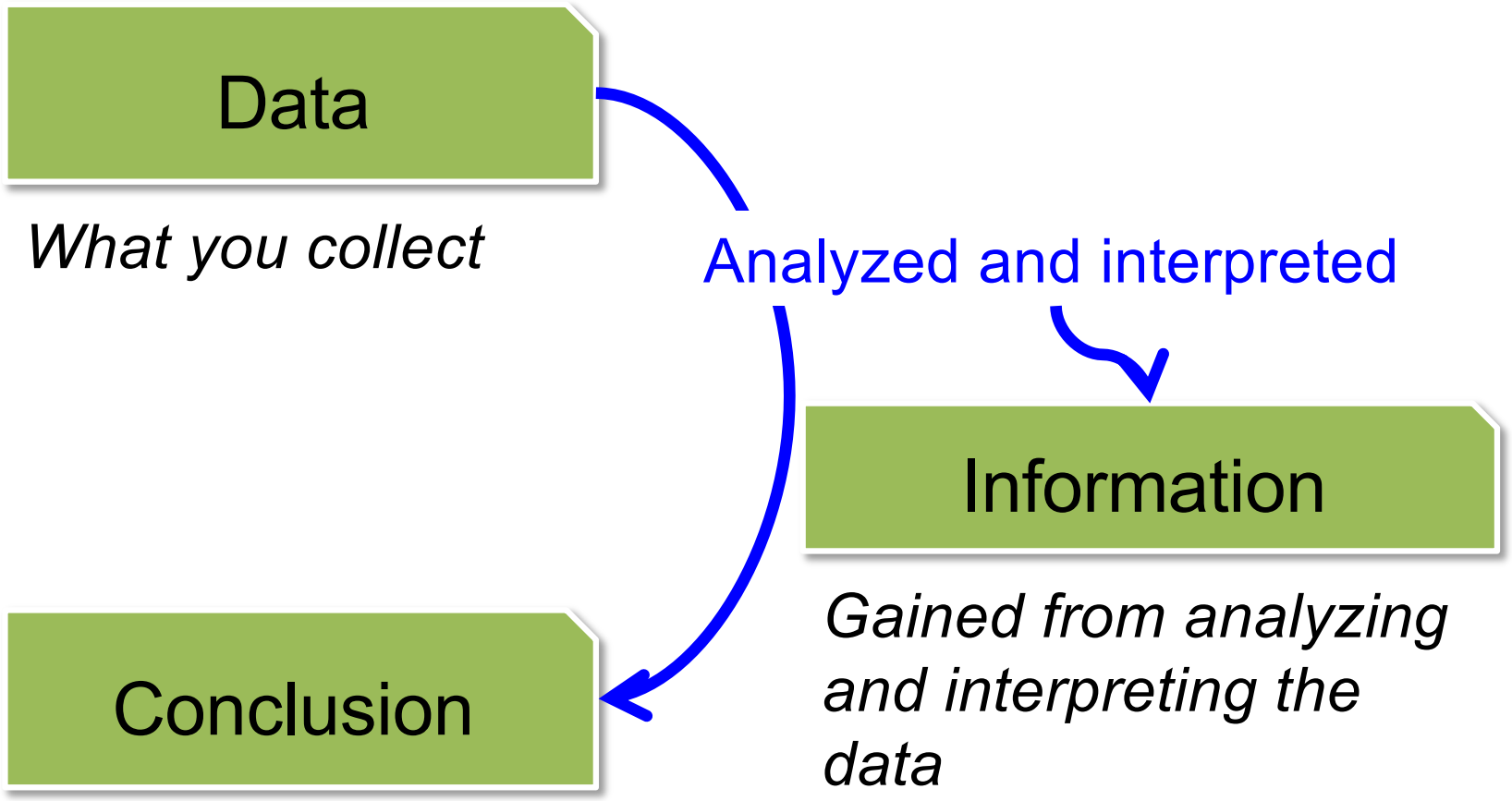
Sampling

- **Probability sampling（機率取樣）**
  - Random sampling（隨機取樣） or stratified sampling（分層取樣）
  - Apply statistical tests and generalize to the whole population
- **Non-probability sampling（非隨機取樣）**
  - Convenience sampling(便利取樣) or volunteer panels（自願者名單）
  - Generalizations are not robust
- **Saturation Sampling (浸透抽樣）**
  - You have access to all members of your target population

Triangulation

- **Triangulation of data**
  - Data is drawn from different sources (at different times, in different places or from different people)
  - Possibly by different sampling techniques
- **Investigator triangulation**
  - Different researchers (observers, interviewers…) to collect and interpret the data
- **Triangulation of theories**
  - Use different theoretical frameworks to view the data or findings
- **Methodological triangulation**
  - Employ different data gathering techniques

Data, Information and Conclusions



Data Gathering Techniques

- Observation
  - Direct observation in the field
  - Direct observation in a controlled environment
  - Indirect observation
- Interview
  - One-on-one interview
  - Focus group
- Survey
  - Questionnaires

Data recording

Notes, audio, video, and photographs can be used individually or in combination:

- Notes + photographs
- Audio + photographs
- Video

- *Level of detail collected*
- *Extent of intrusive*

Interviews

在你去訪談之前…

- 先計畫要去哪裡(sites)？訪談誰(people)？
- 準備工作
  1. 訪談的目的
  2. 訪談問題/大綱
     - **你的主要問題有哪些 (guiding questions)？**
       - 準備好問題列表、或架構圖
     - **你的訪談問題有哪些 (tailoring questions)？**
       - 用多重的tailoring questions去引導出guiding questions想獲得的答案
  3. 聯繫訪談機會（確保收到回覆）
  4. 檢查清單 Checklist for the interview
     - 如果沒有準備好，漏掉一次就沒有回來的機會了

要開始訪談前...

- 進行訪談
  - 訪談是一個有目的性的對話，不是一般的閒聊
- 受訪者
  - 一次性訪談還是長期的聯絡？
  - 建立關係, 認識彼此, 讓受訪者感到自在

訪談中...

- 過程
  1. 通常先簡短閒聊，為了讓彼此感到自在，也瞭解周遭環境，帶入後面訪談的主題
  2. 告知受訪者你的目的，知情同意
  3. 進行訪談對話

好的訪談：受訪者感覺輕鬆自在、暢談觀點

訪談中: 訪問者的角色

- 溝通個人的興趣（你想多了解的事情）
- 問明情況（確認、澄清）
  - 不要表示自己的意見，只是表示傾聽和支持。但不是肯定或反對，不要幫受訪者下結論。
  - 要讓受訪者說他自己的意見看法
- 不要怕安靜 >_<
- 不要太早放棄受訪者
- 專注傾聽
- 使用相片、材料來鼓勵對話
  - 如果受訪者很不健談，可以提選項讓他選擇或引導他說出看法
- 注意意識形態或政治立場的可能衝突
  - 不要顯示政治立場、宗教等。不要問Yes/No的問題

訪談中：記錄

- 錄音/錄影
  - 事前準備：足夠的儲存空間、電池、編號日期跟受訪者、決定訪談時間長度
    - 先貼好note, 時間地點
  - 沒有取得同意前絕對不能錄
  - 如果受訪者不希望錄，必須尊重
  - 注意訪談中有沒有干擾。注意蛛絲馬跡
  - 別忘了「筆」記。即便有在錄也做筆記

訪談中...

- 有彈性、有耐心
  - 受訪者講太長時，要適當地抓其中重點，再換句話說，把他拉回來。
- 面對面訪談 vs. 電話訪談

訪談後...

- 謝卡
  - Email, 小卡片
- 謄稿
  - 大綱、逐字稿、語氣
- 研究倫理
  - 注意受訪者隱私，維護自己對受訪者的承諾
- 交叉 triangulation
  - 交叉比對，確認各種說法
- Going back for more 再訪
  - 若有遺漏，或想到其他問題，要再回去訪問

Interviews

Conversation with a Purpose

- **Unstructured** (open-ended) – are not directed by a script. Rich but not replicable.
- **Structured** - are tightly scripted, often like a questionnaire. Replicable but may lack richness.
- **Semi-structured** - guided by a script but interesting issues can be explored in more depth. Can provide a good balance between richness and replicability.
- **Focus Groups** –participants (3-10) are selected to provide a representative sample of the target population

Question Examples

- Unstructured
  - What are the advantages of using a touch screen?
- Structured
  - Which of the following websites do you visit most frequently: amazon.com, barnes&noble.com, google.com?
- Semi-structured
  - Which music websites do you visit most frequently?

  <Answer: mentions several but stresses the favorite>
  - Why? <Answers: site layout>
  - Tell me more about the site interface

Interview questions

- Two types:
  1. Closed questions: have a predetermined answer format, e.g., ‘yes’ or ‘no’
  2. Open questions: do not have a predetermined format
- Ask **open-ended questions** that encourage participants to elaborate. *e.g. who, what, where, when, why and how questions are particularly useful?*
- Clarify understanding by **paraphrasing** what the participant says

Interview questions

✗ Avoid

- ✗ Long questions
- ✗ Compound sentences - split them into two
- ✗ Jargon and language that the interviewee may not understand
- ✗ Leading questions that make assumptions, or distort responses. e.g., ~~*What's wrong with our websites?*~~
- ✗ Unconscious biases e.g., gender stereotypes

Goal-oriented questions

Focus	Question examples
Goals	What makes a good day? What makes a bad day?
Opportunity	What activities currently waste your time?
Priorities	What is most important to you?
Information	What helps you make decisions?

(Cooper, Reimann, Cronin & Noessel, 2014)

System-oriented questions

Focus	Question examples
Functions	What are the most common things you do with the product?
Frequency	What parts of the product do you use most?
Preference	What are your favorite aspects of the product? What drives you crazy
Failure	How do you work around problems
Expertise	What shortcuts do you employ?

(Cooper, Reimann, Cronin & Noessel, 2014)

Work flow-oriented questions

Focus	Question examples
Process	What did you do when you first came in today? What did you do after that?
Occurrence & recurrence	How often do you do this? What things do you do weekly or monthly, but not every day?
Exceptions	What constitutes a typical day? What would be an unusual event?

(Cooper, Reimann, Cronin & Noessel, 2014)

Attitude-oriented questions

Focus	Question examples
Aspiration	What do you see yourself doing five years from now?
Avoidance	What would you prefer not to do? What do you procrastinate on?
Motivation	What do you enjoy most about your job/lifestyle? What do you always tackle first?

(Cooper, Reimann, Cronin & Noessel, 2014)

Running the interview

- **Introduction** – introduce yourself, explain the goals of the interview, reassure about the ethical issues, ask to record, present any informed consent form.
- **Warm-up** – make first questions easy and non-threatening.
- **Main body** – present questions in a logical order
- **A cool-off period** – include a few easy questions to defuse tension at the end
- **Closure** – thank interviewee, signal the end, e.g, switch recorder off.

Enriching the interview process

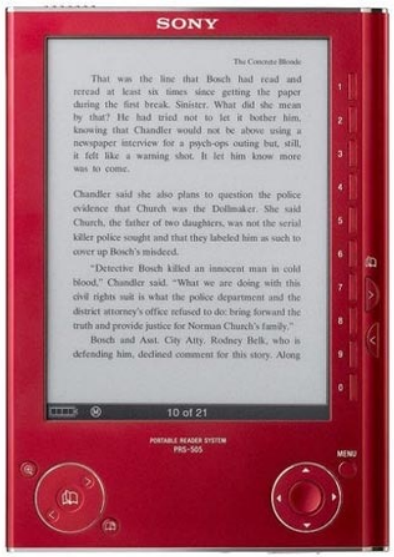
Props - devices for prompting interviewee, e.g., a prototype, scenario

- **數位影像記錄**：捕捉與記錄物理空間環境、設備、使用情境中的使用者，以及任何可以傳達使用情境的視覺資料
- **繪製流程、角色、關係圖表**：根據資料快速繪製，並可讓使用者/受訪者確認
- **繪製物理空間配置**：人員的位置、動線、家具、器材、通訊設備等
- **量化資料**：使用情境的統計概況資料（例如：多少人員、每天使用時間、產出）

Conversation Starters

http://www.designkit.org/methods/44

EXAMPLE



- Semi-structured interview questions
  - Closed questions
    - Have you used an e-reader before?
    - Would you like to read a book using an e-device?
    - In your opinion, is the e-reader easy to handle?

Semi-structured interview questions

1. Have you used an e-reader before? (Explore previous knowledge)

   ☐Yes ☐No ☐Don't remember/know

2. Would you like to read a book using an e-reader? (Explore initial reaction, then explore the response)

   ☐Yes ☐No ☐Don't know

3. Why?

Semi-structured interview questions

3. Why?

If response is ‘Yes’ or ‘No’, interviewer says ‘Which of the following statement represents your feelings best?’

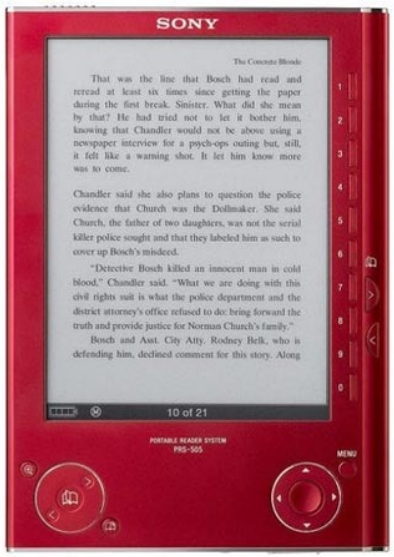
- ☐ I don’t like carrying heavy books
- ☐ This is fun/cool
- ☐ It’s going to be the way of the future
- ☐ Another reason (notes)
- ☐ I don’t like using gadgets if I can avoid it
- ☐ I can’t read the screen clearly
- ☐ I prefer the feel of paper
- ☐ Another reason (notes)

Semi-structured interview questions

4. In your opinion, is an e-reader easy to handle or cumbersome?

- ☐ Easy to handle
- ☐ Cumbersome
- ☐ Neither (notes)

EXAMPLE



- Semi-structured interview questions
  - Open questions
    - What do you like most about the e-reader, Why?
    - What do you like least about the e-reader, Why?
    - Give me an example where the e-reader was uncomfortable or difficult to use.

Other forms of interviews

- Digital conferencing systems such as Skype, Zoom, email, and smartphones can be used to conduct interviews. Some advantages are:
  - Participants are in their own environment so are more relaxed
  - Participants don’t need to travel
  - Participants don’t need to worry about what to wear
  - For interviews involving sensitive issues, it is easier for interviewees to be anonymous

資料收集注意事項 How to Proceed

- 哪些問題不要問？
  - 不要問有關「未來」的問題：不要問使用者他們在給定的假設情境之下會怎麼做。因為答案可能不會反應現實（真的遇到了他們不會那樣做）
  - 不要問對「設計」的建議：不要問使用者他們會如何設計某個功能或機制。使用者不是設計師，也不一定具備設計思考的心態。詢問使用者對設計的建議，答案很可能脫離原本規劃，使用者的答案可能對他本身目前的狀態有效，但無法適應其他使用情境。
  - 不要一邊問問題一邊暗示使用者你的想法：你把一個想法放到使用者的腦海裡，他可能會給你他認為你期待的回答。使用者對於他的所有行動、行為，通常並不會以理論或是邏輯架構來考慮。

Observation

Observation

- Direct observation in the field
  - Structuring frameworks
  - Degree of participation (insider or outsider)
  - Ethnography
- Direct observation in controlled environments
- Indirect observation: tracking users' activities
  - Diaries
  - Interaction logging
  - Video and photographs collected remotely by drones or other equipment
  - Experience sampling method (ESM)

Structuring frameworks to guide observation

- The person: Who is using the technology at any particular time?
- The place: Where are they using it?
- The thing: What are they doing with it?

Structuring frameworks to guide observation

(Robson, 2002)

- Space: What is the physical space like and how is it laid out?
- Actors: What are the names and relevant details of the people involved?
- Activities: What are the actors doing and why?
- Objects: What physical objects are present, such as furniture?
- Acts: What are specific individual actions?
- Events: Is what you observe part of a special event?
- Time: What is the sequence of events?
- Goals: What are the actors trying to accomplish?
- Feelings: What is the mood of the group and of individuals?

Fieldwork Chart

01 FIELDWORK CHART

Date ____/____/____

Name _____

Photo

照片、圖片

Space

空間

Locative Element

定位元素

Objects

物體

Sensations

感覺、情緒

Description

情節、使用狀況

Planning and conducting observation in the field

- Decide on how involved you will be: from passive observer to active participant
- How to gain acceptance
- How to handle sensitive topics, for example, culture, private spaces, and so on
- How to collect the data:
  - What data to collect
  - What equipment to use
  - When to stop observing

Problematizing existing settings

- 值得注意的活動：Why is an observation about a work practice or other activity striking?
- 既有優劣勢：What are the pros and cons of the existing ways technologies are used in a setting?
- 既有變通替代方案：How have "workarounds" evolved and how effective are they?
- 沒有被淘汰的？Why do certain old-fashioned practices, using seemingly antiquated technologies persist, despite more advanced technologies being available in the setting?

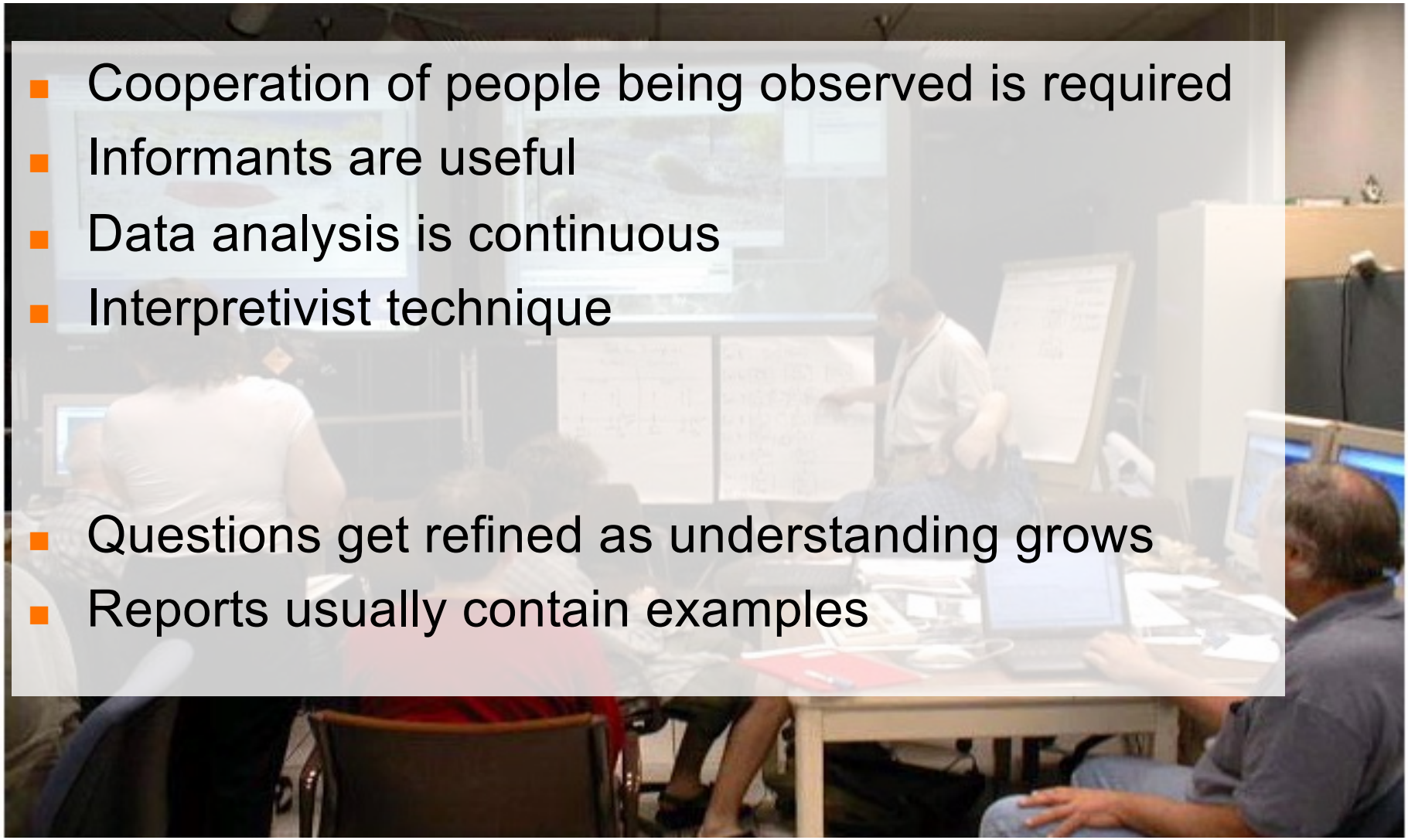
Envisioning future settings

- **採用後優劣勢：**What would be gained and lost through changing current ways of working or carrying out an activity by introducing new kinds of technological support?
- **連鎖效應：**What might be the knock-on effects for other practices and activities through introducing new technologies?
- **其他可應用/受影響場域：**How might other setting be enhanced and disrupted through deploying the same kinds of future technologies?

Ethnography

- Ethnography is a philosophy with **a set of techniques** that include participant observation and interviews
- Debate about differences between participant observation and ethnography
  - Ethnographers immerse themselves in the culture that they study
  - A researcher's degree of participation can vary along a scale from 'outside' to 'inside'
- Analyzing video and data logs can be time-consuming
- Collections of comments, incidents, and artifacts are made

Ethnography



- Cooperation of people being observed is required
- Informants are useful
- Data analysis is continuous
- Interpretivist technique

- Questions get refined as understanding grows
- Reports usually contain examples

Online Ethnography

- Virtual, Online, Netnography
- Online and offline activity
- Interaction online differs from face-to-face
- Virtual worlds have a persistence that physical worlds do not have
- Ethical considerations and presentation issues are different

Observations and materials that might be collected (Crabtree, 2003)

- Activity or job descriptions
- Rules and procedures that govern particular activities
- Descriptions of activities observed
- Recordings of the talk taking place between parties
- Informal interviews with participants explaining the detail of observed activities
- Diagrams of the physical layout, including the position of artifacts
- Other information collected when observing activities:
  - Photographs of artifacts (documents, diagrams, forms, computers, and so forth)
  - Videos of artifacts
  - Descriptions of artifacts
  - Workflow diagrams showing the sequential order of tasks
  - Process maps showing connections between activities

Observation in a controlled environment

- Direct Observation
  - Think-aloud technique
- Indirect Observation
  - Diaries
  - Interaction Logs
  - Web Analytics

Questionnaires

Questionnaires

- Questions can be closed or open
- Closed questions are easier to analyze, and may be done by computer
- Can be administered to **large populations**
- Paper, email and the web used for dissemination
- Sampling can be a problem when the size of a population is unknown as is common online

Questionnaire design

- The impact of a question can be influenced by **question order**.
- Do you need **different versions** of the questionnaire for different populations?
- Provide clear **instructions** on how to complete the questionnaire.
- Strike a balance between using white space and keeping the questionnaire compact.
- Decide on whether phrases will all be positive, all negative or mixed. (be consistent)

Question and response format

- ‘Yes’ and ‘No’ checkboxes
- Checkboxes that offer many options
- Rating scales
  - Likert scales
  - semantic scales
  - 3, 5, 7 or more points?
- Open-ended responses

Rating Scales

- Likert scales
  - Measuring opinions, attitudes, beliefs, and user satisfaction with products

1. The use of the color is excellent (where 1=strongly disagree, and 5=strongly agree):

1	2	3	4	5
☐	☐	☐	☐	☐
Strongly agree	Agree	OK	Disagree	Strongly disagree
☐	☐	☐	☐	☐

Rating Scales

- Semantic Differential Scale
  - Explore a range of bipolar attitudes about a particular item.
  - Each pair of attitudes is represented as a pair of adjectives.

Attractive	|- - - -|- - - -|- - - -|- - - -|- - - -|- - - -|	Ugly
Clear	|- - - -|- - - -|- - - -|- - - -|- - - -|- - - -|	Confusing
Dull	|- - - -|- - - -|- - - -|- - - -|- - - -|- - - -|	Colorful
Exciting	|- - - -|- - - -|- - - -|- - - -|- - - -|- - - -|	Boring
Annoying	|- - - -|- - - -|- - - -|- - - -|- - - -|- - - -|	Pleasing
Helpful	|- - - -|- - - -|- - - -|- - - -|- - - -|- - - -|	Unhelpful
Poor	|- - - -|- - - -|- - - -|- - - -|- - - -|- - - -|	Well designed

Long or short scales…

- Arguments remain
  - Advocates of long scales (5, 7 and more)
    - Show discrimination
  - Against
    - People cannot be expected to discern accurately among points on a large scale
    - Any scale more than five points is unnecessarily difficult to use

Odd or Even scales…

- Arguments remain
  - Odd (3, 5, 7)
    - A clear central point
  - Even (4, 6, 8)
    - Forces participants to make a decision and prevents them from sitting on the fence

Scales

- Use a small number when the possibilities are very limited

  ☐Yes ☐No ☐Don't know

- Use a medium-sized range when making judgments that involve like/dislike, agree/disagree statements

Strongly Agree	Agree	OK	Disagree	Strongly disagree
☐	☐	☐	☐	☐

- Use a longer range when asking respondents to make subtle judgments, eg. Level of appeal

Very Appealing |- - - -|- - - -|- - - -|- - - -|- - - -|- - - -| Repulsive

OK

2. State your age in years: ☐

3. How long have you used the Internet?
(check one only)

- ☐ <1 year
- ☐ 1-3 years
- ☐ 3-5 years
- ☐ >5 years

4. Do you use the Web to:

- ☐ Purchase goods
- ☐ Send emails
- ☐ Visit chatrooms
- ☐ Use bulletin boards
- ☐ Find information
- ☐ Read the news

5. How useful is the Internet to you?

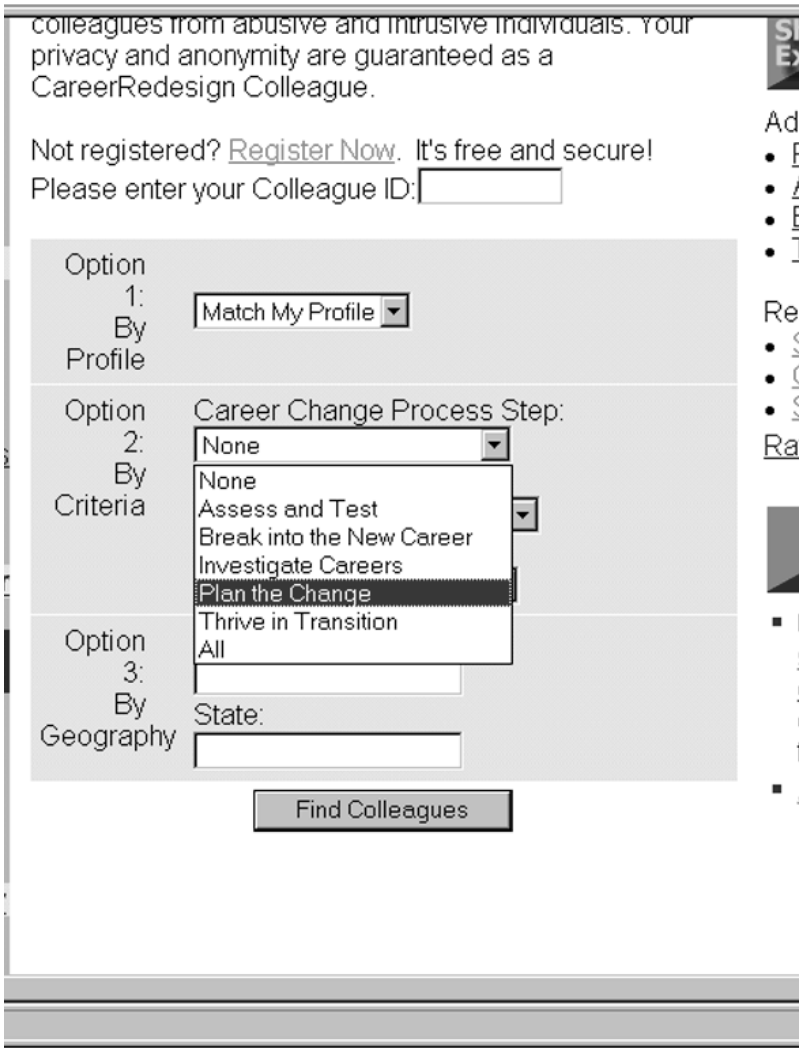
_____

_____

Encouraging a good response

- Make sure purpose of study is clear
- Promise **Anonymity**
- Ensure questionnaire is well designed
- Offer a short version for those who do not have time to complete a long questionnaire
- If mailed, include a stamped addressed envelope
- Follow-up with emails, phone calls, letters
- Provide an incentive
- 40% response rate is high, 20% is often acceptable

Advantages of online questionnaires



- Relatively easy and quick to distribute
- Responses are usually received quickly
- No copying and postage costs
- Data can be collected in database for analysis
- Time required for data analysis is reduced
- Errors can be corrected easily

Problems with online questionnaires

- Sampling is problematic if population size is unknown
- Preventing individuals from responding more than once
- Individuals have also been known to change questions in email questionnaires

Deploying online questionnaires

- Plan the timeline
- Design offline
- Program/complete online template
- Test the survey to make sure that it behaves as you would expect
- Test it with a group that will not be part of the survey to check that the questions are clear
- Recruit participants

Choosing and Combining Techniques

Technique	Good for	Data	Pros	Cons
Interviews	Exploring issues	Mostly qualitative	Interviewer can guide interviewee if necessary. Encourages contact between developers and users.	Time-consuming. Artificial environment may intimidate interviewee.
Focus group	Collecting multiple viewpoints	Mostly qualitative	Highlights areas of consensus and conflict. Encourages contact between developers and users.	Possibility of dominant characters
Questionnaires	Answering specific questions	Quantitative and qualitative	Can reach many people with low resource	The design is crucial. Response rate may be low. Responses may not be what you want.
Direct observation in the field	Understanding context of user activity	Mostly qualitative	Observing actual work gives insights that other techniques cannot give.	Very time-consuming. Huge amounts of data.
Direct observation in a controlled environment	Capturing the detail of what individuals do	Quantitative and qualitative	Can focus on the details of a task without interruption	Results may have limited use in the normal environment because the conditions were artificial.
Indirect observation	Observing users without disturbing their activity; data captured automatically	Quantitative (logging) and qualitative (diary)	Users doesn't get distracted by the data gathering; automatic recording means that it can extend over long periods of time	A large amount of quantitative data needs tool support to analyze (logging); participants memories may exaggerate (diary)

Available at https://ceiba.ntu.edu.tw/1102LIS5066_HCI/content/w8_handout_DataTech.pdf

Data processing

Technique	Usual raw data	Example qualitative data	Example quantitative data	Initial processing steps
Interviews	Audio recordings. Interviewer notes. Video recordings.	Responses to open questions. Video pictures. Respondent's opinions.	Age, job role, years of experience. Responses to closed questions.	Transcription of recordings. Expansion of notes.
Questionnaires	Written responses. Online database.	Responses to open questions. Responses in 'further comments' fields. Respondent's opinions.	Age, job role, years of experience. Responses to closed questions.	Clean up data. Filter into different data sets.
Observations	Observer's notes. Photographs. Audio and video recordings. Data logs. Think-aloud	Records of behavior. Description of a task as it is undertaken. Copies of informal procedures.	Demographics of participants. Time spent on a task. The number of people involved in an activity.	Expansion of notes. Transcription of recordings. Synchronization between data recordings.

Available at https://ceiba.ntu.edu.tw/1102LIS5066_HCI/content/w8_handout_DataTech.pdf

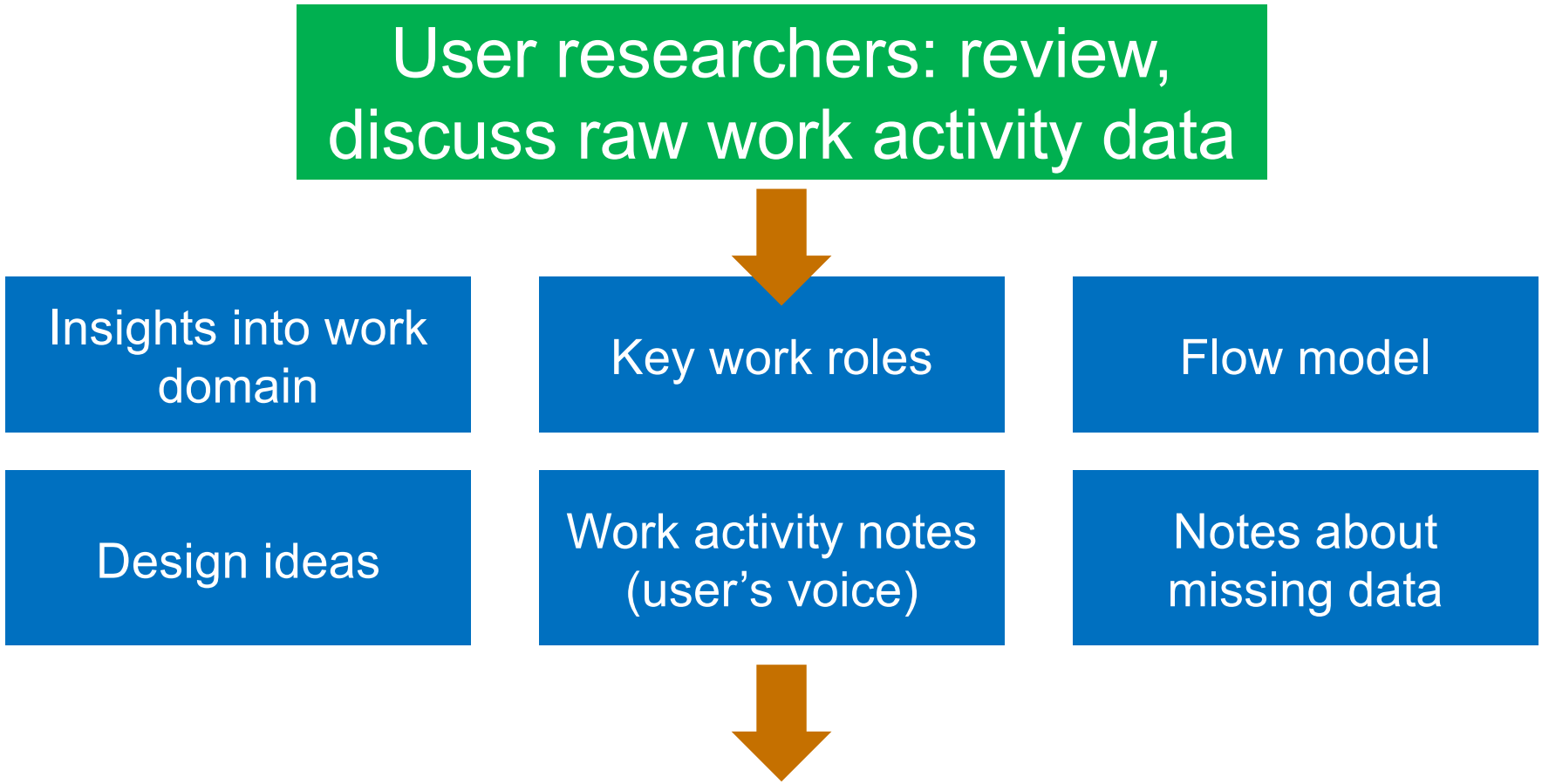
Summary

- Three main data gathering methods: interviews, questionnaires, observation
- Five key issues of data gathering: goals, choosing participants, triangulation, participant relationship, pilot
- Interviews may be structured, semi-structured or unstructured
- Questionnaires may be on paper, online or telephone
- Observation may be direct or indirect, in the field or in controlled setting
- Techniques can be combined depending on study focus, participants, nature of technique and available resources

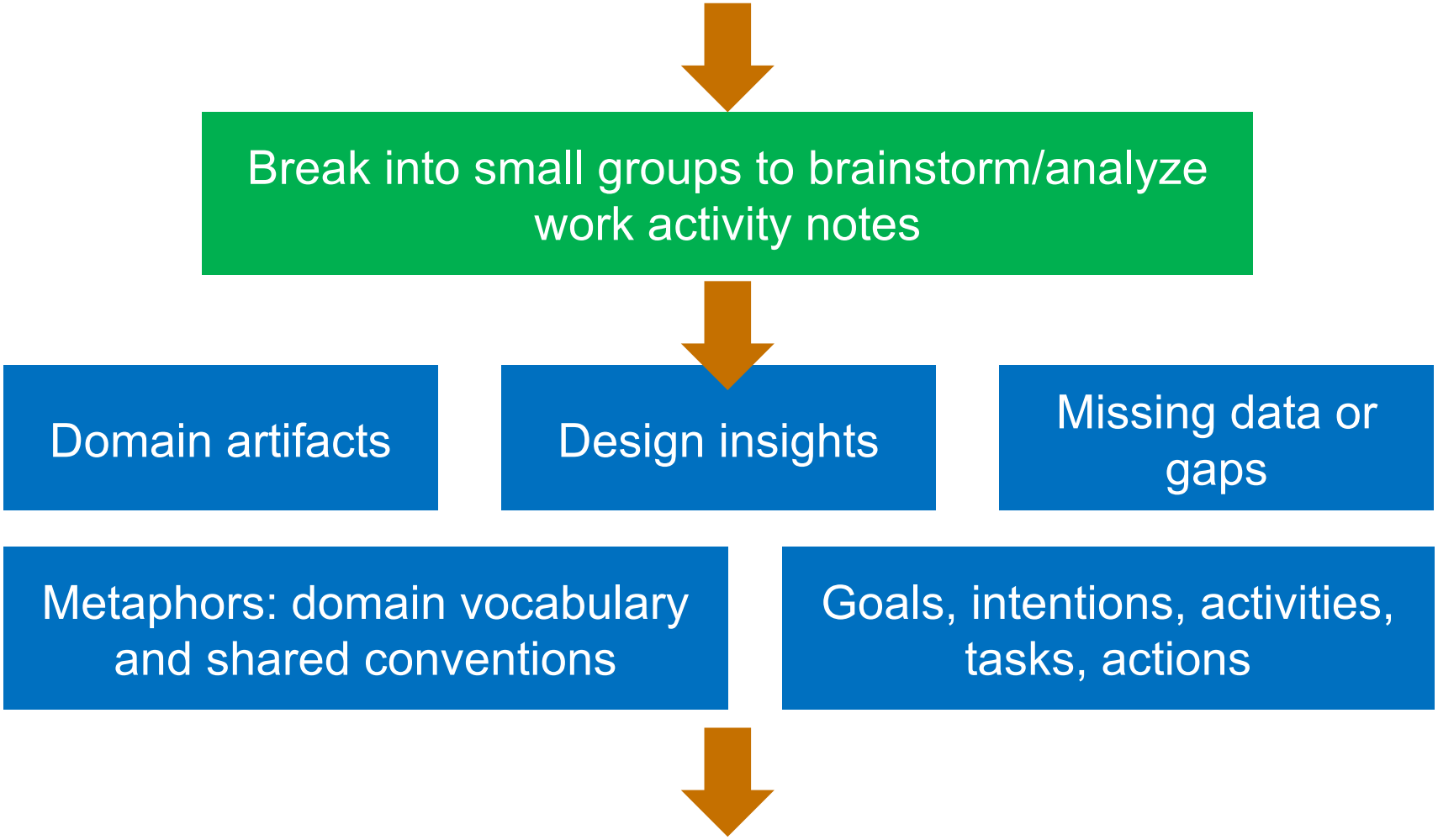
資料分析

資料蒐集了，然後呢...

脈絡訪查資料解析 Data interpretation



脈絡訪查資料解析 Data interpretation



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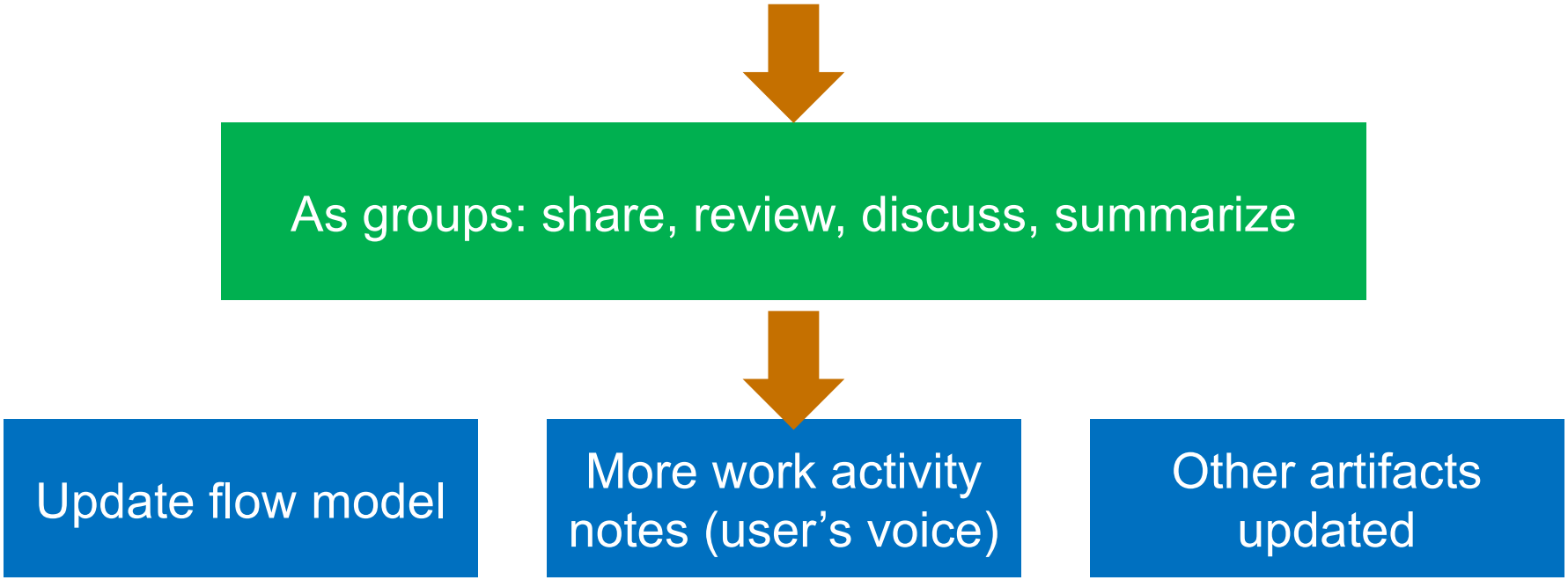
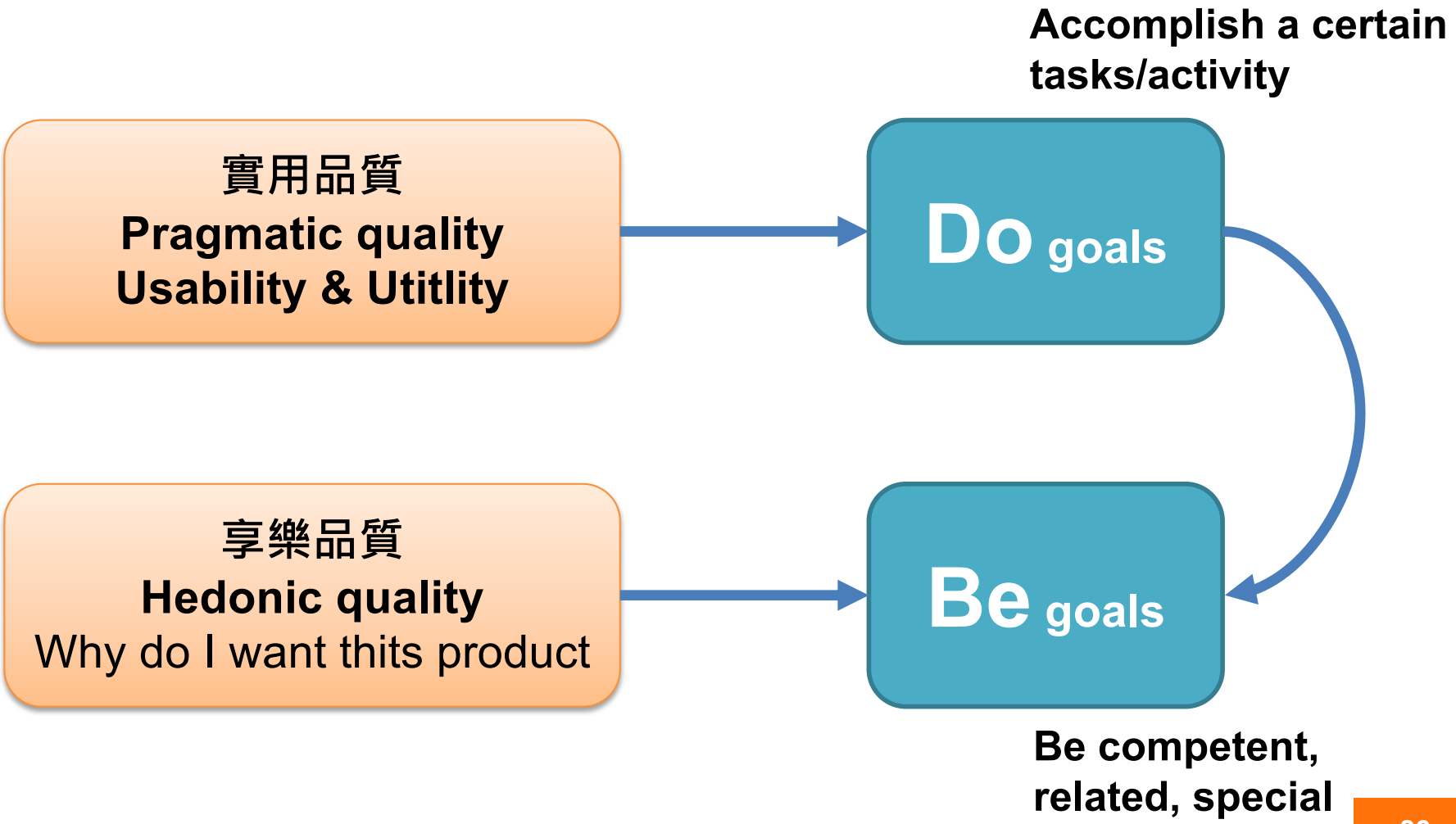


Needs 使用者需求

- UX 是一種目標導向的行為 (Hassenzahl, 2007, 2010)



The Do goals

- What is the task/activity to **achieve**
- User's **mental model**
- What's the **Information** needed
  - Knowledge, Procedure
  - Activity in the context (who, when, why, what)

設計要提供的

Needs

歸納出來的需求可能像是...

- Autonomy 可以做主
- Competence 感覺具有能力
- Relatedness 建立關聯/關係
- Self-actualization... Meaning 自我實現/尋求意義與價值
- Physical thriving 物質上的豐盛
- Pleasure-stimulation 情感上的愉悅
- Money, luxury 實質金錢、感受奢侈（餘裕）
- Security 安全感
- Self esteem 自尊
- Popularity 感覺受歡迎

(Sheldon, Elliot, Kim & Kasser, 2001)

補充：資料分析工具

親和圖

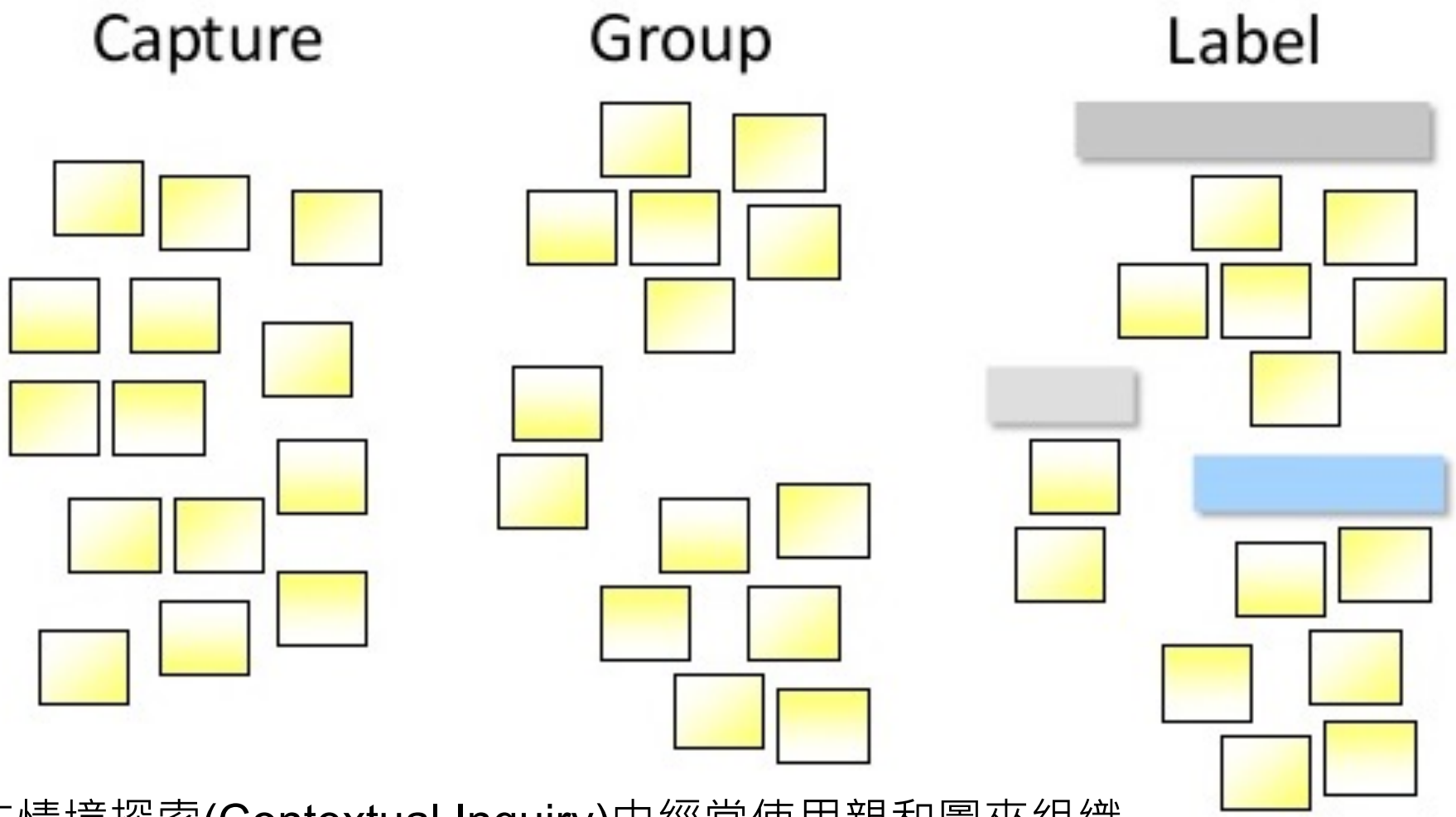
親和圖 Affinity Diagram

- 親和圖法在需求探索階段的可能應用
  - **情境記錄**：以親和圖整理訪談或觀察記錄，將複雜紊亂的情境，理出邏輯和脈絡。
  - **找到使用者的目的或行為動機**：藉由親和圖所呈現的使用者的行為細節，找到行為與行為之間的關聯，並進行歸納。
  - **因素分析**：對類別的定義，與類別之間關係的討論，有助於瞭解在問題現況中的可能影響因素與影響途徑
  - **設計溝通**：小組腦力激盪或討論，透過親和圖共同分析和分享，有助小組定義問題或產出設計決策

親和圖 Affinity Diagram

- 親和圖法是一種組織想法或資料的工具方法，廣泛使用於專案管理，使用親和圖來蒐集並呈現腦力激盪過程中所產出的大量的想法以及相關事實資料，再將其中有關聯、類似的資訊歸類，透過回顧與分析了解想法或問題的屬性。對於混亂或複雜的問題，使用親和圖法可將發散的問題收斂至幾個可行重點，是一種由下而上(bottom-up)由資料本質向上歸納出核心的方法。

親和圖 Affinity Diagram



在情境探索(Contextual Inquiry)中經常使用親和圖來組織
包括筆記、洞察等場域記錄

親和圖 Affinity Diagram

- 使用親和圖法的主要目的，是將分散、大量的想法，組織成有限數量的類別群組，以利想法選擇或是問題現況的理解。親和圖法藉由三大步驟來組織想法：
  - 記錄：使用卡片/筆記來記錄每個想法
  - 關聯：尋找類似/關聯的想法
  - 組織：將所有想法依照關聯進行分類

初步歸類後的群組，也可以再做子分類或是組間關聯，甚至與因果關係圖(cause-effect diagram)併用以進行複雜現象的分析。透過親和圖，將未知領域的實際情形全部記錄並呈現出來，可以幫助我們掌握情況與尋求問題解決方案；也有助於團隊合作中成員的相互了解、溝通與共識形成。

親和圖法操作與進行方式 Affinity Diagram

1. 清楚說明主題或定義問題
2. 提供參與者索引卡片或便利貼
3. 將想法寫在卡片上
4. 每個人將卡片放到牆上
5. 小組沈默將類似想法或議題歸類
6. 小組討論並對每個類別定義與命名
7. 若類別之間有關係，畫出關係

※ 注意

- 直到第5步驟親和圖完成前不要討論想法
- 在訪談或觀察中使用親和圖法時，原始資料是口語資料，要記錄原始受訪者使用的辭彙（不是用觀察者/研究者詮釋後的辭彙）
- 當小組成員為異質組成時（跨領域、跨功能、跨背景）使用親和圖的效率通常會更好。

顧客體驗旅程地圖 Customer Journey Map

Journey map是從某一個人的觀點角度，視覺化或圖像化演繹整個使用者經驗。包括他們在一段時間之內使用各種管道，與組織機構、服務、產品或品牌之間的互動與關係。顧客體驗旅程地圖由顧客觀點敘事，但也強調使用者期待與互動設計需求中的互動。

顧客體驗旅程地圖 Customer Journey Map

- 重要元素包括
  - 典型使用者 Personas: 使用者的主要特徵（需求、目標、想法、感受、意見、期待、痛點）
  - 時間軸 Timeline: 具體時間範圍或是階段 （例如：一週或一年；或是覺察、決策、購買、更新）
  - 情緒 Emotion: 情緒的高低表現（挫折、焦慮、快樂）
  - 行動點 Touchpoints: 用戶做了什麼(What）、顧客行動以及與組織機構互動的觸發點
  - 管道 Channels: 用戶行動在哪裡發生(Where）、互動發生或使用的場域（例如：網站、app、服務中心、店內等）