



Chapter 7

GATHERING DATA

Data gathering

7.1 Introduction

7.2 Five Key Issues

7.3 Data Recording

7.4 Interviews

7.5 Questionnaires

7.6 Observation

7.7 Choosing and Combining Techniques

3 main techniques

- Interviews
 - A set of questions (structured/unstructured)
 - Usually synchronous and face-to-face
- Questionnaires
 - A set of questions (structured/unstructured)
 - Answered asynchronously on paper or online
- Observation
 - Direct or indirect

2.2 Unstructured questionnaires (Open-ended)

Non-structured questions, or open-ended questions, are questions where there is no list of answer choices from which to choose. Respondents are simply asked to write their response to a question. Here is an example:

An open question is likely to receive a long answer.

Example of a Non-structured Question

1. What are the facilities and services do you expect from your library?

Aims of this chapter

- Discuss how to **plan and run a successful data gathering program.**
- Enable you to **plan and run an interview.**
- Enable you to **design a simple questionnaire.**
- Enable you to plan and **carry out an observation.**

7.2 Five key issues

1. Setting goals
 - Decide how to analyze data once collected
2. Identifying participants
 - Decide who to gather data from
3. Relationship with participants
 - Clear and professional
 - Informed consent when appropriate
4. Triangulation (3 chiều)
 - Look at data from more than one perspective
 - Collect more than one type of data, eg qualitative from experiments and qualitative from interviews
5. Pilot studies
 - Small trial of main study

7.2 Five key issues

1. Setting goals:

- Glean info about something
- Many reasons for gathering data → must identify specific goals for study
- Express the goals: structured or math. Format, simple description,...
- But be clean and concise (rõ và ngắn gọn)

Example: how to choose “send message” icon



7.2 Five key issues

2. Identifying participants

- Kind of people you want to gather data from:
 - the population
 - probability or non-probability sampling
 - probability sampling: **random sampling or stratified sampling**
 - non-probability sampling: convenience sampling or volunteer panels

7.2 Five key issues

3. Relationship with participants

- Clear and professional
- Informed consent form when appropriate: confirm the purpose of data gathering, how the data be used and happy to continue
- Informed consent form: protect data gatherer and data provider

7.2 Five key issues

3. Relationship with participants (cont)

- The employees of company is data provider
- Incentives (ưu đãi) for completing a questionnaire

Crowdsourcing Design for Citizen Science Organizations

SHORT VERSION OF CONSENT FORM for participants at the University of Maryland – 18 YEARS AND OLDER

You are invited to participate in a research project being conducted by the researchers listed on the bottom of the page. In order for us to be allowed to use any data you wish to provide, we must have your consent.

In simplest terms, we hope you will use the mobile phone, tabletop, and project website at the University of Maryland to

- Take pictures
- Share observations about the sights you see on campus
- Share ideas that you have to improve the design of the phone or tabletop application or website
- Comment on pictures, observations, and design ideas of others

The researchers and others using CampusNet will be able to look at your comments and pictures on the tabletop and/or website, and we may ask if you are willing to answer a few more questions (either on paper, by phone, or face-to-face) about your whole experience. You may stop participating at any time.

A long version of this consent form is available for your review and signature, or you may opt to sign this shorter one by *checking off all the boxes that reflect your wishes and signing and dating the form below.*

☐ I agree that any photos I take using the CampusNet application may be uploaded to the tabletop at the University of Maryland and/or a website now under development.

☐ I agree to allow any comments, observations, and profile information that I choose to share with others via the online application to be visible to others who use the application at the same time or after me.

☐ I agree to be videotaped/audiotaped during my participation in this study.

☐ I agree to complete a short questionnaire during or after my participation in this study.

NAME [Please print]	
SIGNATURE	
DATE	

[Contact information of Senior Researcher responsible for the project]

Ex: parents of participants are asked to sign the form

Figure 7.1 Example of an informed consent form

7.2 Five key issues

4. Triangulation

- Look at data from more than one perspective:
 - Triangulation of data (time, place, people)
 - Investigator triangulation (observers, interviewer,..)
 - Triangulation of theories
 - Methodological triangulation (for different data)
- Collect more than one type of data, e.g. qualitative from experiments and qualitative from interviews

7.2 Five key issues

5. Pilot studies

- Small trial of main study
- Ensure the proposed method is viable before real study
- Participants: very unpredictable
- Examples: the equipment and instructions can be checked by interview or questionnaires
- colleagues or peers can be asked to comment

7.3 Data recording

- Notes, audio, video, photographs can be used individually or in combination:
 - Notes plus photographs
 - Audio plus photographs
 - Video
- Different challenges and advantages with each combination

<https://www.youtube.com/watch?v=jTCzxWt1RQk>



Activity

Tưởng tượng bạn là người tư vấn để giúp phát triển một công cụ thiết kế vườn.

Mục tiêu của bạn là tìm hiểu về những người thiết kế vườn dùng prototype (phát thảo) của họ như thế nào khi họ đi vòng vòng vườn của KH để mở rộng ý tưởng thiết kế vườn, ghi chú và hỏi KH về những gì KH thích và gia đình KH sử dụng vườn như thế nào.

Sau khi quan sát người thiết kế vườn, hãy nêu những điểm thuận lợi và bất lợi của ba cách thu thập dữ liệu trong ngữ cảnh của người thiết kế vườn nêu trên.

Chú thích: SV quan sát người thiết kế vườn sử dụng 2 pp (phỏng vấn, gửi bảng câu hỏi) để thu thập dữ liệu từ khách hàng của họ. SV cho biết điểm thuận lợi và bất lợi của 2 pp thu thập dữ liệu.

<https://www.youtube.com/watch?v=xqSh7XMve5g>



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o search



EN

<https://www.surveymonkey.com/mp/mobile-cell-phone-survey-template/>

Products ▾

Solutions ▾

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Plans & Pricing

Log in

Sign up free

Mobile or cell phone survey template

Get started

https://www.surveymonkey.com/pricing/?ut_ctatext=Get+started&ut_source=mp&ut_source2=mobile-cell-phone-survey-template&ut_source3=hero



ENG



4:33 PM
9/21/2022



Mobile or Cell Phone Template

1. Do you currently have a working mobile or cell phone, or not?

☐ Yes, I do

☐ No, I do not

2. Do you currently have an account with a mobile or cell phone service provider, or not?

☐ Yes, I do

☐ No, I do not

3. Which of the following mobile or cell phone service providers do you use? (Please select all that apply.)

☐ AT&T

☐ Trac-Fone

☐ Boost Mobile

☐ U.S. Cellular

☐ Cricket

☐ Verizon Wireless

☐ MetroPCS

☐ Virgin Mobile

☐ Sprint

☐ I do not have a cell phone

☐ T-Mobile

☐ My cell phone service provider is
not listed above

4. How many working mobile or cell phones do you currently have?

5. In a typical weekday, do you use your mobile or cell phone most often for work, for personal reasons, or about an equal amount on both?

☐ Much more often for work

☐ Slightly more often for personal reasons

☐ Somewhat more often for work

☐ Somewhat more often for personal reasons

☐ Slightly more often for work

☐ About an equal amount for work and personal reasons

☐ Much more often for personal reasons

6. In a typical weekday, about how much time, in total, do you spend using your mobile or cell phone?

Hours

Minutes

8. Which of the following activities do you do on your mobile or cell phone? (Check all that apply)

☐ Send or receive emails

☐ Take photos

☐ General internet use (other than using social networking websites)

☐ Play videos (other than video games)

☐ Send or receive instant messages

☐ Send or receive videos

☐ Make or receive phone calls

☐ Send or receive photos

☐ Play games

☐ Send or receive texts

☐ Purchase products or services

☐ Play music

☐ Record videos

☐ Use social networking websites

☐ Play podcasts

☐ Other (please specify)

9. In a typical weekday, which of the following activities do you do on your mobile or cell phone most often?

- | | |
|--|--|
| <input type="radio"/> Send or receive instant messages | <input type="radio"/> Take photos |
| <input type="radio"/> Make or receive phone calls | <input type="radio"/> Send or receive videos |
| <input type="radio"/> Play podcasts | <input type="radio"/> Play games |
| <input type="radio"/> General internet use (other than using social networking websites) | <input type="radio"/> Purchase products or services |
| <input type="radio"/> Send or receive photos | <input type="radio"/> Send or receive texts |
| <input type="radio"/> Record videos | <input type="radio"/> Send or receive emails |
| <input type="radio"/> Play music | <input type="radio"/> Use social networking websites |
| <input type="radio"/> Play videos (other than video games) | |
| <input type="radio"/> Other (please specify) | |

10. If you could use your mobile or cell phone for only one of the following activities, which activity would you choose?

- | | |
|--|--|
| <input type="radio"/> Send or receive texts | <input type="radio"/> Play games |
| <input type="radio"/> Send or receive photos | <input type="radio"/> Take photos |
| <input type="radio"/> Send or receive videos | <input type="radio"/> Make or receive phone calls |
| <input type="radio"/> Play videos (other than video games) | <input type="radio"/> Purchase products or services |
| <input type="radio"/> Send or receive emails | <input type="radio"/> Record videos |
| <input type="radio"/> Send or receive instant messages | <input type="radio"/> Play podcasts |
| <input type="radio"/> General internet use (other than using social networking websites) | <input type="radio"/> Use social networking websites |
| <input type="radio"/> Play music | |
| <input type="radio"/> Other (please specify) | |

Activity – thiết kế bảng câu hỏi

- Hãy thiết kế bảng câu hỏi (câu hỏi đóng hoặc mở) lấy ý kiến người dùng, để cải tiến phần mềm LMS của trường ĐH Công Nghiệp
- Các nhóm nộp file .docx lên LMS

CLSA Comprehensive - Home Interview and Site Visit

https://www.youtube.com/watch?v=y_hmj0cZMHc

clsacomprehensive

những gì liên quan đến CLS
một phần toàn diện của nghiên cứu của chúng tôi cảm ơn

Toàn màn hình

▶ ▶| 🔊 5:40 / 6:24



7.4 Interviews

- Open-ended/Unstructured - 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 – a group interview: guided by a facilitator

Interview questions

- Two types:
 - ‘closed questions’ have a predetermined answer format, e.g.. ‘yes’ or ‘no’
 - ‘open questions’ do not have a predetermined format
- Closed questions are easier to analyze
- Avoid:
 - Long questions
 - Compound sentences - split them into two
 - Jargon and language that the interviewee may not understand
 - Leading questions that make assumptions e.g.. why do you like ...?
 - Unconscious biases e.g.. gender stereotypes

Running the interview

- *Introduction* – introduce yourself, explain the goals of the interview, reassure about the ethical issues, ask to record, present the 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, eg. switch recorder off.

Enriching the interview process

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



Activity for interview

<https://www.youtube.com/watch?v=n90BmhDdGYs>



Activity for interview

Có một số thiết bị đọc trên thị trường: đọc ebooks, đọc báo, tạp chí, xem phim, chiếu hình.

Chúng mỏng, nhẹ, có nhiều thiết kế khác nhau từ nhiều nhà sản xuất và models, nhưng đều tiện dụng như thẻ đọc sách in.

Nhà phát triển thiết bị đọc mới, muốn tìm hiểu làm sao thiết kế ra sản phẩm hấp dẫn đối với giới trẻ, dưới 18 tuổi. Nhà phát triển đó nhờ bạn tổ chức việc phỏng vấn người dùng trẻ tuổi.

Activity for questionnaire (edited)

Có một số thiết bị đọc trên thị trường: đọc ebooks, đọc báo, tạp chí, xem phim, chiếu hình.

Chúng mỏng, nhẹ, có nhiều thiết kế khác nhau từ nhiều nhà sản xuất và models, nhưng đều tiện dụng như thẻ đọc sách in.

Nhà phát triển thiết bị đọc mới, muốn tìm hiểu làm sao thiết kế ra sản phẩm hấp dẫn đối với giới trẻ, dưới 25 tuổi. Nhà phát triển đó nhờ bạn soạn bảng câu hỏi khảo sát ý kiến người dùng để đạt được mục tiêu trên.

Activity for interview

- Xác định mục tiêu của việc thu thập thông tin
- Đề xuất những cách thức ghi lại dữ liệu phỏng vấn
- Đề xuất một nhóm câu hỏi để dùng trong một cuộc phỏng vấn (không cấu trúc, cái kết mở) để tìm kiếm những ý kiến về thiết bị đọc và sự hấp dẫn của thiết bị đó đối với người dưới 18 tuổi.

7.5 Questionnaires

- Questions can be closed or open
- Closed questions are easier to **analyze**, and may be **distributed and analyzed** by computer
- Can be administered to large populations
- Disseminated by paper, email and the web
- Sampling can be a problem when the size of a population is unknown as is common online evaluation

Questionnaire design

- The impact of a question can be influenced by **question order**.
- You may 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.
- Avoid very long questionnaires
- Decide on whether phrases will all be positive, all negative or mixed.

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

Likert scales

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

1 2 3 4 5
☐ ☐ ☐ ☐ ☐

2. The use of color is excellent:

strongly agree agree OK disagree strongly disagree
☐ ☐ ☐ ☐ ☐

Attractive	_ _ _ _ _ _ _	Ugly
Clear	_ _ _ _ _ _ _	Confusing
Dull	_ _ _ _ _ _ _	Colorful
Exciting	_ _ _ _ _ _ _	Boring
Annoying	_ _ _ _ _ _ _	Pleasant
Helpful	_ _ _ _ _ _ _	Unhelpful
Poor	_ _ _ _ _ _ _	Well designed

Figure 7.6 An example of a semantic differential scale

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 good, 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

Example of an online questionnaire

World Summit on the Information Society - Microsoft Internet Explorer

Address: <http://www.itu.int/wsis/stocktaking/scripts/q.asp>

D. Internationally-agreed development goals outlined in the Millennium Declaration : Is this activity relevant to achieving the MDGs listed below? (see www.un.org/millenniumgoals/ and the targets for each goal) ☒ Yes ☐ No
If yes, please tick all goals that apply

- ☐ 1. Eradicate poverty and hunger
- ☐ 2. Achieve Universal Primary Education
- ☐ 3. Promote gender equality & empower women
- ☒ 4. Reduce child mortality
- ☐ 5. Improve maternal health
- ☐ 6. Combat HIV/AIDS, Malaria and other diseases
- ☐ 7. Ensure environmental sustainability
- ☐ 8. Develop a global partnership for development

E. More Information : Please provide a website for this activity
Website (URL) :

F. Geographical Coverage* : Please tick a box to indicate the geographical coverage
☐ Local ☐ National ☐ Regional ☒ International
Please specify coverage :

G. Timescale* : Please tick a box to indicate the timescale of the activity
☐ Completed ☐ Planned for future ☐ Ongoing
Specify dates using the format day/month/year (dd/mm/yyyy) :
From: To:

H. Activity Type* : Please tick one or more boxes to indicate the type of activity described above
☐ Project ☐ Programme ☐ WSIS Thematic Meeting ☐ Conference ☐ Publication ☐ Training initiative
☐ Guidelines ☐ Tool-kit ☐ Website ☐ Database
Other (please specify) :

Figure 7.8 An excerpt from a web-based questionnaire showing check boxes, radio buttons, and pull-down menus

Activity for Questionnaire

Có một số thiết bị đọc trên thị trường: đọc ebooks, đọc báo, tạp chí, xem phim, chiếu hình.

Chúng mỏng, nhẹ, có nhiều thiết kế khác nhau từ nhiều nhà sản xuất và models, nhưng đều tiện dụng như thẻ đọc sách in.

Dựa vào kết quả cuộc phỏng vấn (vừa rồi), nhà phát triển thấy có 2 yếu tố vô cùng quan trọng: thiết bị cầm nắm dễ dàng, kiểu chữ và cách hiển thị có thể thay đổi được.

Activity for Questionnaire (tt)

1. Nhà phát triển đó nhờ bạn **soạn bảng câu hỏi** để hỏi người dùng trẻ tuổi, tìm hiểu làm sao thiết kế ra sản phẩm hấp dẫn đối với giới trẻ, dưới 18 tuổi, đặc biệt để đánh giá 2 yếu tố trên (thiết bị cầm nắm dễ dàng, kiểu chữ và cách hiển thị có thể thay đổi được.)

2. Nếu em có sẵn thiết bị đó, hãy đưa nó cho 2 người bạn xem và **nhờ họ cho ý kiến về bảng câu hỏi đó.**

Sau đó, **chỉnh sửa bảng câu hỏi** dựa vào ý kiến của những người bạn của em.

Observation

https://www.youtube.com/watch?v=-_9BYSDtwRc



Figure 7.9 Mars Exploration Rover

Source: Reproduced by permission of NASA Jet Propulsion Laboratory (NASA-JPL).

7.6 Activity for Observation

Kịch bản 1: một nhà tư vấn thiết kế tham gia một nhóm du khách được trang bị các thiết bị dò đường gắn trên cổ tay trên đường thăm Stockholm.

Sau một ngày đi tham quan, họ dùng thiết bị để tìm danh sách nhà hàng trong bán kính 2km.

Họ chọn vài nhà hàng, gọi cho nhà hàng để hỏi về menu, đặt món và đi đến nhà hàng. Như tư vấn thiết kế quan sát thấy vài khó khăn khi vận hành thiết bị, đặc biệt là khi di chuyển.

Nhà tư vấn thảo luận với nhóm du khách để nói cho người đánh giá (evaluator) rằng có vấn đề với giao diện thiết bị khi di chuyển, nhưng khi ở vị trí thẳng bằng thì thiết bị rất hữu ích và nhóm du khách rất hài lòng khi có thể đặt bàn tại một nhà hàng ngon gần đó.

7.6 Activity for Observation

Kịch bản 2: nhà tư vấn quan sát những người tham gia thực hiện một số tác vụ đã được lên kế hoạch trước trong phòng thí nghiệm.

Đó là người tham gia tìm số điện thoại của nhà hàng Matisse. Mất vài phút để tìm ra số điện thoại và xuất hiện lỗi ở giao diện.

Trong phòng thí nghiệm, có quay video và có ghi âm để ghi nhận sự tương tác giữa người dùng và thiết bị. Thực tế trong phòng thí nghiệm cho thấy giao diện thiết bị gây khó chịu cho người dùng, chất lượng thu âm thì kém.

Người tham gia còn được mời trả lời bảng câu hỏi về mức độ hài lòng khi dùng sản phẩm.

7.6 Structuring Frameworks for Observation in the Field

- Direct observation in the field
 - Structuring frameworks
 - Degree of participation (insider or outsider)
- Direct observation or indirectly through records
- In the field (day-to-day tasks in the natural setting) or in controlled environments (in usability laboratory)
- Indirect observation: tracking users' activities
 - Diaries
 - Interaction logging
 - Video and photographs collected remotely by drones or other equipment (máy bay không người lái hay các thiết bị khác)

Structuring frameworks to guide observation

- Three easy-to-remember parts (in evaluation studies):
 - (WHO) The person: Who is using the technology at any particular time? (WHO)
 - (WHERE) The place: Where are they using it?
 - (WHAT) The thing: What are they doing with it?

Structuring frameworks to guide observation

A more detailed framework (Robson, 2014):

1. Space: What is the physical space like and how is it laid out?
2. Actors: What are the names and relevant details of the people involved?
3. Activities: What are the actors doing and why?
4. Objects: What physical objects, in addition to the technology being studied, are present, and do they impact on the technology use?
5. Acts: What are specific individual actions?
6. Events: Is what you observe part of a special event?
7. Time: What is the sequence of events?
8. Goals: What are the actors trying to accomplish?
9. Feelings: What is the mood of the group and of individuals?

Activity

1. Observe a small group of people using Reader
 - Answer the question, “What are these people doing?”
 - Write down what you observe
 - When you have finished, note down how you felt doing this, and any reactions in the group of people you observed.
2. If you were to observe the group again, how would you change what you did the first time?
3. Observe this group again for about 10 minutes using Robson’s framework.

7.6 Structuring Frameworks for Observation in the Field

- Direct observation in the field
 - Structuring frameworks
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- Direct observation or indirectly through records
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 - Diaries
 - Interaction logging
 - Video and photographs collected remotely by drones or other equipment (máy bay không người lái hay các thiết bị khác)

7.7 Choosing and combining techniques

- Depends on the:
 - Focus of the study
 - Participants involved
 - Nature of the technique(s)
 - Resources available
 - Time available

Summary

- Data gathering sessions should have **clear goals**.
- **An informed consent form** may be needed.
- Five key issues of data gathering are: goals, choosing participants, triangulation, participant relationship, pilot.
- Data may be recorded using **handwritten notes, audio or video recording, a camera, or any combination** of these.
- Interviews may be structured, semi-structured or unstructured
- Focus groups are group interviews
- Questionnaires may be on paper, online or telephone
- Observation may be direct or indirect, in the field or in controlled settings.
- Techniques can be combined depending on the study focus, participants, nature of technique, available resources and time.