Establishing Requirements

- What, How and Why
- Types of Requirements
- Data Gathering
- Task Description
- Task Analysis

What, How and Why

What is it?

- Find the needs of users
- From the users' needs, determine the requirements of the proposed system

In more detail, 2 aims in this activity are:

- Understand as much as possible about users, task, context, etc., so that the system under development can support them in achieving their goals
- Produce a stable set of requirements that form a sound basis to move forward into thinking about design

Sometimes it is referred to as requirements activity

What, How and Why

How to achieve the aims?

- Data gathering activities
- Data analysis activities
- Requirements determination
- All of the above activities should be iterative

e.g., once you start to analyse your collected data, you may find that you need to gather some more data to clarify some ideas you have

Why we need requirements activity?

- Failure occurs most commonly for “unclear objectives and requirements” while critical success occurs most often for “clear, detailed requirements”
- Getting requirements right is crucial

Establishing Requirements

A requirement is a statement about an intended product that specifies what it should do or how it should perform:

- What do users want?
- What do users 'need'?
- Requirements need clarification, refinement, completion, re-scoping (e.g., time to load a map in a smartwatch GPS app should be short enough, what is "short"? 5 seconds?)
- Input: requirements document (maybe)
- Output: stable requirements
  - Arise from understanding users' needs
  - Can be justified & related to data

Types of Requirements

Two types:

- Functional requirements, i.e., what the system should do?
- Non-functional requirements, i.e., what constraints there are on the system and its development, e.g., usability

Taking a word processor as an example:

Functional requirements: Support a variety of formatting styles, e.g., must include 20 typefaces

Non-functional requirements:

- Able to run on different platforms including Windows, Mac and Unix
- Able to run on a computer with a minimum of 64 MB RAM
- The product should be delivered in 6 months' time
- Novices should learn how to use it easily

Types of Requirements

Non-functional requirements can be refined as:

- Data requirements: type, size/amount, accuracy, storage, etc., of the required data, e.g., in a share-dealing application domain, the data must be up-to-date and accurate, and are likely to change many times a day
- Environmental requirements: circumstances in which the product will be expected to operate
  - Physical –lighting, noise, etc. of operational environment
  - Social –collaboration and coordination issues: Will data be shared in synchronous or asynchronous mode? Do collaborators have to communicate across great distances?
  - Organizational – e.g., hierarchy of the management, user support, facilities or resources for training?
  - Technical – e.g., what technologies will the product run on or need to be compatible with?

Types of Requirements

- User requirements:
  - Characteristics of the intended user group: nationality, educational background, attitude to computers
  - System use:
    - Novice: prompted, constrained, clear
    - Expert: flexibility, access/power
    - Frequent: short cuts, e.g., provide function keys rather than expecting them to type long commands or to have to navigate through a menu structure
    - Casual/infrequent: clear menu paths
  - Humans vary in many dimensions, e.g.,
    - Size of hands may affect the size and positioning of input buttons

Types of Requirements

- Motor abilities may affect the suitability of certain input and output devices
- Height if designing a physical kiosk
- Strength - a child's toy requires little strength to operate, but greater strength to change batteries
- Disabilities such as sight or hearing problem

- Usability requirements (≠ user requirements)

Example: Suppose CityU has proposed a self-service café so that users are allowed to pay for their food (bread, sandwiches, drinks) using a credit system, e.g., payment is settled via their CityU or Octopus cards

Suggest one key functional, data, environmental, user and usability requirement for the proposed system.

Types of Requirements

Functional: The system will calculate the total cost of purchases

Data: The system must have access to the prices of all products in the café

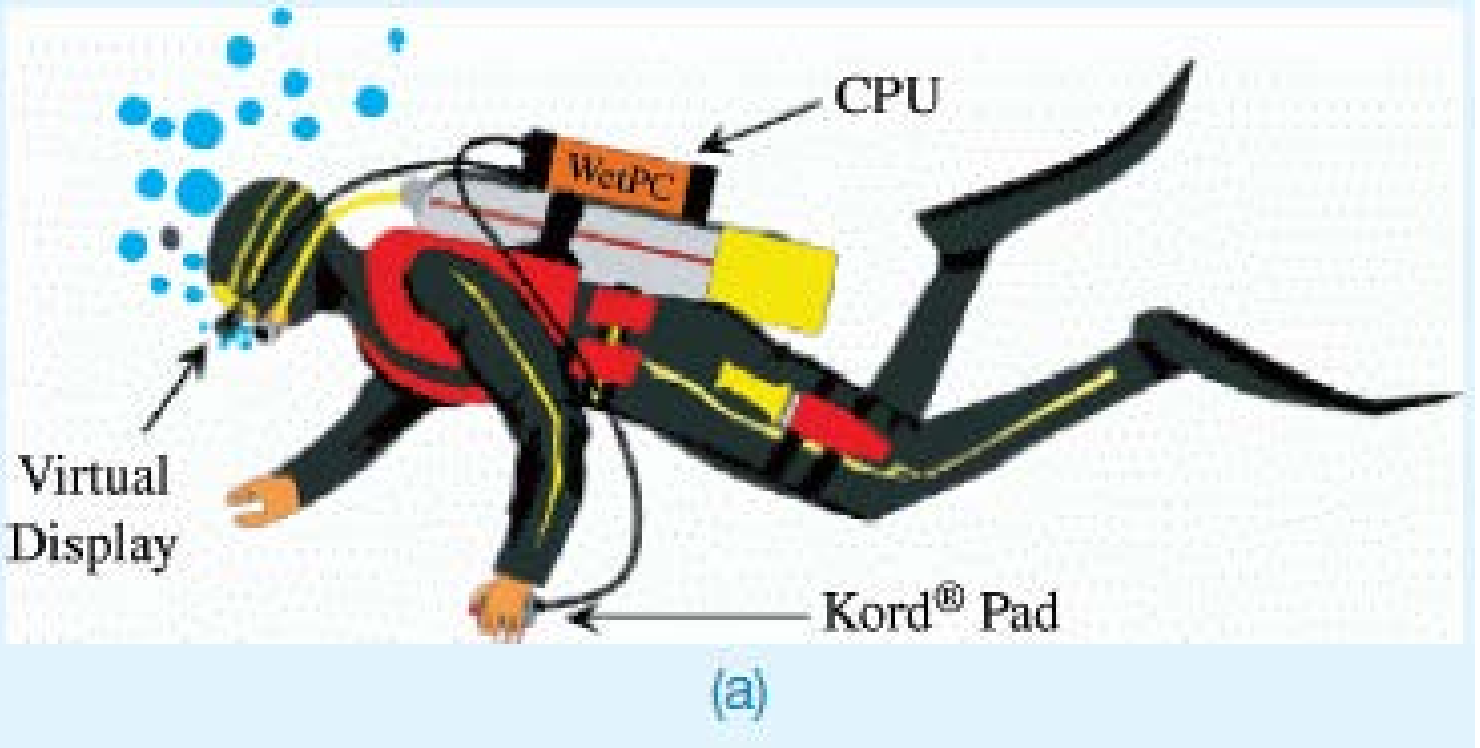
Environmental: Café users will be carrying a tray and will most likely be in a reasonable rush. The physical environment will be noisy and busy, and users may be talking with friends and colleagues while using the system

User: The majority of users are likely to be under 25 and comfortable when dealing with technology

Usability: The system needs to be simple so that new users can use the system immediately, and memorable for more frequent users. Users will not want to wait around for the system to finish processing, so it needs to be efficient and to be able to deal easily with user errors.

Types of Requirements

Example: WetPC is a computer for divers. The environment is surrounded by water: waterproof wearable computer, mask-mounted head-up display, five-key Pad as only one hand is free



http://www.wetpc.com.au/wetpc

Types of Requirements

User profile: Collection of characteristics for a typical user, and multiple user profiles are needed in a design

Personas can be used:

- Rich descriptions of typical users of the product under development that the designers can focus on and design the product for
- Capture a set of user characteristics
- Not real people, but synthesised from real users
- Should not be idealised
- Bring them to life with a name, characteristics, goals, personal background
- Develop a small set of personas with one primary

Types of Requirements

Example:

Types of Requirements

Example: Betty is 37 years old, she has been Warehouse Manager for five years and worked for Simpkins Brothers Engineering (SBE) for twelve years. She did not go to university, but has studied in her evenings for a business diploma. She has two children aged 15 and 7 and does not like to work late. She did part of an introductory in-house computer course some years ago, but it was interrupted when she was promoted and could no longer afford to take. Her vision is perfect, but her right-hand movement is slightly restricted following an industrial accident 3 years ago. She is enthusiastic about her work and is happy to delegate responsibility and take suggestions from her staff. However, she does feel threatened by the introduction of yet another new computer system (her third time at SBE).

Data Gathering

Collect sufficient, relevant and appropriate data for establishing user requirements (for evaluation as well)

Five key issues are:

- Setting goals
  - Clear and concise, e.g., determine which of two icons representing “send message” is easier to use
  - Decide what data to look for and how to analyze data once collected

- Identifying participants
  - Decide who to gather data from
  - Can be all users in a small group while sampling is needed for large population

Data Gathering

- Relationship with participants
  - Clear and professional
  - Informed consent when appropriate, for protecting the interests of both the data gatherer and data provider
- Triangulation
  - Investigation from at least two perspectives
  - Data (e.g., from different sources at different times); Investigators (e.g., different people to collect and interpret the data); Theories (use viewpoints from different frameworks); Methodologies (use different techniques, e.g., qualitative from experiments and qualitative from interviews)
- Pilot studies
  - Small trial of main study, e.g., fix potential problems before main study

Data Gathering

Data can be recorded using – notes, audio, video, photograph, computer logging, etc.

- Notes: cheap but limited to writing speed
- Audio: cheap, difficult to match with other protocols (cannot record some actions)
- Video: accurate but the user may feel uncomfortable (obtrusive)
- Computer logging: automatic & unobtrusive, difficult to analyze for large amounts of data

Data Gathering

Commonly used techniques:

1. Questionnaires

- A series of questions designed to elicit specific information
- Questions may require different kinds of answers: YES/NO; choice of pre-supplied answers; comment
- Often used in conjunction with other techniques
- Can give quantitative or qualitative data
- Good for answering specific questions from a large, dispersed group of people
- Usually no one is needed to help answer the questions or to explain what they mean

Data Gathering

- Questions can be closed or open (e.g., What is your gender? Any suggestions on the interface?)
- Closed questions are easiest to analyse, and may be done by computer
- Paper, email & the Web used for dissemination
- Advantage of electronic questionnaires is that data go into a database & are easy to analyse

Data Gathering

Questionnaire design:

- The impact of a question can be influenced by question order, e.g., specific questions usually follow general questions
- Do you need different versions of the questionnaire for different populations? e.g., different language versions
- Provide clear instructions on how to complete the questionnaire, e.g., only one choice in a checkbox?
- 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

Data Gathering

Questionnaire format:

- 'Yes', 'No' checkboxes that offer one option
- Checkboxes that offer many options
- Likert rating scales (3, 5, 7 & 9 point scales are common)

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

1	2	3	4	5
☐	☐	☐	☐	☐

- Semantic scales

Instructions: for each pair of adjectives, place a cross at the point between them that reflects the extent to which you believe the adjectives describe the home page. You should place *only one cross* between the marks on each line.

Attractive |_____|_____|_____|_____|_____|_____|_____| Ugly

- Open-ended responses

Data Gathering

To encourage 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

Data Gathering

Web-based questionnaires:

- Start from developing the paper version
- Advantages:
  - 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
- Disadvantages:
  - Individuals may response more than once
  - Lower response rate than paper questionnaires
  - Usually rely on convenience sampling which involves only those who are available

Data Gathering

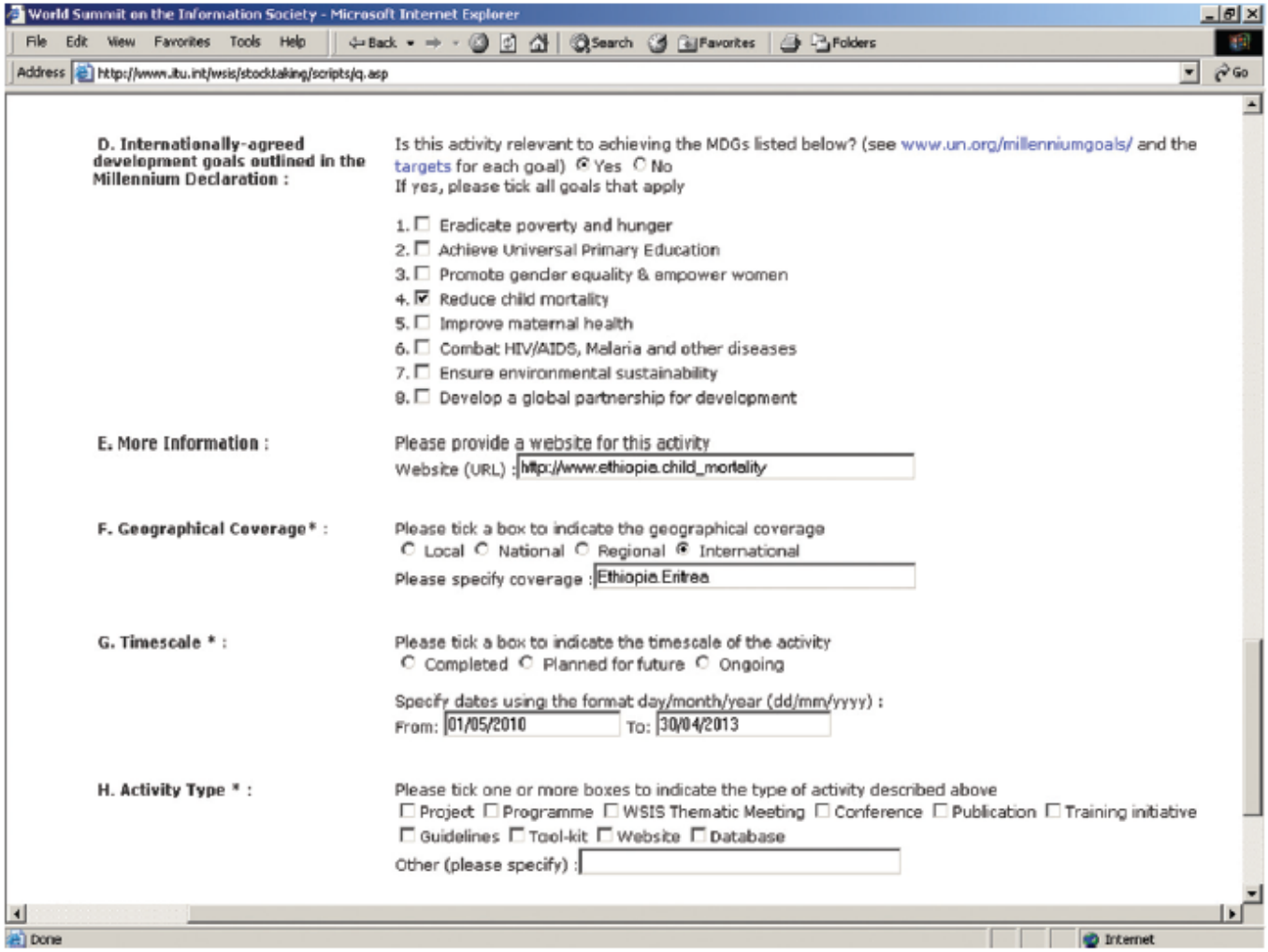


Figure 7.8 An excerpt from a web-based questionnaire showing check boxes, radio buttons, and pull-down menus

Data Gathering

2. Interviews

- Forum for talking to people: can be face-to-face or telephone interviews
- Involve asking a set of questions:
  - Unstructured - are not directed by a script; Rich but not replicable
  - Structured - 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
- Good for exploring issues
- Time consuming and may be infeasible to visit everyone

Data Gathering

- Props - devices for prompting interviewee, e.g., a prototype, scenario, can be used to enrich the interview process

Data Gathering

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 ...?

Data Gathering

Common steps for interview:

- *Introduction* – introduce yourself, explain the goals of the interview, reassure about the ethical issues, ask to record, present an informed consent form (state the purpose of the test, explain the fact that it is being video-recorded, promise confidentiality, etc.)
- *Warm-up* - make first questions easy & non-threatening
- *Main body* – present questions in a logical order
- *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

Data Gathering

A sample Informed Consent form:

Computer Science Curriculum Study

Informed Consent and Privacy Statement

The study in which you are being asked to take part is an evaluation a website for a new textbook. A member of the team that is developing the text is conducting this study.

The general purpose of this study is to get feedback on the course topics and supporting materials during the early stages of development.

Please be informed that you must sign this informed consent before participating in the study. This informed consent document is intended to provide you with general information about the study and to assure you that, as a participant, your privacy will be maintained.

Please also be informed that:

Your participation in the study is fully voluntary. You have the right not to participate, and you will not be penalized in any way if you do not participate.

All information you provide in this study is confidential. Any report of the study results will be used only to evaluate the topics and materials in question.

Other than seeing a preview of the text's subject matter, there is no direct benefit to you. There are also no foreseen risks from participating in this study.

At the completion of the study, you will be given a thorough explanation of the research techniques, possible publication, and impact of the study, if you request it.

By signing this informed consent you certify that you are 18 years of age or older.

Data Gathering

3.Group interview

- Get a group of stakeholders together for discussion
- Also known as 'focus group' and workshop
- Good at gaining a consensus view and/or highlighting areas of conflict and disagreement
- Typically 3-10 participants
- Provide a diverse range of opinions
- Need to be managed to:
  - Ensure everyone contributes
  - Discussion is not dominated by one person
  - The agenda of topics is covered

Data Gathering

嘉湖海逸誘空姐租 省招牌

奇招引客

市區的服務式住宅愈見受歡迎，長租酒店的需求亦見增長，而位於天水圍的嘉湖海逸酒店更因找中對象，吸引了150位空姐入住，替其月租套房「省靚」招牌。

其總經理徐英略說，7年前酒店開幕時，看到地點不方便，宣傳經費及人力又有限，「必須針對一群為數不少的潛在客人，旨在一擊即中。」結果，酒店選定空姐。

穿梭巴士去機場

「找空姐來做小組訪問（focus group），發現她們對居所的要求是方便去機場、安全，還可以購物。」他表示，酒店遂每小時提供穿梭巴士前往機場，又聘用退役踞喀兵當保安員，「酒店附近有商場方便購物，所以吸引150位空姐入住，佔月租房間約30%。」他還說，酒店約有550個月租套房，現每月平均入住率維持94%至97%。

他透露，酒店月租由5,900元至2.2萬元，住客佔40%為本地人，33%為在港工作的外籍人士，12%為海外華僑，其餘的是商務客及內地遊客。

另方面，該酒店日租客房部分（約550間），也預留5至10%房間，提供1周及2周的長住套餐，分別每晚由435元起及385元起（未連稅項）。徐英略指，這類套餐的住客多數是回港探親人士。

港島香格里拉大酒店發言人也說，自去年起，長租套房需求顯著增長，住客以單身來港的外籍人士居多，「他們較享受酒店環境多過一般住宅。」

■本報記者　黃卓敏

An example of using focus group to collect needs of flight attendants who would like to rent a service apartment
(Hong Kong Economics Times, Nov. 05)

Data Gathering

4. Observation

- Motivation: it can be difficult for users to explain what they do or describe accurately how they achieve a task
- Users may be observed directly by the investigator as they perform their activities, or indirectly through records of the activities
- Can take place in the field, or a controlled environment
- Can be passive (listening and watching) or active (asking questions)
- Can include audio/video recording, computer logging and diary studying
- Good for understanding the nature and context of the stakeholders' tasks
- Require time and commitment from member(s) of the design team, and it can result in a huge amount of data

Data Gathering

Direct observation in the field

Structuring frameworks for helping observers to keep their goals and questions in sight:

- Three easy-to-remember parts:
  - 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?

Data Gathering

- A more detailed framework (Robson 2014):
  - 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?

Data Gathering

Degree of participation can be characterized as insider or outsider:

- Outsider: Passive observer and he will not take any part in the study environment. This is more appropriate in laboratory studies

- Insider: Participant observer who attempts, at various levels depending on the type of study, to become a member of the group. He needs to keep two roles clear and separate: observation notes are objective and participation is maintained

Data Gathering

Issues in planning and conducting observation in the field include:

- Decide on how you will be involved: passive observer to active participant
- How to gain acceptance in the group being studied
- How to handle sensitive topics, e.g., cultural differences, access to private spaces
- How to collect the data, e.g.,
  - What data to collect
  - What equipment to use
  - When to stop observing

Data Gathering

Ethnography: aim to observe a situation without imposing any *a priori* structure upon it and to view everything as "strange"

- Traditionally used in social sciences to uncover the social organization of activities
- In interaction design, it allows designers to obtain a detailed and nuanced understanding of people's behaviour and the use of technology
- A philosophy with a set of techniques that include participant observation and interviews. Here, the participant observers, called ethnographers, immerse themselves in the culture that they study

Data Gathering

- Collected data have many forms, e.g., documents, notes of ethnographers, comments from users, pictures. However, analyzing video and data logs can be time-consuming
- Co-operation of people being observed is required. At the beginning, they have to understand: why ethnographers are there, what they hope to achieve, and how long they plan to be there
- Data analysis is continuous
- Questions get refined as understanding grows
- Reports usually contain examples

Data Gathering

Observations and materials that might be collected:

- 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, e.g., room layouts
- Photographs of artifacts (documents, diagrams, forms, computers, etc.)
- Videos of artifacts
- Descriptions of artifacts
- Workflow diagrams showing the sequential order of tasks
- Process maps showing connections between activities

Data Gathering

Direct observation in controlled environments

- In the laboratory, the emphasis is on the details of what individuals do while in the field the context is important and the focus is on how people interact with each other, the technology, and their environment
- Think-aloud technique can be used: users in controlled settings speak aloud any words in their mind as they complete a task

Indirect observation

- Tracking users' activities when direct observation is not feasible or observers cannot be present over the duration of the study

Data Gathering

- Diaries – participant are asked to write a diary of their activities on a regular basis, e.g., what/when they did, what they found easy/hard, what were their reactions
  - Advantages: not take up much time for data collection, not require special equipment or expertise, suitable for long-term studies
  - Disadvantages: rely on participants being reliable, participants' memories of events are often exaggerated or detailed is forgotten

Data Gathering

- Interaction Logs – record users' activity in a log that can be examined later, e.g., key presses, mouse movements, time spent in searching a Web
  - Advantages: unobtrusive when the system performance is not affected, large volume of data can be logged automatically
  - Disadvantages: raise ethical concerns if the users do not know, visualization tools are needed for data analysis
  - Web analytics: involve collecting, analysing, and reporting data that tracks a user's behaviour when interacting with a Website, typically focus on the number of Web visitors and page views

Data Gathering

(a)

Figure 7.14 Segments of the Google Analytics dashboard for id-book.com in September 2014 (a) audience overview, (b) screen resolution of mobile devices used to view the website

Data Gathering

5.Studying documentation

- Include manuals, regulations, stakeholders' work diaries
- Good for understanding legislation and getting background information on the work
- Good source of data about the steps involved in an activity, and any regulations governing a task
- Not to be used in isolation (e.g., users may not follow the documented work procedures exactly)
- Advantage over other techniques is that it does not involve stakeholder time

6.Research similar products

- Help to generate alternative designs and prompt requirements

Data Gathering

Technique	Good for	Kind of data	Advantages	Disadvantages
Questionnaires	Answering specific questions	Quantitative and qualitative data	Can reach many people with low resource	The design is crucial. Response rate may be low. Responses may not be what you want
Interviews	Exploring issues	Some quantitative but mostly qualitative data	Interviewer can guide interviewee if necessary. Encourages contact between developers and users	Time consuming. Artificial environment may intimidate interviewee
Focus groups and workshops	Collecting multiple viewpoints	Some quantitative but mostly qualitative data	Highlights areas of consensus and conflict. Encourages contact between developers and users	Possibility of dominant characters
Naturalistic observation	Understanding context of user activity	Qualitative	Observing actual work gives insights that other techniques can't give	Very time consuming. Huge amounts of data
Studying documentation	Learning about procedures, regulations and standards	Quantitative	No time commitment from users required	Day-to-day working will differ from documented procedures

Data Gathering

Basic guidelines:

- Focus on identifying the stakeholders' needs
- Involve all the stakeholder groups
- Involve more than one representative from each stakeholder group
- Use a combination of data gathering techniques
- Support the process with props such as prototypes and task descriptions
- Run a pilot session
- Need to compromise on the data you collect and the analysis to be done due to constraints on resources
  $\Rightarrow$ Know what you really want first
- Consider carefully how to record the data, e.g., via video

Data Gathering

Suppose you are developing a new software system to support a small accountant's office. There is a system running already with which the users are reasonably happy, but it is outdated and needs upgrading.

Based on the above descriptions, what kinds of data gathering techniques would be appropriate for establishing requirements of the new system? Why?

Data Gathering

- Small office implies a small number of stakeholders. Interviewing the staff rather than giving them questionnaires is likely to be appropriately because of the small number of users, and this will yield richer data and give the developers a chance to meet the users
- Since users are happy with the old system, observation is important to understand context of new and old system
- Accountancy is regulated by a variety of laws and thus there is a need to look at documentation to understand some of the constraints from this direction

-> A series of interviews with the main users to understand the positive and negative features of the existing system; a short observation session to understand the context of the system; and a study of documentation surrounding the regulations

Data Gathering

2017年12月8日

老占　俺俺占占

10億理髮店

一百方呎唔夠的飛髮舖，十分鐘剪個頭，一年做十億元生意？你冇睇錯，我也冇寫錯，我樓下的QB House，來自日本，老闆五十幾歲才創業，一九九六年創立第一家店面，之後十幾年間已經在亞洲開設近五百五十家分店，除在日本本土外，已經插旗中國、香港、台灣、新加坡、馬來西亞等地區和城市，而在日本，QB House接待近一千六百萬人次，國外接待超過二百八十萬人次；且其上一財政年度收入超過一百六十六億日圓（約十億港元），更攞命的是，QB House這兩年為了給老人提供方便，還投放了很多移動飛髮房車，一樣十分鐘，公司還自掏腰包給員工進行專業的護理培訓，即使無法久坐的老人，也能享受剪髮的過程。

麻甩佬飛髮，唔使急，最緊要快，傳統的飛髮舖，掠頭掠半個鐘，等一個小時才到自己，一條又一條熱毛巾殷勤地遞着、然後趁着沒完沒了按摩的時候，洗頭仔使出渾身解數，好不容易才開始剪髮，Stylist又推銷洗護產品，看到最後賬單二千五百大元。

老闆做了一個市場調查，如果有一間理髮店，十分鐘一千日圓搞掂，不廢話，你願意去嗎？沒想到，結果讓他大吃一驚：超過百分之三十四受訪者歡迎這種理髮店，尤其是男性。他本來再等兩年就可以咬長糧拿着退休金安享晚年了，可心裏這股氣愈來愈強烈：開店！於是，QB House（Quick Barber）開業了。

StartUp唔係一定High Tech如雷蛇閱文，Low Tech一樣可以玩大，這間理髮店從顧客對快、便宜的單剪髮要求出發，唔洗頭，用空氣洗頭器，清理顧客理髮後留在頭上和頸部的碎髮，把時間還給客人，在每個細節上用盡了心機，係咪抵佢咁「髮」？

Barber shops in Japan traditionally provided an integrated 'total' service involving shampoo, shaving, and hair cutting and styling. The cost was high and it was very time consuming. The barbers' associations set the norm, and there were few alternatives. In 1995 the founder of QB House introduced a new concept based on a much cheaper and quicker service offering hair cutting only.

Data Gathering

After data gathering, we proceed to interpretation and analysis:

- Good to start data interpretation just after data gathering activity, because experience will be fresh in the minds of the participants and this can help overcome any bias caused by recording via audio, video, etc.
- Initial interpretation before deeper analysis
- Interpretation: structure and record descriptions of requirements from collected data
- Analysis: obtain requirements from the interpreted data
- More interpretation and analysis $\Rightarrow$ deeper understanding of requirements $\Rightarrow$ requirement description will be expanded and clarified

Task Description

Description of user task can help users to articulate existing work practices and help to express envisioned use for new products

Three common description types are:

- Scenarios
  - an informal narrative story, simple, ‘natural’, personal, not generalisable
- Use cases
  - assume interaction with a system
  - assume detailed understanding of the interaction
- Essential use cases
  - abstract away from the details
  - does not have the same assumptions as use cases

Task Description

Example scenario for travel organizer:

"The Thomson family enjoy outdoor activity holidays and want to try their hand at sailing this year. There are four members of the family: Sky who is 10 years old, Eamonn who is 15 years old, Claire who is 35, and Will who is 40. While out on a shopping trip they call by at the travel agents in their local town to start exploring the possibilities ... The travel organizer is located in a quiet corner of the agents' office, where there are comfortable seats and play things for young children. They all gather around the organizer and enter their initial set of requirements—a sailing holiday for four novices. The stand-alone console is designed so that all members of the family can interact easily and comfortably with it. The system's initial suggestion is that they should consider a flotilla holiday, where several novice crews go sailing together and provide mutual support for first-time sailors..."

Task Description

Scenario is related to persona:

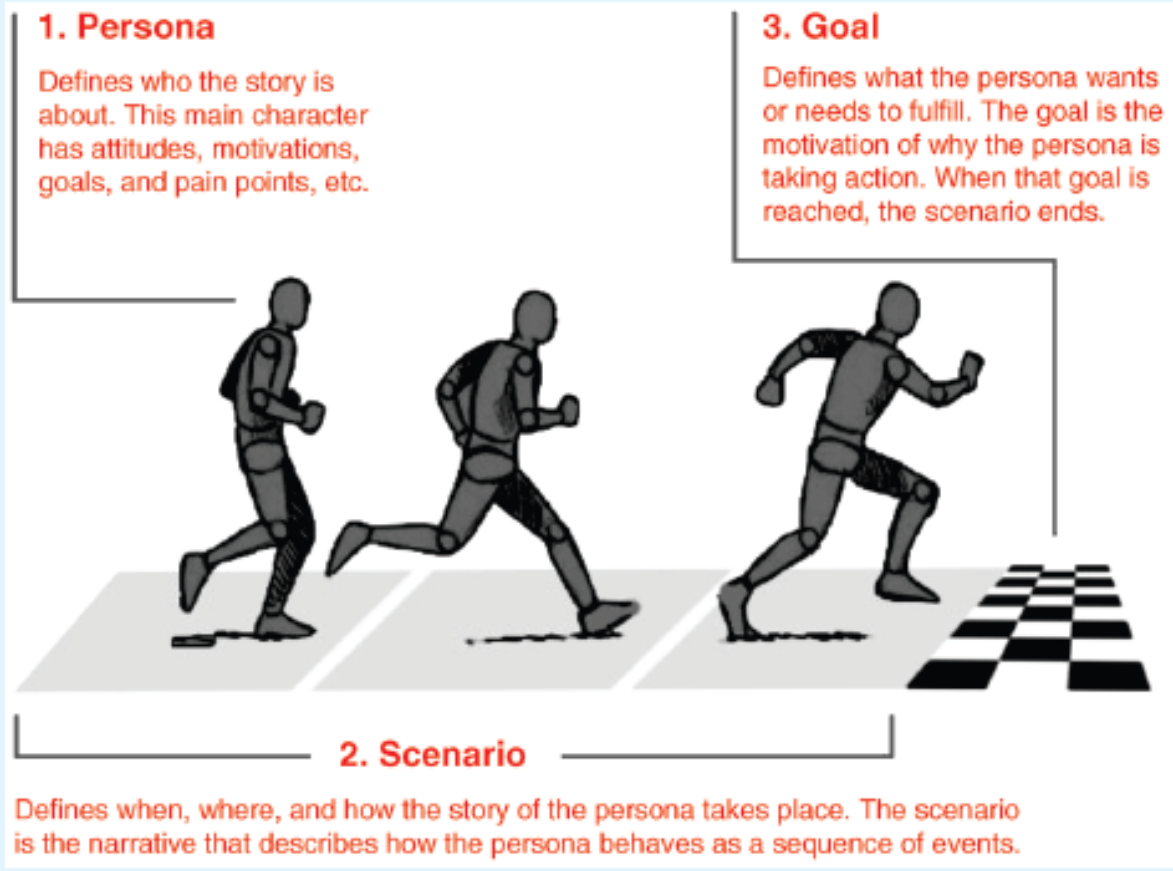


Figure 10.10 The relationship between a scenario and its associated persona

Source: http://www.smashingmagazine.com/2014/08/06/a-closer-look-at-personas-part-1/

Task Description

Example use case for travel organizer:

1. The system displays options for investigating visa and vaccination requirements.
2. The user chooses the option to find out visa requirements.
3. The system prompts user for the name of the destination country.
4. The user enters the country's name.
5. The system checks that the country is valid.
6. The system prompts the user for her nationality.
7. The user enters her nationality.
8. The system checks the visa requirements of the entered country for a passport holder of her nationality.
9. The system displays the visa requirements.
10. The system displays the option to print out the visa requirements.
11. The user chooses to print the requirements.

Task Description

Some alternative courses:

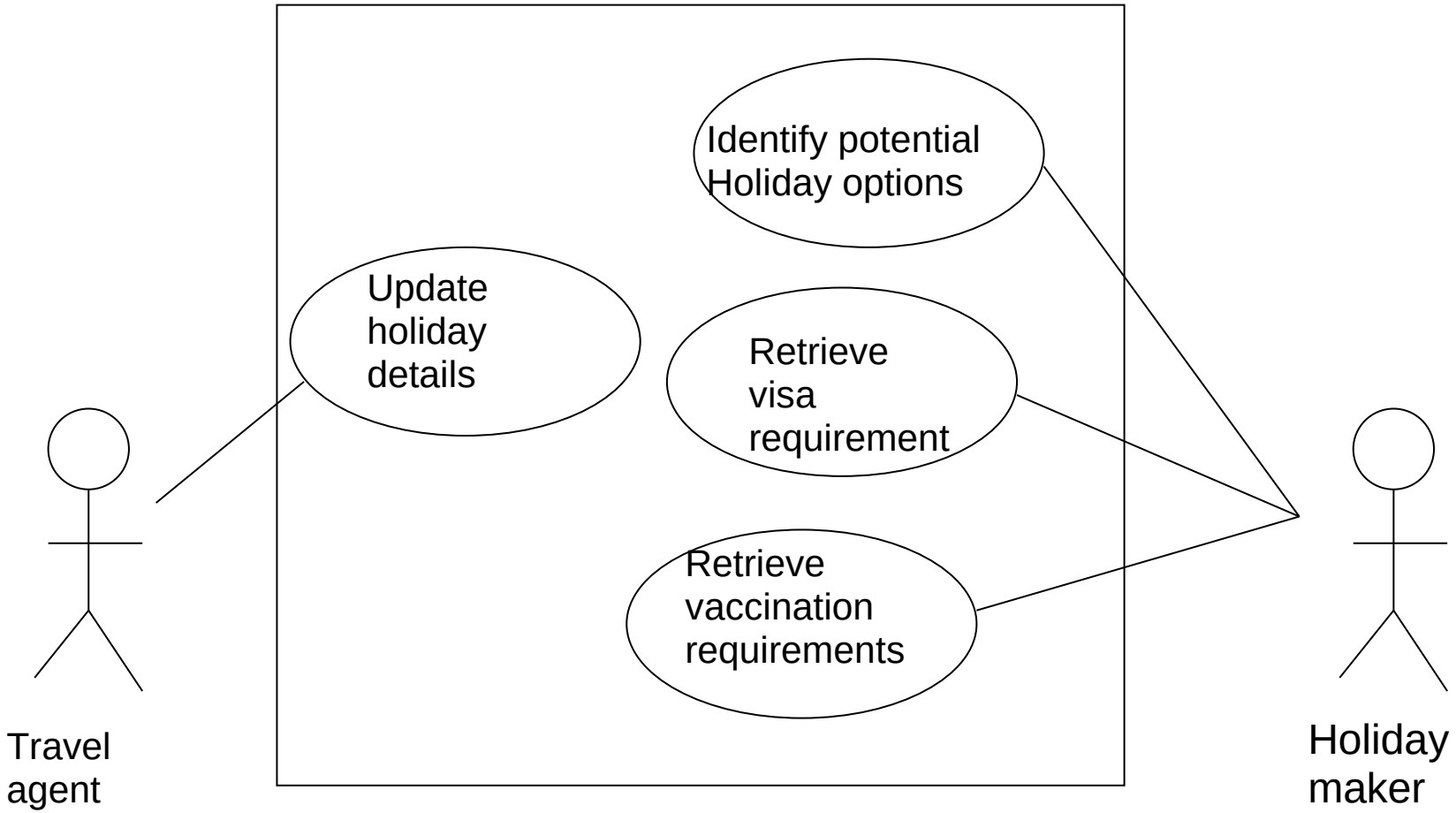
6. If the country name is invalid:
6.1 The system displays an error message.
6.2 The system returns to step 3.

8. If the nationality is invalid:
8.1 The system displays an error message.
8.2 The system returns to step 6.

9. If no information about visa requirements is found:
9.1 The system displays a suitable message.
9.2 The system returns to step 1.

Task Description

Example use case diagram for travel organizer:



Task Description

Example essential use case for travel organizer:

retrieveVisa

USER INTENTION	SYSTEM RESPONSIBILITY
find visa requirements	
	request destination and nationality
supply required information	
	obtain appropriate visa information
obtain copy of visa information	
	offer information in different formats
choose suitable format	
	give information in chosen format

Task Analysis

Analysing what users do by building a complete description of their duties

Used mainly to investigate existing situations and current practices, not to envision new systems or devices, e.g., how a user does cooking with a microwave oven

The description of user tasks includes:

- What tasks they perform?
- Why they perform them?
- How they perform them?

Task Analysis

The three questions can be answered by obtaining

- Goals: What people want to accomplish
- Tasks: The mechanisms people use to accomplish goals
- Actions: Subcomponents of tasks

Example:

Goal: Get to mountain vacation

Tasks: Rent car, drive, get repairs

Action: Get gas

Hierarchical Task Analysis

- Hierarchical task analysis (HTA) is a very common technique for task analysis
- Involves breaking a task down into subtasks, then sub-sub-tasks and so on. These are grouped as plans which specify how the tasks might be performed in practice
- HTA focuses on physical and observable actions, and includes looking at actions not related to software or an interaction device. Hence it is used for existing systems and practices
- Start with a user goal which is examined and the main tasks for achieving it are identified
- Use text and/or diagrams to show task-subtask hierarchy and plans to describe order

Hierarchical Task Analysis

Example: Determine the HTA for borrowing a book from the library

Task-subtask hierarchy:

0. In order to borrow a book from the library
    1. Go to the library
    2. Find the required book
        2.1 Access library catalogue
        2.2 Access the search screen
        2.3 Enter search criteria
        2.4 Identify required book
        2.5 Note location
    3. Go to shelf and get book
    4. Take book to checkout counter

Hierarchical Task Analysis

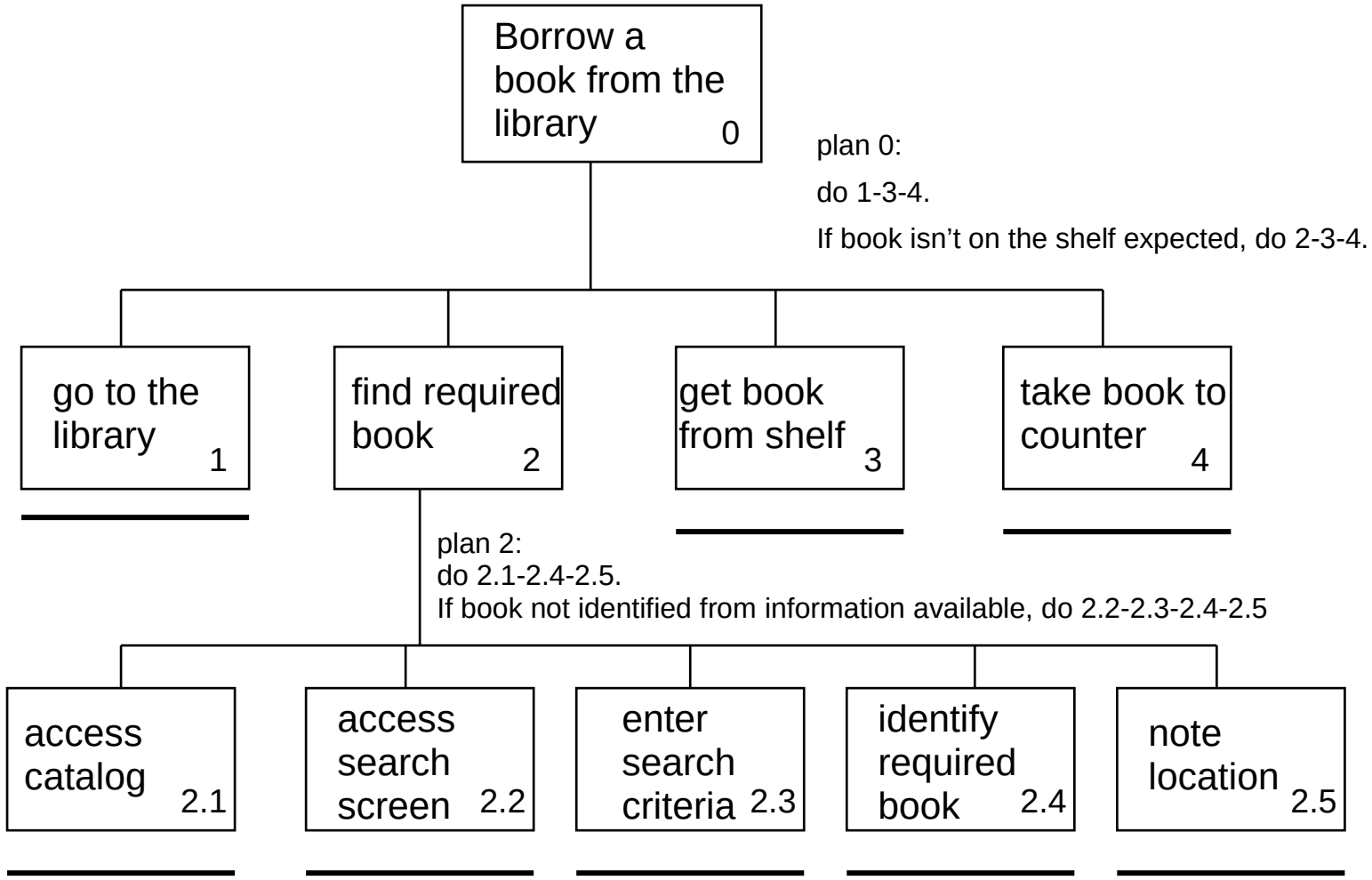
Plans to describe the task order:

- Plan 0: Do 1-3-4. If book is not on the expected shelf, do 2-3-4.
- Plan 2: Do 2.1-2.4-2.5. If book not identified, do 2.2-2.3-2.4-2.5.

This is called textual HTA

Hierarchical Task Analysis

Graphical HTA:



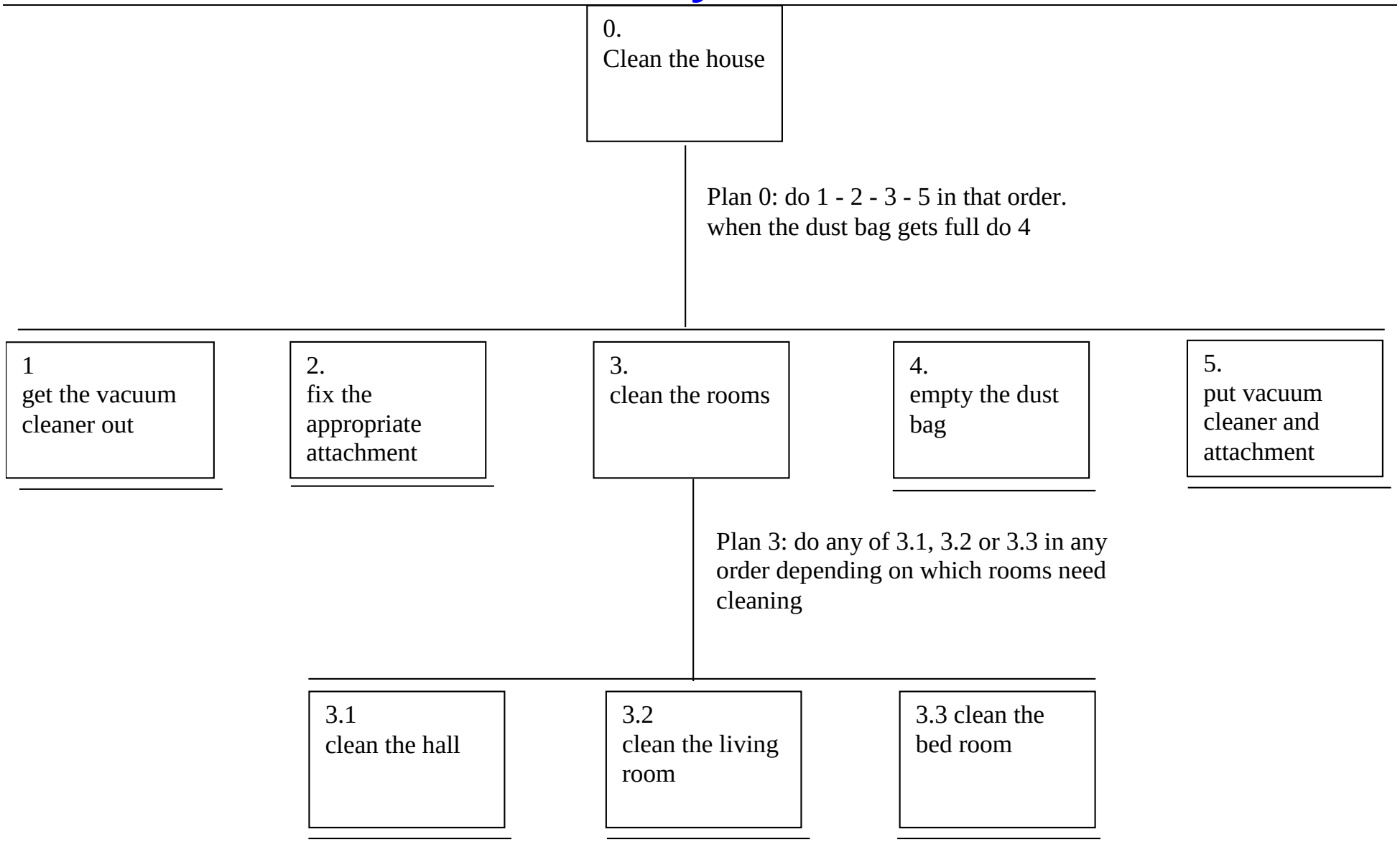
Hierarchical Task Analysis

Example: Determine the HTA for cleaning a house

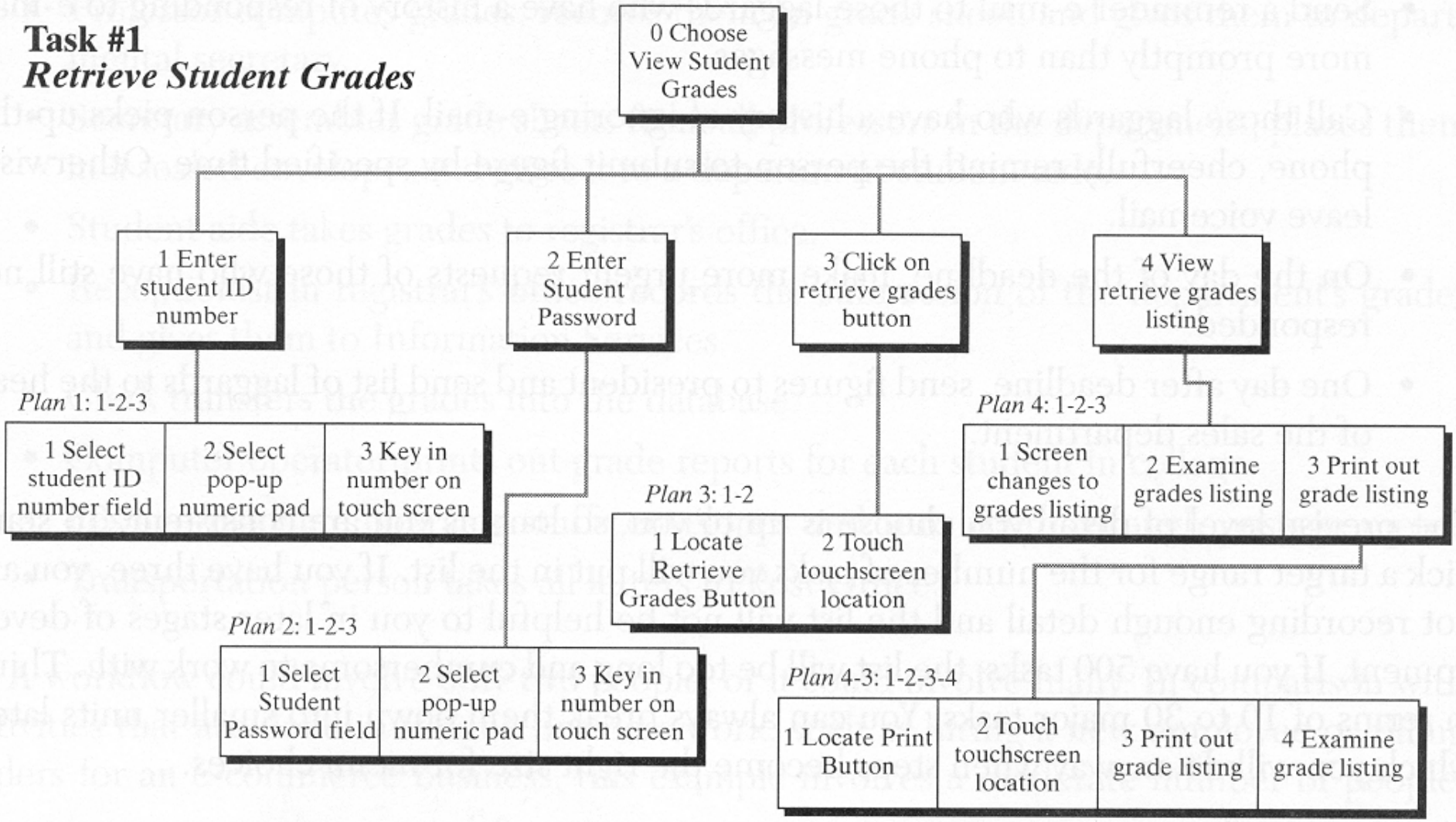
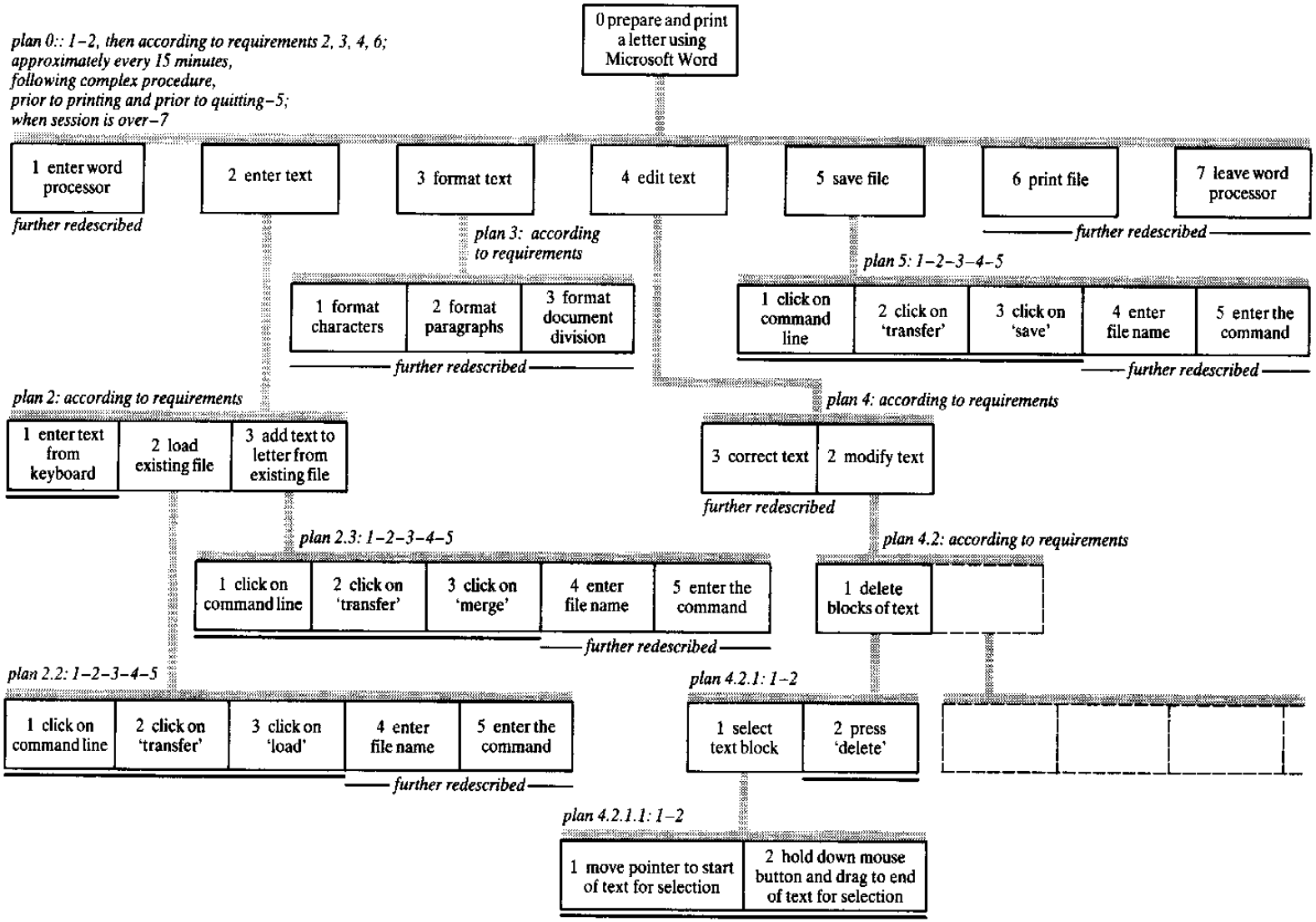
0. In order to clean the house
    1. Get the vacuum cleaner out
    2. Fix the appropriate attachment
    3. Clean the rooms
        - 3.1 Clean the hall
        - 3.2 Clean the living room
        - 3.3 Clean the bedroom
    4. When the dust bag gets full, empty it
    5. Put the vacuum cleaner & attachments away

Plans: Plan 0: Do 1-2-3-5.
If the dust bag gets full, do 4
Plan 3: Do any of 3.1, 3.2 or 3.3 in any order depending on which rooms need cleaning

Hierarchical Task Analysis



Hierarchical Task Analysis



Hierarchical Task Analysis