MOBILE INTERACTION DESIGN

PhD Course, 21-22-23 January 2020

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OVERVIEW

Unit 1	Unit 2	Unit 3
Interaction design	Mobile Interaction Design	User research

Unit 4	Unit 5	Unit 6
Prototyping	iOS Human Interface Guidelines, Google Material Design	Hands-on activity

UNIT 3

User research
Task Analysis
Scenarios

THINGS TO KNOW BEFORE DESIGNING A SYSTEM

- Who will use it?
- Where will they use it?
- What will they use it for?
- How will they use it?

ETHNOGRAPHY

- Users are observed at their workplace. The evaluator should be as unobtrusive as possible so as to allow the user to work normally.
- Digital camera (or video recording if possible) and notepad.
- Attention is paid to how tasks are actually done, as opposed to the way they are thought to be done.
- The purpose is to understand the context.
- Computer systems exist within a network of human relationships.

ETHNOGRAPHY

- It is important to see the original work practice or the system in use to understand what needs to be changed.
- What needs to be automated and what has to be left to human skills and expertise.
- A minimum of 2 users should be observed - the more users that can be observed, the better the results; however due to time restrictions it may be necessary to observe a subset of the entire team. Where possible try to select team members with different job descriptions and daily tasks.

ETHNOGRAPHY

- Successful only if accepted by the users otherwise there would be modified behavior and hence invalid results.
- Even though the evaluator tries to remain as unobtrusive as possible their presence may still affect the performance of the observed workers.
- It may be difficult to get accurate results if video recording is not available.
- The study can be difficult to pin down to a time frame
- Analyzing video and data logs can be time-consuming.
- Qualitative data.

INTERVIEWS

- May be used in conjunction with other techniques such as ethnography.
- Interviews should be thematic yet open-ended and discursive to allow the participant to direct the process somewhat.
- Extracts of interviews can be made to highlight details of particular interest.
- Two types of interview:
  - Structured
  - Unstructured

INTERVIEWS: STRUCTURED

- All questions are prepared in advance
- Looks more like an interrogation than a conversation.
- Questions can be:
  - Closed-ended: answers can be restricted to two options (dichotomous) (e.g., 'yes' or 'no,' 'male' or 'female'), or can include lists of alternatives (polytomous). Can also provide ordinal data (e.g., strongly agree / agree / neutral / disagree / strongly disagree / unable to answer). Quantitative data.
  - Open-ended: allow people to express what they think in their own words. Qualitative data.

INTERVIEWS: UNSTRUCTURED

- Questions can be adapted and changed depending on the respondents' answers. The interview can deviate from the interview schedule.
- The objective is to gather as much information as possible concerning the user's experience.
- The primary objective is to obtain information on procedures adopted by users and on their expectations of the system.
- The user can talk in some depth, choosing their own words. This helps the evaluator develop a real sense of a person's understanding of a situation.
- Qualitative data.

INTERVIEWS – TASK LIST

- Introduce yourself
- Explain the goals of the interview
- Reassure about the ethical issues - privacy, rights to information
- Ask to record
- Present and have the user sign an informed consent form
- Record the interview. Making notes is often a distraction to the subject
- Make first questions easy & non-threatening.

INTERVIEWS – TASK LIST

- Do not ask leading questions. For example, "how did that poorly designed dialog affect you?"
- Include instructions about the answer. For example, answers can range from lengthy descriptions, to briefer explanations, to identification or simple selection, to a simple "yes" or "no".
- Do not agree or disagree with the user; remain neutral.
- Include a few easy questions to defuse tension at the end
- Thank interviewee
- Switch recorder off

QUESTIONNAIRES

- Need to be very careful designed
- Three types of questions:
  - Closed-ended questions (sensitive data: use sets of ranged multi choice answers)
  - Rating scale
  - Open-ended questions
- Questionnaires may naturally form part of a structured interview. But they can also be given out filled out by the users independently of the presence of the expert. This may make it cheap and easy to gain large amounts of information
- Questionnaires require testing before release and statistical verification and analysis, and therefore can be unwieldy.

FOCUS GROUP

- A technique for collecting data from a range of users
- It is essentially a group interview
- Provides a diverse range of opinions
- A moderator is required to lead the group, but the session should be as fluid as possible whilst staying on topic.
- All participants should contribute
- Care should be taken to cover a broad range of topics and not allow one person to dominate
- Between 6 and 9 participants

FOCUS GROUP – TASK LIST

- Locate representative users who are willing to participate.
- Select a moderator.
- The list of issues to be discussed should be prepared beforehand. Normally focuses discussion on
  - Task flow
  - Suitability of design to task
  - Suitability of design to user
  - Quality of work produced
  - Impact on work environment
  - Impact on workload
  - Impact on worker relationships
  - Ease of use
  - Other topics from floor

FOCUS GROUP – TASK LIST

- Keep the discussion on track without inhibiting the free flow of ideas and comment.
- Ensure that all participants get to contribute to the discussion. Guard against having a single participant's opinion dominate the discussion.
- Have the discussion feel free-flowing and relatively unstructured to the participants, but try to follow a predefined script.
- Write a summary of the prevailing mood and critical comments of the session, including representative quotes.
- Audio recording could help

FOCUS GROUP

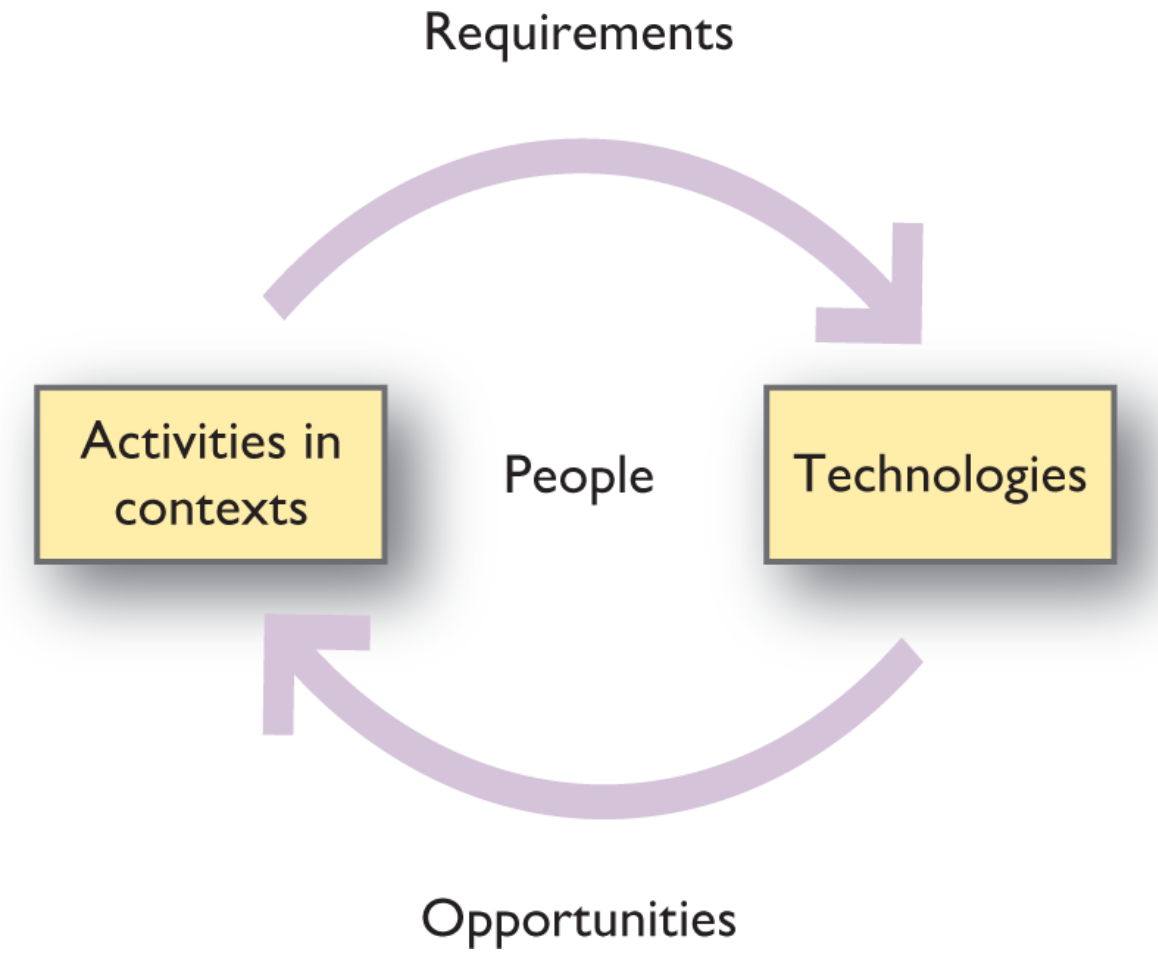
- Data is not quantitative and may not be generalisable
- More than one focus group may be required, as the outcome of a single session may not be representative and a single discussion may have focused on a subset of the issues or minor aspects of the system.

USER LOGGING

- Participants are given themes or particular questions to which they respond in writing.
- Used to gain understanding of internalization of process or environment including emotional response.
- Very useful when designing virtual reality systems.
- There can be a high non-completion rate - incentives/reminders may be required
- May unduly interfere with users normal daily tasks

PACT ANALYSIS

- The main characteristics of People
- The main issues of Activities
- The Contexts in which they occur
- The key features of interactive Technologies



PACT: PEOPLE

- Physical characteristics: height, weight, sight, hearing, touch, smell, taste, colour blindness, short-sightedness, long-sightedness, hearing and finger dexterity impairments, large fingers vs small buttons
- Psychological differences: different spatial abilities, language differences, cultural differences
- Social differences: goals and motivations, beginner/intermediate/expert users, motivation to learn

PACT: ACTIVITIES

- Temporal aspects
  - Frequency: frequent tasks are easy to do, infrequent tasks are easy to learn or remember how to do)
  - Time pressure: quiet or busy
  - Single or continuous actions: Can be interrupted?
  - Acceptable response time

PACT: ACTIVITIES

- Cooperation
  - One users? More users?
  - For collaborative activities:
    - Awareness
    - Coordination
    - Communication

PACT: ACTIVITIES

- Complexity
  - Well-defined task (can be accomplished by step by step design)
  - For a vague activity people have to be able to:
    - to browse around
    - see different types of information
    - move from one think to another

PACT: ACTIVITIES

- Safety-critical aspects:
  - any mistake could result in in an injury or serious accident – designers must pay attention to ensuring that mistakes do not have a serious effect
  - designers must:
    - think what happens when people make mistakes and errors
    - design for that circumstances

PACT: ACTIVITIES

- Data requirements
  - What is input?
    - large/modest/small amount of required data?
  - How to input?
  - What is output?
    - alphanumerical data, video records, other media
- Good content:
  - accurate, up to date, relevant, good presented

PACT: CONTEXTS

- Environment in which activity happens
  - Physical environment (temperature, humidity, noise, …)
  - Social contexts (private issues, individual or group activity)
  - Organizational contexts (changes in technology alter communication and power structure; automation can lead to deskilling)

PACT: TECHNOLOGIES

- Input devices
  - switches and buttons
  - keyboards
  - touch screen
  - pointing devices
  - gestures
  - QR codes
- Output technology
  - screens
  - haptic technologies
  - 2D or 3D printers

PACT - EXAMPLE

Access to university laboratories:

- People – students, lecturers, technicians
- Activities – enter some form of security clearance and open the door
- Contexts – indoor activity, people may carry books, in a crowd
- Technologies – small amount of data has to be entered quickly – the output must be clear – accessible for people in wheelchairs

PERSONAS

- Fictional characters, created according to what emerged during user research, that represent the different user types.
- Help the designer understanding users' needs, experiences, behaviours, and goals.
- Personas can help to recognize user diversity.
- They do not describe real people, but are based on real data collected from multiple individuals.
- Bring them to life with a name, characteristics, goals, personal background.
- Develop multiple personas.

Daivd Miller

- 28
- New-York
- Product Designer
- Living with his girlfind

Bio

Lives in a rented apartment, 2.5 rooms, with his student girlfriend, works in a high-tech job. Likes hosting people. After a long day at work, he likes to throw on the couch with his girlfriend in front of the TV.

Tech

Internet	●●●●●
Social Media	●●●●○
Online Shopping	●●●●○
Gatgets	●●●●○
Early Adopter	●●●●●

Favorite Brands

VANS

Wants & Needs

- Create a cozy atmosphere at home with innovative design.
- Design the house at low investment and without much effort.

Frustrations

- Don't want to spend money on interior designer and he doesn't have much time to deal with the design planning.
- He designs his apartment, but he thinks that she can look much better.

Lisa Jarrett "Zotero helps me stay organized with my classes."

BACKGROUND:

- 23 years old
- Masters student in Archives Management at the University of Maryland
- Lives with boyfriend of 4 years, Derek
- Wants to become an archivist for a public library
- Works part-time doing shelving at the library
- Friendly but also quiet and introspective at times; very detail-oriented and likes organization

TECHNOLOGY USE:

- Uses the web constantly to check her email, Facebook, and favorite celebrity gossip blog, as well as do schoolwork for classes

- Is not an early adopter of new web technologies, but does use popular tools like de.icio.us to help her organize her bookmarks

- Owns a Dell laptop running Windows XP that is two years old

NEEDS & GOALS:

- Wants software to be free as she doesn't have much spare cash

- Wants her citations to be formatted automatically in her bibliographies to save her the time & effort

- Wants it to be easy to add and organize citations for her classes so she can easily find them later for writing papers

TOBI DAY

PERSONA TEMPLATE

AGE 26
OCCUPATION Record Store Manager
STATUS Single
LOCATION New York, NY

TIER Enthusiast
ARCHETYPE The Maestro

Ambitious | Admired | Focused

"If I had a way to share projects and collaborate in real time, that would make my workload so much easier to manage."

MOTIVATIONS

- Incentive
- Fear
- Achievement
- Growth
- Power
- Social

GOALS

- To grow a strong industry reputation
- To build an audio-pro portfolio
- To keep track of everything

FRUSTRATIONS

- Slow download times
- Data crashes
- Poor communication

BIO

Tobi has a day job at a record store, but on the side she does all kinds of production work for up-and-coming artists. She never hesitates to learn something new and she often acts as tech support for her friends and clients. She is usually working on a dozen projects at a time and is trying to establish herself in the industry, so she hates data crashes or anything that makes her look bad. Because she works alone and in her home, collaboration is everything.

PERSONALITY

Extrovert	Introvert
Sensing	Intuition
Thinking	Feeling
Judging	Perceiving

TECHNOLOGY

- IT and Internet
- Software
- Mobile Apps
- Social Networks

Audi

Coca-Cola

SONY

PreSonus

Nerdy Nina

"The book is way better than the movie!"

#booklover
#bookaddict
#booknerdproblems

DEMOGRAPHICS

Age:	25
Location:	Sao Paulo, Brazil
Education:	Software Engineer
Job:	Q/A at Indie Game Company
Family:	Lives with her boyfriend

TECH

Internet	●●●●●
Social Networks	●●○○○
Messaging	●●●○○
Games	●●●●●
Online Shopping	●●●●○

GOALS

- Discovering new books / authors to read
- Finding unique stories
- Cataloging book collection

FRUSTRATIONS

- Keeping track of different series
- Forgetting a book launch date
- Finding space for more books

READING HABITS

- Fast pace reader
- Never lends books
- Likes hardcovers and boxed collections
- Pre-order books to get them first
- Reads eBooks, but prefer physical copies
- Always finishes a book
- Loves binge reading and re-reading

FAVORITE BOOKS

American Gods
Neil Gaiman

Harry Potter
J.K. Rowling

Ready Player One

DEMOGRAPHIC DIVERSITY

- The user interface design focuses attention on the users trying to understand them.
- In a global economy the differences between users may reflect world-wide cultures.
- Needs, wants, preferences and expectations of different cultures should be analyzed.

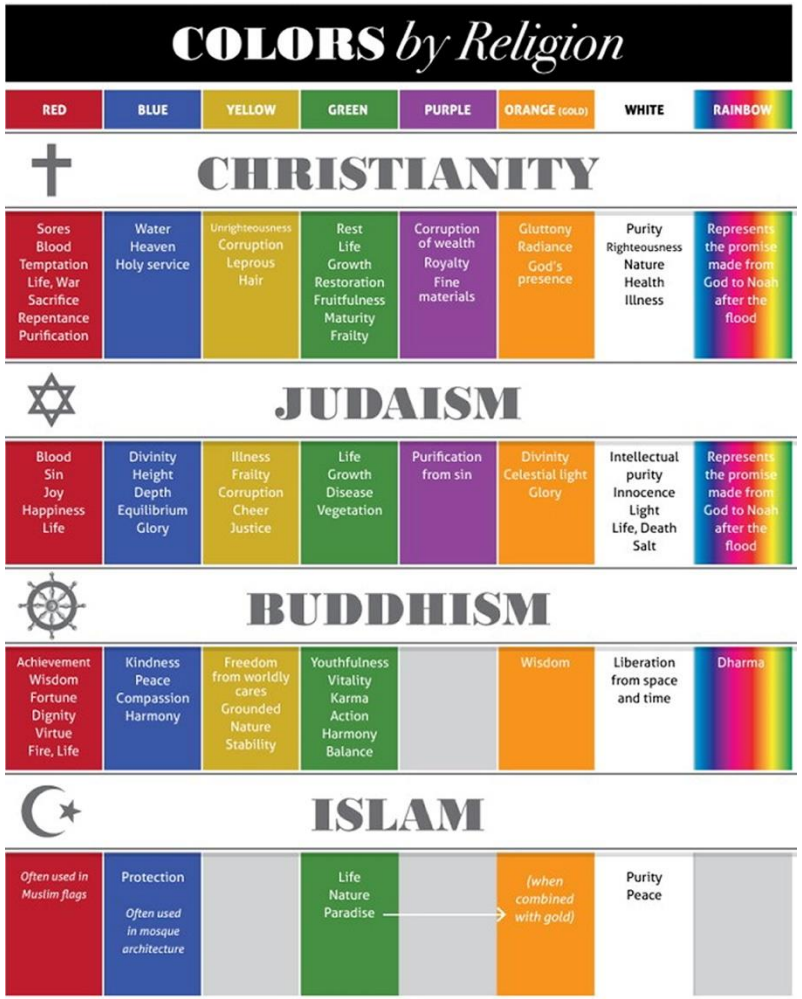
EXAMPLE 1: YEARS

- The year 2020 in the Gregorian Calendar «translated» into several other calendars.
- Source: wikipedia

2020 in various calendars

Gregorian calendar	2020 *MMXX*
Ab urbe condita	2773
Armenian calendar	1469 ԹՎ ՌՆԿԹ
Assyrian calendar	6770
Bahá'í calendar	176–177
Balinese saka calendar	1941–1942
Bengali calendar	1427
Berber calendar	2970
British Regnal year	68 Eliz. 2 – 69 Eliz. 2
Buddhist calendar	2564
Burmese calendar	1382
Byzantine calendar	7528–7529
Chinese calendar	己亥年 (Earth Pig) 4716 or 4656 — *to* — 庚子年 (Metal Rat) 4717 or 4657
Coptic calendar	1736–1737
Discordian calendar	3186
Ethiopian calendar	2012–2013
Hebrew calendar	5780–5781
Hindu calendars	
- *Vikram Samvat*	2076–2077
- *Shaka Samvat*	1941–1942
- *Kali Yuga*	5120–5121
Holocene calendar	12020
Igbo calendar	1020–1021
Iranian calendar	1398–1399
Islamic calendar	1441–1442
Japanese calendar	Reiwa 2 (令和2年)
Javanese calendar	1953–1954
Juche calendar	109
Julian calendar	Gregorian minus 13 days
Korean calendar	4353
Minguo calendar	ROC 109 民國109年
Nanakshahi calendar	552
Thai solar calendar	2563
Tibetan calendar	阴土猪年 (female Earth-Pig) 2146 or 1765 or 993 — *to* — 阳金鼠年 (male Iron-Rat) 2147 or 1766 or 994
Unix time	1577836800 – 1609459199

EXAMPLE 2: COLOURS



GEERT HOFSTEDE

- Dutch cultural anthropologist. During 1978-1983 he conducted interviews with hundreds of IBM employees in 53 countries
- Determined patterns of similarities and differences
- Formulated his theory that world cultures vary along consistent, fundamental dimensions

- His subjects were all employees of the same multinational corporation (world-wide distributed)
- Ascribed their differences to the effects of their national cultures (weakness: each country -> one dominant culture)

FIVE DIMENSIONS

- Power-distance
- Collectivism vs individualism
- Femininity vs masculinity
- Uncertainty avoidance
- Long vs short-term orientation

POWER-DISTANCE (PD)

- Refers to the extent to which less powerful members expect and accept unequal power distribution within a culture

- High and Low PD countries

POWER-DISTANCE (PD)

- High PD countries:
  - Political power: typically centralized
  - Organizations: exhibit tall hierarchies with large differences in salary and status (Boss is seen as a benevolent dictator and subordinates are expected to do as they are told)
  - Parents: teach obedience and expect respect
  - Teachers: possess wisdom and are esteemed
  - Inequalities: expected and may even be desired

POWER-DISTANCE (PD)

- Low PD countries:
  - Subordinates and supervisors: closer and more interchangeable
  - Hierarchies: more flatter and less differences in salaries and status
  - Parents-children / Teachers-children: view themselves as equals (not necessarily as identical)
  - Equality: expected and generally desired

- Higher geographic latitude, smaller populations, higher gross domestic product per person

Aspect	High PD	Low PD
Access to information	Highly structured	Less-highly structured
Hierarchies in mental models	Tall	Shallow
Emphasis on social/moral order and its symbols	Significant/frequent	Minor/infrequent
Focus on expertise, authority, experts, certifications,	Strong	Weak
Prominence given to leaders vs citizens, customers or employees	High	Low
Importance of security and restrictions or barriers to access	Explicit, enforced, frequent restrictions	Transparent, integrated, implicit freedom
Social roles used to organize information	Frequent	Infrequent

COLLECTIVISM VS INDIVIDUALISM

- Collectivism: people are integrated from birth into strong, cohesive groups that protect them in exchange for unquestioning loyalty

- Individualism: loose ties; everyone is expected to look after one's self or immediate family but no one else

Aspect	Individualist cultures	Collectivist cultures
Motivation based on personal achievement	Maximized	Underplayed
Images of success	Materialism and consumerism	Achievement of social-political agendas
Rhetorical style	Controversial/argumentative speech and tolerance or encouragement of extreme claims	Official slogans and subdued hyperbole and controversy
Prominence	Youth and action	Aged, experienced, wise leaders and states of being
Importance	Individuals	Groups
Underlying sense of social morality	Emphasis on truth	Emphasis on relationships
Emphasis on change	What is new and unique	Tradition and history
Privacy	Willingness to provide personal information	Protection of personal data differentiating the individuals from the group

FEMININITY VS MASCULINITY

- Refer to gender roles, not physical characteristics
- Traditional assignments:
  - Masculine roles: assertiveness, competition, toughness
  - Feminine roles: orientation to home and children, people, tenderness
- In masculine cultures the distinctions are strongly maintained. In feminine cultures the distinctions tend to collapse (overlap gender roles)
- MAS: masculinity index value (e.g. Japan 95, Austria 79, USA 62, Sweden 5)

UNCERTAINTY AVOIDANCE (UA)

- Expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity.

- High UA cultures: high rates of suicide, alcoholism, accidental deaths, numbers of prisoners per person. Business have more formal rules, require longer career commitments. People are more expressive (talk with their hands, raise their voices and show emotions).

UNCERTAINTY AVOIDANCE (UA)

- Low UA cultures: what is different may be viewed as a threat and what is unconventional is often equated with what is dangerous. Higher caffeine consumption, lower calorie intake, higher hearth-disease death rates, more chronic psychosis per person. Business is more informal and focuses on long-range strategies. Less expressive and less openly anxious. People behave quietly without showing emotions, seem easy-going and relaxed. What is different is viewed as curious or ridiculous

LONG VS SHORT-TERM ORIENTATION

- LT countries:
  - Content focused on practice and practical value
  - Relationships as a source of information and credibility
  - Patience in achieving results and goal
- ST countries:
  - Content focused on truth and certainty of beliefs
  - Rules as a source of information and credibility
  - Desire for immediate results and achievement of goals

Country	PDI	IDV	MAS	UAI
UK	35	89	66	35
India	77	48	56	40
Spain	57	51	42	86
Iran	58	41	43	59
Pakistan	55	14	50	70
Italy	50	76	70	75

TASK ANALYSIS

- Task Analysis is used to identify the sequence of tasks required to complete an activity.
- It involves breaking down tasks into discrete steps, and noting the order in which they occur.
- This is most useful when designing a new system as the computerized version should mimic the manual system in the type of and ordering of tasks as closely as possible, so that users can easily make the transition to the new computerized system.
- It should also expose areas of under-productivity which a computerized system could automate.
- Any of the following methods can be used to collect information about a system:
  - Interviews with users
  - Ethnography
  - User logging

TASK ANALYSIS

- The purpose is to produce a clear understanding of what it is that the system must do.
- The next stage is to produce the interface.

TASK ANALYSIS – TASK LIST

- Identify the steps involved in the task
- What information is used for each task?
- What affects or causes error in task performance?
- What are the good features of the system?
- What are the bad features?
- What skills are required for each task and how are they acquired?
- How do external factors (time constraints, environment) affect the task?
- How could you 'improve' the experience of undertaking the task?

TASK ANALYSIS

- 4 approaches:
  - Task decomposition: splitting task into (ordered) subtasks
  - Knowledge based techniques: what the user knows about the task and how it is organized
  - Entity/object based analysis: relationships between objects, actions and the people who perform them
  - Many different notations/techniques

TASK ANALYSIS – GENERAL METHOD

- Observe
- Collect unstructured lists of words and actions
- Organize using notation or diagrams

HIERARCHICAL 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
- Focuses on physical and observable actions, and includes looking at actions not related to software or an interaction device
- Start with a user goal which is examined and the main tasks for achieving it are identified
- Tasks are sub-divided into sub-tasks

HIERARCHICAL TASK ANALYSIS

- Get list of tasks
- Group tasks into higher level tasks
- Decompose lowest level tasks further

Stopping rules

- How do we know when to stop?
- Purpose: expand only relevant tasks

HIERARCHICAL TASK ANALYSIS – EXAMPLE 1

- In order to clean the house:
  - Get the vacuum cleaner out
  - Fix the appropriate attachments
  - Clean the rooms
  - When the dust bag gets full, empty it
  - Put the vacuum cleaner and tools away

- Must know about:
  - Vacuum cleaners, their attachments, dust bags, cupboards, rooms, etc.

HIERARCHICAL TASK ANALYSIS – EXAMPLE 1

Hierarchy:

0. In order to clean the house
    1. get the vacuum cleaner out
    2. get the appropriate attachment
    3. clean the rooms
        3.1. clean the hall
        3.2. clean the living rooms
        3.3. clean the bedrooms
    4. empty the dust bag
    5. put vacuum cleaner and attachments away

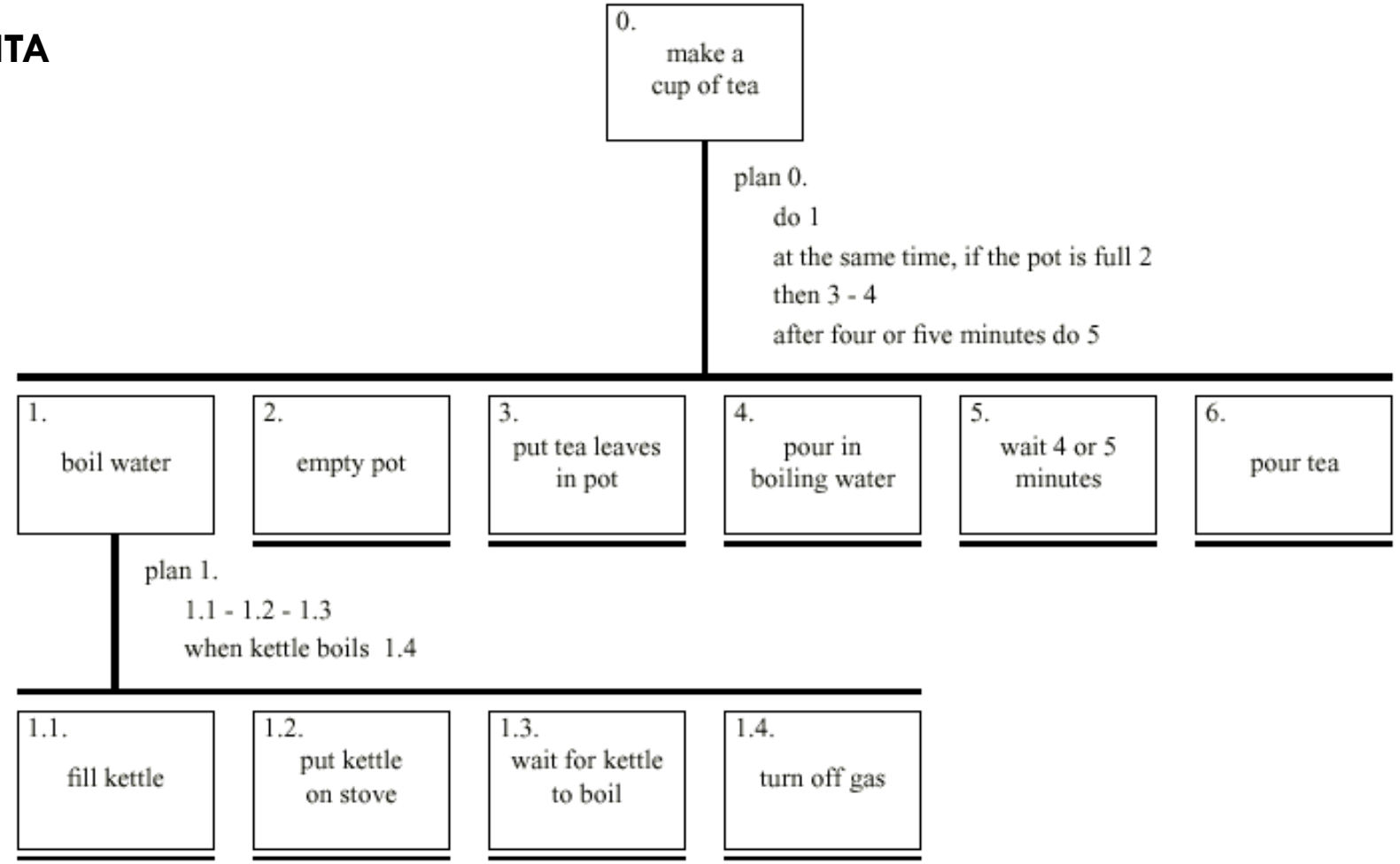
Plans:

Plan 0: do 1-2-3-5 in that order. When 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 – EXAMPLE 2

Diagrammatic HTA



HIERARCHICAL TASK ANALYSIS – EXAMPLE 2

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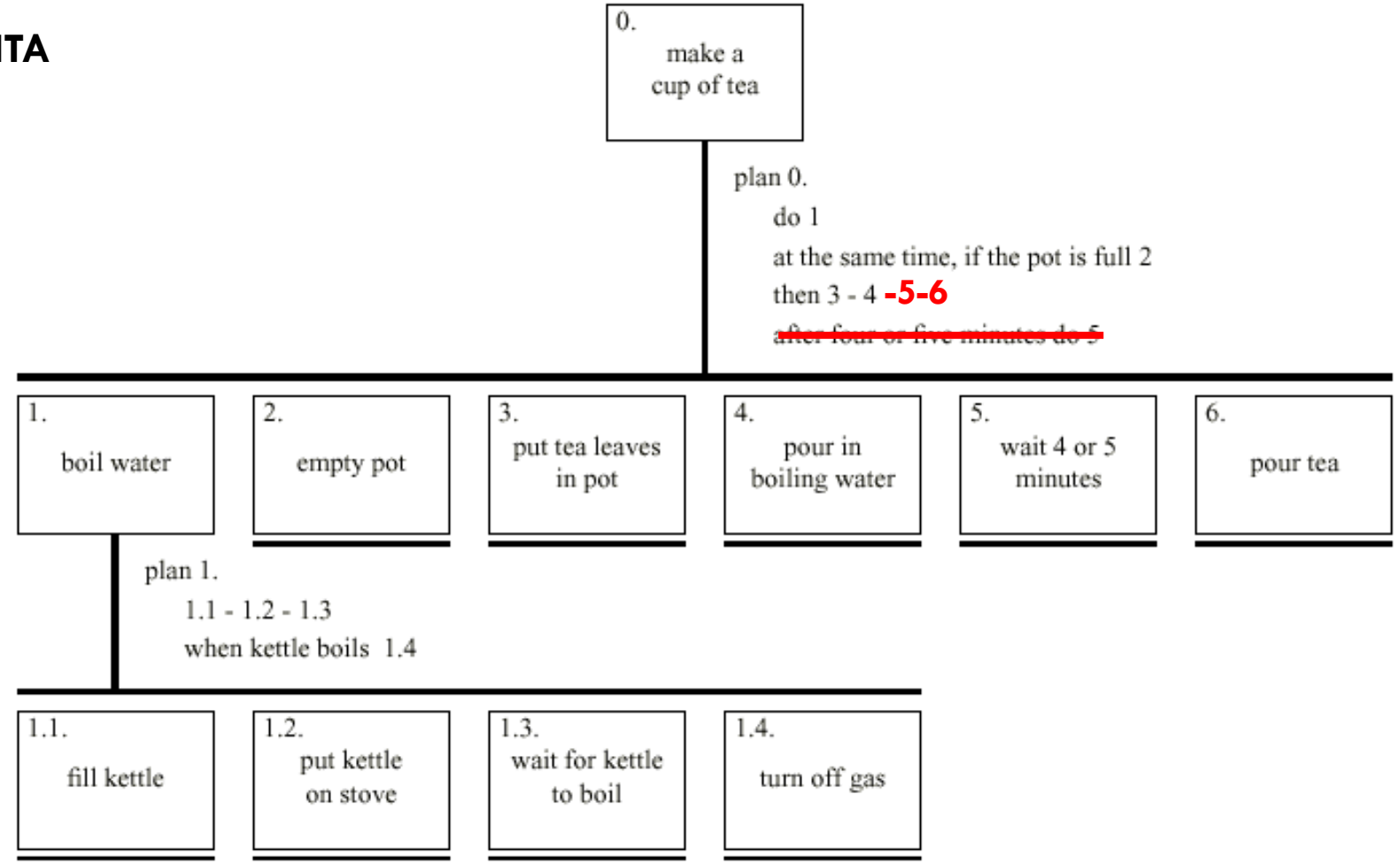


HIERARCHICAL TASK ANALYSIS – EXAMPLE 2

Is waiting part of a plan or is it a task?

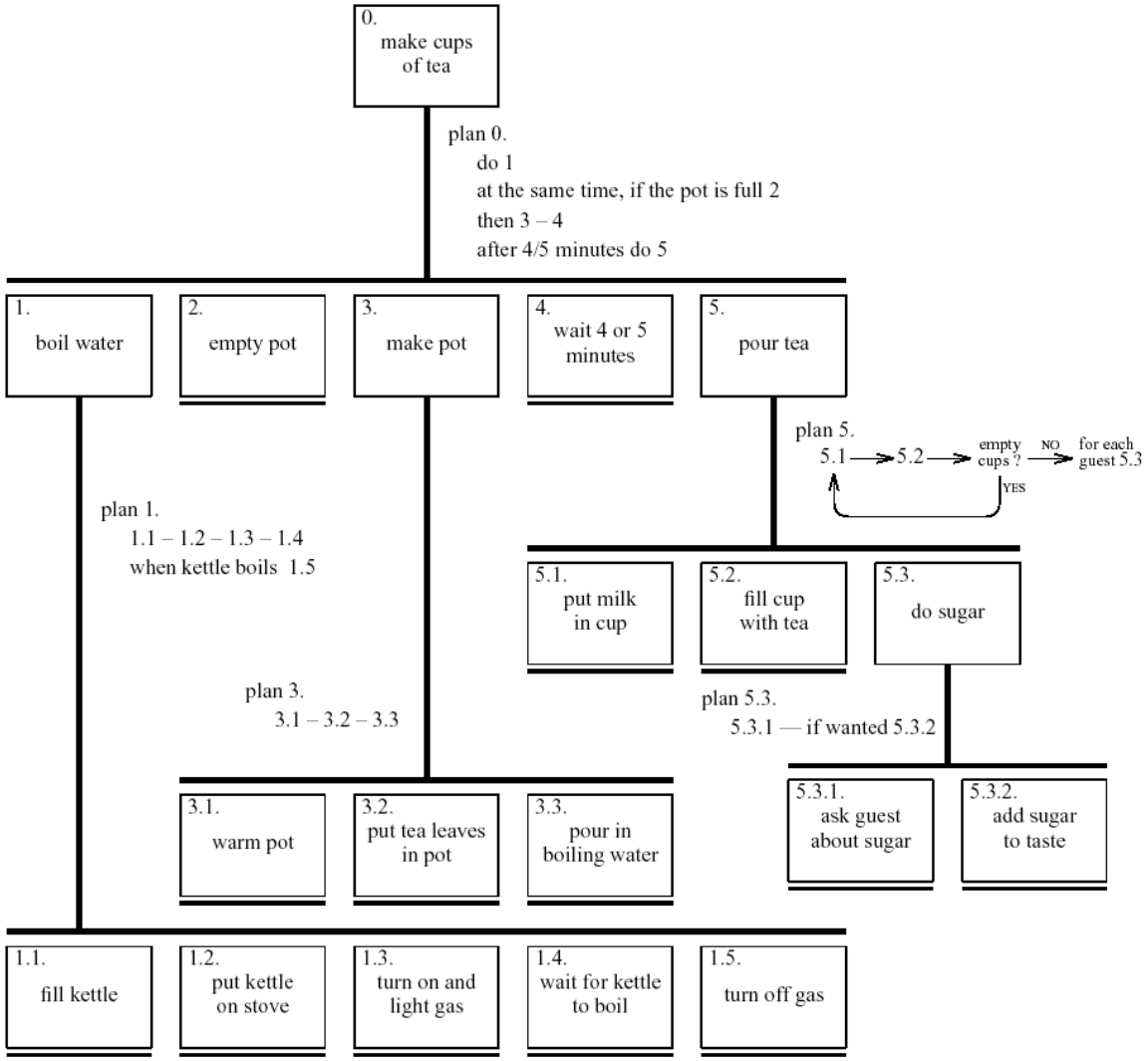
Generally:

- Task – if «busy» wait (you are actively waiting)
- Plan – if end of delay is the event («when alarm rings», «when reply arrives»)

In this example is a little redundant BUT task analysis is not an exact science!

HIERARCHICAL TASK ANALYSIS – EXAMPLE 2

Diagrammatic HTA – Refined!



SCENARIO

- Short stories about people and activities using technology in context
- A representation of the designer's understanding of activities so that it can be discussed and verified
  - By other designers
  - By the people undertaking the activities

SCENARIO: CHARACTERISTIC ELEMENTS

- Setting
- Actors (write for specific Personas)
- Goals (for each actor)
- Sequence of actions and events

SCENARIO – TASK LIST

- Give the scenario a name, version number, author, …, and the rationale (reason why) for the scenario
- Write up a particular scenario with a particular person in a particular context
- It can help to do a PACT analysis on which to base the scenario
- Number the paragraphs and include endnotes to record issues with the activity - these might be issues with current problems or future designs

EXAMPLE 1

- The Thomson family enjoy outdoor activities and want to try their hand at sailing this year. There are four family members: Sky (8 years old), Eamonn (12 years old), Claire (32), and Will (35). One evening after dinner they decide to start exploring the possibilities. They want to discuss the options together but Claire has to visit her elderly mother so will be joining the conversation from her mother's house down the road. As a starting point, Will enters an idea they had been discussing over dinner– a sailing trip for four novices in the Mediterranean. The system supports users to log on from different locations and use different devices so that all members of the family can interact easily and comfortably with it wherever they are. The system's initial suggestion is a flotilla, where several crews (with various levels of experience) sail together on separate boats. Sky and Eamonn aren't very happy at the idea of going on vacation with a group of other people, even though the Thomsons would have their own boat. The travel organizer shows them descriptions of flotillas from other children their ages and they are all very positive, so eventually, everyone agrees to explore flotilla opportunities. Will confirms this recommendation and asks for detailed options. As it's getting late, he asks for the details to be saved so everyone can consider them tomorrow. The travel organizer emails them a summary of the different options available.

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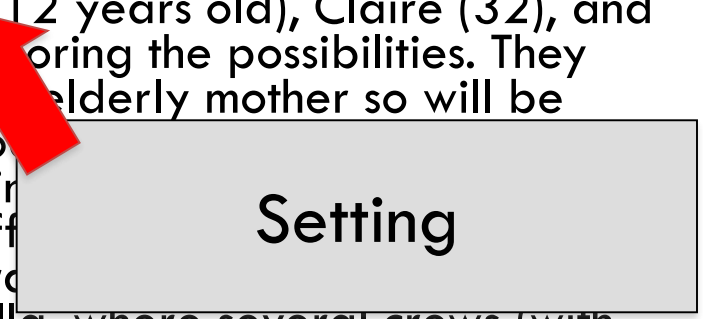
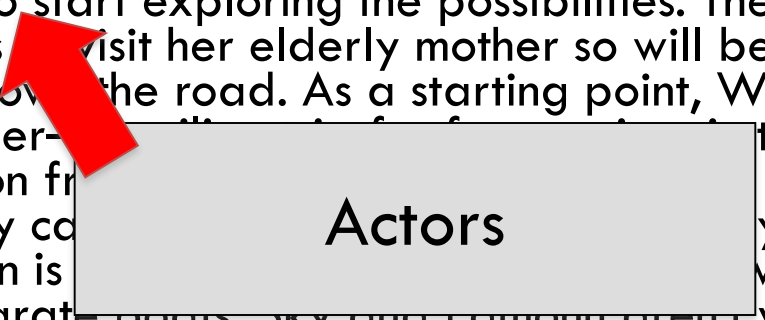


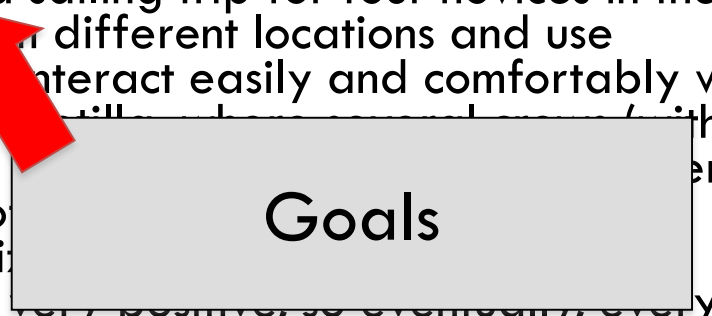
EXAMPLE 1

- The Thomson family enjoy outdoor activities and want to try their hand at sailing this year. There are four family members: Sky (8 years old), Eamonn (12 years old), Claire (32), and Will (35). One evening after dinner they decide to start exploring the possibilities. They want to discuss the options together but Claire has [illegible] visit her elderly mother so will be joining the conversation from her mother's house do[illegible]the road. As a starting point, Will enters an idea they had been discussing over dinner-[illegible] the Mediterranean. The system supports users to log on fr[illegible] different devices so that all members of the family co[illegible]y with it wherever they are. The system's initial suggestion is [illegible] with various levels of experience) sail together on separate boats. Sky and Eamonn aren't very happy at the idea of going on vacation with a group of other people, even though the Thomsons would have their own boat. The travel organizer shows them descriptions of flotillas from other children their ages and they are all very positive, so eventually, everyone agrees to explore flotilla opportunities. Will confirms this recommendation and asks for detailed options. As it's getting late, he asks for the details to be saved so everyone can consider them tomorrow. The travel organizer emails them a summary of the different options available.



EXAMPLE 1

- The Thomson family enjoy outdoor activities and want to try their hand at sailing this year. There are four family members: Sky (8 years old), Eamonn (12 years old), Claire (32), and Will (35). One evening after dinner they decide to start exploring the possibilities. They want to discuss the options together but Claire has to visit her elderly mother so will be joining the conversation from her mother's house down the road. As a starting point, Will enters an idea they had been discussing over dinner– a sailing trip for four novices in the Mediterranean. The system supports users to log on f[illegible] different locations and use different devices so that all members of the family c[illegible]nteract easily and comfortably with it wherever they are. The system's initial suggestion is a[illegible] various levels of experience) sail together on separate [illegible]ery happy at the idea of going on vacation with a group o[illegible] Thomsons would have their own boat. The travel organi[illegible] flotillas from other children their ages and they are all [illegible]yone agrees to explore flotilla opportunities. Will confirms this recommendation and asks for detailed options. As it's getting late, he asks for the details to be saved so everyone can consider them tomorrow. The travel organizer emails them a summary of the different options available.



EXAMPLE 1

Actions/events

- The Tho ities and want to try their hand at sailing this year. There are four family members: Sky (ars old), Eamonn (12 years old), Claire (32), and Will (35). One evening after dinner the ecide to start exploring the possibilities. They want to discuss the options together but Claire has to visit her elderly mother so will be joining the conversation from her mother's house down the road. As a starting point, Will enters an idea they had been discussing over dinner– a sailing trip for four novices in the Mediterranean. The system supports users to log on from different locations and use different devices so that all members of the family can interact easily and comfortably with it wherever they are. The system's initial suggestion is a flotilla, where several crews (with various levels of experience) sail together on separate boats. Sky and Eamonn aren't very happy at the idea of going on vacation with a group of other people, even though the Thomsons would have their own boat. The travel organizer shows them descriptions of flotillas from other children their ages and they are all very positive, so eventually, everyone agrees to explore flotilla opportunities. Will confirms this recommendation and asks for detailed options. As it's getting late, he asks for the details to be saved so everyone can consider them tomorrow. The travel organizer emails them a summary of the different options available.

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