



Task Analysis

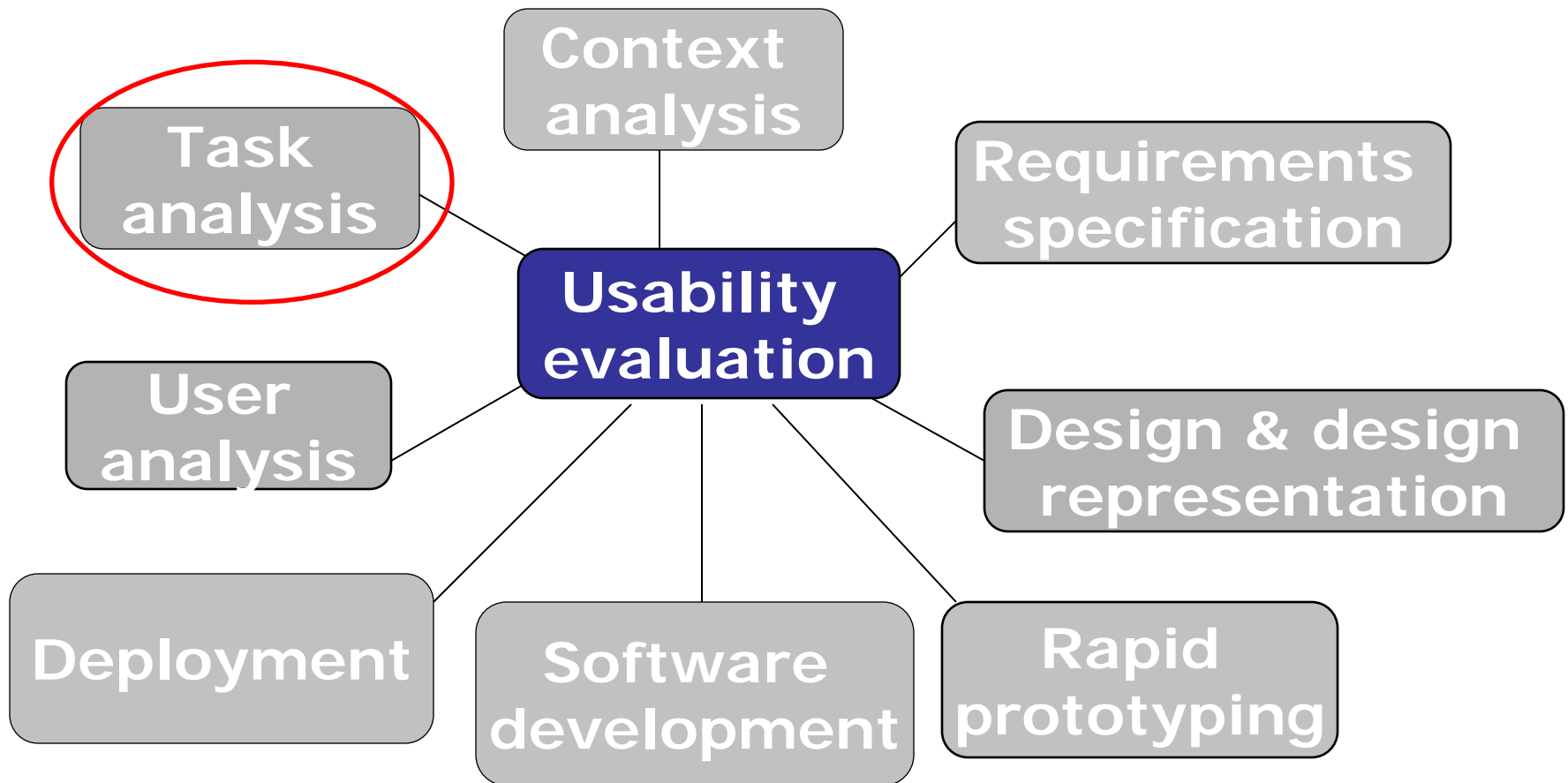
Judith Masthoff



What is usability and why is it important?

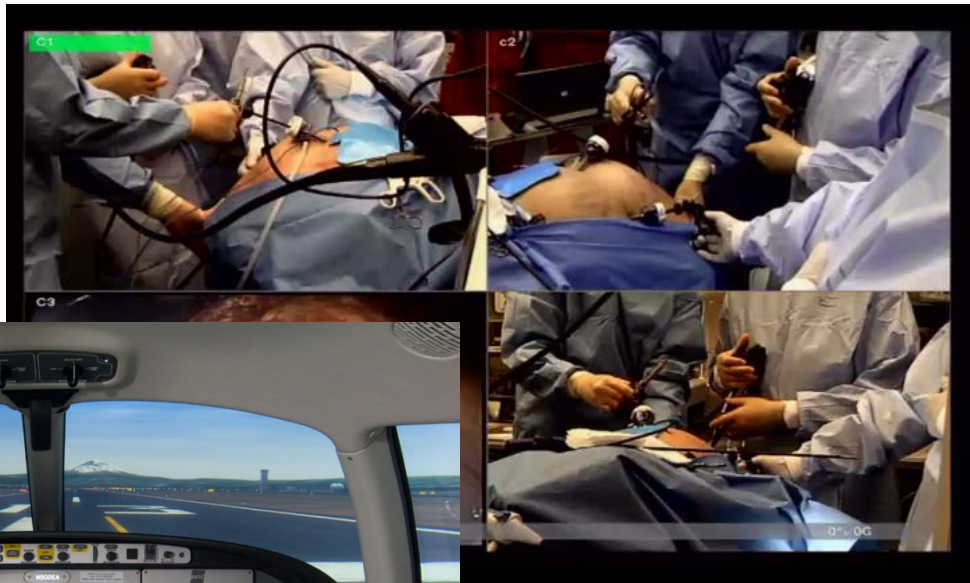
Users, user classes and personas

Usability engineering methodology



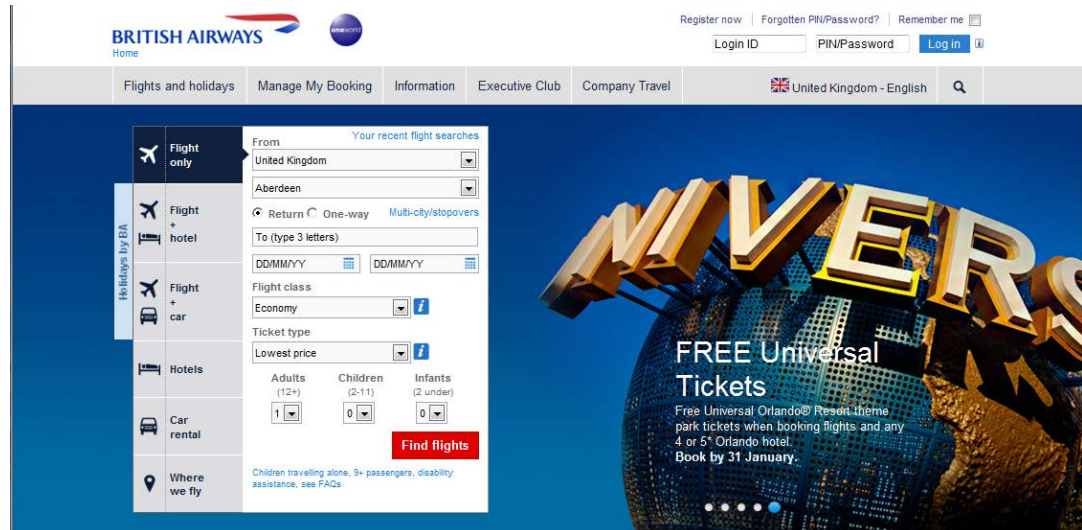
What we will cover...

- Tasks
- Task models
- Scenarios



Define Core Tasks: E-flights

- Search for a flight to a certain destination
- Search for a flight on a certain day
- Search for a cheap flight
- Add flight to order
- Pay by Credit Card...



The screenshot displays the British Airways website's flight search interface. At the top, the British Airways logo and a 'Home' link are visible. To the right, there are links for 'Register now', 'Forgotten PIN/Password?', and 'Remember me', along with a login section for 'Login ID' and 'PIN/Password' with a 'Log in' button. Below the header, a navigation bar includes links for 'Flights and holidays', 'Manage My Booking', 'Information', 'Executive Club', and 'Company Travel'. The main search area is titled 'Your recent flight searches' and includes a 'From' dropdown set to 'United Kingdom' and a 'To' dropdown set to 'Aberdeen'. It also features a 'Return' button, a 'One-way' button, and a 'Multi-city/stopovers' link. The search criteria section includes a 'Flight class' dropdown set to 'Economy', a 'Ticket type' dropdown set to 'Lowest price', and a 'Find flights' button. The passenger selection section shows 'Adults (12+)' set to 1, 'Children (2-11)' set to 0, and 'Infants (2 under)' set to 0. A sidebar on the left lists travel options: 'Flight only', 'Flight + hotel', 'Flight + car', 'Hotels', 'Car rental', and 'Where we fly'. A promotional banner on the right side of the page advertises 'FREE Universal Tickets' for Universal Orlando Resort theme park tickets when booking flights and any 4 or 5* Orlando hotel, with a deadline to book by 31 January.

BRITISH AIRWAYS
Home

Register now | Forgotten PIN/Password? | Remember me ☐
Login ID PIN/Password Log in

Flights and holidays | Manage My Booking | Information | Executive Club | Company Travel | United Kingdom - English

Flight only

From
To

☒ Return ☐ One-way [Multi-city/stopovers](#)

To (type 3 letters)

DD/MM/YY DD/MM/YY

Flight class
Ticket type

Adults (12+) Children (2-11) Infants (2 under)

Children travelling alone, 8+ passengers, disability assistance, see FAQs

FREE Universal Tickets
Free Universal Orlando® Resort theme park tickets when booking flights and any 4 or 5* Orlando hotel.
Book by 31 January.

Example of email program

- Core Tasks:
 - Compose email
 - Add recipients
 - Include Attachments
 - Include signature
 - Read email
 - Delete email, etc...





What is a Task?

- A task is something that the user wishes to achieve
 - an element of work or an activity with a specific start and termination point.
- A task should be meaningful to the user:
 - associated with a goal
 - described using the language the user normally uses
- Focus is on the user...

Scenarios

Persona

+



Who is she?
Name, age,
interests

Tasks

What does she want to do?

= Scenario

Define Scenarios

Combine persona and task, plus realistic data

E-flights:

Helen Beatty wants to book a flight to Amsterdam. She only needs a single, as her brother will come back with her and he has a car. Because of her tight work schedule, she needs to fly on 7th November. She is worried about the cost of flying and a friend has recommended using the web to find a cheap flight.



What is Task Analysis?

Method of analysing people's jobs:

- What people do
- What things they work with
- What they must know

General design methodology

- Not only for computer science



An Example

- 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 away
- Typical user knows about:
 - Vacuum cleaners, their attachments, dust bags, cupboards, rooms , etc.



Your go...

What are the core tasks for making a sandwich?



Task Decomposition



- Aims:
 - describe the actions people do
 - structure them within task-subtask hierarchy
 - describe ordering constraints of subtasks
- Focus on Hierarchical Task Analysis (HTA)
 - text and diagrams to show **hierarchy**
 - **plans** to describe order

Textual HTA description

Hierarchy description ...

- 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

... and plans

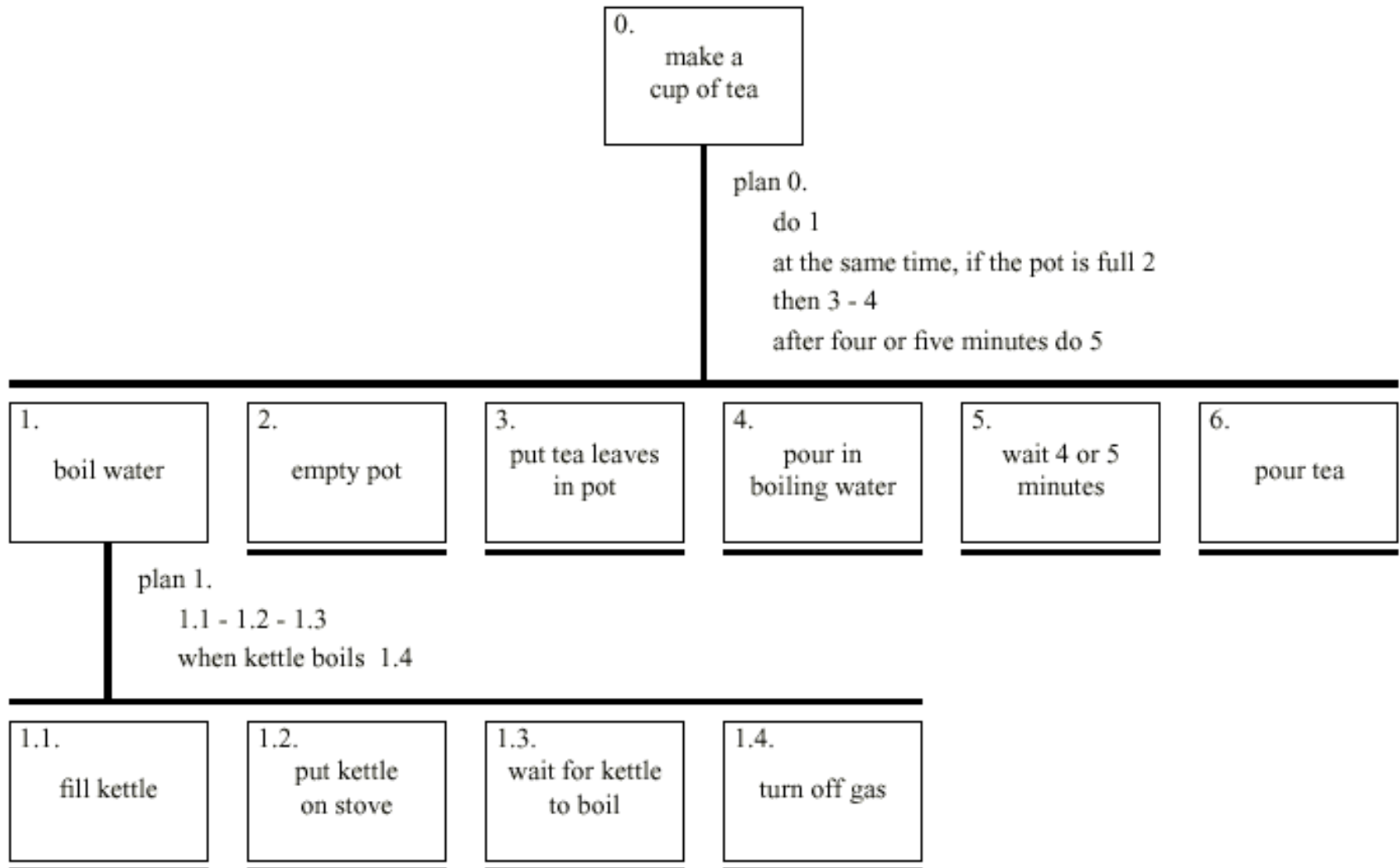
Plan 0: do 1 - 2 - 3 - 5 in that order. when the dust bag gets full do 4

Plan 3: do any of 3.1, 3.2 or 3.3 in any order

Generating the hierarchy

- Get list of tasks
- Group tasks into higher level tasks
 - Aim for 4-8 tasks at top level
- Decompose lowest level tasks further
- Stopping rules - How do we know when to stop decomposing?
 - Is “empty the dust bag” simple enough?

Diagrammatic HTA



Refining the description

Given initial HTA (textual or diagram)
How to check/improve it?

Some heuristics:

paired actions

e.g., where is 'turn on gas'

restructure

e.g., generate task 'make pot'

balance

e.g., is 'pour tea' simpler than making pot?

generalise

e.g., make one cup or two..... or more



Refined HTA for making tea

0. Make cups
of tea

Plan 0.

Do 1

At the same time, if the pot is full 2

Then 3 – 4

After 4/5 minutes do 5

Plan 5.

5.1 – 5.2 – 5.3

1. Boil water

2. Empty pot

3. Make pot

4. Wait 4 or 5
minutes

5. Pour tea

Plan 3.

3.1 – 3.2 – 3.3

5.1 Put milk
in cup

5.2 Fill cup

5.3 Do sugar

3.1 Warm pot

3.2 Put tea
leaves in pot

3.3 Pour in
boiling water

5.3.1 Ask guest
about sugar

5.3.2 Add
sugar

1.1 Fill kettle

1.2 Put kettle
on stove

1.3 Turn on
and light gas

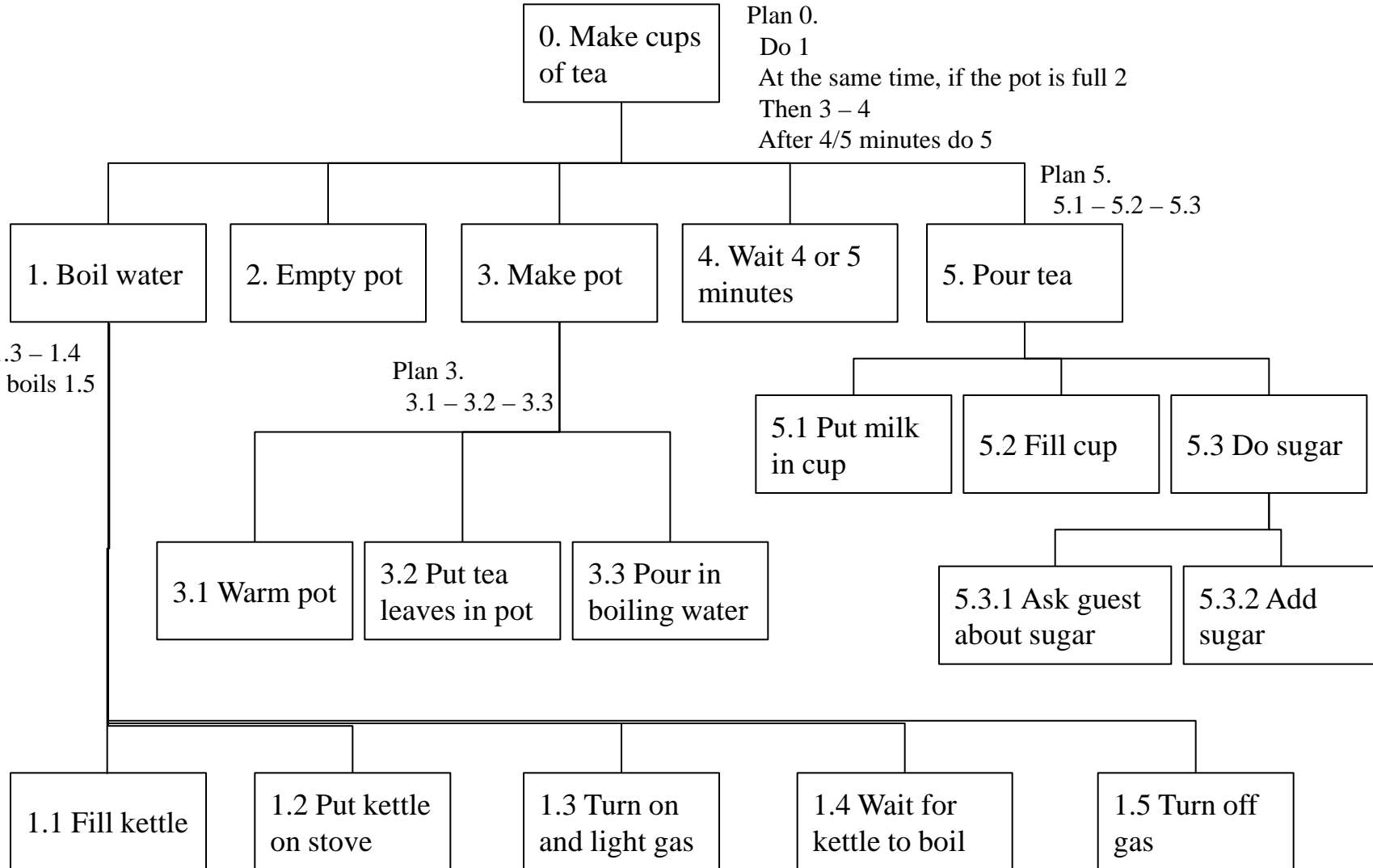
1.4 Wait for
kettle to boil

1.5 Turn off
gas

Plan 1.

1.1 – 1.2 – 1.3 – 1.4

When kettle boils 1.5



Types of plan

- Fixed sequence
 - 1.1 then 1.2 then 1.3
- Optional tasks
 - if the pot is full 2
- Waiting for events
 - when kettle boils 1.4
- Cycles
 - do 5.1 5.2 while there are still empty cups
- Time-sharing
 - do 1; at the same time ...
- Discretionary
 - do any of 3.1, 3.2, 3.3 in any order
- Mixtures
 - most plans involve several of the above

Uses of Task Analysis (1)

Help and documentation,
e.g. procedural ‘How to do it’ Manual

- from HTA description
- good for novices
- assumes all tasks known

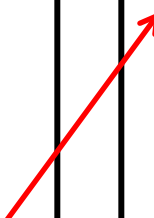
To make cups of tea

boil water — see page 2
empty pot
make pot — see page 3
wait 4 or 5 minutes
pour tea — see page 4
— page 1 —

Make pot of tea

once water has boiled
warm pot
put tea leaves in pot
pour in boiling water

— page 3 —



Uses of Task Analysis (2)

Requirements capture and systems design

- lifts focus from system to use
- suggests candidates for automation
- uncovers user's conceptual model

Detailed interface design

- Hierarchy suggests menu layout
- Task frequency guides default choices
- Existing task sequences guide dialogue design

NOTE: task analysis is never complete

- Rigid task based design => Inflexible system

Seperation of concerns

- Tasks and scenarios should **not** contain information about the user-interface
- So, same task analysis can be used for different types of interfaces
 - PC, web, mobile..
 - Touch screen, voice control, gesture control...



Another Use of Scenarios

- As a story showcasing what your system/app may do
- Making your ideas easier to communicate (to potential investors, end-users, your colleagues) for feedback, input, approval
- Stories can be just text or illustrated
- Illustration may show some implementation detail
(e.g. mobile phone app, with touch in next example)

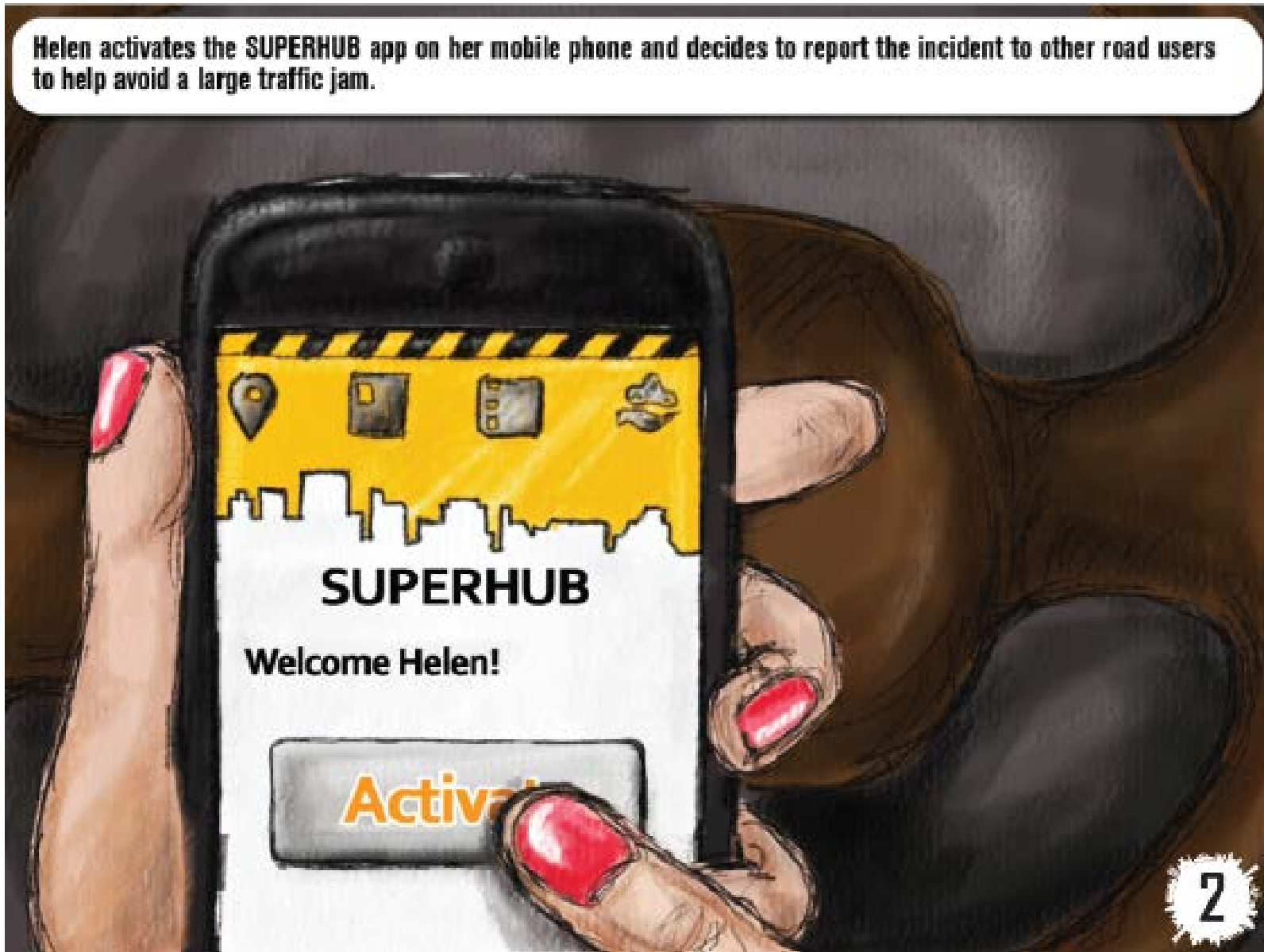
Example Scenario from EU Project Superhub Illustrated – Part 1

Helen is travelling home from work city to the suburb where she lives when she can see a collision about 200 metres ahead.



Example Scenario from EU Project Superhub Illustrated – Part 2

Helen activates the SUPERHUB app on her mobile phone and decides to report the incident to other road users to help avoid a large traffic jam.



Example Scenario from EU Project Superhub Illustrated – Part 3

Meanwhile, Stephen goes to the bus stop. He checks the **SUPERHUB** app to see if his bus is on time, a pop up notice appears telling that an accident has occurred.



Example Scenario from EU Project Superhub Illustrated – Part 4

Stephen decides that the train would be a better option than the bus for his commute home tonight.



Example Scenario from EU Project Superhub Illustrated – Part 5

Stephen clicks the “Thanks for saving me time” icon on the SUPERHUB app after purchasing a single saver ticket.



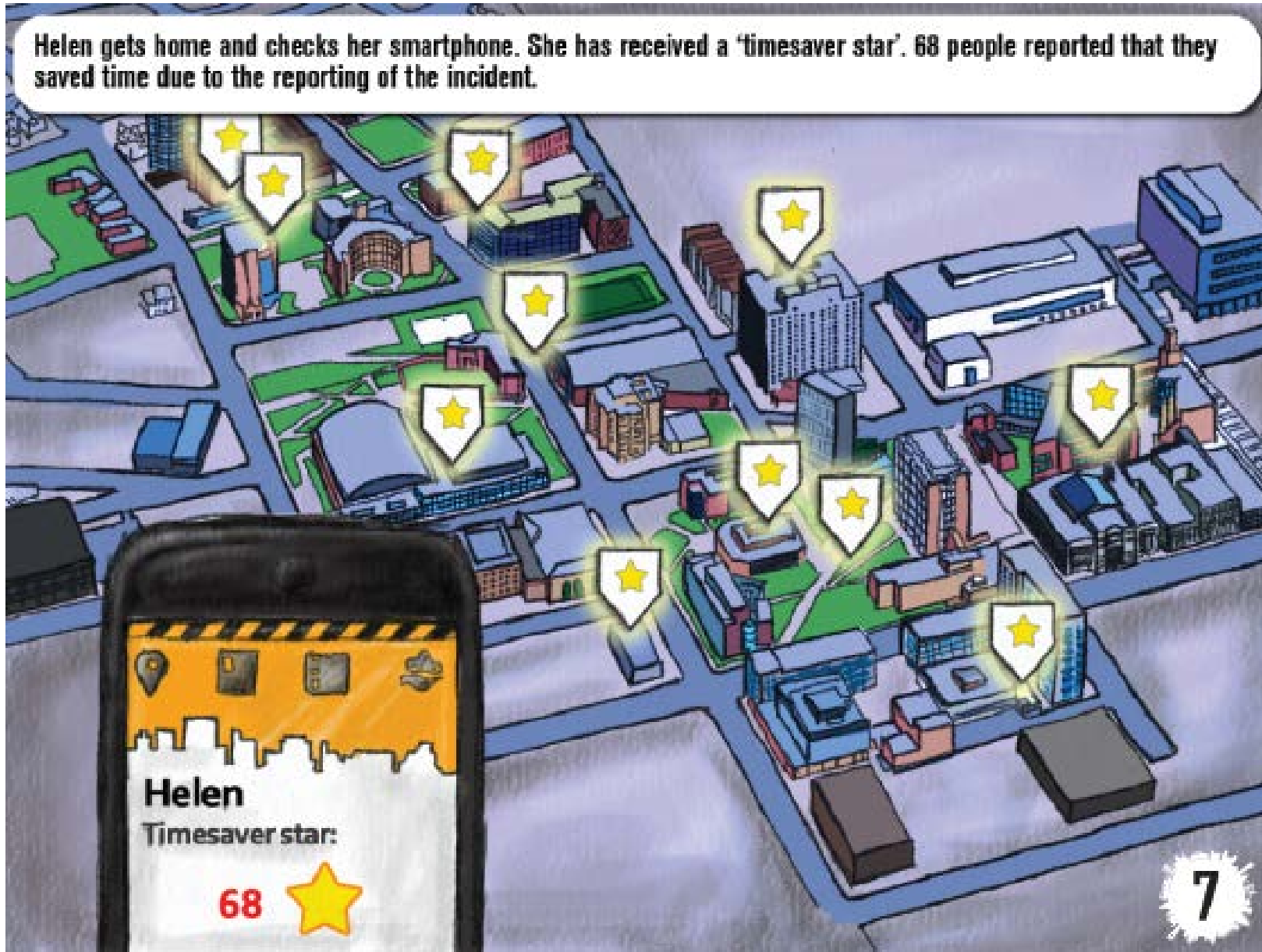
Example Scenario from EU Project Superhub Illustrated – Part 6

The police redirected traffic onto a trunk road, Helen has never been here, she asks the app to 'Navigate Home' and the system finds the quickest way.



Example Scenario from EU Project Superhub Illustrated – Part 7

Helen gets home and checks her smartphone. She has received a 'timesaver star'. 68 people reported that they saved time due to the reporting of the incident.



Example scenario from EU project MyWay illustrated – Part 1



Example scenario from EU project MyWay illustrated – Part 2



Example scenario from EU project MyWay illustrated – Part 3



What you should be able to do

Given an application in a domain you know

- What are the core tasks in this application?
- Develop some scenarios
- Make a hierarchical task model