Designing universally
accessible objects
and services

Good
Design
Playbook

**Tools and methods
for inclusive design,
for use across all sectors**

Enhanced content is available
throughout the guide: audio, video,
tools for you to use, fact sheets.

You can access this content via
the QR codes or on the website:
www.apf-conseil.com/good-design-playbook

A video looking back at the
various stages of the Good
Design Playbook, from
March 2019 to March 2020.

Good Design

Playbook

How to read the Good Design Playbook

01

Good Design Playbook: the philosophy

To understand the challenges of inclusive design.

02

Inclusive design: a design method

To develop projects with and for people with disabilities.

03

Inclusive design: best practices

To design real objects and services.

04

Good Design Playbook: what about the future?

To take the inclusive design approach further.

It's great to know that someone is listening and to feel at last that we are not being ignored!

This is what the people involved in the many workshops organised throughout this project must have felt.

We should of course point out all these people have disabilities. That's why they worked very closely with the designers to come up with the utensils of the future. The benefit for them, and for all of us, is more independence. Being able to cook alone or serve guests without having to ask for help really gives a sense of dignity. And what goes for me, goes for you too. In other words, objects that are more practical for people with disabilities will also be easier for non-disabled people to use.

How many times have I struggled to carry heavy pans or to transfer the contents into other containers, or even to hold vegetables in place so that I can chop them properly? Experience has taught me how to manage, but it would have been easier if I could have benefited from the design input of these focus groups, making everyday life easier.

This guide presents the outcome of these good-humoured discussions, constantly searching for innovations to improve the quality of our everyday lives, for each and every one of us.

Let's hope that this will the first of many and that it will inspire plenty more discussions and collaborative work.

GRÉGORY CUILLERON, CHEF
www.gregorycuilleron.com

Good Design Playbook: the philosophy

GRÉGORY, NILS, LAURE, ANTONY
AND LYDIE DURING A WORK SESSION

01

The Good Design Playbook is a guide to best design practices for products and services that are accessible to everyone. It aims to improve everyday life for people with disabilities or with impaired autonomy in their day-to-day lives. This guide has been developed and tested **in the context of a situation** and activity that is essential for everyone: **cooking**.

The Good Design Playbook has been produced using an inclusive approach, based on the knowledge and experience of **people with disabilities**, who were involved in every stage of the project.

This approach can be applied, adapted and tested across other sectors, including the design of products, services, environments, digital interfaces etc.

The objective of the Good Design Playbook is to present **analyses, recommendations and design methods** for others to enhance and develop further. The Good Design Playbook is the result of a partnership between APF France Handicap and Groupe SEB, with the support of the Caisse Nationale de Solidarité pour l'Autonomie (the French national funding agency for the elderly and people with disabilities). The project took place over a 12-month period from 2019 to 2020.

The kitchen, where the Good Design Playbook was cooked up

JULIA'S KITCHEN

The kitchen and cooking were chosen as the subject for the study because they represent a key everyday challenge in terms of **diet and autonomy**.

Accessible cooking products enable people to play an active role in making meals. Any loss of autonomy that affects cooking can lead to malnutrition, which in turn exacerbates the loss of autonomy, forming a vicious circle.

Apart from any **healthcare** concerns, the kitchen and cooking also represent **sharing, enjoying life and living well**. This area of study also provides an opportunity to identify tools and methods that can be applied to other products, services, environments or sectors of activity.

The data collected during the study is indicated by this pictogram:

Lessons learned
in the field

A — Inclusive design

Inclusive design: all in it together

A person living with a permanent disability has the **same needs** as someone dealing with an occasional, temporary or progressive disability.

21 million people affected by the use of one hand (USA)

26 thousand amputees | **13 million injured people** | **8 million new parents**
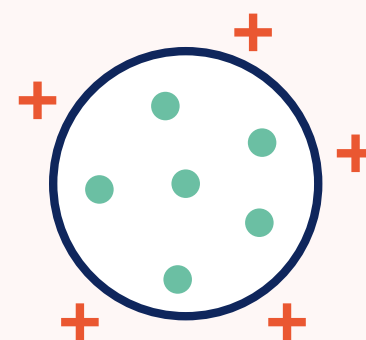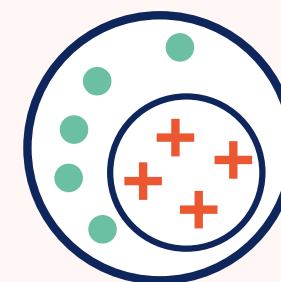
permanent   temporary   situational
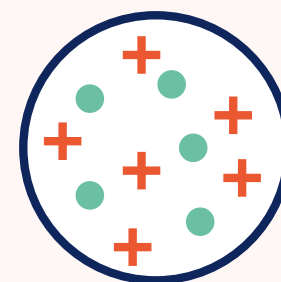
—

Inclusion

An inclusive society takes the **diversity** of each individual into account. It also recognises society as it exists today, made up of many different people, and as it evolves, including the **ageing** population. Inclusion concerns all areas of activity and everyone involved in them, in both public and private sectors: education, healthcare, the food industry, leisure, employment, mobility, housing, culture etc.
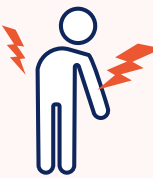
EXCLUSION   INTEGRATION   INCLUSION

SOURCE [1]

DISABILITY	PERMANENT	TEMPORARY	SITUATIONAL	AGEING
MANIPULATION	Only one hand	Broken arm	Holding a baby	Pain
VISION	Impaired vision	Swollen eye	Dim light	Deteriorating eyesight
COGNITION	Amnesia	Fatigue	First use	Alzheimer's
MOBILITY	Wheelchair	Broken leg	Uncomfortable shoes	Walking stick

[2]

Solving everyday frustrations

"I use a Y-shaped peeler, which is easy for me to use. Some peelers are not very practical. The ones with a blade that moves, I just can't use at all."

GILLES

The user-centred approach of inclusive design detects, immediately and specifically, the main sticking points encountered by everyone on a daily basis.

Apart from the people who share the same restrictions throughout their lives, this situation reveals improvements that can bring benefits for everyone, making things more accessible and more pleasant to use.

USER

It's easy !

It's frustrating !

It's difficult !

I'm excluded !

OBJECT

Specific limitation

Permanent disability

Temporary disability

Situational disability

Ageing

Everyone
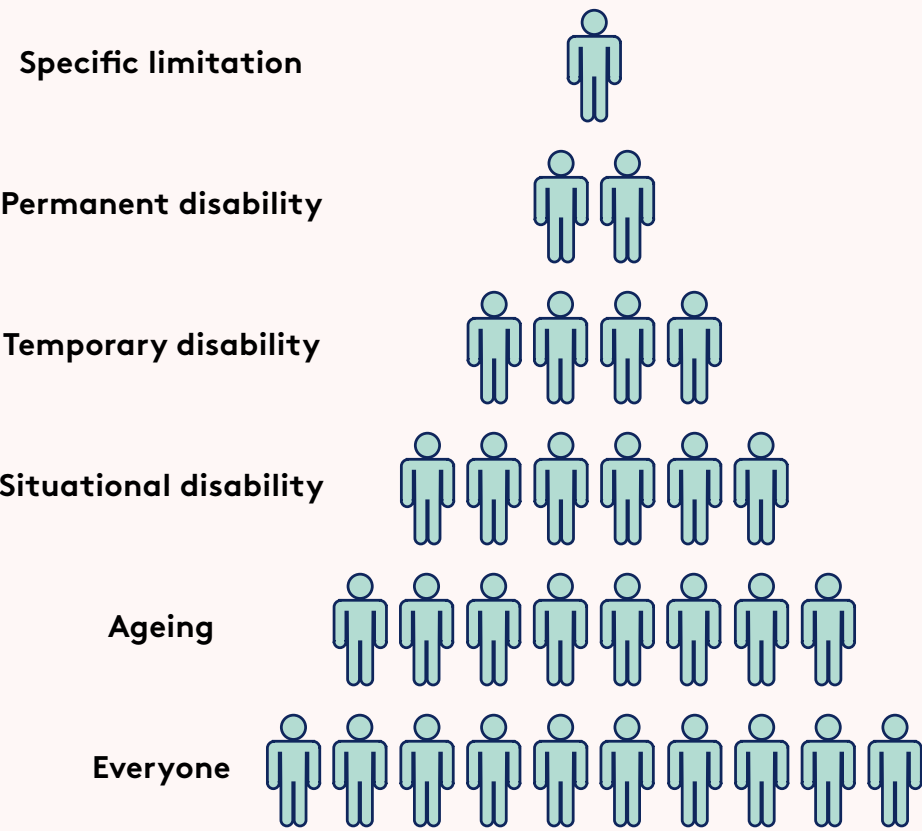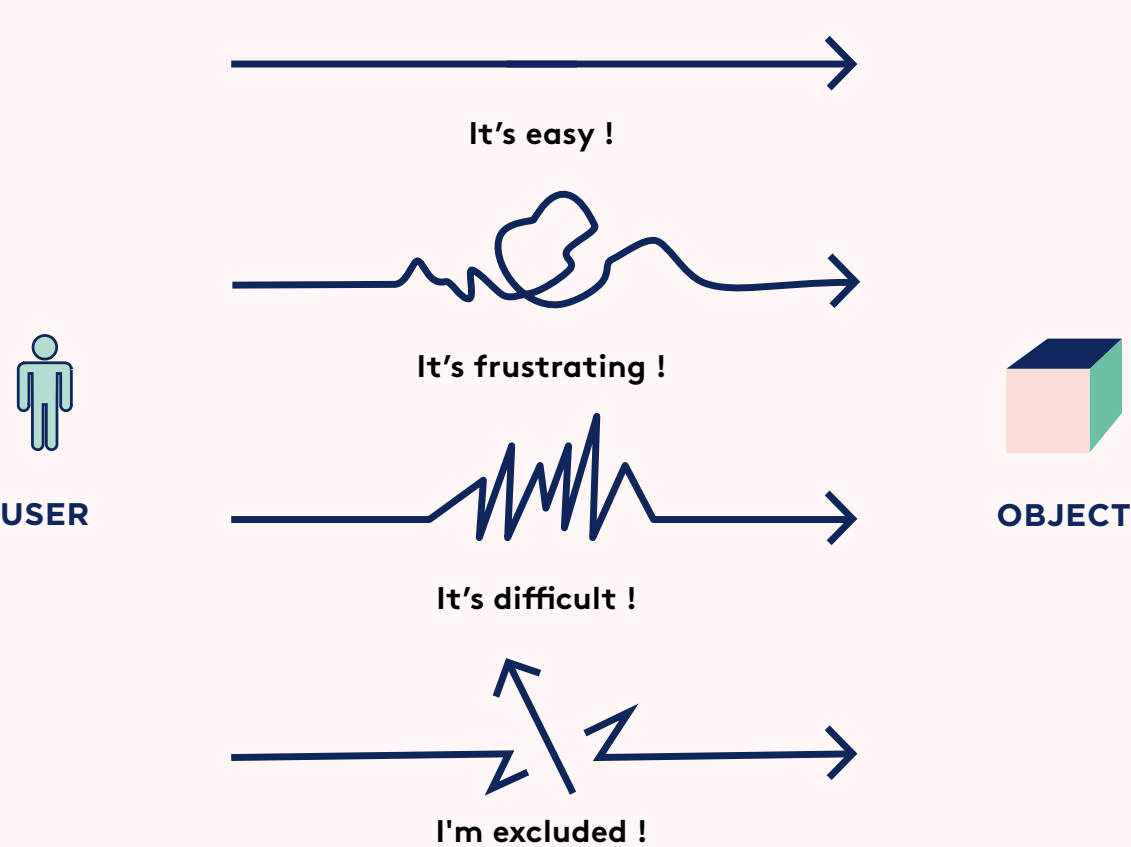
Inclusion, for today's society and for the future

1/10

More than 1 person in 10 worldwide lives with a permanent disability, which is equivalent to 650 million people. This represents the "largest minority" in the world.

SOURCE [3]

35%

of the French population in 2015 is living with a permanent or temporary disability.

SOURCE [4]

80%

of people with disabilities have an invisible disability, such as hearing or cognitive impairments.

SOURCE [5]

13

million French people are over 65 today.

SOURCE [6]

1/5

1 in 5 people worldwide is over 65 today. By 2040, this figure will be 1 in 4 people.
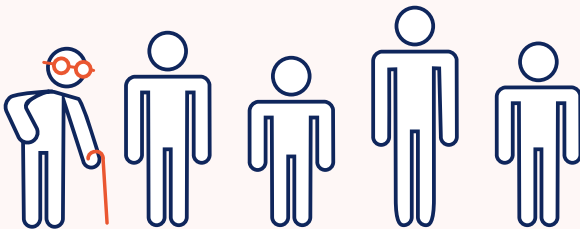
Pushing back the critical point for loss of autonomy by compensating for reductions in physical, sensory and cognitive abilities

Contrary to popular belief, the decline in human ability does not start at the point of retirement, but affects each one of us a lot sooner than you might think.

The line on the graph showing level of ability rises rapidly from childhood to adulthood, before declining gradually from the age of around 25 for physical capabilities and from around 30 for cognitive abilities.

The objective of inclusive design is to take this reduction in physical, sensory and cognitive ability into account, in order to extend people's autonomy for as long as possible, and beyond the critical point for loss of autonomy.

assistive devices

ABILITY

Critical point for loss of autonomy

AGE
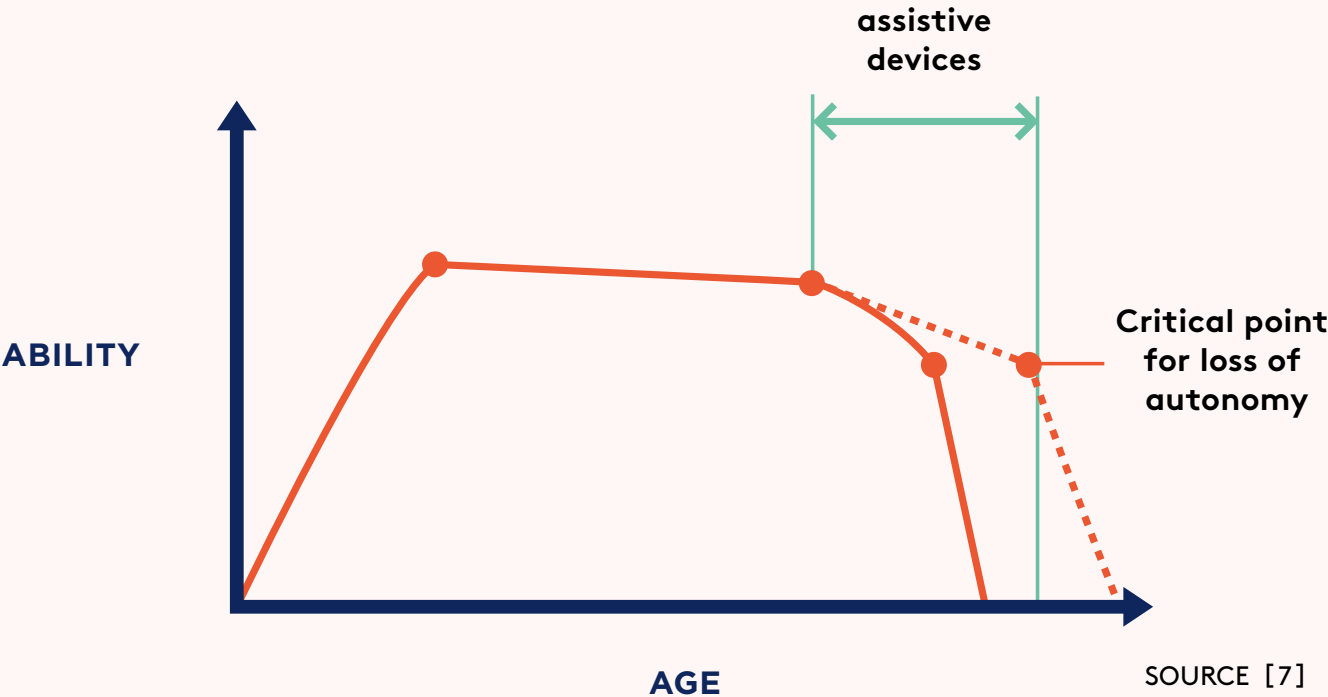
SOURCE [7]

B _ The approach: user-centred design

Innovation through usage

The user is directly involved in the innovation process, alternating repeatedly between phases of understanding usage, exploring solutions and testing.

Innovation through usage focuses initially on **resolving a genuine need identified in the user**, before choosing a suitable technology.

THÉO AND SOPHIE PREPARING A MEAL TOGETHER

Sharing the experiences of future users

"One of the first times I had the opportunity to see a project from the user's viewpoint was during the design of a website, a few years ago now.

When I was on the train between two meetings, I was amazed to find out, quite by chance, just how slowly the website I was in the middle of designing was loading on my mobile phone with such poor reception. In fact I was having the same frustrating experience as future users would experience in the same conditions, whether on a train or in other places. The intercity Lyon to Paris train became my test laboratory, so I could allow for these problematic situations in the design and come up with practical solutions.

Later, I was invited to join the inclusive design work sessions for this project. In the same way, this made me aware of frustrating situations that I would never have been able to imagine by confronting me directly with the experience. I found out a great deal by talking to people who live with disabilities every day and by learning from their experiences. And the fact that I was able to try these situations myself allowed me to understand their needs better and to design things differently. "

SÉBASTIEN DESBENOÎT, DIGITAL USER
EXPERIENCE PROJECT MANAGER

The user experience

Inclusive design is based on a methodology focusing on the user: the design does not start directly with the object, but first looks at **the user and their practices, requirements, habits, desires, expectations and behaviour.**

This exploration gradually extends to the objects themselves. These objects are analysed according to the ways they are **used**, looking at each individual element in turn. A few of the best design practices that were highlighted during this study are shared in the form of fact sheets at the end of the Good Design Playbook.

SIHAME PREPARING A HEALTHY BREAKFAST

1

♦

MOTIVATIONS

Search for well-being (emotions and sensations)

2

♦

MOMENTS IN LIFE

Waking up and having breakfast

3

♦

OBJECTS

4

♦

USAGE

Adjust

5

♦

ELEMENTS

Button
Typeface

6

♦

BEST PRACTICES

Size
Colour
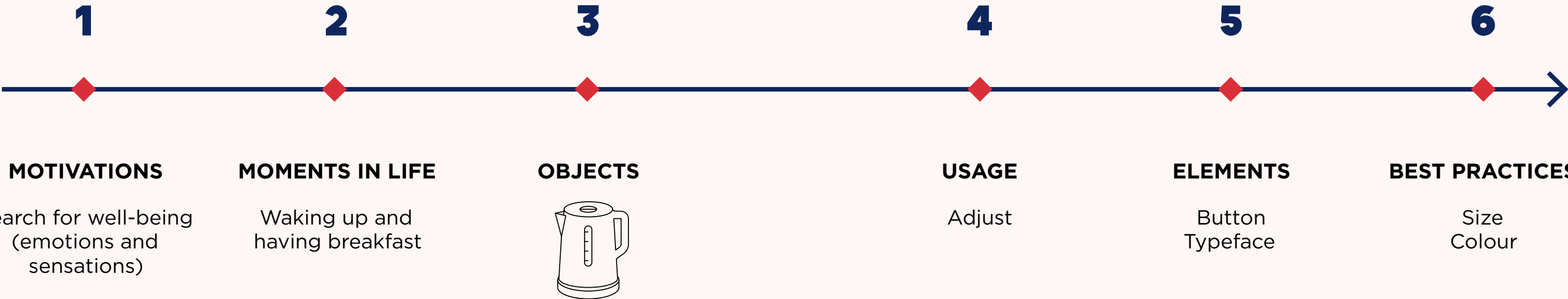
A diverse panel

The participants with disabilities in this experiment form a diverse and inspiring panel, with differing **ages, needs, desires and lifestyles.**.

A choice was made at the beginning of the study not to target a specific disability, so that we could avoid starting the study with stereotypes

and prejudices. As the disabilities were gradually observed and understood, three priority requirements were identified in the kitchen: manipulation, vision and cognition. Other requirements are also taken into account, such as hearing or mobility for example, as additional needs.

PRIORITY REQUIREMENTS

MANIPULATION
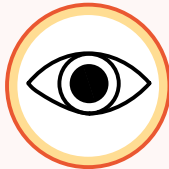
VISION

COGNITION

EXAMPLES

ONE HAND

IMPAIRED VISION

MEMORISATION

DEXTERITY
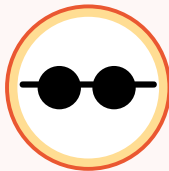
TOTAL BLINDNESS

COMPREHENSION

FATIGUE DUE TO WEIGHT

User-centred design:

observation

ideation

prototyping

evaluation

Observe, understand and analyse users' requirements.

Come up with new solutions together (people with disabilities, carers, occupational therapists, designers, anthropologists, engineers etc.).
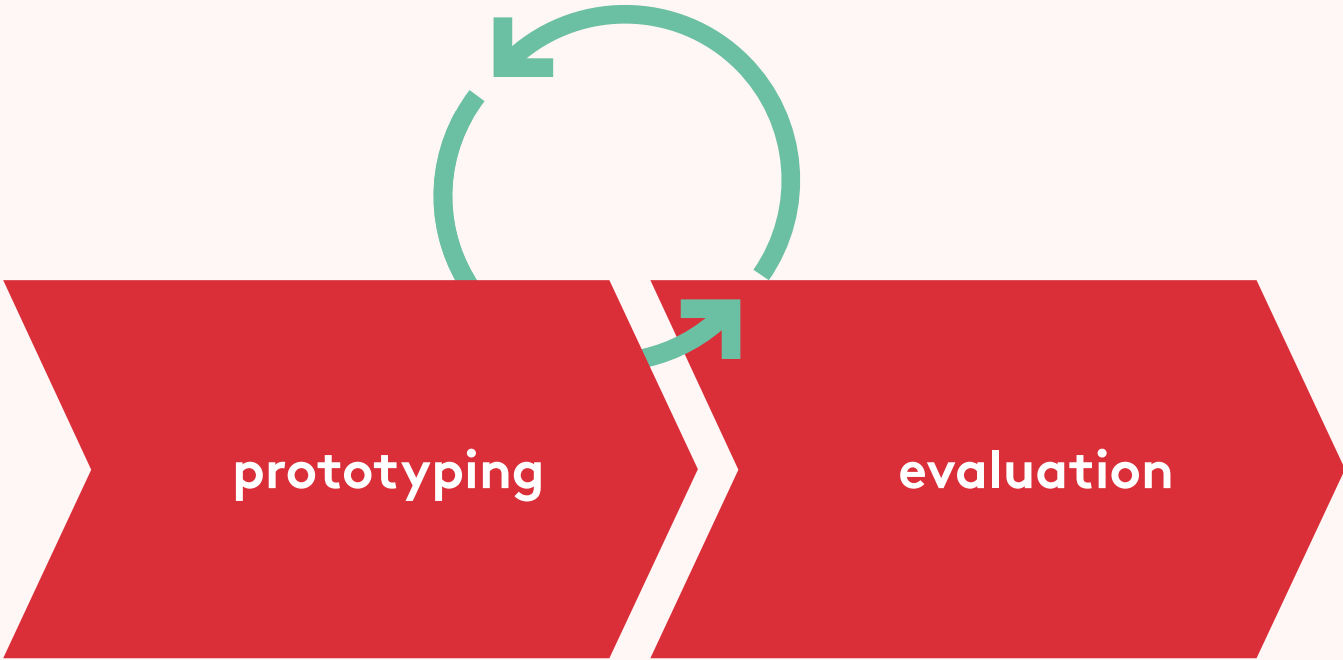
Bring ideas for solutions to life with pictures, mock-ups and prototypes.

Assess prototypes in real-life situations to improve or endorse them.

Inclusive design: a design method

JULIA IN HER KITCHEN

OBSERVATION IDEATION PROTOTYPING EVALUATION

02

OBSERVATION

Observe, understand and analyse user requirements.

"Design needs to make observations in the field to understand how products are used, before making improvements in practical applications."

SARAH BASTIEN, ETHNOLOGICAL RESEARCH MANAGER.

A — An exploratory and ethnological approach

The protocol for interviews and observations takes place **in real-life situations**.

Lessons learned in the field

MAKING A RECIPE AT HOME

A semi-structured questionnaire

To understand users' behaviour: **their motivations, habits, any** sticking points they may encounter, **tricks** they develop, improvements they wish for, desires, fears, imagination etc.

A log book

To be handed out to each participant so that they can keep a record of their daily lives outside the actual interview: any sticking points encountered during the week, time spent, frequency, important elements to add once they've had time to think **after the interview,** etc.

A catalogue of objects

To connect the practices they mention to a **list of objects** to investigate: design faults, actual accessibility, the necessity of certain functions, the rejection or desire for certain objects for the experiences they offer etc.

An observation guide

To **observe the user in an actual situation** and compare what is said during the interview with what actually takes place in the situation. Some information will be confirmed, while other information that had not consciously been expressed will be discovered. Care should be taken, though, as observations may be biased, particularly in situations of failure (stress, change of habits, workarounds etc.).

33

Observation in a situation is a genuine source of inspiration for design. **Tricks and workarounds** are the first areas for improvement developed by users to get over any sticking points and to make daily life easier.

Common tricks:
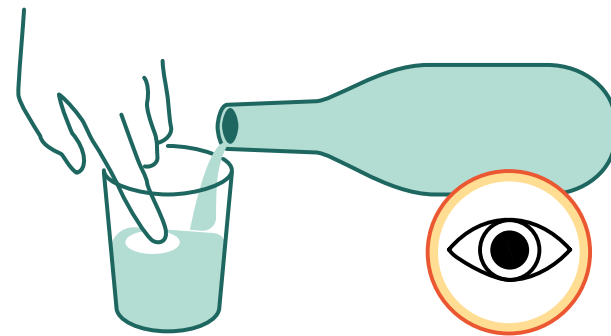
Put a finger in the glass to measure the water level.

Place an adhesive, non-slip mat under a bowl to keep it stable while stirring.

Stick coloured or raised stickers on the programmes of electrical appliances to help find preferred settings
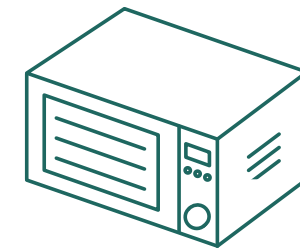
30s
+ 30s
+ 30s
+ 30s

For microwave ovens, press four times to heat for two minutes.
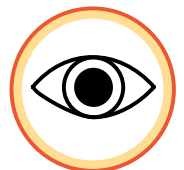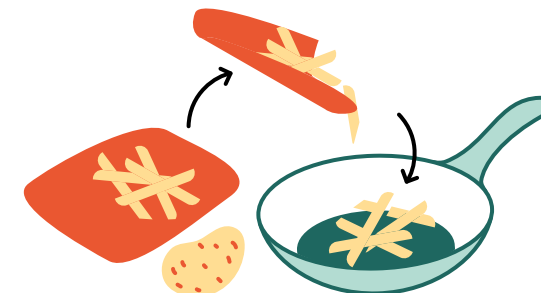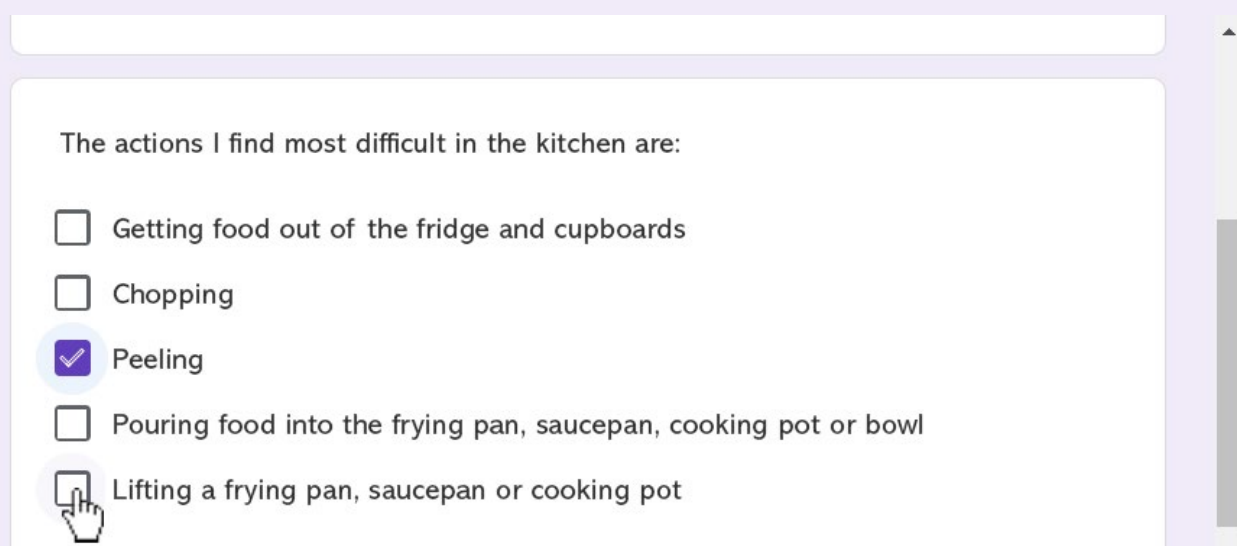
Use a semi-rigid table mat as a chopping board to make it easier to pour ingredients

B — A quantitative study: sample survey

Knowledge already gained in the field can be used **to guide the quantitative survey**, avoiding any prejudice and making sure that no key area for exploration is left out.

AN ONLINE SURVEY

The actions I find most difficult in the kitchen are:

- ☐ Getting food out of the fridge and cupboards
- ☐ Chopping
- ☑ Peeling
- ☐ Pouring food into the frying pan, saucepan, cooking pot or bowl
- ☐ Lifting a frying pan, saucepan or cooking pot

To be accessible:

- The questionnaire takes **less than 20 minutes**, so that it does not take up too much of the participants' attention and time.

- The questions are written in Easy-to-Read language so that they can be understood by everyone.

- The questionnaire can be read with **voice guidance** in accordance with digital accessibility standards for people with impaired vision.

In order to obtain universal feedback, the questionnaire is aimed at people with and without disabilities.

41%

of participants say that one of the most complicated parts of cooking is the **preparation stage.**

This is one of the very first stages involved in making a recipe. The fact that it is a sticking point could discourage people from all the stages that follow in the cooking process, or even make it impossible for them to continue.

Making this stage easier is one of the main challenges in giving people food autonomy and ensuring the quality of the user experience.

What is the most difficult part of cooking?

- 🔴 **41%** Preparation (chopping, peeling, mixing)
- 🟢 **13.5%** Assisted preparation (blenders, pressure cookers)
- 🟠 **11.5%** Cooking (on the hob, in the oven)
- 🟦 **11.5%** None of these stages
- 🔵 **9.6%** Cleaning up
- 🟡 **8.7%** All of these stages
- 🟣 **4.2%** Organising the ingredients (getting the ingredients out, measuring them)
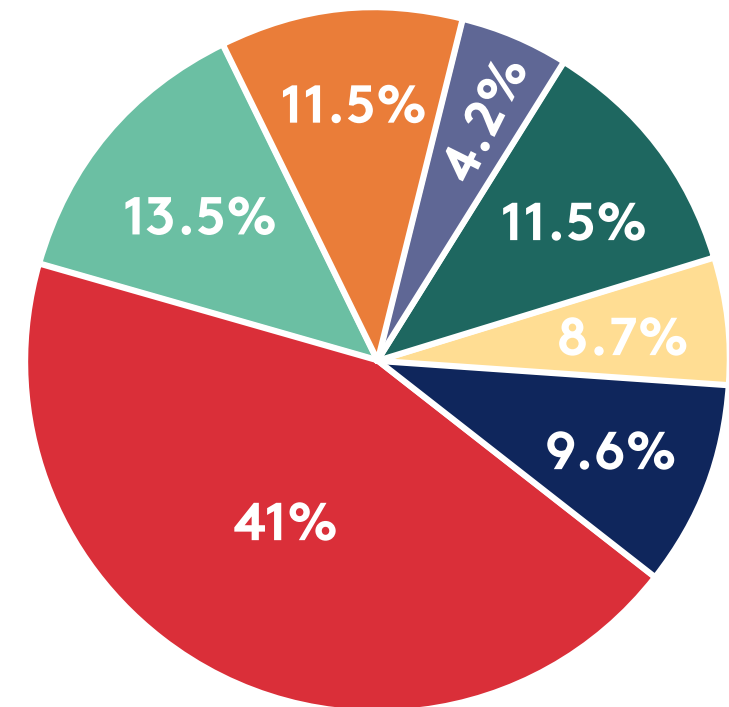
SOURCE [8]

C — A qualitative study: usage tests

Usage tests are another way of carrying out qualitative studies, as a complement to the ethnological approach. The objective is to **observe usage** in a situation and identify any actual sticking points to be improved and any workaround strategies used by participants.

JEAN-FRANÇOIS AND COLIN DURING A WORK SESSION

Tests can be carried out in two ways:

- In a **real-life context**: at home, for example.

- In a **"laboratory"**: in a testing room within an organisation, for example.

6 workshops were organised:

visibility and readability

tactile relief

understanding of pictograms

aim

grip

weight

Lessons learned in the field

The weight workshop, for example, consists of defining the optimum weight that can be supported in various positions (lifting, pouring etc.). To do this, the participant measures their strength by pressing on a set of scales and then lifts one of the empty mock-ups. The weight of the water is added or taken away to determine precisely the optimum weight estimated by the participant.

Grip using one handle parallel to the arm
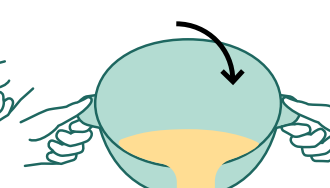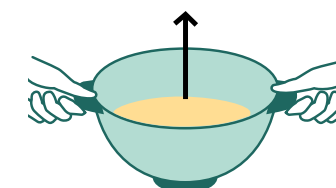
Grip using two handles parallel to the arm

Grip using one handle perpendicular to the arm

SOURCE [9]

Saying vs Doing

Verbatims are the actual words expressed by the participants. It is important that these verbatims are always compared with the actions that actually take place. Unconsciously, what is said can sometimes be the opposite of what is actually done in a real-life situation.

For example, during a weight testing session, many participants subconsciously push their own abilities through a desire to succeed. They may therefore overestimate the weight that they would actually want to lift during everyday use.

Lessons learned
in the field

Normal pouring
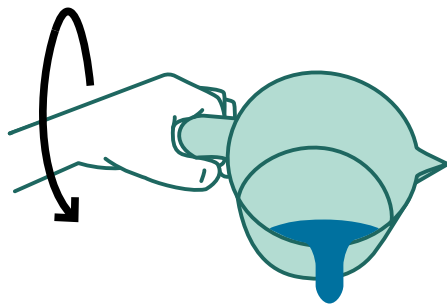
Alternative pouring

The kettle is filled until it weighs 1.8 kilos.

"That's about right," says Leo.

However, under observation, he subconsciously uses a **workaround strategy** to deal with the heavy weight. Leo no longer pours by tipping the handle forwards, as he usually would.

He now pours by twisting the handle to the side. He pours this way unconsciously in order to deal with the weight when it becomes too difficult for him to pour forwards. In this case, the participant should be asked to remove some weight until they can go back to using a natural, easy action.

Capable vs Comfortable

A user-centred design approach goes beyond ergonomics or accessibility to take into account what is comfortable to use and what is not.

One of the usage tests concerns the visibility and readability of texts depending on size and contrast. Two questions are put to participants:

"What is the first line you are able to read?"

The participant screws up their eyes, leans forward, strains and points out text in font size 8 or 9.

"What is the line that is comfortable for you to read?"

The participant relaxes their eyes, comes back to a comfortable position for reading and points out text in font size 11 or 12. The difference between what they are able to read and what they find comfortable to read is essential to their own personal experience.

Lessons learned
in the field

DIANE SHOWING ALEXANDRE WHICH TEXT IS VISIBLE AND READABLE
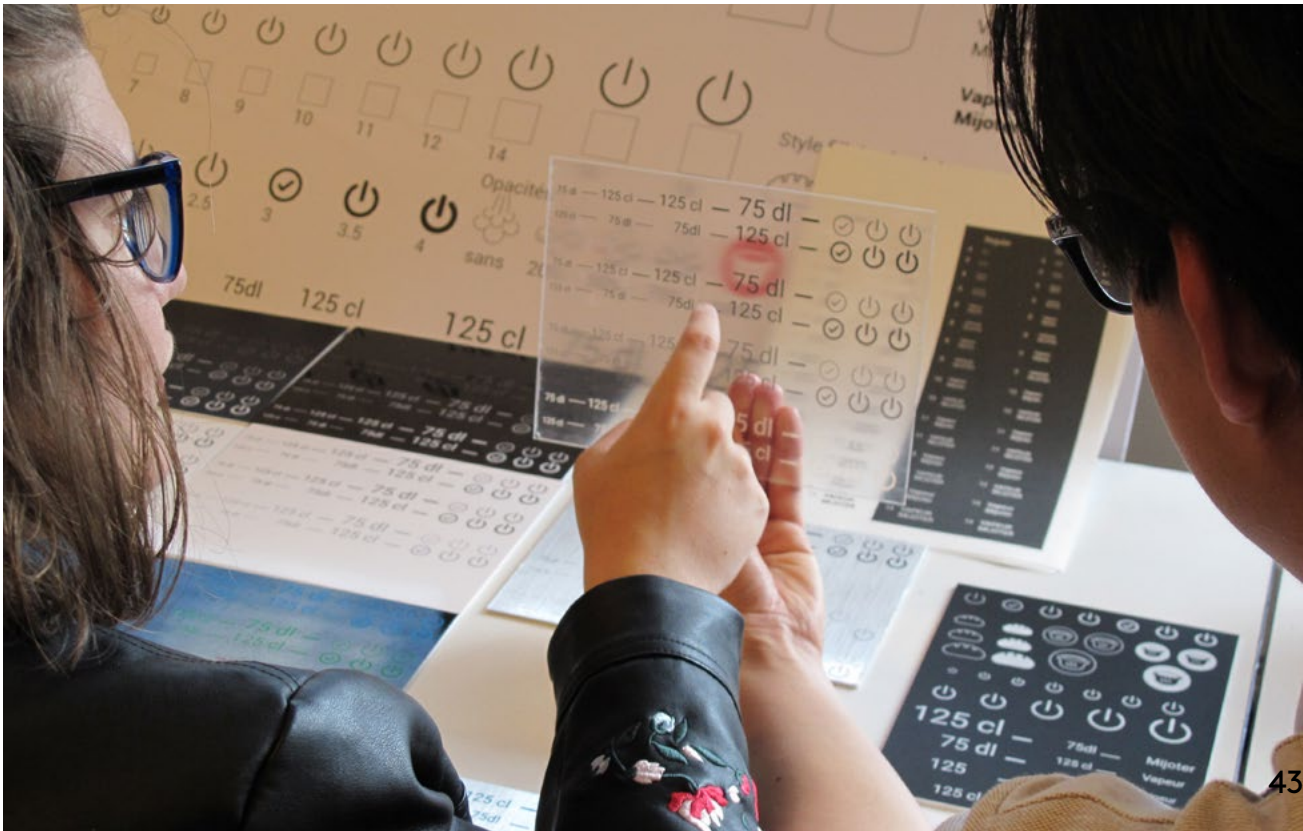
D — Tools to summarise the data collected

It is possible to interpret the data collected differently by **cross-referencing these tools.** Triangulating the methods provides a more comprehensive overview of the subject.

Recommendation diagram

For commenting directly on the illustration of the object according to each of its design elements and according to its strengths and points to watch out for.

Comments :

1
LID

2-3
READABILITY

4-5-6-7
GRIP

8
POSITIONING
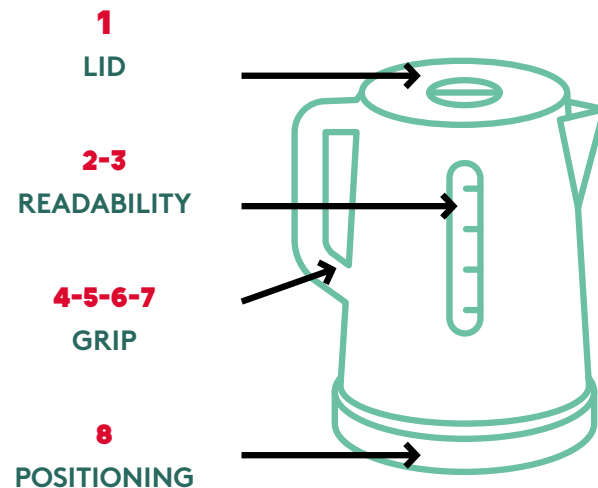
Mind map

For organising and representing data by linking bubbles to each other around a central subject. The links follow a logical relationship: cause and effect, analogy, function etc.

...

Requirements collected when cooking

Observed requirements

...

...

...

...

...

...
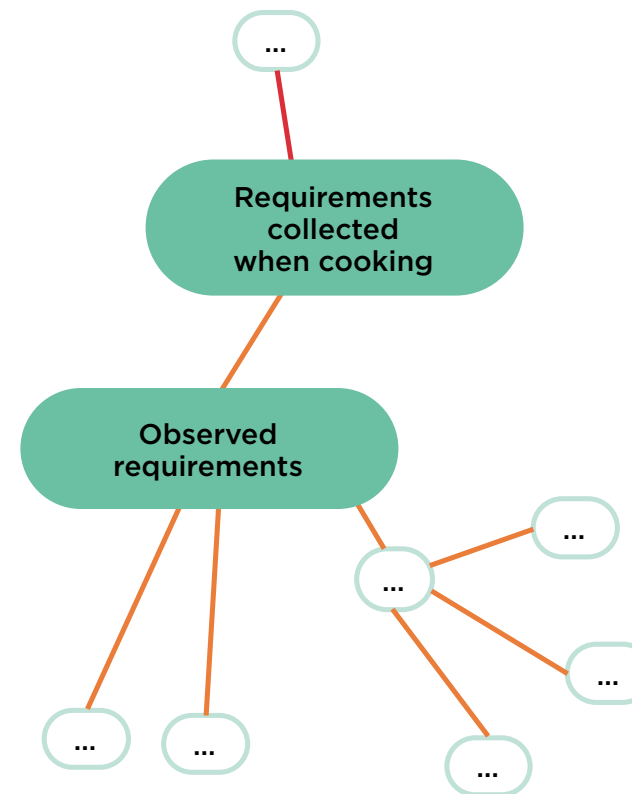
Radar chart

For visualising **usage** according to its different characteristics. The graph allows the strengths and weaknesses of usage to be assessed.

PASSION

YES, VERY

YES, QUITE

COMFORTABLE

A LITTLE

PLEASANT

DESIRABLE

NO

ERGONOMICS AFFORDANT

PLEASANT

PERCEPTION

EFFICIENT

PRACTICAL

REASSURING

REASON
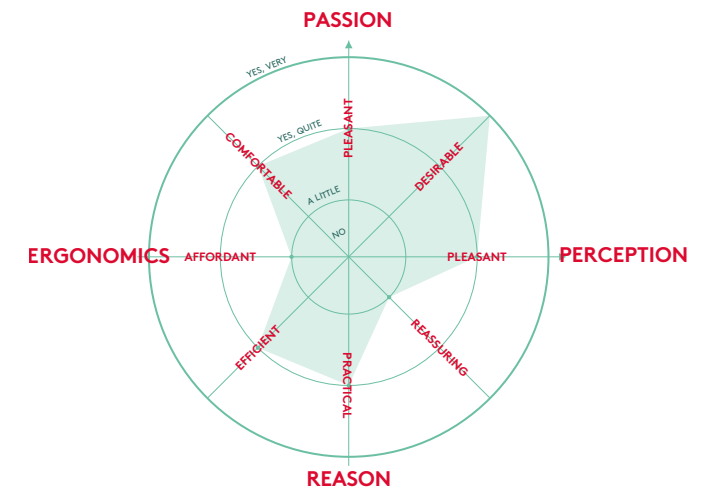
The keys to success

- ## Diversify the panel
  so that it is representative of society (different ages, genders, cultures, lifestyles etc.).

- ## Cross-reference observation methods
  to confirm the overlapping results from the various methods.

- ## Increase the number of summary tools
  to review the data collected from different angles and reveal any additional areas for exploration.

MARYNE'S KITCHEN

A READABILITY TEST USING DIFFERENT COLOURS

02

IDEATION

SHANTI AND JEAN-MARC DURING A WORK SESSION

Coming up with new solutions together

The observation phase was an opportunity to identify any sticking points. The ideation phase enables the development of solutions. This phase takes place through co-design workshops to encourage collective intelligence, by bringing together people with diverse and complementary profiles and experiences.

The co-design workshops for this study brought together over 60 participants: people with disabilities, carers, occupational therapists, members of APF France Handicap and Groupe SEB employees (Design, Marketing, Research, Digital etc.). These workshops took place at Maison SEB, a furnished apartment on the Groupe SEB campus including a kitchen, living room and bathroom, enabling realistic situations to be created.

A — A co-design workshop method

THE USER PATHWAY

A user pathway sequences all the steps taken by the user throughout their experience. One activity for the co-design workshop could be to identify any **problems** and the **solutions** for each interaction. The pathway is "real" if it carried out ordinarily or "projected" if it is fictitious.

SHANTI COUNTING VOTES DURING A WORK SESSION

There are several different time scales for the pathway, depending on the objective:

- **A precise task**, such as making a recipe.

- **An everyday ritual**, such as breakfast.

- **A practice**, such as cooking habits.

- **A phase**, such as a diet that evolves over the course of a lifetime.

"I take items out of the cupboard one by one. And that tires me out, because I'm always going backwards and forwards."

VÉRONIQUE

"I always add the pasta to the water before bringing it to the boil to avoid the water splashing when it's hot."

VÉRONIQUE

start		
4 Get the ingredients and utensils out		

How do I prepare my ingredients and utensils?
Get them out of the fridge? Get them out of the cupboard?

preparation
9 Open the packet of pasta

How do I open the packet of pasta?
Using scissors? Using a knife? With my hands?

boiling in water
10 Bring the water to the boil

How do I boil the water for cooking?
In a saucepan? In a kettle?

boiling in water
11 Pour the pasta into the saucepan

How do I pour my pasta?
Do I pour it from the packet? Do I take a handful? Do I use a utensil?

boiling in water
12 Wait 11 minutes for it to cook

How do I time the cooking?
Do I stay next to it? Do I set a timer? Do I just remember? Do I test the pasta to see if it's done?

boiling in water
13 Take the pasta out of the saucepan

How do I remove the pasta from the hot water?
Do I pour it into a colander?

Lessons learned in the field

"It's heavy, it's hot, there's steam everywhere, I might scald myself."

JEAN-FRANÇOIS

53

DESIGN FICTION

This design practice allows a subject to be addressed by **changing the context**. The subject is projected into an alternative context, such as the future, in a possible, probable or totally fictional way.

LYDIA DRAWING A CARD MARKED "I AM AN ASTRONAUT"

Creativity is stimulated by getting rid of any current technical limitations. In co-design workshops, situations involving disability are approached through **role play**. Participants draw a random situation card, which has a situation described on it.

situation

I am an astronaut

My helmet blocks my **hearing**, my sense of **smell**, my sense of **touch**, my **vision**, my **communication**. The uniform makes it difficult to **move** and restricts my **reach zone**.

For example, one of the situation cards drawn from the pack is the "I am an astronaut" card. The card describes various situations involving sensory, physical and cognitive disability. The participants work through the user pathway for this situation.

What problems are encountered by an astronaut making pasta?

- How do they get the ingredients and utensils out while wearing the cumbersome outfit?

- How do they open the packet of pasta when wearing mittens?

- How do they hear the water boiling with the helmet on?

55

THE ACCESSIBILITY WHEEL

Situation cards bring together several of the disability situations set out on the wheel on p.113.

For example, the "I'm holding a melting ice cream in my hand" card sets out a fictitious situation, which allows us to question similar situations such as the use of just one hand or difficulty in maintaining gestures or strength over time.

SHANTI AND ALEXANDRE ROLE-PLAY USING THE "I'M HOLDING A MELTING ICE CREAM IN MY HAND" CARD

Lessons learned in the field

situation

I'm holding a melting ice cream

I'm holding **an ice cream** in my hand. I need to do things **quickly** before it melts.

SEATED
MOBILITY
TOUCH
POOR VISION
FLEXIBILITY
SENSITIVITY
VISION
TOTAL BLINDNESS
REACH
GROSS MOTOR SKILLS
VISIBILITY
HEARING
STRENGTH
MANIPULATION
physical
sensory
AUDITION
DEXTÉRITY
cognition
OLFACTION
ONLY ONE HAND
x1
CHEMIORECEPTION
TASTE
RÉSOLUTION
AFFORDANCE
ENUNCIATION
COMMUNICATION
ATTENTION
RECOGNITION
MEMORISATION
MEMORY LOSS

SOURCE [10]

57

B — A programme for co-design workshops

EXPERIENCING A SITUATION

Participants can role-play during the co-design workshop, with accessories and simulators to test the proposed pathway under real conditions.

INGREDIENTS AND UTENSILS FOR ROLE PLAY

Stimulating without exhausting

Ensure that activities are interspersed with breaks, "warm-up" rounds, discovery learning or stimulation exercises.

Typical programme for a long co-design workshop over a full day.

Free time to prepare, discuss and expand on the subjects.

1 Introduction of participants around the table.

2 Stimulation exercise to prepare for the first activity.

3 Warm-up round to test a simple user pathway.

   example: cooking pasta

4 Analysis of a complete user pathway.

   example: making a cake, from finding the recipe to washing up and putting away.

5 Summary of new ideas by mapping.

Typical programme for a short co-design workshop over a half-day.

Afternoons are often more accessible in terms of availability and susceptibility to fatigue (child care, medical appointments, morning preparation).

1 Introduction of participants around the table.

2 Analysis of a user pathway.

   example: making pasta with a goat's cheese and courgette sauce.

3 Summary of new ideas by mapping.

C — The right tools for workshops that are accessible to everyone

Lessons learned in the field

OPENING WORKSHOPS TO EVERYONE

The tools that guide the co-design workshop must be accessible to everyone, regardless of their disability, culture, creativity or profession.

Leadership of workshops

Facilitators are people who help to guide the session. They may help to adapt the tools so that each participant can take part fully in the workshop.

Adaptation of brainstorming

Brainstorming is a technique used for group discussions, in which each participant outlines their ideas on a subject. These ideas are generally displayed on post-it notes to clarify the discussion and make progress as a group.

For example, for each post-it note on display, someone with a visual impairment will need to use a lot of brain power to spatialise and memorise the information. Summarising the information on display orally enables the discussion to be moved forward together.

To make brainstorming accessible, make sure you:

- Record all the ideas put forward during **discussions in different formats** (writing, drawing, oral description), perhaps with the help of facilitators.

- Write and sketch ideas on **large post-it notes**, which can be read from a distance.

- Always **describe orally** everything that is shown or displayed.

- Use **simple sentences**, which are easy to understand.

- **Give everyone a chance** to express themselves.

- Offer a **variety of communication methods** for the participants and group leaders (oral, written, voice synthesis etc.).

- **Allow enough time** for people to respond during discussions, depending on each individual's level of responsiveness and speech.

- **Provide frequent reminders of the stage discussions are at** to keep all participants at the same pace and the same level of attention.

The keys to success

- ## Choose a creative method

  that guides the collective imagination towards new solutions.

- ## Alternate activities

  to stimulate creativity in stages without exhausting it.

- ## Adapt tools

  for a workshop that is accessible to everyone, regardless of disability, culture, creativity, profession etc.

ALEXANDRE ZOOMING IN ON A PHOTO OF A POST-IT-NOTE

A FUN WORK SESSION

"As a Product Designer, it has always been important to me to place the user at the heart of our thinking. The object must above all be appealing and pleasant for everyone to use. In order to understand this, you have to meet people, test, identify desires and requirements and, above all, listen.

After that, all these elements are put into an equation to be solved along with industrial constraints, such as technical feasibility, actual costs, deadlines etc. There is a balance between the choices made for the user and successful industrial production. "

NILS WESSELS, PRODUCT DESIGNER

STEPHANIE MODELLING A 3D OBJECT ON HER COMPUTER

02

PROTOTYPING

Bringing solution ideas to life with pictures, mock-ups and prototypes.

Designers and other design specialists produce prototypes of the ideas they have come up with. The prototype is the first actual model of an object or service, which is produced so that it can be developed further before it goes into production. It may present the aesthetic aspect of the object or only its ergonomics (volumes, parts to be gripped etc.).

A — Selecting ideas for solutions
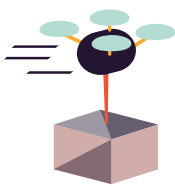
SUMMARISING IDEAS

The selection of ideas depends on the way in which they are summarised after the ideation phase.

A WORK SESSION IN A
CO-DESIGN WORKSHOP

Sorting ideas according to type

The ideas that fulfil the **same requirements** or the **same functions** are collected together so that they can be compared or brought together under one global solution.

A drone delivering
in real time
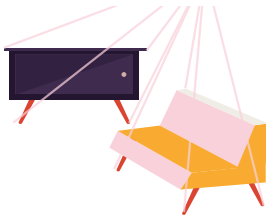
Products from the store
projected into the home
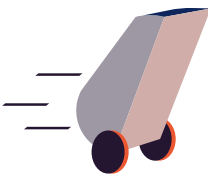
A shopping trolley
following automatically

A wallet that can be
attached to clothing

Mapping relevant ideas

Ideas can be positioned according to **two axes**. For example, along one axis, the ideas are ranked from least to most universal. Along another axis, the ideas are ranked from least to most **relevant**. The relevance criteria were defined together by the group during the co-design workshops.

UNIVERSAL

A balloon that carries shopping to upper floors

An adhesive, non-slip mat

Packaging that can be read in Braille

RELEVANT
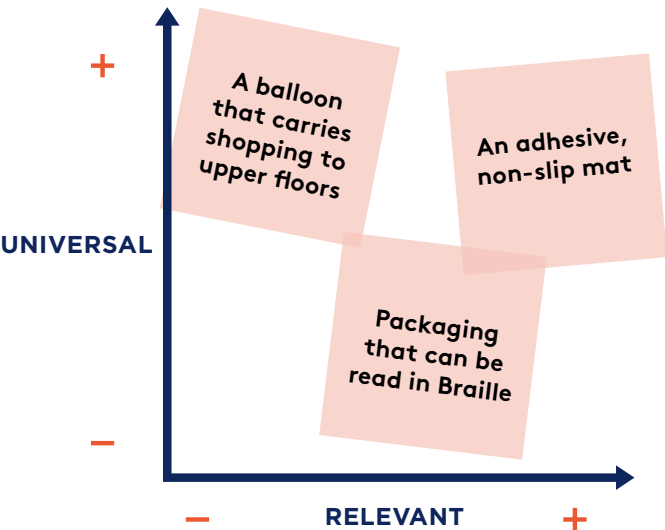
Finding a criterion for selecting ideas

Here, the criterion for selecting ideas was defined in a debate during the co-design workshops: what is the preferred level of delegation for facilitation and accessibility? How much is about the **pleasure of doing something yourself** and what is a question of a **task to be delegated?**

THÉO COOKING AT HOME

Including ideas in usage scenarios

A usage scenario is a descriptive device that represents the **concept in use** through **narration**. It's a story that describes how the imagined object or concept would be used.

Lessons learned

in the field

— **Three scenarios have been developed to question the desired level of delegation:** +

level of delegation

SCENARIO 1

A convenient kitchen

Clever tools to help you, but you do everything yourself.

SCENARIO 2

An assisted kitchen

Tools and services that offer discreet step-by-step support while you cook.

SCENARIO 3

An intelligent kitchen

An intelligent ecosystem, which adapts your kitchen environment with utensils and services in real time so that you can easily delegate certain steps when cooking.

A convenient kitchen

Tools to help you but you do everything yourself.

This time, the utensil you are given is a handy chopping board. Use it to chop a courgette.
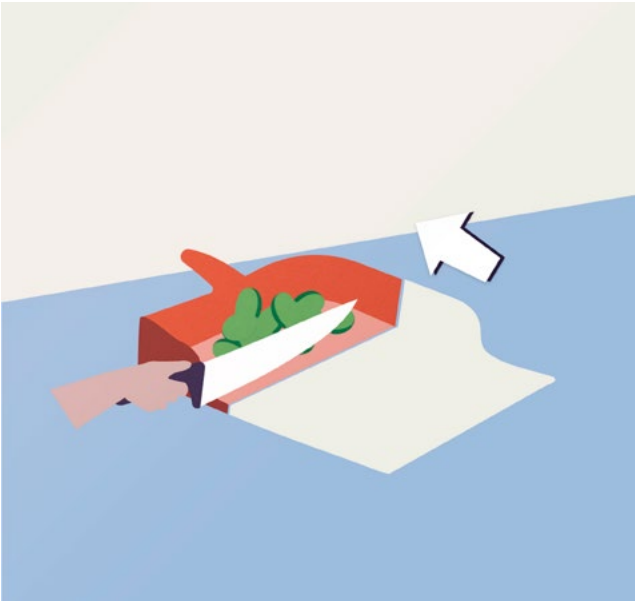
To move and separate different foods, just slide them into a storage area.

You receive a Recipe Box, including a recipe, all the ingredients and handy utensils to help you cook.
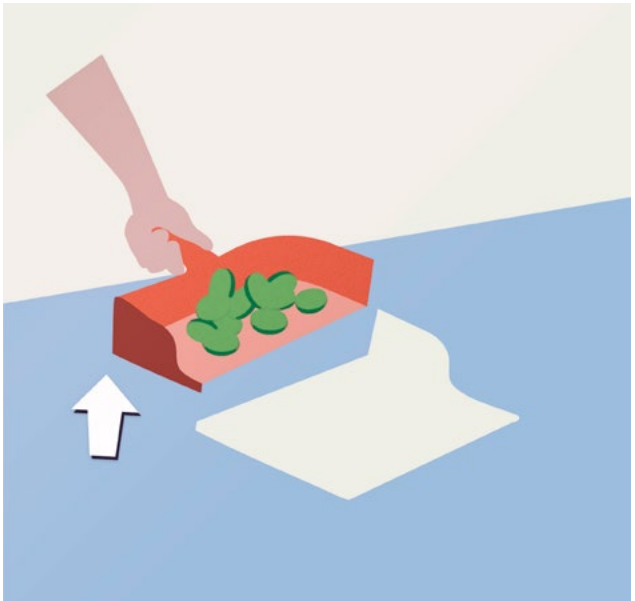
This storage area can be removed and helps you transport and transfer foods easily using one hand.
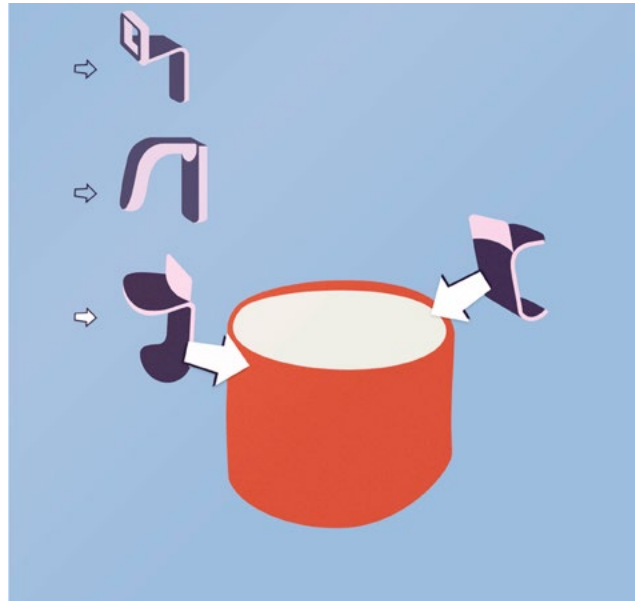
Your cooking pot is also quite handy: you can clip customisable handles onto the pan where you need them. The handles are adapted to suit your needs.
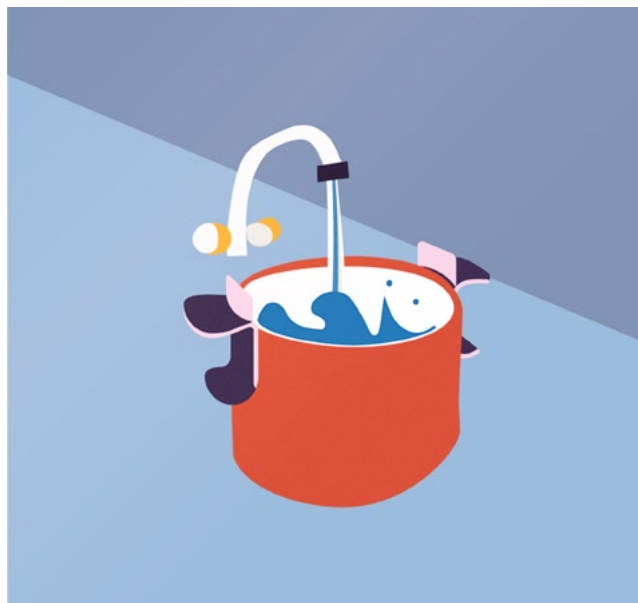
Place your pot under the tap and fill it with water.

Place your colander in the pot to cook the chopped courgettes. This means you can put the food into the boiling water and remove it again without effort and without risk of scalding.

There are tricks for mixing, too: use an adhesive, non-slip mat to stabilise your bowl.

MOELLEUX
AU CHOCOLAT

VELOUTÉ
AU POTIRON

TORTILLA
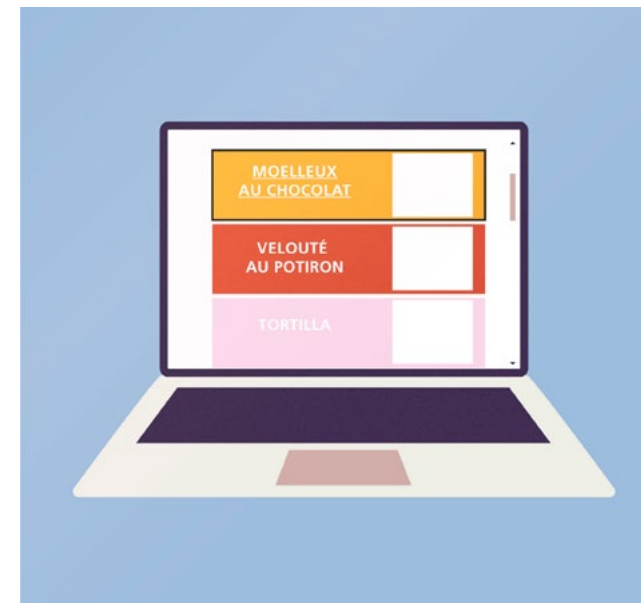
Now your courgette quiche recipe is ready. Visit the platform to order a new Recipe Box.

Read through the recipe in your Recipe Box. It tells you to add two measuring cups of crème fraîche.

All the recipes use this measuring cup. This handy cup means you never have to do any conversions.

RECEVOIR UN USTENSILE
EASY-TO-COOK :

☑ je ne veux pas en recevoir
☐ planche à découper
☐ pot à doser
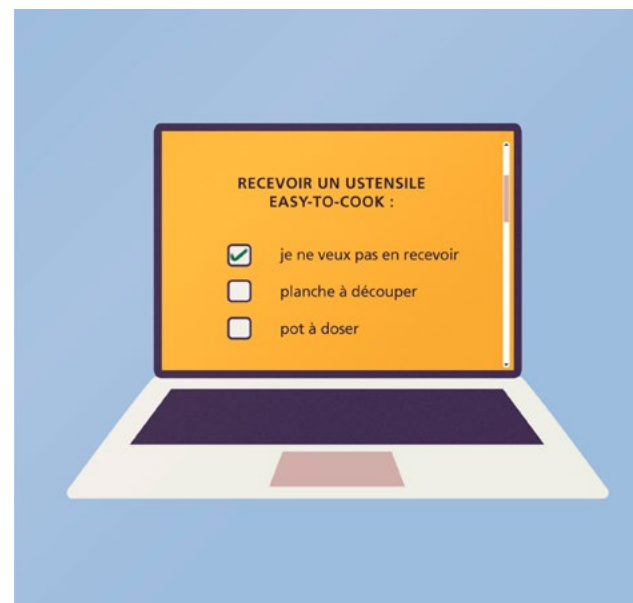
This time, you don't want to be sent a smart utensil, since you have everything you need already.
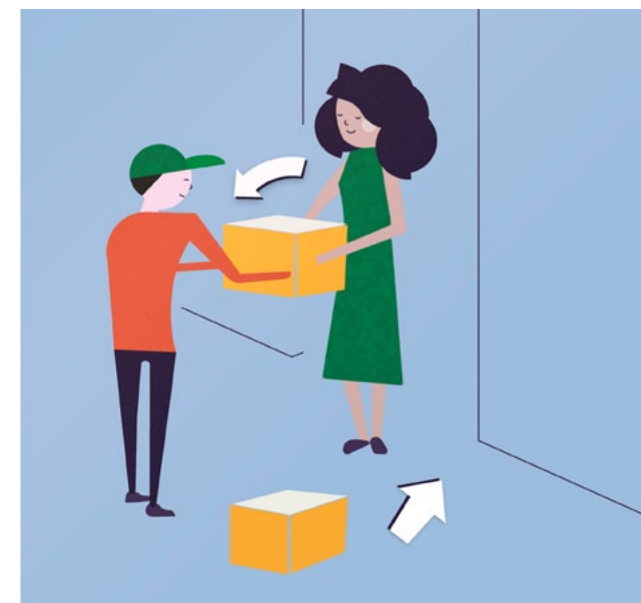
When the new Recipe Box is delivered, give the old one back to the delivery service along with any utensils you've tested and want to return.

An intelligent kitchen

An intelligent ecosystem, which adapts your kitchen environment in real time so that you can delegate certain steps when cooking.

Project your store into your living room. Stroll virtually around the shopping aisles and browse the products.
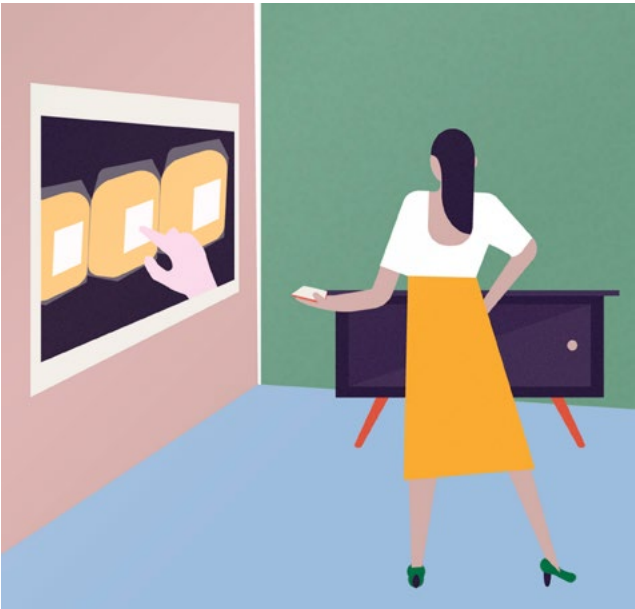
Virtually place a packet of pasta in your basket.

Your shopping is delivered to your home. Place your cooking pot in the sink. The tap detects the pot and fills it with water.

The bottom of your sink rises automatically to the same level as the worktop so that you don't have to lift the pot.

Slide the pot onto your sliding worktop.
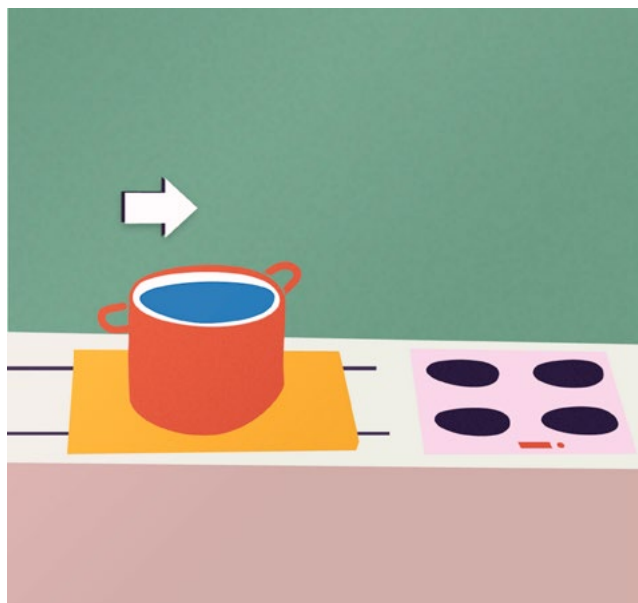
The sliding worktop allows you to slide your pot to your hob without effort.

The hob detects the pot, switches itself on and brings the water to the boil.
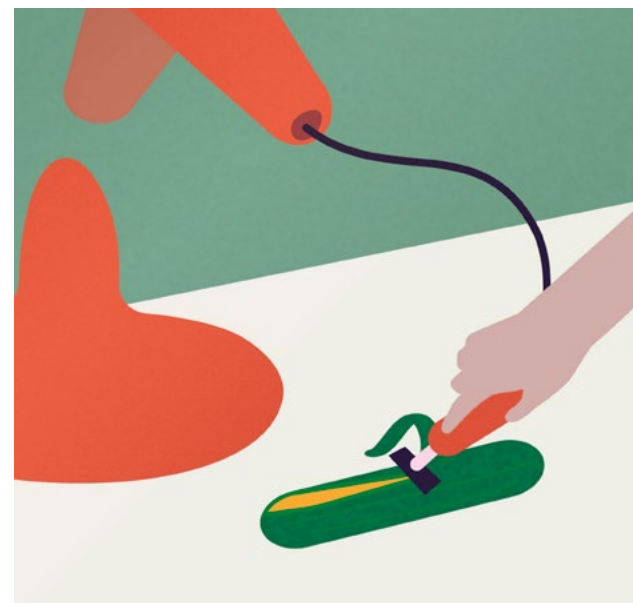
Attach a peeler, which acts like an electric razor. All you have to do is slide the peeler along the courgette to peel it automatically and effortlessly.
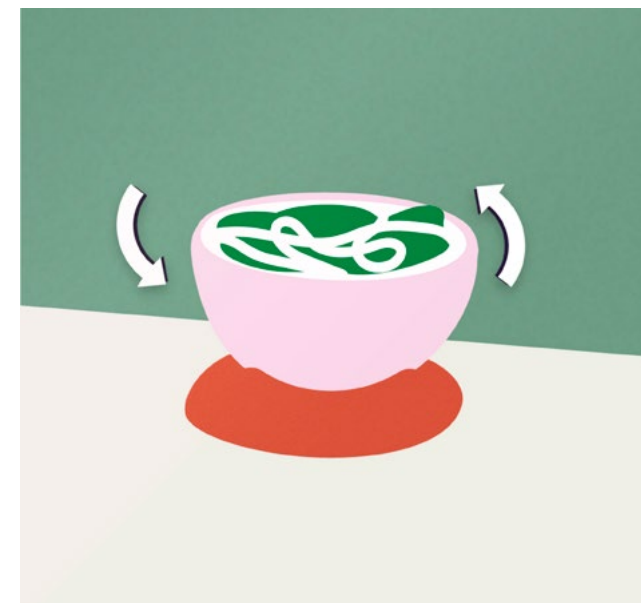
Place a bowl containing your chopped courgettes and other ingredients on a mixing base. The base allows you to stir, combine and mix in any container you place on top of it.

Place the pot underneath the measuring jars hanging above your worktop. Pour in a measured quantity of pasta for two people.
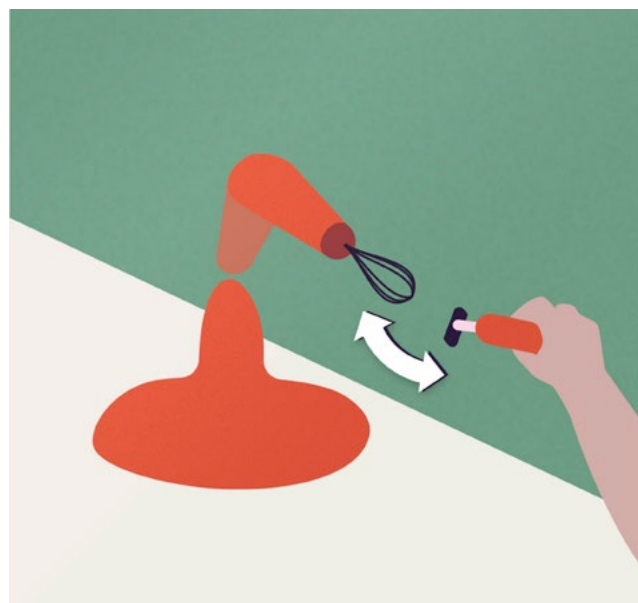
Now use a kitchen aid to help you cook directly in the cooking pots, adding the accessory you want.

The base continuously and thoroughly mixes the food to produce a smooth sauce. Place two bowls to the side. The base tips and pours the sauce onto your bowls of pasta.
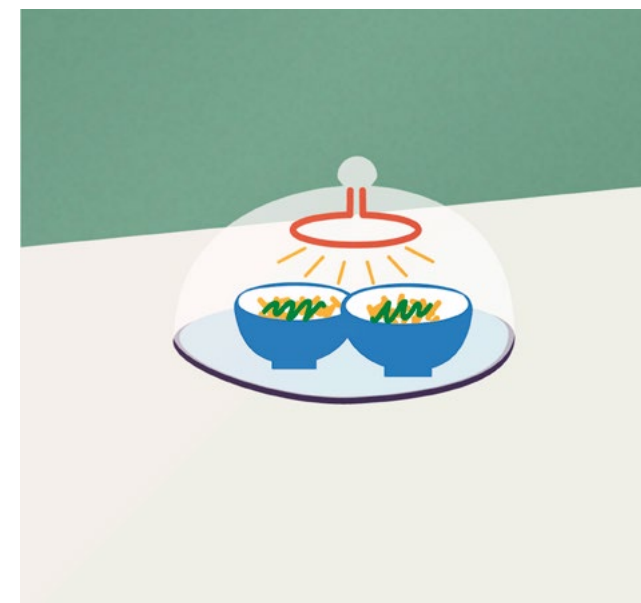
Place a heating cover over the bowls while you wait for your guest.

B _ From modelling to prototyping

Rapid prototyping allows the new ideas to be made into tangible forms. The **prototype** is tested and improved *iteratively* until it is approved.
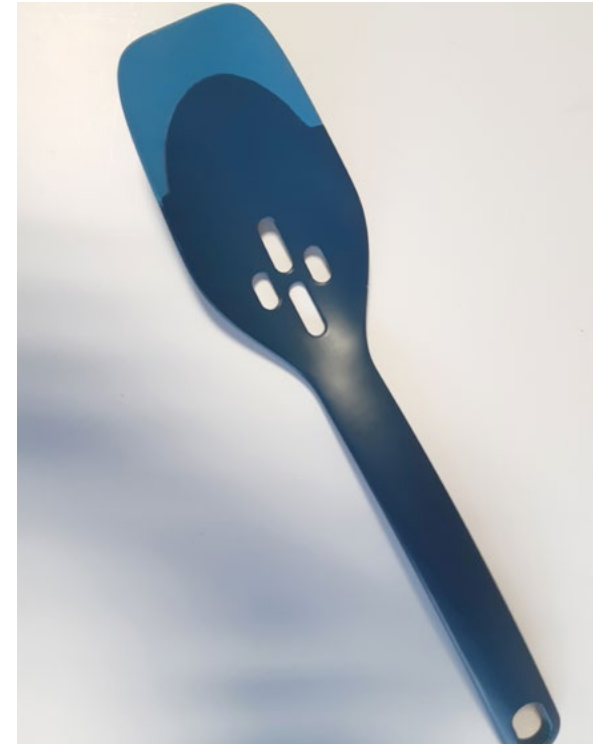
Before the industrialisation stage, various levels of prototypes can be tested according to requirements:

- An appearance mock-up to present the aesthetic aspects of the object as it will be perceived (shapes, colours, textures etc.).
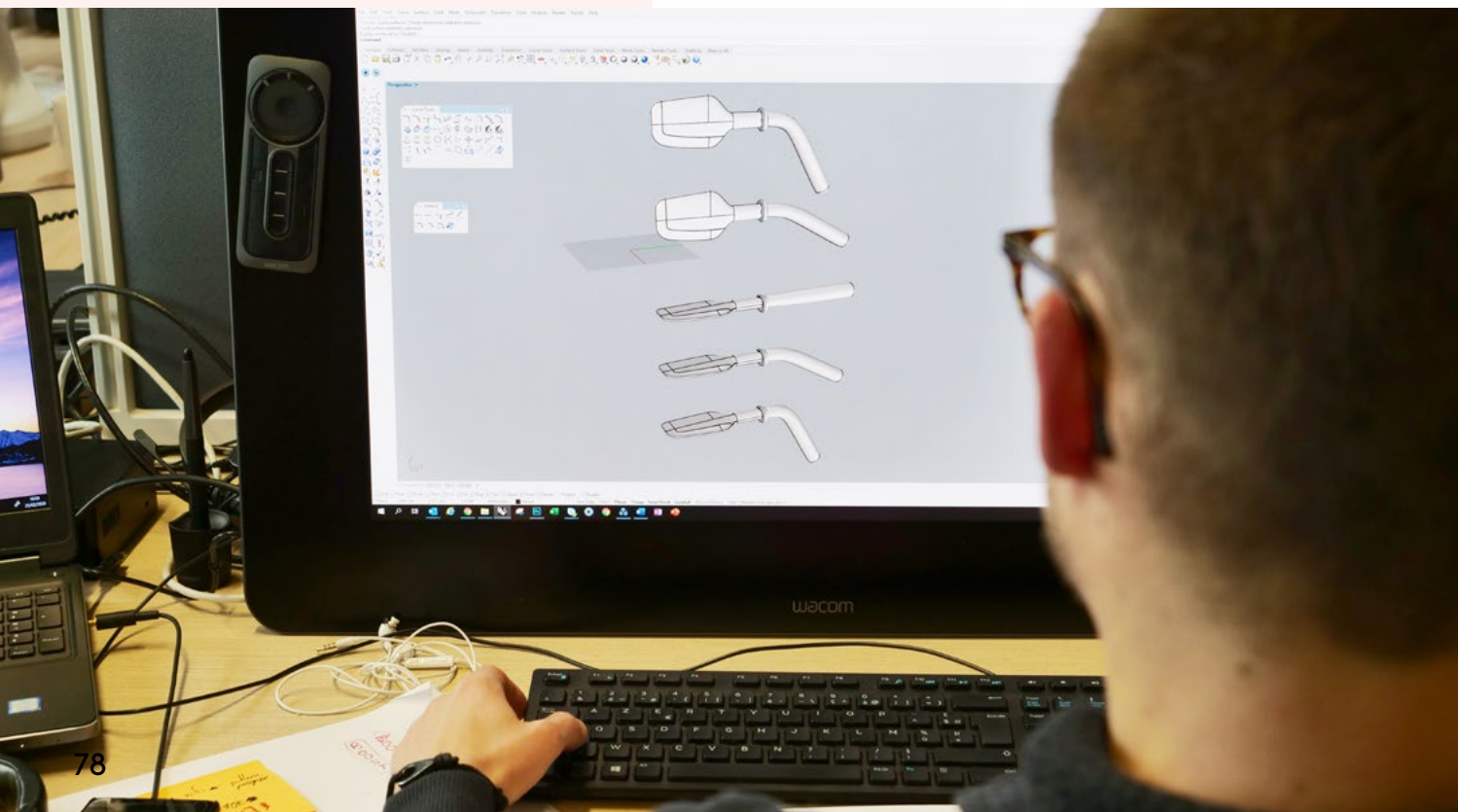
- A functional **prototype** to present the ergonomics of the object as it will be used (forms of handling, volumes, weight etc.).

The keys to success

- ## Select the relevant ideas

  to be prototyped using an objective method.

- ## Model the prototypes

  with designers and engineers.

- ## Define the finish level of the prototypes

  depending on what is to be evaluated(aesthetic aspects, general ergonomics etc.)

NILS, SHANTI AND AGNÈS SUMMARISING THE IDEAS

02

EVALUATION

KENZA AND MAÏSSANE TESTING PROTOTYPES

Assessing prototypes to improve or approve them.

"The evaluation phases require empathy, so that we can understand the diversity of our users, and humility, so that we can challenge any preconceived ideas: it's about rediscovering what we thought we knew already! As designers, we really need to fuel our research by setting it before a diverse **panel**, representing the future users of our services and products.

Nowadays, there is a whole range of methods for testing the user experience and these all genuinely help with the design. Evaluating the human experience iteratively allows us to take a pragmatic, usage-centred approach to our design, while also taking the hedonic dimension of our proposals into account. "

ANTONY MASSON, DIGITAL
USER EXPERIENCE DESIGNER

A _ Online **evaluation** of usage scenarios

TO MEASURE THE EMOTIONAL IMPACT OF A CONCEPT

1 **Define the preferred** usage scenario **among several imagined usage scenarios**

2 **Describe the emotions you feel**

The participant selects the emotions they feel for each of the scenarios.

Assess the scenario you prefer:

When you imagine experiencing scenario 1, with the convenient kitchen:

☐ It makes you want to try it

☐ It makes you feel satisfied

☐ It makes you happy

☐ It makes you feel scared

☐ It makes you feel dissatisfied

☐ It puts you off

☐ It gives you hope

☐ It makes you proud

☐ It annoys you

☐ It makes you sad

☐ It bores you

☐ You don't feel any of these emotions

3 **Distinguish which concepts are preferred or rejected**

The participant identifies the parts of the scenario they prefer and those they reject.

4 **An overview of the results**

The results figures shared as part of this study should not be considered as exhaustive, but as an overview of the methodology.

Which steps of scenario 1 do you like the most?

OR
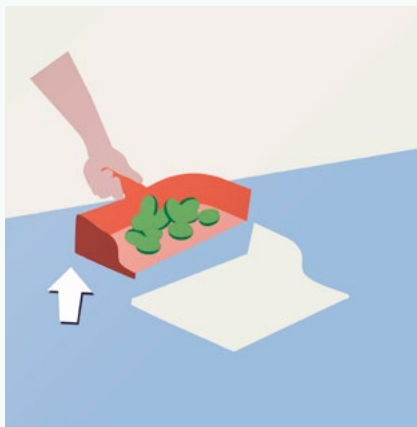
Using a handy chopping board allowing you to separate foods and extract them easily.

Using a colander placed in the pot to insert and extract foods safely and easily.

What is the participants' preferred scenario?
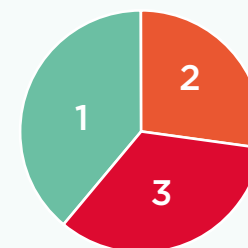
- 39% prefer scenario 1
- 27% prefer scenario 2
- 34% prefer scenario 3

SOURCE [11]

What kinds of emotions are experienced for scenario 1?

64% want to try it

57% are satisfied

11% are bored

What are the preferred concepts for scenario 3?

54% reject the concept of virtual purchasing at home

64% prefer the concept of movable kitchen work tops

A major criterion: emotion

Make sure you objectify the evaluations so that you can get past the emotion stage and obtain tangible feedback.

Watch out for the influence of first impressions over the overall evaluation. A person who dislikes the graphic style of a usage scenario at first sight, for example, could reject the concept it illustrates entirely. Going beyond the **subjective "I like it / I don't like it"** will allow you to delve deeper into how assessing how they feel.

"I really don't like connected products"

MARIE

"I like colourful things!"

VÉRONIQUE

An influential criterion: personal ability to project

Usage scenarios must be simplified so that they represent clear concepts, but without making them universal. A few details can help to make the concept easier to understand, whereas too many details risk presenting the concept as a fixed solution.

At this stage, an element of **appropriation** and **imagination** is left to the participants. Some people will find it easier than others to project themselves into the scenario and imagine beyond the details that are presented. Make sure you identify the profiles that are most resistant to evaluation amongst the participants – those who will take a biased view in their assessment due to a lack of understanding of the projection exercise.

An open-ended question could be asked at the end of the questionnaire to ask the participant's opinion and help you assess how well they have understood.

2 EVALUATION CRITERIA RESULTING FROM THE SURVEYS

B _ Evaluation of usage scenarios in focus groups

COLLECTING QUALITATIVE DATA DURING DISCUSSIONS

A focus group involves discussions between a group of around six people to gain a deeper understanding of their opinions, attitudes and habits on the subject in question.

Group discussions accessible to everyone

The advice is the same as for the co-design workshops (p.60).

Discussions without influence

Group bias occurs when a person influences the group's opinion by sharing their opinion first or in a convincing way. It is advisable to ask the participants to outline their opinions individually in advance before sharing them with the others.

For example, during a focus group carried out for this study, the participants first voted for their preferred scenario individually before revealing their vote to the group.

Tested focus group guide.

Sharing and comparing opinions

Group discussions allow feedback to be enriched and qualified.

A WORK SESSION IN A FOCUS GROUP
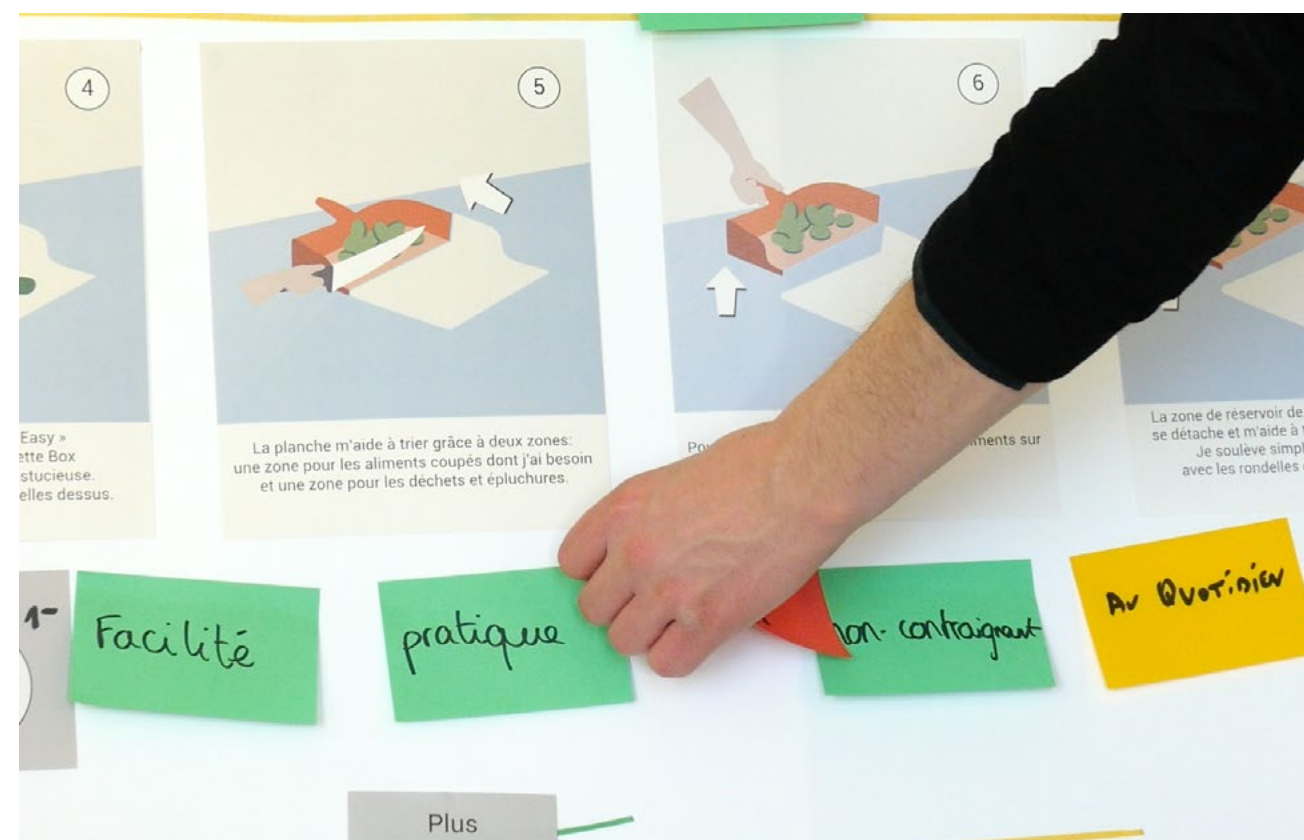
Analysing opinions

Going beyond first impressions, it's interesting to analyse the words used during discussions. This analysis consists of sorting the semantic data by subject to allow a deeper understanding of the evaluation process.
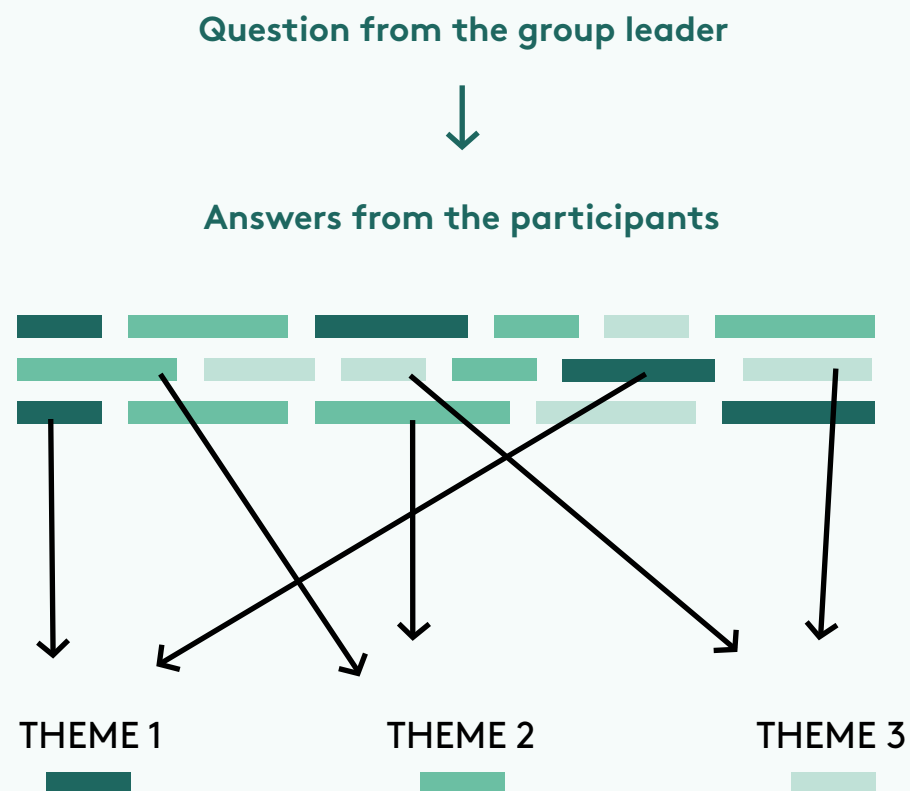
Imagining usages and limitations

It is possible to guide the discussion to understand how participants adopt the usage, use their imagination to go beyond the concept presented and assess its limitations. The objective here is to see just how universal the concept may be:

Is the concept useful to just one person or one specific disability, for example? Or could the concept be useful to everyone, with or without a disability, for example?

Question from the group leader

↓

Answers from the participants

THEME 1   THEME 2   THEME 3

"You have your shopping delivered, by virtually projecting your local shop into your kitchen."

IT'S USEFUL IF...

- "The shops are closed"
- "You haven't got time to go to the shops"
- "You're stuck at home"
- "You're ill, you're bedridden etc."
- "You're looking after your children"
- "You need to do your shopping using voice ordering"
- "You're not able to carry your shopping yourself"
- "You need to check what you have in the house already"

IT'S USELESS IF...

- "You want to see other people"
- "You want to get out"
- "You want to choose and touch the products"
- "You want to browse, choose the ingredients you feel like using"
- "You want to ask the shop staff for advice"

6 EVALUATION CRITERIA
RESULTING FROM
THE FOCUS GROUPS

The experiments carried out
throughout this study have
enabled us to analyse and
identify six evaluation criteria
measured subconsciously
by the participants.

These criteria provide
the means to analyse
the evaluations, albeit
in a non-exhaustive way.

Lessons learned

in the field

Convenience

Practical — Restrictive

Necessary — Useless

Compact — Bulky

**"It's great – you only need one
accessory in your cupboard."**

THIERRY

Ease

Comfortable — Uncomfortable

**"Sound signals beeping all the time
just add background noise."**

MARYLINE

Economical — Costly

**"It's good value for money, it's not
a huge investment for what it does."**

ROLAND

Prioritisation

Essential, handy, useless

**"It's not essential but
it's quite handy."**

PATRICIA

Efficiency

Fast — Time-consuming

**"It's even quicker than
supermarket deliveries!"**

ROLAND

Easy to use — Hard work

**"It's a lot of hard work
for not very much."**

PATRICIA

Versatile — Single-task

**"Using voice commands
to open the oven means
I can do two things at once."**

PATRICIA

Diversification
of usage

Flexible — Exclusive

**"I'm free to choose
the size of my container –
it works for everything."**

ROLAND

Continuous — Occasional

**"It's good on weekdays
and at the weekend."**

MARYLINE

Universal — Specific

**"It's no use to me as I don't have
any trouble gripping things."**

THIERRY

Perceived
values

Reassuring — Unsettling

**"It makes me feel safe from
any danger of scalding myself."**

THIERRY

Clean — Dirty

**"I can go through the recipe
without getting everything
dirty with my hands."**

ROLAND

**Environmental
— Non-environmental**

**"It saves water and
prevents waste."**

PATRICIA

C — Evaluation of prototypes in the home

COLLECTING QUALITATIVE DATA DURING USAGE TESTS

The prototypes tested may be models of services or prototypes of products.

Comparisons with existing products or services

Testing prototypes in the home means more **information can be collected** in the users' everyday context. Here, for example, a participant is assessing a prototype of a measuring jug made during the study. At the end of the test, she shows two measuring jugs she normally uses to make her tasks easier. This new information enriches the data collected during the observation phase.

VÉRONIQUE'S KITCHEN

Use in the home

Testing at home allows the prototypes to be used in the actual context and according to the user's habits. For example, as part of the study, the user tests a prototype chopping board. She uses a mandolin slicer on the board, just as she normally would.

"I use my mandolin to chop and peel quickly. Like that it's great – it can go straight into the board's storage area"

VÉRONIQUE

Identifying usage improvements

The test allows the affordance of the prototype to be tested. Affordance is the intuitive understanding of forms and their functions. It includes the intuitive gestures carried out when using an object for the first time, for example.

The prototype for the storage area of the chopping board is tested by several different users during the study. All the participants systematically position their hand on the side rather than along the length of the object, where the handle had originally been designed. The handle positioned on the long edge turns out to be useless and so it needs to be removed or moved to the side. The test allowed modifications to be made to the prototype.

VÉRONIQUE TESTING PROTOTYPES AT HOME

MARYNE TESTING PROTOTYPES AT HOME
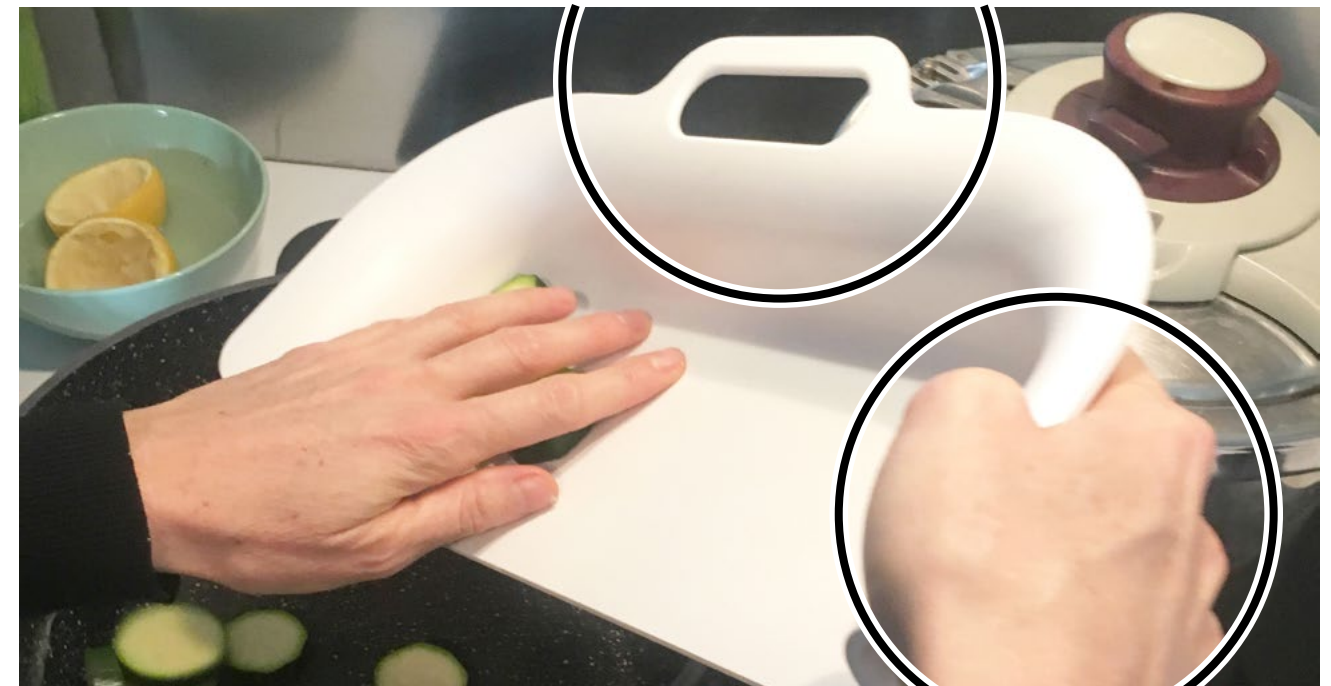
The experiments carried out throughout this study have enabled us to analyse and identify five evaluation methods used subconsciously by the participants.

These methods provide a basis for analysing the evaluations, albeit in a non-exhaustive way.

Estimating added value by comparison

Users routinely compare prototypes to assess them. The prototype is approved by the participant if it is better than the one they own or are familiar with.

"I've got everything I need – I've no use for it"

MARIE

"I prefer this one o my own spatula"

MAÏSSANE

Suitability for the user's lifestyle

Evaluation in relation to he user's own lifestyle often dominates the overall assessment of the prototypes or scenarios presented. The prototype is approved if it fits in with the user's habits in a real-life context.

"It's not at all how I like to cook"

MARYNE

You must ensure that the prototype is tested right through to the end, despite feedback on first impressions. People's opinions may change as they use it.

"It's OK after all – it's just that I wasn't used to it"

VÉRONIQUE

Watch out for any **bias** due to **habits** or **prejudices**. For example, some people may reject a digital concept out of hand, while enthusiastically welcoming the same concept presented in a physical or traditional way.

The participant explores a model of a service to help search for recipes.

"Would you use this application?

No

What if it was available in non-digital format as a recipe book?

Oh yes! I would love to use it!"

MARIE

100

101

Ability to project

The evaluation is biased and should be cancelled if the participant is not able to look beyond the level of finish of the prototype.

For example, during a usage test at home, a participant has been warned about the unattractive and uniquely functional aspect of a prototype. The prototype has been 3D-printed, and is therefore not the right colour or made of the right material, but it is the right shape. However, she subconsciously assesses the aesthetic aspect without looking beyond it:

"I prefer my own spatula, it has a coloured silicone handle which I like better"

CLARA

Affordance

Usage tests allow the **intuitive use** of the prototype to be observed in practice.

For example, during a usage test at home, a participant does not use the prototype of the chopping board as she should to get the ergonomic benefits. The prototype must be improved so that it is understood more intuitively.

Once this has been explained, the participant is satisfied:

"Oh yes, it's more practical that way"

MARIE

Unexpressed needs

Usage tests enable **subconscious requirements** that have not been verbalised by the participants to be collected There is sometimes a discrepancy between what is said and what is done in an actual situation. It is important that this subconscious feedback is detected during the assessment.

A participant in one of the usage tests is visually impaired. He assesses the various models of pan handles. Since he does not feel that he has any problems with manipulation, he does not feel that this concerns him. He rejects the concept before even trying:

"It could be good for others, but I don't need it"

MIGUEL

However, he does in fact try one of the models and very specifically chooses a particular handle, which suits him better than the others:

"This one is ideal for transporting my tin so that I can keep it level until it goes in the oven. Since I don't have any visual reference points, the problem is it often spills over when I lean forward. I can hold it really straight with this handle – it's great."

MIGUEL

The participant does not consciously express his needs straight away. During use, however, his enthusiasm clearly expresses the benefit of one of the handles for his visual needs.

PROTOTYPES OF HANDLES

D — Evaluation tools to be adopted

A RADAR CHART SHOWING THE EVALUATION CRITERIA COLLECTED

The radar chart allows the scope of the prototype's usage to be defined and potential improvements to be identified visually.

This radar chart uses the evaluation criteria collected during the study. These criteria overlap with the usability and desirability criteria.

These elements allow the user to assess the object ergonomically and socially.

Lessons learned in the field
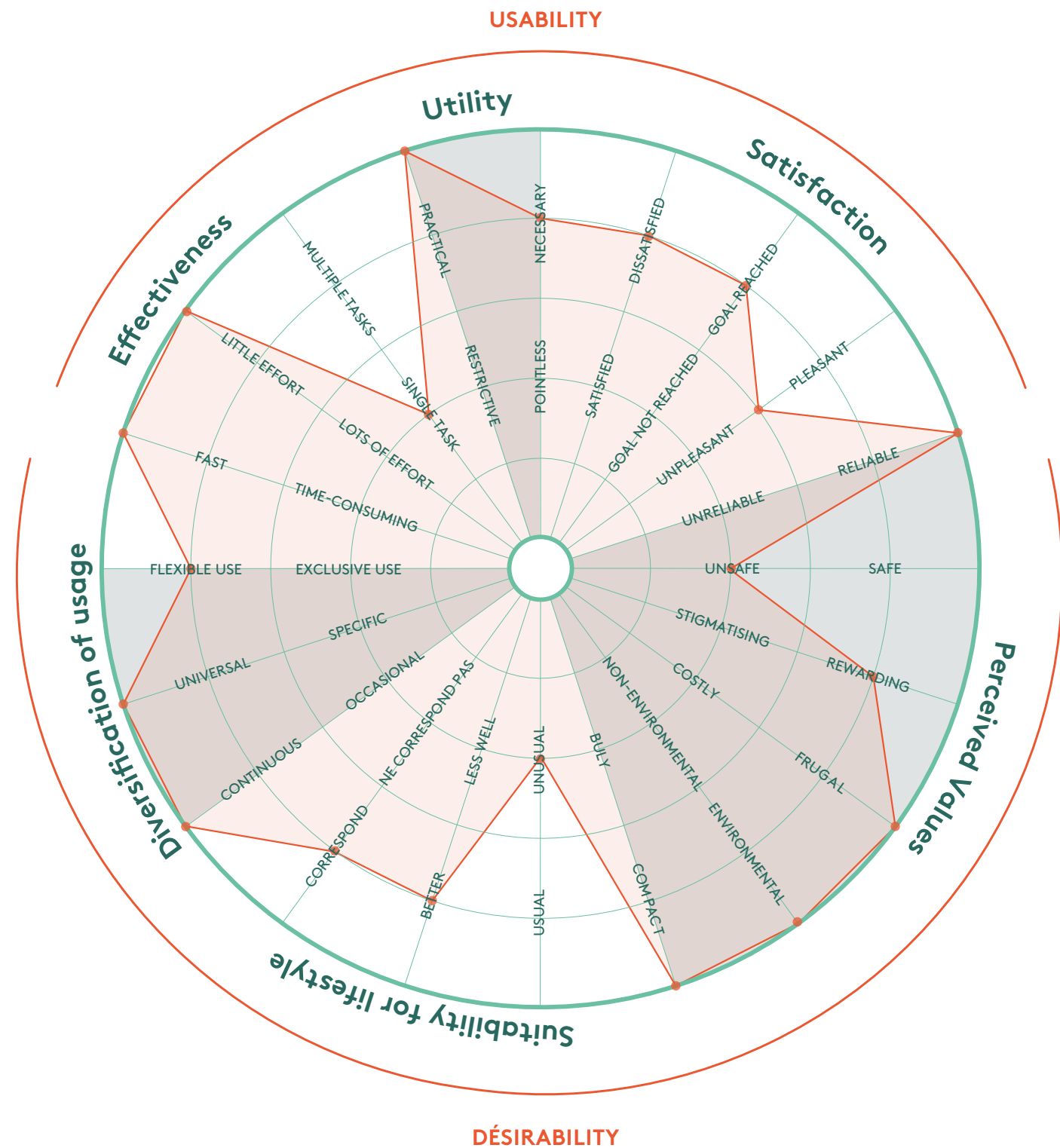
ACCESSIBILITY CRITERIA

The experiments carried out as part of this study have highlighted a number of accessibility criteria.

Possible interactions

REACH   FLEXIBILITY   MOBILITY

Accessibility criteria

The object can be used in front of you

You don't have to lean down

You can use the object when seated.

You can use the object without lifting your arms above your shoulders

You can move around with one hand free to use a walking stick or wheelchair.

Example situation

You are sitting down
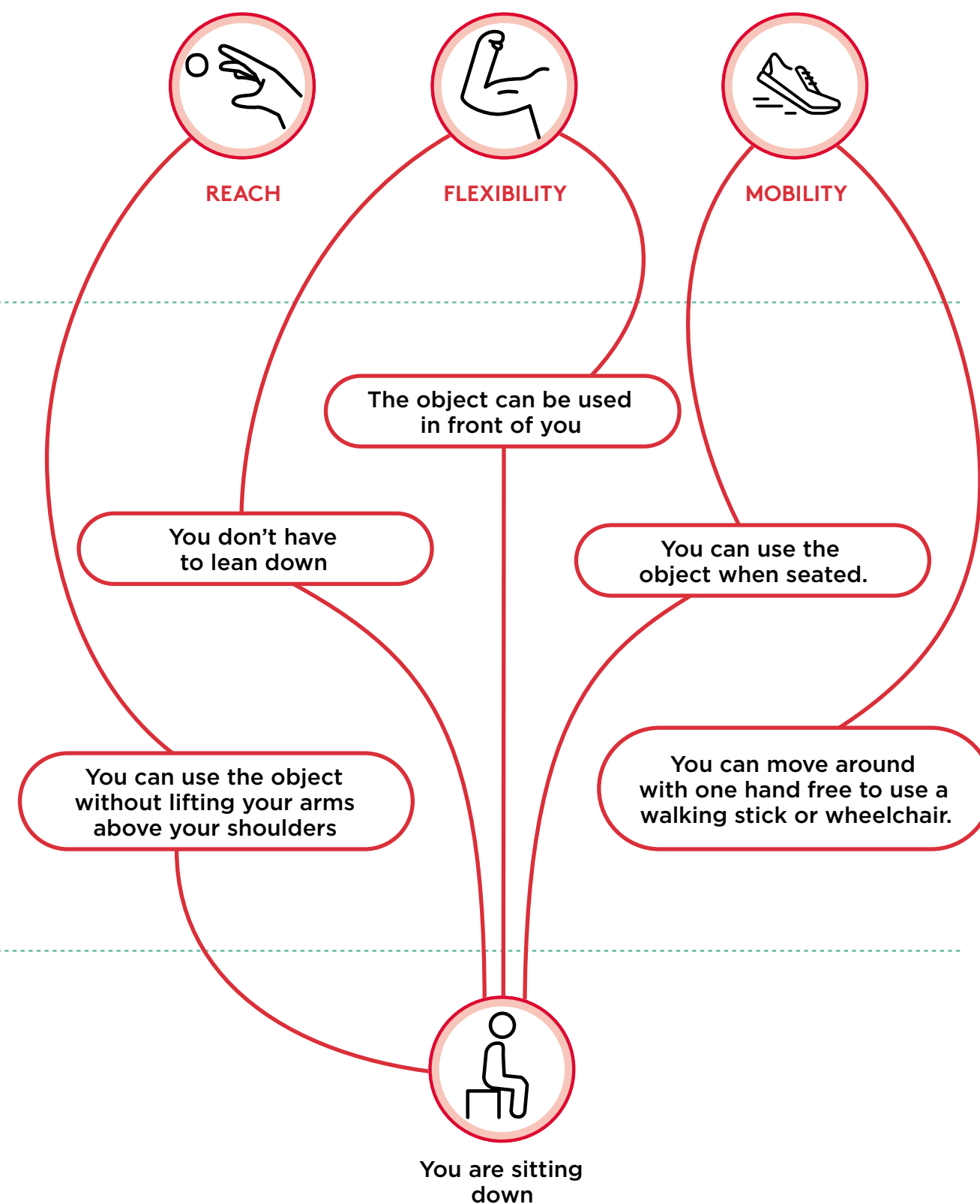
For more details, see the accessibility criteria tested p.113

The keys to success

- Diversify the panel

  to obtain universal feedback, the evaluation is carried out by people with and without disabilities, with different ages, genders, cultures and lifestyles.

- Increase the number of evaluation methods

  to obtain full feedback on emotions and perceptions as well as on ergonomics.

- Repeat the prototyping phase

  until the evaluation has been approved.

01

Good Design Playbook:
the philosophy

02

Inclusive design:
the design method

03

04

Good Design Playbook:
what about the future?

Inclusive design, best practices

NILS WRITING DOWN WHAT JEAN-FRANÇOIS
TELLS HIM DURING A WORK SESSION

SOURCE [12]

03

Information and recommendations for
accessibility were collected throughout all
the experiments carried out for this study.

These best practices are shared here in the
form of diagrams, models and summary sheets.

The intention is for this knowledge to be added
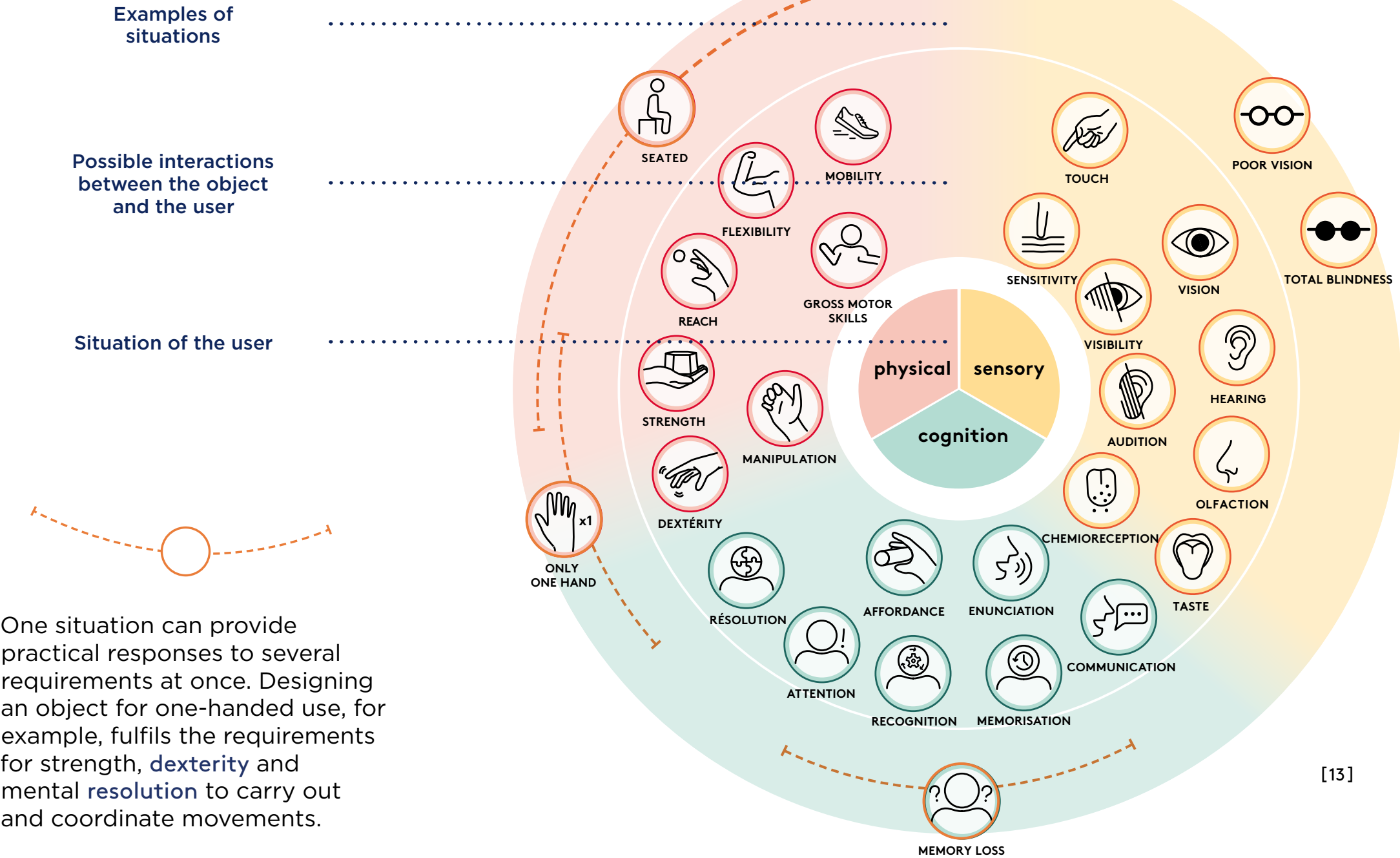to and enriched by everyone involved.

All the fact sheets

A — Practical models

The accessibility wheel

The accessibility wheel shown here has been formalised based on lessons learned from this study and on research publications.
It proposes accessibility parameters to be taken into account during design. It is intended to evolve as projects and knowledge develop.

Examples of situations

Possible interactions between the object and the user

Situation of the user

One situation can provide practical responses to several requirements at once. Designing an object for one-handed use, for example, fulfils the requirements for strength, dexterity and mental resolution to carry out and coordinate movements.

physical — sensory — cognition

SEATED · MOBILITY · FLEXIBILITY · GROSS MOTOR SKILLS · REACH · STRENGTH · MANIPULATION · DEXTÉRITY · ONLY ONE HAND

TOUCH · POOR VISION · SENSITIVITY · VISION · TOTAL BLINDNESS · VISIBILITY · HEARING · AUDITION · OLFACTION · CHEMIORECEPTION · TASTE

RÉSOLUTION · AFFORDANCE · ENUNCIATION · ATTENTION · RECOGNITION · MEMORISATION · COMMUNICATION · MEMORY LOSS

[13]

Possible interactions between the user and the object

cognition

RESOLUTION
You find it difficult to work out conversions between grams and centilitres.

ATTENTION
You find it difficult to concentrate, you're often distracted and you lose focus.

RECOGNITION
You find it hard to recognise, understand and interpret information such as pictograms.

MEMORISATION
You have short-term memory loss.

COMMUNICATION
You have problems with oral or written communication.

physical

DEXTERITY
Your actions are imprecise or shaky.

STRENGTH
You find it hard to hold weights of more than 1kg

REACH
You find it hard to reach areas above shoulder level.

FLEXIBILITY
You find it hard to keep your balance and stay comfortable unless sitting or standing.

MOBILITY
You find it hard to move around, depending on distance and how the space is configured.

sensory
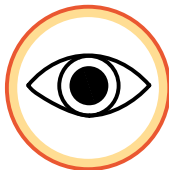
VISION
You find it difficult to see and read at certain distances or under certain conditions of lighting, contrast etc.

TASTE
You find it hard to distinguish different flavours.

SMELL
You find it hard to distinguish different odours.

TOUCH
You're not very sensitive to temperature, pain etc.

HEARING
You find it hard to hear and locate sounds in your environment.

B — Fact sheets

These sheets can be used for different objects, services and sectors.

Big ideas sheets

—

Support a user-centred approach with explanations of a few ideas.

p.118

Best design practices sheets

—

Support global design with **accessibility** recommendations.

p.122

Element sheets

—

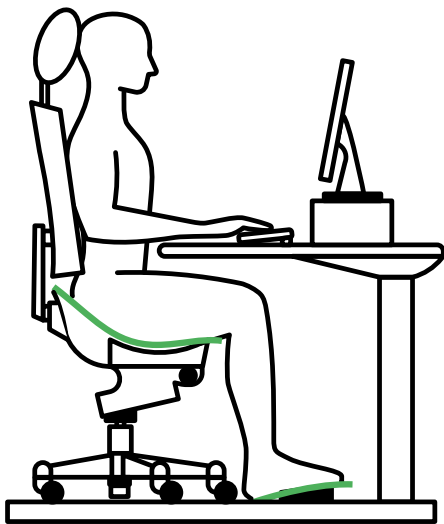Support the design of one element of an object in particular.

p.154

Big ideas sheets

—

1. Ergonomics

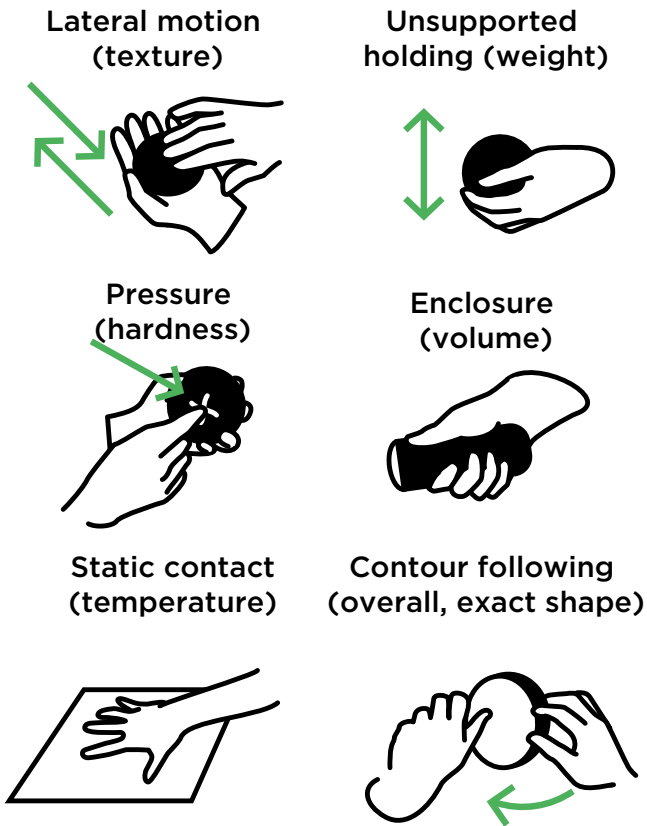Ergonomics originated in the work place.

In more general design, ergonomics concerns the comfortable use of an object, service or space (convenience, handling, proper grip of a handle, ease of navigation on a website etc.).

2. Haptics

Haptics refers to the science of touch, just as optics refers to sight and acoustics to sound.

There are six processes of manual exploration:

Lateral motion (texture)

Unsupported holding (weight)

Pressure (hardness)

Enclosure (volume)

Static contact (temperature)

Contour following (overall, exact shape)

3. Affordance

Affordance is about "all the action possibilities of an object" and, more specifically, the intuitive understanding of forms and their functions. Some shapes naturally induce certain gestures.

The more affordant an object is, the less explanation it will need and the greater the likelihood that it will be used correctly the first time.
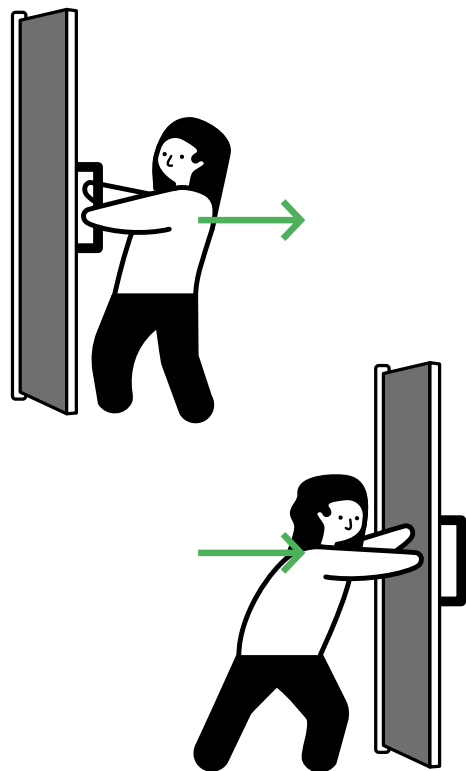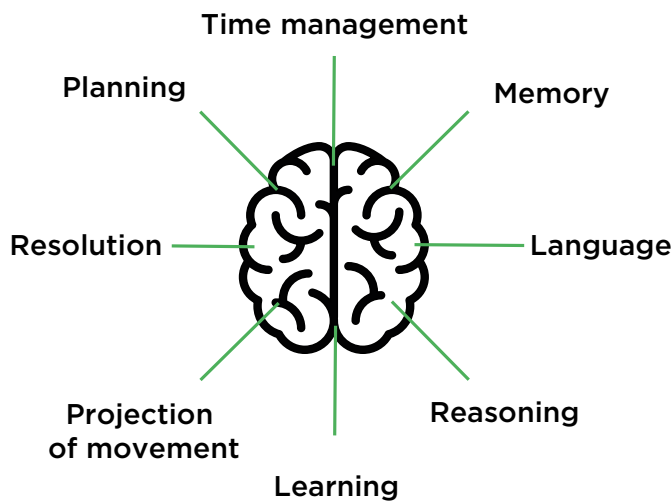

4. Cognitive processes

Acquiring awareness and knowledge are **cognitive processes**.

Cognitive processes and emotional processes mutually contrast with and influence one another.

Cognition deals, for example, with processing information:

Time management

Planning

Memory

Resolution

Language

Projection of movement

Reasoning

Learning

5. The user experience

The objective is for the design to coincide as much as possible with the experience the user wants to have. The user's experience depends on their perception of all the **interactions** experienced throughout the **user pathway**.

This pathway extends well beyond the use of the object at a precise moment: the term can be applied, for example, from the moment the object is purchased until it is repaired after it has been in use for several years.
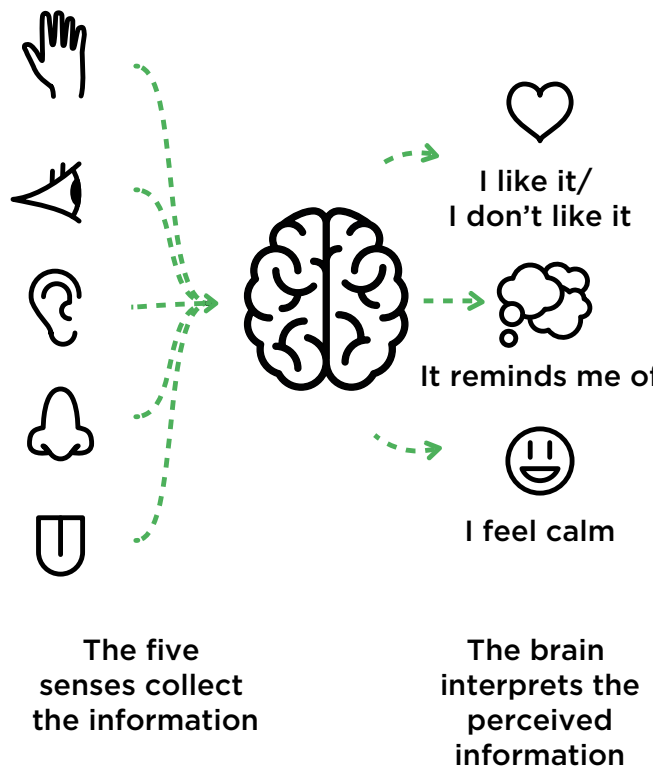

The user experience
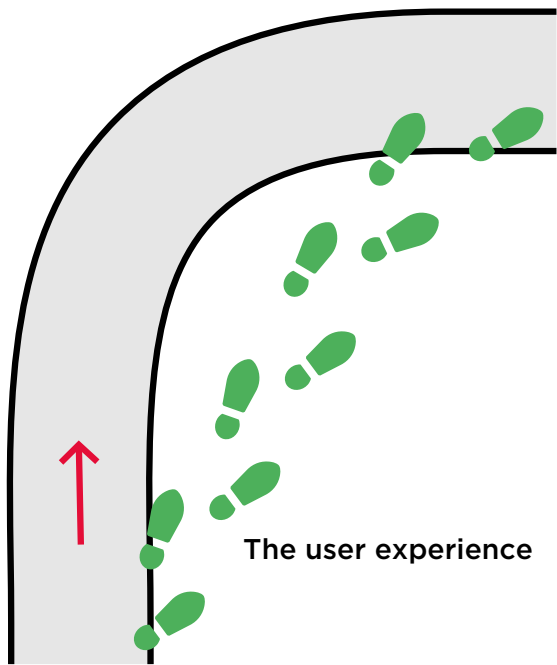
6. Perception

Perception is a process with two stages:

- The five senses absorb information and signs from the environment.
- Then the brain interprets this data through emotional and cognitive reactions (based on culture, past experiences, logic etc.).

For example, a car door slamming with a low-pitched noise will generally be perceived as reliable and reassuring. This impression is due to the interpretation of signals as perceived values.


I like it/ I don't like it

It reminds me of

I feel calm

The five senses collect the information

The brain interprets the perceived information

Best design practices sheets

—

1. Aim for vertical movements

Actions should follow the vertical axis – securing an element in place, for example – so that they only need one hand.

Horizontal actions often require the use of a second hand to stabilise the object.
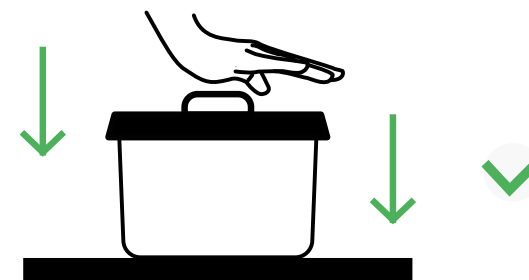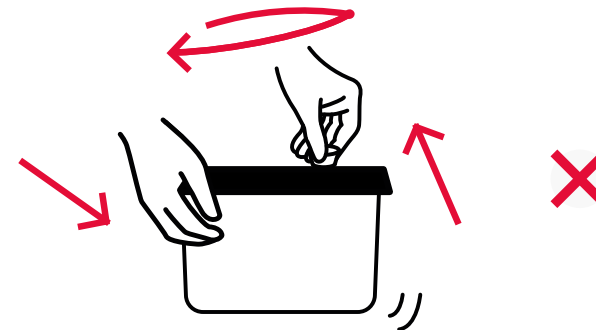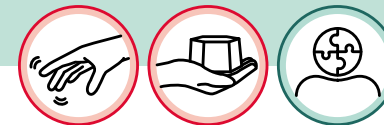
2. Follow the direction of gravity

Actions that are carried out from high to low follow the force of gravity and require minimum effort from the user.
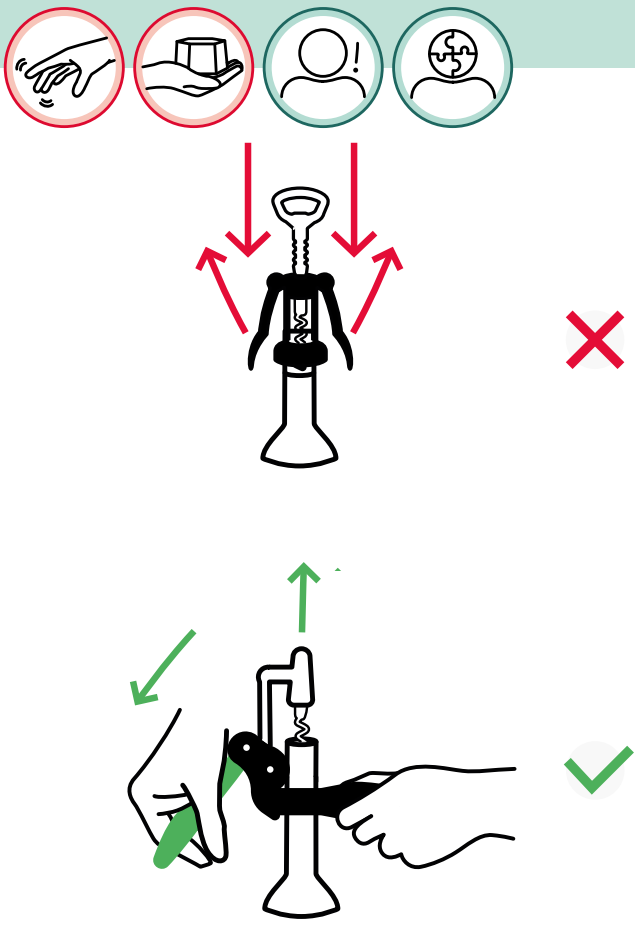
On the other hand, movements from low to high require more effort. An element may therefore be hard to fasten in this direction.
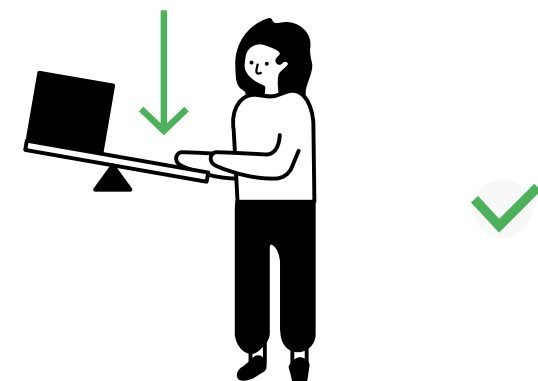
3. Aim for single actions

A single motion is required to carry out an action on an object.

Carrying out more than one movement at once requires the use of a second hand, synchronised movements, precise gestures and **attention**.
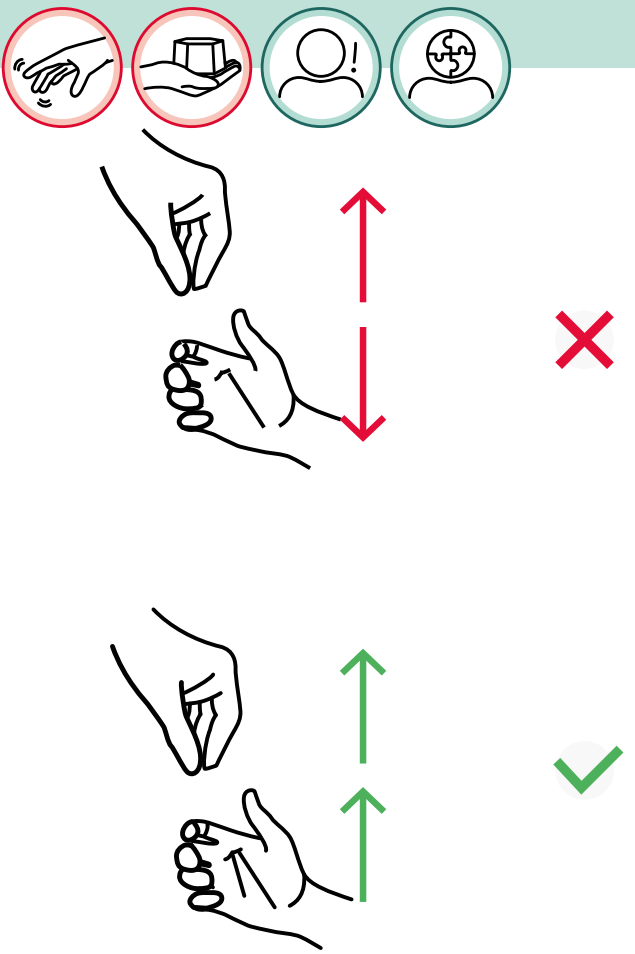

4. Think in a unidirectional way

Complex actions are carried out in the same way and in the same direction.
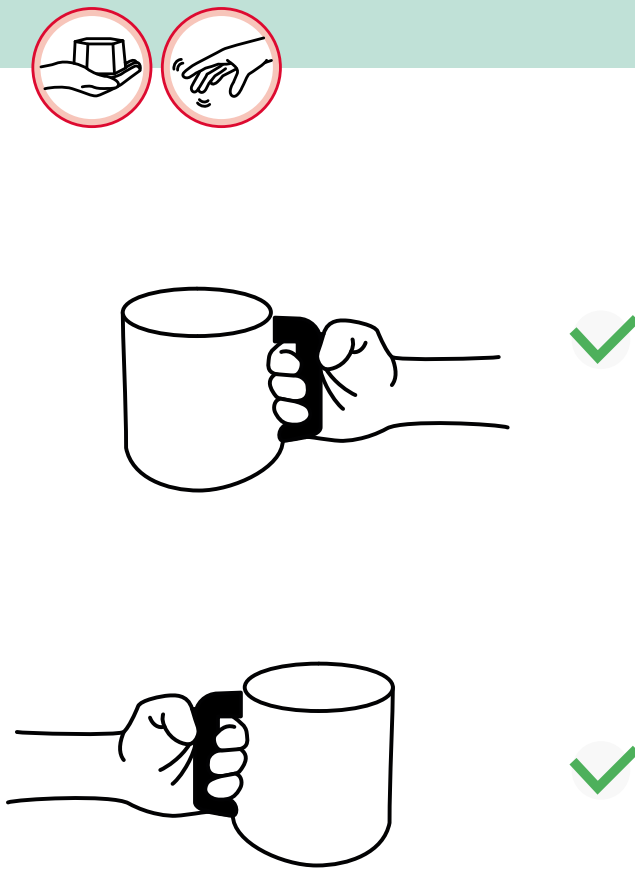
A complex action requires the coordination of several limbs at once, for example both hands.

The comprehension, coordination, **attention** and level of strength and precision required will be easier if the movements follow the same trajectories.

5. Consider left-handed and right-handed users

The action must be possible for both right-handed and left-handed users.

6. Confirm the action with a signal

Each step in an action is confirmed by an audible and visual signal. Particularly in cases which are not perceived to be very safe, it is important to reassure the user by confirming that the step has been carried out correctly.

The absence of a confirmation signal can confuse the user and reduce their confidence in their **interaction** with the object.

Confirmation through feedback therefore has value in terms of both usage and perception.

Clic!
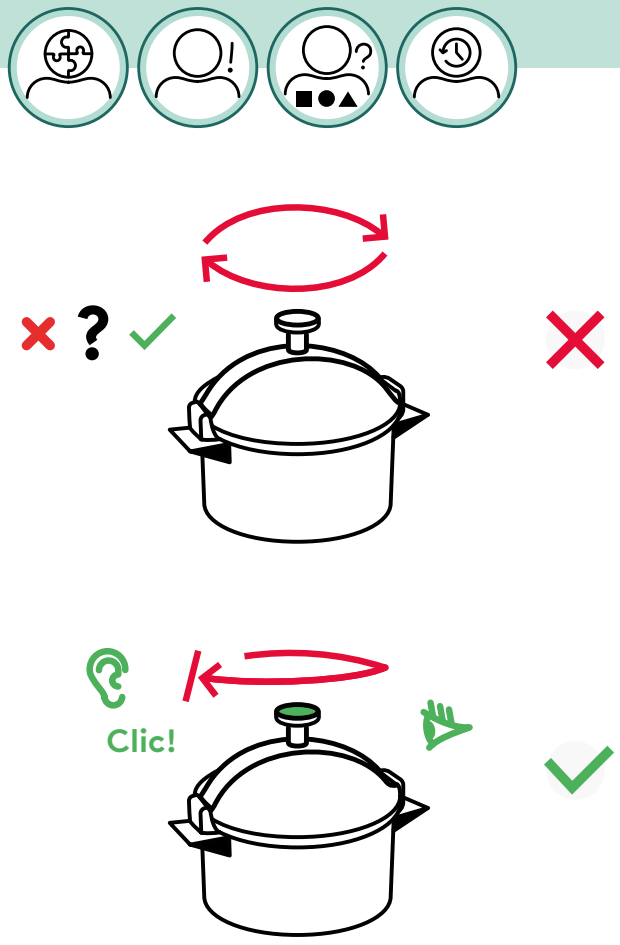
7. Guide the action

Movements are guided and limited by an element of the design, which prevents any other movements being made in error along other trajectories. For example, the action could be limited to one possible trajectory by a hinge or by sliding along rails.

This guidance counteracts any potential errors in trajectory caused by imprecise movements, shaking, lack of strength, visual impairment or lack of comprehension.
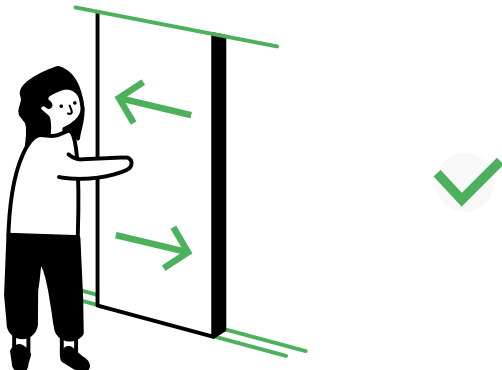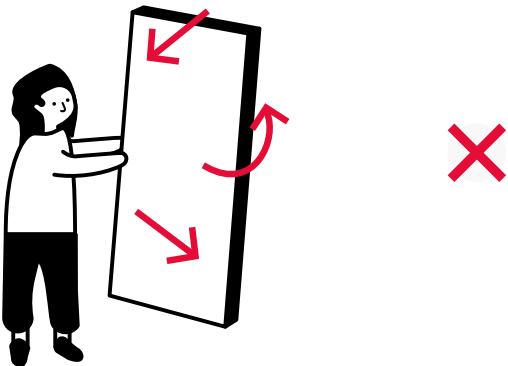
## 8. Aim for a stationary position

Actions carried out when stationary require minimum effort for the user to move around. So it sometimes makes sense to simplify situations that are traditionally spread out over an area, limiting them to a fixed point to make manipulation easier.

9. Give preference to dials with notches

Dials with notches allow users with visual impairments or attention deficit disorders to choose an option by counting the number of notches or remembering a dial position that has already been selected.

An infinite dial does not make it easy to select a precise setting, for people with shaking hands for example, or to select options without an associated audible, touch or visual signal.

clic clic clic
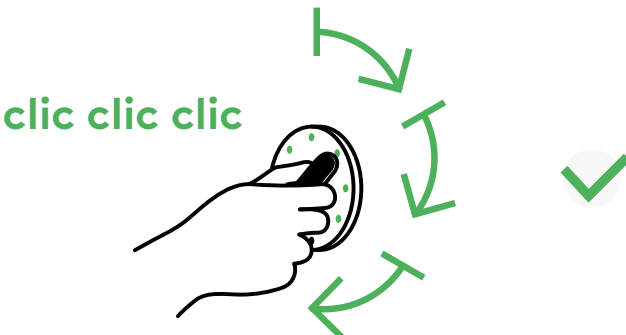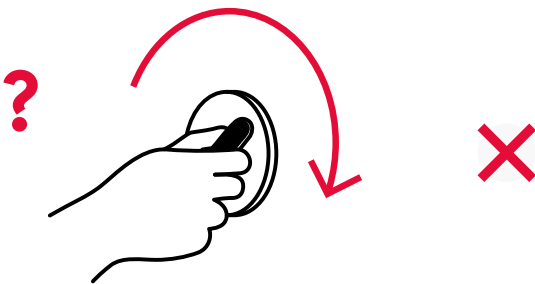
10. Make functional elements stand out

Visible functional elements (buttons, marks for measuring etc.) are easier to make out if they raised.
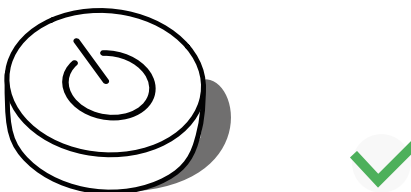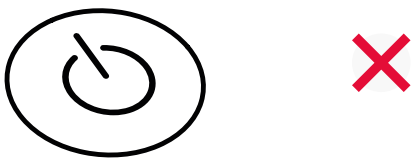
11. Separate information into blocks

Large amounts of information are structured in blocks to make it easier to process and memorise. These blocks can be classified by type according to function, chronology etc.

Open
Close
Measure
Option 1
Option 2
Maintain the temperature
Switch on
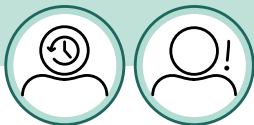Adjust
Switch off

✗

Open
Close
_____
Measure
Option 1
Option 2
_____
Maintain the temperature
Switch on
Adjust
Switch off

✓

12. Communicate using Easy-to-Read language

Information given in writing or orally must follow the Easy-to-Read guidelines so that it can be understood, assimilated and memorised by everyone. These rules are shared by a number of associations. The Easy-to-Read guidelines are available in the appendix under source [20].

These guidelines tell you, for example, not to use serif fonts, not to write in italics and to formulate simple sentences.

YOU WILL RECEIVE A PARCEL. THIS WILL BE SENT BY POST ON 12/12/22

✗

Your parcel will be sent by post on 12 December 2022.

✓

13. Optimise the readability of contrast levels and colours

The WCAG and RGAA guidelines present three levels of accessibility (A, AA and AAA). The AA (double A) and AAA (triple A) ratings specify minimum levels of contrast between text colour and background colour to improve the readability of the content. There are a number of websites and applications that allow you to check the visual accessibility of different levels of contrast between background colour and text colour.
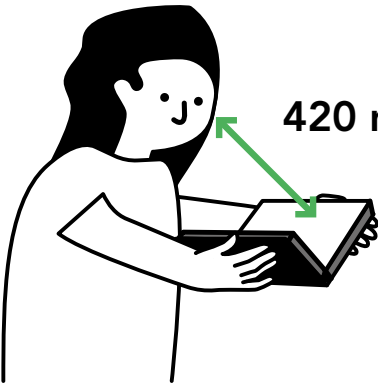

DIFFICULT TO READ

✗

EASY TO READ

✓

14. Pay attention to the font size

For optimum readability, the font size is calculated as the reading distance divided by 30.


420 mm

$$\frac{420 \text{ mm}}{30} = 14 \text{ pt}$$

15. Make things easier to reach

The time required to reach a target depends on its size and how far away it is. For example, the further away the button, the larger its diameter. The closer the button, the smaller its diameter can be.

The quicker the movement and the smaller the target, the higher the error rate will be. There is a compromise between speed of **reach** and precision. To find out more, take a look at **Fitts's law**.

 ✗

 ✓
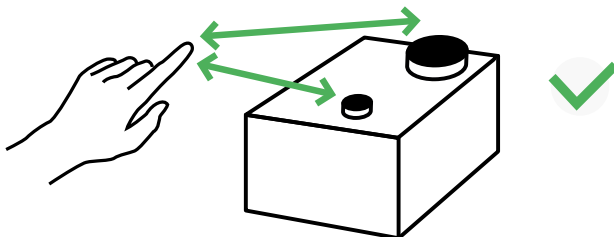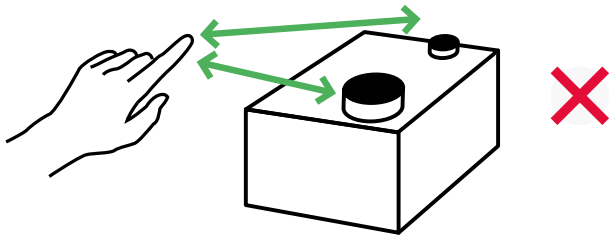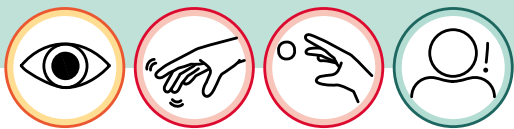
16. Important information

Important information and elements are highlighted through sensory differentiation. For example, a word in a text can be shown in bold. The texture of a "start" button can be identified by touch.

For written information, refer to the **Easy-to-Read** guidelines. For example, using bold to highlight a word is recommended. Highlighting a word by underlining it, however, is not advisable.

Emphasising words by <u>underlining</u> or <mark>highlighting</mark> them is not recommended ✗

Emphasising **important** words in **bold** is recommended ✓

17. Illustrate text

Pictures are easier to remember than words. Written information is easier to understand and remember if it is supported by a figurative illustration such as a drawing, photo or pictogram.

User manual:

Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugait nulla facilisi.

✗

blade ——

—— Handle

button ——

✓
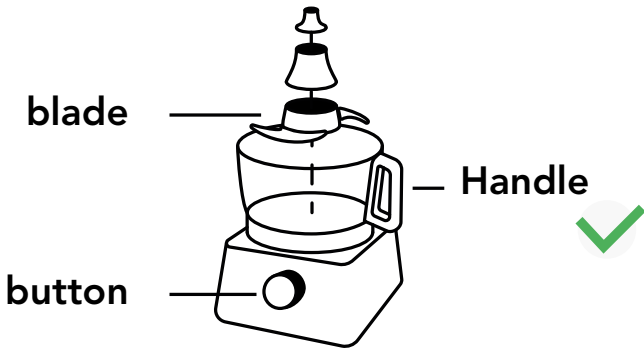
18. Figurative illustration

Figurative pictograms are the most easily recognisable.

Schematic or abstract pictograms require more knowledge and thought.

 ✗

The "recycling" logo is an abstract pictogram. The user has to recognise the symbol to be able to understand its meaning.

 ✓

The "waste disposal" logo is an illustrative pictogram. The user will easily recognise the action of throwing a piece of paper in the bin.

[21]

19. Avoid cognitive interference

Messages represented by contradictory information slow down the mental pathways for processing and assimilating information. The meaning of the information must match the perception of its mental representation (style, colour etc.) so that it can be understood without any interference. Cultural perception plays a key role in the significance of a colour, material or message. To find out more, look up the ideas behind the **Stroop effect** and **proactive and retroactive interference.**

STOP! **GO.** ✗

STOP. **GO!** ✓

20. Arrange controls in a similar way

Controls and the elements of the object they control are arranged in a similar way.
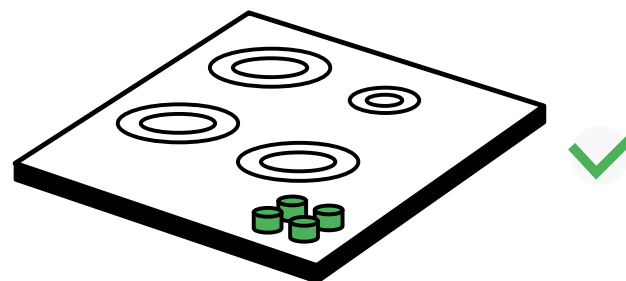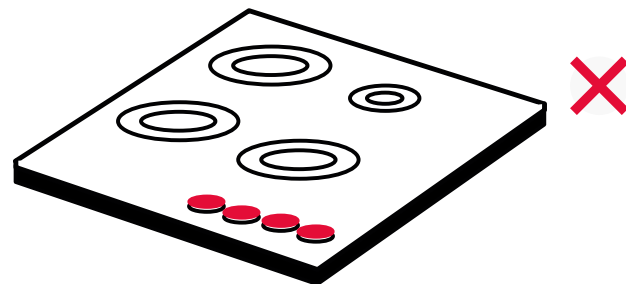
21. Margin of error

The margin of error for each use is taken into account and corrections are possible. It is important that potential usage errors are considered from the design stage or identified during usage tests.

The user may deliberately or involuntarily use an object incorrectly. The device is designed to take this margin of error into account by allowing the user to go back, blocking any unintended usage etc.

Go Back   Confirm

Element sheets

_

BEST PRACTICES
FOR ORIENTATION

clic
clic
clic
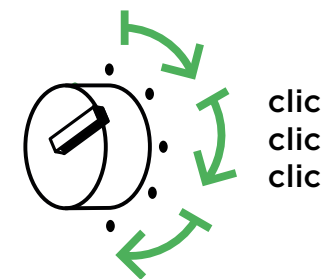
Dials with notches allow people with visual impairments to identify notches for different settings by counting them, unlike dials that rotate infinitely without any notches.
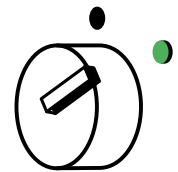
The setting can be indicated with a raised mark so that the button can be aligned with the selected programme by touch.
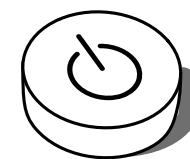
Raised buttons are easily recognisable by touch, unlike buttons that are flush with the panel or recessed buttons.

A push button shows whether it is on or off depending on whether it is in its initial position or pushed in. When pushed in, the button indicates that the machine is switched on.

BEST PRACTICES FOR ACCESSING DIGITAL CONTENT

BEST PRACTICES FOR MATERIALS AND FINISHES TO FACILITATE HANDLING

Digital content on screens fulfils the rules for visual **accessibility** with regard to the contrast, colour and size of visible and readable information.

The access path for adjusting **accessibility** settings (enabling the screen reader, increasing text size, changing colour contrast) is itself easily accessible, without having been pre-set.
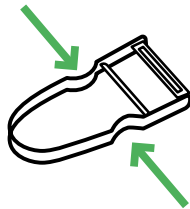
Grip areas designed to be easy to hold help users to keep a firm grip when handling the object.

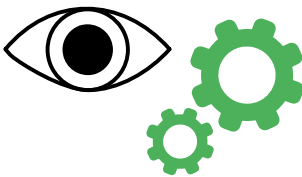Pay attention to the amount of adhesion offered by surfaces, according to the type of material, finish and angle of use. For example, a bumpy surface will offer better adhesion than a smooth surface.

It is preferable to allow written information on the screen to be communicated by a voice alternative.

Tilting screens allow each user to adjust them to suit their own requirements and account for light conditions. It is important to check the visibility of screens from various angles (side, low, high etc.).
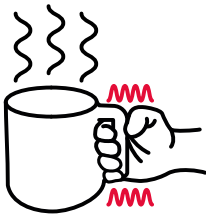
High-risk areas (burns, falls, cuts etc.) in particular must be made safe by using the appropriate materials (low heat conductivity, protection, good grip etc.).

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Good Design Playbook:
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Good Design Playbook: what about the future?

A WORK GROUP COMING UP WITH NEW SOLUTIONS TOGETHER.

04

A guide to enrich together.

As well as the teams from APF France Handicap, Groupe SEB and the CNSA who produced it, the Good Design Playbook has also been reviewed by its various target audiences: researchers, occupational therapists, designers, project managers, disability advisers etc.

The Good Design Playbook is designed to be updated as society evolves and as more relevant knowledge and methods are developed. Everyone is welcome to enrich it with their own experiments and expertise and to adapt it to their own projects.

The best design practices sheets should be supplemented according to profession (occupational therapist, architect etc.) or sector of activity (digital, tourism etc.).

Hervé Delacroix

Director of APF France Handicap,
Coordinator of APF Lab - Le Hub,
President of H-Lab

Kim Helmbold

Vice-President Design Groupe SEB

Different perspectives

How does the Good Design Playbook project reflect the ambitions of APF France Handicap and Groupe SEB?

Hervé Delacroix

This project is part of a comprehensive approach led by APF France Handicap to help people living with disabilities. We want to transform the position in society of those living with disabilities, so that they are no longer seen as people who make demands on society, with needs that must be satisfied and compensated for, but as people who contribute towards developing a number of services to create a more humane society in which everyone can live more easily.

Kim Helmbold

The starting point for the thinking of all designers at Groupe SEB is always the person and the user experience. We monitor the uses of our products and services, with an eye for user requirements, expectations and behaviour.
A few months ago, we developed several inclusive products with the "Boost societal innovation" team, which is part of our Sustainable Development department.
The Good Design Playbook is the natural progression of this approach.

Rethinking design standards to make products and interfaces accessible to everyone: is this utopian?

Hervé Delacroix

No, of course not. Many different examples prove that this makes sense and that it has a commercial value that benefits everyone. I'm thinking in particular of cruise control in cars or remote controls: rethinking how cars are driven or how televisions are operated for people who have specific needs makes them easier for everyone to use.

The approach we have committed to with SEB is extremely promising. When facing problems that fall outside the scope of disability, such as the ageing population, coming up with products that are easy to use will be a key factor for the development of these products, as well as for the development of the companies that produce them.

Kim Helmbold

It is definitely necessary for design standards to be overhauled. We are working hard to ensure that this is not a utopian vision but a genuine reality in the solution development process.

Our objective is to establish approaches, methods and tools that will allow us to define solutions that are seductive as well as offering the best possible user experience on a daily basis.

Hervé Delacroix

I'd like to pick up on this idea of seduction, which is very important. The products brought to market must be enticing. Neither stigmatising nor off-putting, they must have the wow factor!

Non-disabled people can cope with a need that is not satisfied. This is impossible, however, for people living with disabilities. As a result, we need to come up with new solutions, do things differently, even transcend the creation of objects. We can do this by designing useful objects that are easy for everyone to use and look good, not just objects to be sold...

Kim Helmbold

Yes, when people talk about design, they often mean the aesthetic aspect. This is a very important component, since first impressions are what count when it comes to an object's appeal. The designer's job is to find stand-out features, the seductive elements that will make the

difference. But let's not forget the rest of the process: going beyond its aesthetic appeal, the product must also fulfil its purpose on a daily basis. So the two need to be reconciled, which is not always easy... prioritising functionality can have an effect on the aesthetics and vice-versa. This is a real challenge for designers...

Isn't inclusive design just the latest bandwagon?

Kim Helmbold

When explaining inclusive design, we often look at its opposite: if you're not practising inclusion, you're practising exclusion. Looking for inclusive solutions is about enabling everyone to understand how to interact with an object, or be able to read or manipulate the buttons... it's a long way from being just a bandwagon!

Hervé Delacroix

Of course it's not a bandwagon, it's an urgent need! The challenge we are facing is about sustainable development. The consumerist imperative needs to be transformed into an understanding of the usability and utility of products by and for everyone. This is the only way of guaranteeing their sustainability.

Why was the kitchen chosen as the basis for the study?

Kim Helmbold

Groupe SEB provides solutions for personal care, home cleaning and comfort, with a historical background in cooking and food preparation.

We realised that this was the most engaging subject for the people we met during the project preparation phase. Eating is part of everyone's daily routine and playing an active role in preparing a meal is a source of pleasure. So it was natural for us to narrow the field down to this area.

Hervé Delacroix

The kitchen is a place that can naturally be used by everyone and for the benefit of everyone. For people with disabilities, it's one of the places where the idea of autonomy is most relevant. Being able to prepare a meal is essential, especially as in principle it doesn't require any specific skills. The context for our study encompassed multiple disabilities, since different disabilities can bring with them a variety of difficulties. Preparing a meal requires essential abilities in terms of memory, movement within a space, vision, hearing and understanding. It is therefore important for all these aspects

to be taken into account in product development.

What feedback can you give on the methods used?

Kim Helmbold

The idea of things being easy to use is not new to SEB: the CLIPSO pressure cooker was designed on this principle a few years ago. Co-design exercises draw on collective intelligence: each individual can contribute ideas from their own experience, which will probably be very different from that of the next person. I'm convinced that these co-design sessions must become the new way of developing products or services, since all these aspects of usage and requirements are not always identifiable by designers, despite all their knowledge. The methodology we used for the Good Design Playbook project was genuinely designed to be duplicated in other areas and to inspire other organisations and teams working on other subjects.

Hervé Delacroix

Our contribution at APF France Handicap was to get people involved in this co-design process. Every time we carry out this type of exercise, we have great difficulty bringing it to a close because there is such

an enormous appetite for it. People with disabilities find themselves in an entirely new situation for them: getting actively involved in something. They can say to themselves, I've participated in a project. I wasn't just someone who needs to be cared for; I was someone who was capable of doing something with and for others. So it's important that this continues and that their contribution is followed up, because otherwise it would be really frustrating.

On that subject, what are the next steps planned for this approach?

Kim Helmbold

The project initially focused specifically on the design department. Over time, through this co-design process involving people with disabilities as well as many other Groupe SEB activities such as marketing, development etc., we were delighted to be the catalysts for a new awareness of the challenges of inclusivity, even changing the mindset within the Group.

The partnership with APF France Handicap has definitely given legitimacy to inclusive design at Groupe SEB and we are very confident that this approach will spread within our organisation

and prove to be a great influence. These days, inclusive design is no longer an issue for the design department alone, but for the entire organisation.

There is a very strong desire within the company to make our solutions more accessible: future ranges of products and services will incorporate this principle of inclusivity. Groupe SEB has a genuine ambition to change things for the products we bring to the market in future. We hope this example will be copied by others in our sector so that it will carry a greater influence in the market as a whole. It would be a great source of satisfaction and pride for us to have been able to contribute towards the implementation of this change.

Hervé Delacroix

When we first committed to this approach, it was a bit of a gamble, maybe even a little utopian at the time. Today, we have reached the proof of concept.

This opens up major new prospects for civil society and for people with disabilities, who have been reinvented as people with value. They have economic value, which is essential for Groupe SEB of course as Kim has just pointed out, but also social value, since

they are involved in the evolution of society.

APF France Handicap is already considering getting involved in other areas, such as clothes – designing clothes that are easier for everyone to put on and do not carry a stigma, which is essential for self-esteem. And restoring certain ethical standards in clothing, in terms of the pollution generated by the manufacture of clothing.

We have also been asked to get involved in more technological areas such as driverless vehicles, a subject in which people with disabilities could make an extremely important contribution. If you ask someone to design the vehicle of the future, they are very likely to imagine a car that resembles the cars of today, with four wheels and a steering wheel, whereas if you ask the same question of someone who is not able to drive, they will focus more on the function of movement, the ability to go from A to B in the most comfortable and convenient way possible, and that's when you start to reinvent a vehicle…

How can the Good Design Playbook contribute towards the development of inclusive design that you are calling for?

Kim Helmbold

The Good Design Playbook is not a book of set rules – it's our way of sharing our experience of our approach, the methodology we used and the solutions and tips resulting from this process. Of course, it is neither exhaustive nor a finished product, since it will evolve as new requirements and new technologies emerge in order to remain relevant.

We have tried to capture this experience and this mindset so that it can serve as a basis and a springboard for other designers and teams, so that they can come up with their own ideas and inclusive solutions to suit their own contexts. To this end, the Good Design Playbook will be made available on an open-source basis to as many people as possible. If it means we are able to set the ball rolling for this process of inclusivity, we will have fulfilled our objective!

Hervé Delacroix

I would just like to add that the Good Design Playbook is largely common sense. After all, it explains how to develop a product by listening to people and working alongside people. Instead of simply trying to convince people that this is the product they need, it convinces them that this product they have co-designed fulfils their requirements, which is very different!

Obviously, the Good Design Playbook is about methodology, but for me the added value is the fact that it shows this approach is useful and possible. If you have to make a decision on the size of a button or on the way you are going to do things, write them down or present them, there are two ways of doing it. There is the old-fashioned way and then there is the other way, which is based on the principles presented in this guide to ensure that the use of the product is natural and applicable to everyone.

Extra content for the glossary, sources and bibliography.

MAKING PANCAKES AT HOME

Glossary

Accessibility

Easy access to the use of an object, service, environment etc.

Accessibility wheel

The accessibility wheel is a tool resulting from this study, which displays **accessibility** criteria according to type of disability (physical, sensory and cognitive).

Affordance

The definition of this big idea is provided on p.120. Affordance is about "all the action possibilities of an object" and, more specifically, the intuitive understanding of forms and their functions.

Attention

Attention relates to concentration, impulsiveness or hyperactivity.

Audition

The perception of sounds through hearing.

Brainstorming

Brainstorming is a group discussion technique to produce ideas, under the guidance of a group leader. Generally, participants express ideas or suggestions on a subject, which the group leader displays on post-it notes to clarify discussions and make progress as a group.

Chemoreception

Chemoreception is about olfaction and taste, or the process of detecting chemical stimuli that allows us to taste and smell.

Co-design workshops

These creative workshops take place during the ideation phase to come up with solutions through **collective intelligence**, by bringing together various profiles and experiences (people with disabilities, carers, occupational therapists, designers, anthropologists etc.).

These workshops are described in detail on p.49.

Cognition

Detailed definition of the cognitive process on p.120.

Collective intelligence

Collective intelligence describes the capacity of a community of people to bring together their intelligence and knowledge to make progress towards achieving a shared goal. Collective intelligence is not the same as simply working as a group. It is important that genuine quality is created in the interactions between members of the group so that a real synergy is generated. The **co-design workshops** in this guide are based on the principle of collective intelligence. This concept is set out on p. 49.

Communication

Transmission of information, making a connection with another person.

Delegation

Action of passing on a task to someone or something else.

Design

In this context, the industrial design of objects, services or environments.

Design fiction

This method is set out on p. 54. This design practice allows a subject to be addressed by changing the context. The subject is projected into an alternative context, such as the future, in a possible, probable or totally fictional way.

Desirability

Used here to describe all the psychological and mental characteristics that make a user attracted to an object.

Recommendation diagram

All the recommendations for each element are labelled on the drawing of the object. This device is used and explained on p. 44.

Dexterity

Dexterity is the skill of using part or all of the body to carry out movements. It can be about the precision or coordination of movement.

Dyspraxia

Dyspraxia involves difficulty in carrying out certain movements and voluntary actions, in the absence of brain injury. It is due to a malfunction in the brain signals that control movement. It can affect spatial awareness, manual dexterity and/or the coordination of movement. Dyspraxia is a learning disorder, along with dyslexia, dysphasia etc.

Enunciation

Expression through language, clear and precise formulation of a concept. Enunciation can be oral or written.

Decision entropy

Decision entropy is the quantity and complexity of possible alternatives when making a decision.

Ethnology

Ethnology is a branch of the human sciences. It is the study of the characteristics of different ethnic groups (groups of human beings sharing a language, culture, certain characteristics of civilisation etc.) in order to establish the general principles behind the structure and evolution of societies.

Evaluation

Estimation of the value of something.

Facilitator

One of the people who helps to ensure a **co-design workshop** runs smoothly. He or she supports and guides the participants through the various activities. This role is used and explained on p. 60.

Fine motor skills

Fine motor skills describe the precise movements requiring small muscles in the body, particularly those in the hands and fingers. Examples include performing coordinated, precise gestures, dexterity etc.

Fitts's law

Fitts's law sets out a ratio between the time it takes to reach a target, its distance and its size. The smaller the target, the closer it needs to be so that it can be reached quickly enough.

Easy-to-read

FALC stands for " Facile à Lire et à Comprendre » (Easy to Read and to Understand). Easy-to-read guidelines are rules to ensure cognitive and, to a lesser extent, visual accessibility when information is enunciated in writing or orally so that it can be understood, assimilated and memorised by everyone. This concept is explained on p. 128 and its source [20] is available in the appendix.

Flexibility

Flexibility describes how the body achieves and maintains various postures over time. It may be about balance or different physical positions (twisting, bending, crouching etc.).

Focus group

A focus group involves gathering together around six people to discuss a subject as a group, so that their opinions, attitudes and habits can be understood in depth. This method is set out on p. 90.

Good Design Playbook

Literally translated from the English, a Good Design Playbook. This Good Design Playbook can be defined as a guide to best design practices.

Gross motor skills

Gross or physical motor skills are mainly about balance, general coordination of arms and legs, laterality and body tone.

Hearing

Sense enabling the perception of sounds.

Hick's law

Hick's law sets out a ratio between the time it takes to make a decision and the number of potential options. The higher the number of potential options, the longer the decision will take to make.

Ideation

This word is used to describe the creative phase of the design process, which involves the formation of ideas and new solutions. This phase is set out on p. 49.

Inclusive

Something that includes. This is the opposite of "exclusive", a word used to describe something that is reserved for certain people in particular. The word "inclusive" is used here to describe the inclusion of the diversity of people in society (whatever their disability, age, culture, gender, lifestyle etc.) in the design and use of objects, services and environments.

Interaction

Reciprocal action in which one thing has an influence on another. It could be the action of a user and its physical effect on an object or the colour of an object and its effect on the user's emotions, for example.

Iteration

Repetition of a process or argument. This word is used to describe the prototyping and evaluation phases of the design process, which are repeated in a loop to improve prototypes until they are approved, for example.

Manipulation

Manipulation involves the fine motor skills relating to the hands and fingers.

Memorisation

The process of committing something to memory or remembering something.

Mind map

A mind map is a diagram used to organise and represent ideas (often in bubbles) by connecting them in a logical way around a central subject. This tool is described in detail on p. 45.

Mobility

Mobility is about movement. The word is used to describe movement across accessible distances and environments.

Modelling

Here, this word describes the design of a three-dimensional object using software.

Olfaction

Sense of smell.

Onboarding

The onboarding of a mobile application is the process by which users are supported and guided through the installation of the app on their phone for the first time by taking them through a sequence of specific screens.

Packaging

Désigne l'emballage d'un objet.

Panel

The people representing a sample of the population who are the subject of a study (whether it is qualitative, quantitative, ethnological etc.).

Proactive and retroactive interference

When two pieces of information come one after the other, in a sentence for example, one piece of information will have an effect on the other. Interference is proactive when the first piece of information influences the second. Interference is retroactive when the second piece of information influences the first.

Prototype

First actual model of an object or service, which is produced so that it can be further developed before it goes into production. This unfinished model closely resembles the potential final form of the object, service or environment. Prototypes are intended to be assessed by users so that they can be approved, rejected or improved. The prototyping phase is set out on p. 65.

Qualitative research

Qualitative research uses various methods (interviews, focus groups, direct or indirect observations, usage tests etc.) to collect non-numerical data with descriptive value. The analysis is based on both verbal declarations (words used, tone of voice etc.) and non-verbal observations (gestures, behaviour, attitudes). This concept is used and explained on p. 32 and p. 40.

Quantitative research

Quantitative research collects numerical data (through surveys, for example), generally in digital format. It targets a sample group of people using certain rules to ensure that it represents the society or group being studied. It is derived from tangible data such as statistics. This concept is used and explained on p. 36.

Radar chart

A radar chart is a graph in the shape of a star made up of several axes radiating out from the same central point. Each axis represents a quantified characteristic. The radar chart is also known as a Kiviat diagram, star chart or spider web chart. This device is used and explained on p. 45.

Recognition

Recognition concerns the easy and rapid comprehension and interpretation of information. It could, for example, describe the rapid comprehension of a pictogram.

Reach

Reach concerns the dimensions, areas and heights than can easily be reached. It is advisable to aim for a reach zone up to a maximum of shoulder level to include low positions (seated or small people) and to require minimum effort during use.

Reiterate

To repeat an **iteration**.

Resolution

Finding a solution to a difficulty or problem through a process of analysis and reflection. Resolution covers several cognitive processes such as the projection of movements, the mental coordination of different gestures, solving problems, reasoning, decision-making, etc.

RGAA

Référentiel Général d'Accessibilité pour les Administrations (General accessibility guidelines for administrative bodies). This French reference system is based on the **WCAG** guidelines.

Semantic data

Data drawing on the study of the sense and meaning of linguistic units and their combinations. This may involve words, turns of phrase, punctuation etc.

Sensitivity

Here, sensitivity refers to fine and precise tactile perception. It could refer to the perception of temperatures, pain or the discrimination of textures by touch.

Situation card

These cards are used in this study during **co-design workshops**, as on p.55. "Situation cards" present situations used for role play.

Standard

Complying with manufacturing standards for mass production.

Sticking point

A sticking point describes an impossible, difficult, painstaking or tedious interaction for the user when using an object, service or

environment. This term can also be referred to as a "stumbling block".

Stroop effect

The Stroop effect is the cognitive interference produced by irrelevant information during the execution of a cognitive task. For example, it could be a confirmation button represented by a red cross, which is generally associated with the opposite action of cancellation.

Universal

Something that applies to everyone, every person in existence. The word is used with caution, with the awareness of not being able to fulfil everyone's needs at the same time. The word "universal" is usually used to refer to the majority.

Usability

Usability refers to the suitability of an object, service or environment for easy use by someone for the purpose for which it was designed. The usability of an object is defined by the ISO 9241-11 standard. According to Jakob Nielsen, an expert in web usability, digital usability relies on five criteria: efficiency (of the user to achieve the objective), the satisfaction of the user with the interface, learnability (how easy the site is to learn), memorability (how easy it is to appropriate) and reliability (low error rate).

Usage

In this context, this word describes a global action resulting from the use of and interactions with an object, service or environment. It could refer to the action of making a phone call

or cooking, or a morning personal care routine. The word "usage" also goes further than the actual use of something to take on a more anthropological meaning, with the analysis of usages (and customs).

Usage scenario

A usage scenario is a descriptive device that represents the concept in its usage situation through its narration. It's a story that describes how the imagined object or concept will be used. This tool is described in detail on p. 69.

User pathway

A user pathway identifies the steps the user takes throughout their experience with the designed object, service or environment. This concept is set out on p. 53.

Verbatims

Verbatims are the words used by a person when interviewed, transcribed exactly as they were spoken.

Visibility

That which can be seen.

WCAG

Web Content Accessibility Guidelines. These international recommendations cover the rules for the accessibility of web content.

Workaround strategy

A workaround strategy involves coming up with clever ideas to avoid having to deal with any stumbling blocks (impossible, frustrating or unpleasant situations).

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[5] Figure provided by the CAF (French family allowance fund), http://www.caf.fr/allocataires/vies-de-famille/vivre-avec-un-handicap/vos-droits/80-des-handicaps-sont-invisibles-le-saviez-vous/ and Handirect, https://www.handirect.fr/accessibilite-handicap-loi-2015/ . The concept of invisible disability is not yet universally shared.

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[8] Diagram from the questionnaire from this study given to 100 people with disabilities. The questionnaire was also given to 100 people without disabilities to compare the results and reveal any universal features. In the second questionnaire for people with no disabilities, the two most tedious tasks were preparation followed by cleaning up. These results are not quantitatively representative of society.

[9] Photograph ©Jean Baptiste Laissard.

[10] and **[13]** The wheel of accessibility is based on data collected during this study as well as on other works:

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[12] ©Jean Baptiste Laissard

[13] Source provided in [10]

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