INNOVATING WITH PEOPLE
INCLUSIVE DESIGN AND ARCHITECTURE

INNOVATING WITH PEOPLE INCLUSIVE DESIGN AND ARCHITECTURE

Innovating with people – Inclusive Design and Architecture is an introduction to Inclusive Design as a strategy for innovation in any design or architecture process. It is a practical guide to understanding and practicing Inclusive Design. It is presented in an easy-to-read format and provides simple techniques you can use immediately. The book is aimed at business leaders, managers, marketers, designers and architects who are involved in design, development or specification.

Design and Architecture Norway

O A
D G

INDEX

Tools 76

Case studies 102

PREFACE

Are you searching for new competitive advantages? Is your company operating in a market undergoing change? Does your organisation need to offer more effective, user-friendly services? Are you looking for sustainable strategies for innovation? How can the built environment and cities become more inclusive and people-friendly?

In Norway in 2009, legislation on the criteria of Inclusive Design (termed Universal Design by the government) was introduced, covering all products, services, and environments. Since then, more laws and regulations have been launched covering areas such as digital solutions and education.

This book shows how you can turn this challenge into opportunities for profitable innovation, delivering effective and people-friendly solutions with little investment. The Innovation for All programme, one of the many activities in the Norwegian Government Action Plan for Universal Design, focuses precisely on this issue. Involving a diverse range of people in your development process can result in new knowledge about customers and clients, yielding insights that can create a deeper level of innovation.

This publication gives an introduction to Inclusive Design, showing how it can be used as a strategy for innovation, that can benefit business, society, communities and individuals. The idea is to inspire, motivate and show how commercial enterprises and public institutions can integrate a people-centred approach in to their own creative processes. It is a practical guide and manual that contains the basic information you need to understand, debate and practise Inclusive Design.

The book is aimed at business leaders, marketing professionals, designers and architects who are involved in design, development or specification. It explains the Inclusive Design process, making the case for its adoption both commercially and creatively, and provides a practical guide to techniques for applying it.

In this revised edition we look at how architects and urban designers can benefit from Inclusive Design and Design Thinking. The goal is to present insights and knowledge that are relevant for the industry for architects, urban planners, academics and students in architecture and the construction sector. We outline a generic architectural process, suggesting nine activities that add people-centric activities throughout all stages to ensure that solutions are more inclusive.

Meeting people's needs and market demands through a people-centred approach can drive innovation, and contribute to increased competitiveness and profitability in this sector. In an ageing and increasingly diverse society, this is more relevant than ever, and represents vast opportunities. Inclusive Design investment is low, but outputs can be high – just the opposite of common opinion, and one of many myths to dispel about Inclusive Design. In an urban context, the economic and social benefits from developing inclusive, sustainable communities are only just beginning to emerge as experience is gained and evidence gathered. Cities should not only be smart, they have to be inclusive and people-friendly too.

Onny Eikhaug
Programme Leader
Innovation for All

HOW TO USE THIS BOOK

There are six main sections to the book each marked by a different colour.

WHAT	*Describes what Inclusive Design is and gives a brief history*
WHY	*Tells you why you should use Inclusive Design and outlines benefits*
HOW	*Demonstrates how to use Inclusive Design in your existing processes*
HOW	*Demonstrates how to use Inclusive Architecture in your existing processes*
TOOLS	*Step-by-step guidance for conducting research with people*
CASE STUDIES	*Examples of how companies have used Inclusive Design*

The content described here has been compiled by individuals with extensive practical experience in working with Inclusive Design across a variety of different sectors and fields of business. The book shares research and presents it in an accessible format.

Case studies and examples explain how others have used and benefited from Inclusive Design. A practice-based guide details research techniques for engaging with people and bringing their points of view into the design process. The pages contain images, insights, quotes, tips and mini-case studies for you to use.

The book contains various types of information for you to use in different ways. It presents practical and accessible advice. Key elements in each section include:

- **Text** to give detailed insight into topics
- **Images** to bring content to life
- **Illustrations** to represent ideas visually
- **Quotes** for you to share with other people
- **Bullet points** to present advice clearly
- **Fact boxes** to summarise key information
- **Case studies** showing business examples

WHAT

This section gives an introduction to Inclusive Design. It presents the practice, describes the potential and provides a brief history. A definition of Inclusive Design and related terms are outlined, and prejudices and preconceptions are addressed. A timeline of some important events shows how the concept has evolved globally.

WHAT IS INCLUSIVE DESIGN?

Inclusive Design is an approach to design and a business strategy. It aims to design mainstream products, services and environments that are accessible and attractive to the largest possible number of people.

Inclusive Design involves people within the design or development process, using a variety of research techniques to understand their needs and reveal their aspirations. Addressing individuals with differences in ability, age, gender and culture it can lead to more varied and inspirational consumer insight. Importantly, it can also be applied when developing any type of design.

Design can be simply described as the process of examining a problem and creating a solution. Inclusive Design brings the perspective of real people to that problem, inspiring a multitude of viewpoints and unexpected ideas. The resulting solutions can therefore be more varied, innovative and user-friendly, bringing new thinking to familiar challenges within your business.

Inclusive Design has become an important design movement in the 21st century, building on both the increasing interest in this approach and recent social advancements. Involving end end-users the design and development process is proving to be a more successful way of engaging with consumers, and one that is also driven by legislation.

WHERE DID IT COME FROM?
Historically, Inclusive Design focused on older or disabled people who were generally excluded by mainstream design. However, its people-centred techniques can be used to address the needs of other marginalised groups within society. More importantly, these methods are now being seen as a business strategy, enabling a direct approach to consumer-led innovation.

Those communities that are traditionally overlooked by designers and businesses can provide the strongest inspiration for ideas that are also applicable to mainstream markets. For example, packaging that has been developed for people with arthritis can be easier to manage for us all. An automatic door benefits everyone, not just older and disabled people.

"Design for the young and you exclude the old; design for the old and you include the young"

Bernard Isaacs, Founding Director, Birmingham Centre for Applied Gerontology

INCLUSIVE DESIGN IS NOT JUST ABOUT GOOD INTENTIONS – IT IS ALSO ABOUT GOOD BUSINESS

Above, left and opposite page: We can all experience barriers such as stairs or heavy doors. Inclusive Design solutions can benefit everyone. Automatic doors and spacious private bathrooms with wall-hung toilets make daily living easier.

INCLUSIVE DESIGN HIGH-RETURN WAY NEW IDEAS

WHY IT IS RELEVANT TO YOU

It is becoming increasingly difficult to understand the complexity of today's consumers. Inclusive Design can help a company define and implement more meaningful ways to engage with people that will enable a deeper understanding of a particular market sector and what it might demand from your product or service.

Design is also being recognised as a strategic tool for innovation, rather than just a way of addressing aesthetics. Inclusive Design can enable design to have a more effective role in any development process. Instead of just talking to people to validate ideas at the end of a project, users can play a lead role in defining issues and helping to set direction. User involvement can be beneficial at all stages of a project.

Conducting research with people is essential, and can help to influence design criteria alongside factors such as cost, materials, safety, technology and sustainability. Consumer relevance is of equal importance as any of these. Inclusive Design techniques can be added to existing working practice within a company at little cost, but will give a high return on investment through the benefits it brings.

The concept of an "average person" holds less and less credibility. With the rapid exchange of information and ideas, our social and cultural definitions are constantly changing and people cannot easily be categorised into neat groups. Whilst traditional market segmentation allows companies to target and focus by generalising consumer types, Inclusive Design can offer ways of qualitatively describing individual customers, bringing marketing data to life. This approach goes beyond describing physical needs in helping you understand the desires and aspirations of people in your potential market.

WHY YOU SHOULD BE INTERESTED

As an approach, Inclusive Design holds many benefits for businesses and designers. For designers, it is a source of inspiration and an opportunity for innovation. It can reveal problems or issues that have not previously been addressed. For businesses the resulting products, services and environments can widen the consumer base, increase appeal and improve competitiveness. By adopting an Inclusive Design process, companies will also be better placed to comply with current and future legislation.
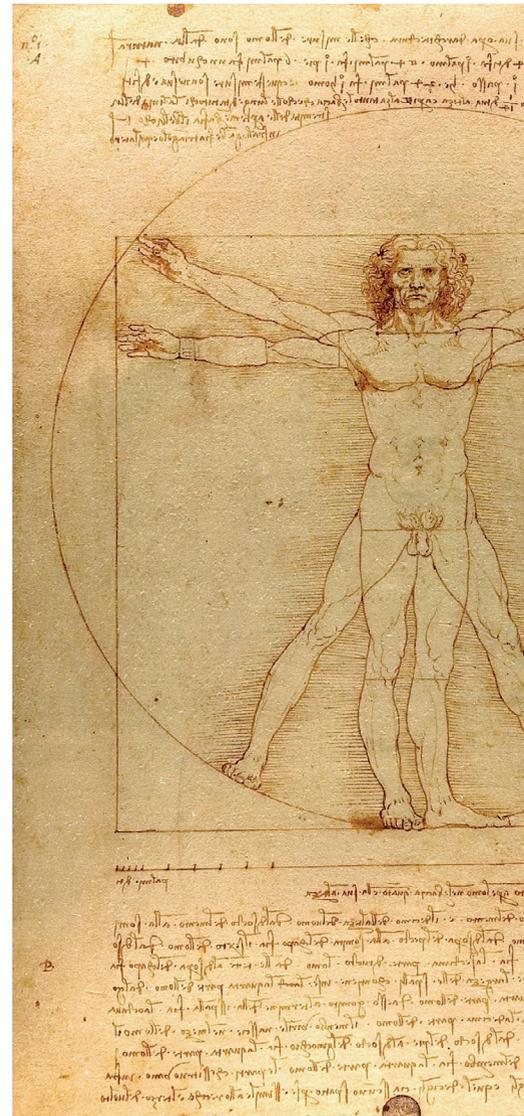
Above: The Vitruvian Man by Leonardo Da Vinci captures idealised, average proportions. Inclusive Design recognises our differences

INCLUSIVE DESIGN
Defined in 2000 by the UK Government as "products, services and environments that include the needs of the widest number of consumers". Its a history stretching back to the social ideals in Europe that materialised after World War II. Inclusive Design goes beyond the needs of older and disabled people to focus on those of other excluded groups. It can be adopted in conjuction with Design Thinking.

INCLUSIVE ARCHITECTURE
A less common term that is defined within this book as "architectural processes that include the needs and aspirations of the widest number of people".

UNIVERSAL DESIGN
This term originated in the United States, and has now been adopted by Japan and the Pacific Rim region. Its original focus was on disability and the built environment. Driven by the significant number of disabled Vietnam War veterans, it was modelled on the Civil Rights Movement.

DESIGN FOR ALL
As highlighted by the European Commission, Design for All is about ensuring that environments, products, services and interfaces work for people of all ages and abilities in different situations and under various circumstances. This term is used in continental Europe and Scandinavia.

There are other terms that are sometimes used in relation to Inclusive Design processes and methods. These include Design Thinking, Co-design, People-centred Design, User-focused Design and Trans-generational Design. The Glossary for further information.

1960 (Italy)
First Paralympics
established in Rome

1963 (UK)
Architect Selwyn
Goldsmith creates
building guidelines
for wheelchair users

1991 (Norway)
Norwegian State
Council on Disability
created

1948 (UK)
Ludwig Guttmann
organises
wheelchair athletics
for war veterans

1968 (Denmark)
Susanne Koefoed
Creates the International
Symbol of Access

European milestones

1948   **Global milestones**   1976

1954 (USA)
Supreme Court
establishes that
"Separate is not equal"

1964 (USA)
The Civil Rights Act
signed a blueprint
for future laws

1979 (UN)
UN Convention on
the Elimination of All
Forms of Discrimination
against Women

A BRIEF HISTORY

A selection of key events in the
development of Inclusive Design from
a European and global perspective.

1976 (UN)
United Nations
international year
for disabled persons

2000 (UK)
The UK government describes Inclusive Design

2005 (Norway)
First Inclusive Design Programme established by Norwegian Design Council

2010 (EU)
The European Commission's EU Disability Strategy for 2010-2020 is adopted

2018 (Norway)
Act relating to equality and the prohibition of discrimination (Equality and Anti-Discrimination Act)

1999 (UK)
The Helen Hamlyn Centre is founded, focusing on Inclusive Design

2004 (Norway)
The first Government Action Plan for Universal Design is launched

2010 (Norway)
The Planning and Building Act, including technical regulations relating to design for universal accessibility and architectural design (TEK10)

1994 (UK)
The Helen Hamlyn Centre for Design describes Inclusive Design

2009 (Norway)
The Anti-discrimination and Accessibility Act comes into effect

---

1991   **2000**   **2010**   **2018**

1986 (USA)
Apple Computer builds easy access into their operating system

2015 (UN)
17 Sustainable Development Goals

1989 (USA)
The Fair Housing Amendments Act (FHAA)

1985 (USA)
Universal Design defined by architect Ron Mace

1989 (UK)
The World Wide Web (WWW) established

1991 (USA)
IDEO International Design firm founded

1997 (USA)
Seven principles of Universal Design created

1990 (USA)
Americans with Disabilities Act passed

1992 (Japan)
First International Conference for Universal Design

PREJUDICES & PRECONCEPTIONS

INCLUSIVE DESIGN AND ARCHITECTURE...

1. When built into the design process, Inclusive Design can actually improve profit, add value and increase market appeal. Conducting research with people does not cost much, but what can be expensive are recalls, retrofitting and unpopular design that does not sell.

2. Inclusive Design actually leads to innovation. Companies such as Toyota, BT (UK Tele-communications company) and Panasonic have all been recognised with Inclusive Design awards for exciting, mainstream designs.

3. Inclusive Design can be applied to any branch of design or market sector, including services, environments, interfaces, packaging and graphics. Websites, electronic menus, software, signage, and wayfinding are also examples of non-physical applications of Inclusive Design.

4. People can face exclusion in many other ways, including social, economic, cognitive, physical and by age or gender. Inclusive Design goes beyond accessibility and disability to address this wider range of issues. It can be applied to improve most mainstream products and services.

5. Inclusive Design and Architecture is not about "special needs" design or specialised equipment. It is design for the widest possible range of users. A stair-lift only helps those in wheelchairs, whereas an elevator is accessible to everyone and does not discriminate according to ability.

1 ...EXPENSIVE

2 ...BORING

3 ...ONLY ABOUT PHYSICAL OBJECTS

4 ...ONLY ABOUT ACCESSIBILITY AND DISABILITY

5 ...ONLY ABOUT ASSISTIVE TECHNOLOGY
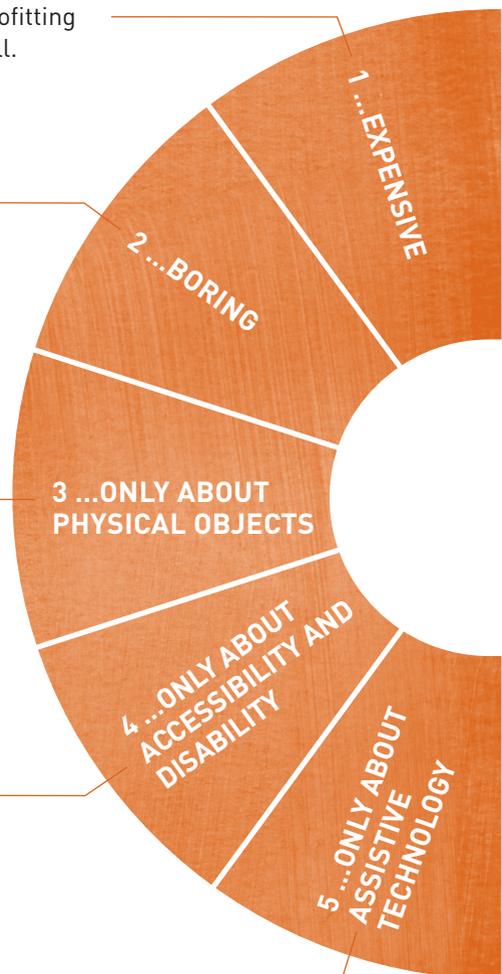
There are many prejudices and misconceptions about Inclusive Design and Architecture. These are due to a lack of understanding or oversimplification. These pages reveal and counter some of the most common prejudices.
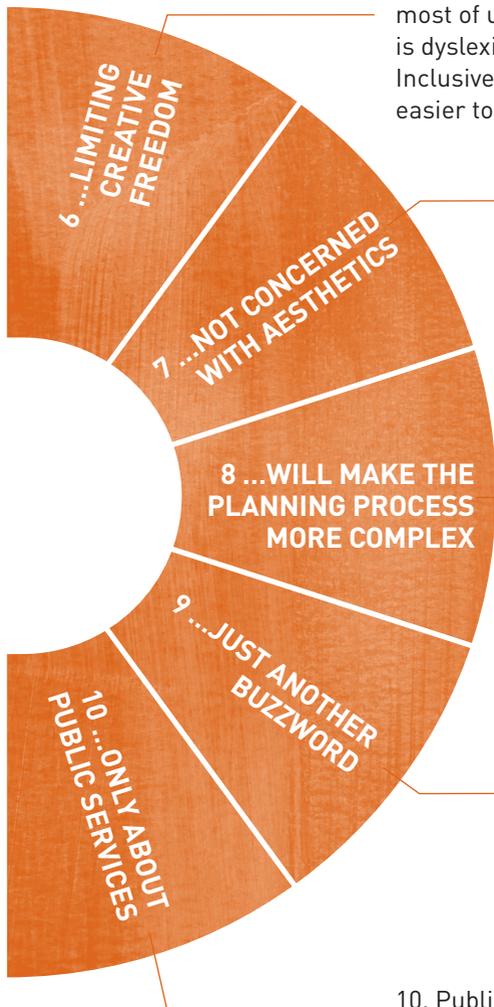
6. Inclusive Design is not just a tool for innovation, it is one for creativity. Insights gathered can fuel the imagination and drive a creative team to better solutions. Everyone can benefit from Inclusive Design, including you. For example, most of us can have some form of disability, whether this is dyslexia, short-sightedness, allergies or a broken leg. Inclusive Design can make packaging easier to open, signs easier to read, and services easier to use.

7. Aesthetics play a major role in the acceptance and comprehension of a design, and should always be considered. Many companies create designs using Inclusive Design principles that have given them an edge. Attractive design and Inclusive Design are not mutually exclusive.

8. The Inclusive Architecture methods described in this book can actually ease the process through greater communication, stakeholder engagement and transparency.

9. Inclusive Design has a history and a future. It is now being written into legislation, and companies that ignore this could be liable. Far from being a trend, Inclusive Design can be considered a design movement, one that will be increasingly important in the coming decades.

10. Public services are just one obvious application, but Inclusive Design equally applies to any commercial design that is used by a wide range of people. Examples include mobile phones, websites, packaging, retail environments and transport, to name a few.

6 ...LIMITING CREATIVE FREEDOM

7 ...NOT CONCERNED WITH AESTHETICS

8 ...WILL MAKE THE PLANNING PROCESS MORE COMPLEX

9 ...JUST ANOTHER BUZZWORD

10 ...ONLY ABOUT PUBLIC SERVICES

WHY

This section explains why you should engage with Inclusive Design, and how it is a socially sustainable approach that benefits both society and individuals. It makes the case for designers, architects and for business, showing how this can lead to innovation, value creation and increased market share for both the private and public sectors. It outlines changes taking place in the world and gives examples of major companies and organisations that have benefited from an inclusive approach.

CONTEXTS ARE CHANGING

Design has to respond to changes that are taking place in the world around us. The diagram below outlines some examples of these, looking at selected issues from a global to an individual perspective.

In 2017, 67% of Americans received the news from social media. This figure is growing.

In 1987 Norway's first female Prime Minister, Gro Harlem Brundtland, presented the UN Report on Sustainable Development. 28 years later the UN launched their 17 Sustainable Development Goals.

The internet generates more greenhouse gases than the airline industry, due to its consumption of electrical energy.

By 2040 it is estimated that developing countries will account for 65% of the world's energy use, up from 54% in 2010

People aged 50 and over account for 58% of travel and tourism in the UK.

Researchers expect that planes in Norway will be electric by 2040.

**ENERGY
ENVIRONMENT
EQUALITY**

**TRAVEL
POLITICAL POWER
SOCIETY**

The average income of the richest 10% in OECD-countries is nine times that of the poorest 10%, up from seven times 25 years ago. This disparity in development is addressed by the UN's SDG goal no 10.

The UN estimates over 70% of people will be living in towns and cities by 2050. Nearly 900 million people around the world live in slums.

Working millennials send about 110 texts every day.

Advanced robotics can potentially improve the lives of 50 million amputees and people with reduced mobility.

Most of the world's population live in countries where more people are killed by obesity than by being underweight.

Approximately 28 % of people aged 15-64 in the EU report longstanding health or basic activity issues.

One third of households in the EU were single-person in 2017.

47% of all households with children in the EU have only one child.

The number of people aged 60 or over is expected to double by 2050 and triple by 2100

Women make more than 80% of purchasing decisions, but 83% of workers in creative industries are men.

In 46 countries of the world, women now hold more than 30% of parliamentary seats.

The global e-commerce market in 2017 reached almost US$1.5 trillion.

HEALTHCARE
WORKING LIVES
DIGITALISATION

SPENDING POWER
HOUSEHOLD
COMMUNICATION

GENDER
AGEING
DIVERSITY

The 'Internet of Things' market is booming, with more than 5 billion connected things in use in the world in 2017

People spend roughly a third of their waking lives on the internet.

It is estimated that there will be 20 billion devices connected to the internet by 2020.

More than two-thirds of the world's population now have a mobile or smartphone (2018).

Companies in the top quartile for gender diversity are 15% more likely to perform better financially. Companies in the top quartile for racial and ethnic diversity are 35% more likely to perform better financially.

HOW CHANGING CONTEXTS AFFECT YOUR BUSINESS

The chart on the previous pages illustrates how social contexts are changing and highlights relevant factors and trends. The themes outlined here detail some of the important market challenges that Inclusive Design can help to address. The opportunities are significant.

THEME 1. **EMBRACING DIVERSITY**

Factors: emerging markets, ignored markets and diverse populations
Effect: wider appeal for products and services

Design and businesses will have to be sensitive to more diverse markets if they are to maintain or expand their appeal. Emerging markets are beginning to become powerful consumer bases in their own right.

The growth in immigrant populations in Europe implies that businesses need to be aware of cultural diversity when designing new products, services or environments.

Diversity should also include gender equality and differences in ability and age. Inclusive Design can help you to understand and embrace diversity and find ways to appeal to a wider market. Embracing Diversity can be seen as an innovation strategy.
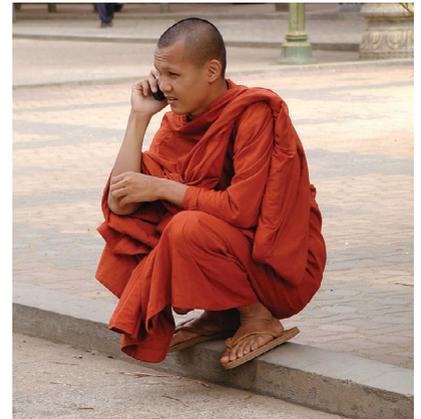
THEME 2. **CONSUMERS ARE NOT STEREOTYPES**

Factors: global stereotyping, multi-layered personas, complexity of individuals
Effect: market segmentation, individual appeal, challenging preconceptions

People no longer fall into traditionally defined market categories. New typologies are constantly being created and people can often display multiple and changeable characteristics depending on context. People can no longer be defined by factors such as gender, age, disability or cultural background – lifestyle, value, attitudes and personal ethics all play a role.

Market segmentation has to use qualitative as well as quantitative measures to address human complexity. Designing for people must take a more sophisticated approach and not just cater for mainstream stereotypes.

Inclusive Design can help to overcome preconceptions and assumptions about target groups and expand our understanding of the consumer psyche.

THEME 3. **LIFESTYLES ARE CHANGING**

Factors: technology, medicine, urbanisation, social structure, consumer lifestyle
Effect: new contexts of use, new markets offer new opportunities

Technology is a main driver in changing the way people live, work and communicate, and this has influenced the structure and behaviour of individuals in society. Improved medicine is leading to longer, healthier lives, with a greater burden on social models of healthcare. Rapid urbanisation is creating large cities that struggle under congestion with an increasing demand for services and supplies.

Family structures are changing with people spread over greater distances and up to four generations still alive in one family. Single living is on the rise as the numbers of newly-divorced or widowed people increase. Businesses will need to understand the changing lifestyles of their customers and the different contexts in which they are now operating.

THEME 4. **VALUE STRUCTURES ARE CHANGING**

Factors: changing values and aspirations
Effect: mapping trends, strengthening brand value

What people desire and value is changing. Key value drivers for design currently include simplicity, efficiency, user-friendliness, sustainability and ethically sound design.

Inclusive Design allows you to map these changes and keep up to date with people's aspirations and expectations.

Improved awareness will help you design desirable products and improve brand image perception. It can also allow companies to 'future-map' activities and respond to societal trends as they happen. People not only see value as a financial metric, but also place emphasis on less tangible areas that are more emotive and personal.

WE CAN ALL BE EXCLUDED

Design generally caters for the mainstream user.
They are typically young, able-bodied, right-handed,
male, technically literate, have money and belong to
the majority race and culture.

But who do you know who fits this description? Is it all the people you know, some of them, or only a few?

This ideal consumer is actually a minority, and is not representative of the wider population. Most people are typically excluded in one or more ways.

All of us fall outside of the mainstream at some point in our lives, and as a result can find the designed world around us difficult. There are many forms of exclusion. A few examples are listed below.

AGE
Older people are routinely ignored as consumers or as active members of the economy yet they are a majority market. We are all ageing and living longer. Other age groups can also be excluded when categorising consumers. A target group of 18-35-year-olds excludes most of society.

ABILITY
Disability is not limited to wheelchair users, and many conditions such as diabetes can be less obvious. We all have some disability, whether minor or major, permanent or temporary. This can be sensory, physical or cognitive. Even a minor condition such as an allergy can be disabling.

GENDER
Women are underserved as consumers, yet are key decision-makers for most household purchases. Many products and services do not include women's needs, representing missed opportunities across the globe. The recognition of differences in sexual orientation and gender identity has also evolved on a global scale.

RACE
Immigration and migration have increased the ethnic and cultural flow into most major cities. However, lack of integration and ghettoisation prevents some communities from being included in mainstream society. The result is evident in education, employment, politics and economics.

FINANCE
Many people across the world struggle at the minimum level of subsistence. In developed countries this translates into a lack of healthcare, housing or education. In developing countries, this can mean living on less than $1 a day. The same design often has to work in both settings.

GEOGRAPHY
Even within a country or city, different areas can have varying standards of healthcare, life expectancy, services and utilities. At a global level, populations in some countries can be further excluded. Geography can dictate access to energy, clean water, staple food and natural resources.

The bull's eye diagram represents the total potential market that you could appeal to, and includes a variety of people across it.

Source: Jeremy Myerson,
RCA Helen Hamlyn Centre for Design

Most companies only focus on a target customer, who is typically younger, average and mainstream. This means your market will only fill the first few rings on the bull's eye excluding everyone who is outside of this focus.

Looking at people who are usually excluded can only broaden your focus and increase the market potential for a design. These people are represented here by the figures in the outer rings of the bulls-eye or outside of it.

THE BUSINESS OF INCLUSIVE DESIGN

A GROWING IMPORTANCE
One of the challenges facing the global business community is to engage with design in a more strategic, people-centred way. It is no longer a question of using design to meet purely aesthetic, functional or emotional needs. Design can also play an essential role in promoting sustainability, enabling human rights and creating social inclusion. The business value of design is now well documented. Companies that can use design to work with real people, will better understand consumer need and respond to emerging trends and create more novel solutions. Inclusive Design, with its people-centred innovation stance, can increase profitability and help you leave the competition behind.

As well as describing an approach, Inclusive Design is most effective when put into practice. It allows companies to view existing customers in a more realistic manner, and to expand into previously untapped markets.

Since Inclusive Design promotes design for human diversity, social inclusion and equality, it has great resonance in the current political climate in which addressing human rights and exclusion is high on the agenda, and the need for empathic approaches is stronger than ever. Inclusive Design strategies can help companies to be more socially responsible by enabling greater diversity and providing equal opportunities for customers, clients and colleagues alike.

Above: Recognising diversity, addressing social inclusion and designing for human aspiration are all becoming increasingly important

This can form a key part of a company's Corporate Social Responsibility and elevate its public perception. Furthermore, according to McKinsey, companies with a more diverse workforce in terms of gender and ethnicity, actually perform better financially.

NEW LEGISLATION – NEW OPPORTUNITIES
Both nationally and internationally, governments and policymakers are writing Inclusive Design into new laws and standards. Legislation is being passed in order to counter discrimination and minimise exclusion. The United Nations, the European Council, the European Union, and the Nordic Council of Ministers have all progressed directives regarding the principles of Inclusive Design.

In 2006 the United Nations agreed on the Convention on the Rights of Persons with Disabilities. This was the first human rights treaty of the 21st century, aimed at increasing and upholding the rights of the estimated 1 billion million disabled people across the world.

In Norway, the Public Procurement Act stipulates that public procurers are required to choose product and service solutions that meet

"If a company is prepared to spend 3 per cent of its turnover on technology, it might achieve the same effect through design with only 0.3 per cent"

Krister Ahlström, Design Matters

Inclusive Design criteria. Suppliers who comply with these demands will be preferred.

The scope of this legislation has a far-reaching effect. All new public buildings, environments, and services in Norway have to fulfil the requirements of Inclusive Design. Public transport and public digital communication services must also be accessible to people with different needs and abilities.

"Social business is the new business"

However, whilst new legislation can be seen as a challenge, companies who adopt an Inclusive Design approach can turn this into a business opportunity and create competitive advantages. Aligning business practice with these changes in law and policy means that you will become the preferred option in the future.
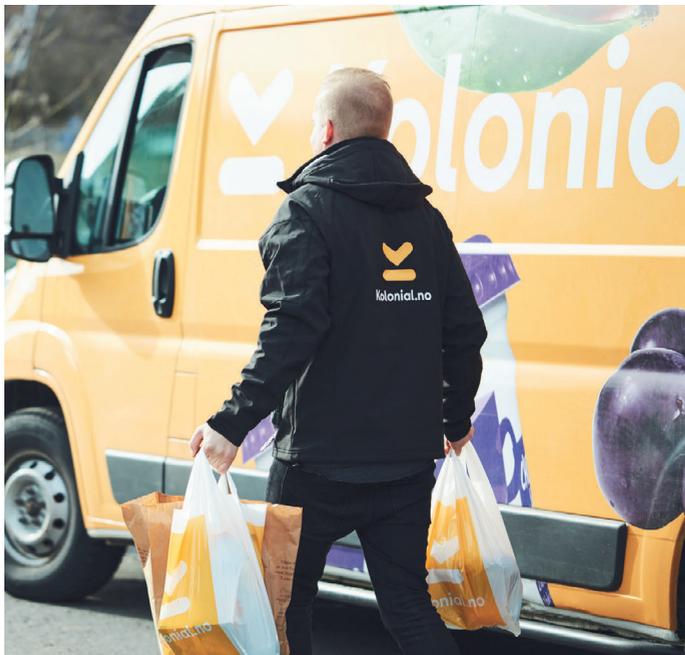
Above: Bergen Light Rail is the first Norwegian public transport system to utilise Inclusive Design and is seen as a successful urban planning project.

Left: Entrepreneurs such as Kolonial.no, with their online shopping service, can benefit from an Inclusive Design approach.

A people-centred design process is not only a strategy to solve problems, but a potent strategy for identifying problems to solve.

26

A CREATIVE STRATEGY

Designers and architects have a role in demonstrating the value of Inclusive Design to their clients, managers and colleagues. The close relationship between them and the innovation process means that they are ideally placed to incubate an Inclusive Design approach or champion it within an organisation. Those designers and architects who have built up expertise in Inclusive Design can differentiate themselves from their peers, and are now seen as more attractive in today's competitive markets. Inclusive Design is part of sustainability, and designers need to address all three aspects (social, environmental and economic) when designing solutions. A holistic perspective is needed across a framework of positive innovation; people, planet and profit. The UN's 17 Sustainable Development Goals provide strong guidance when designing for the future. They can add value to any project.

The dichotomy between meeting the needs of people and planet, as well as working within commercial constraints, can provide a space in which designers are pushed to create inventive solutions that satisfy all demands. The area of overlap between commercial, social and environmental interests represents the greatest potential for innovation in any project, as shown in the diagram. In the following, emphasis is put on social and commercial interests.

INCREASING MARKET POTENTIAL

Inclusive Design can help to increase market potential by widening the appeal of a design beyond the primary target market. At the same time it continues to attract for customers within the primary segment, simply because the solution is better for everyone.

The pyramid diagram demonstrates this potential for expansion. At the bottom is the main market, or primary segment, characterised by healthy and able-bodied customers who are traditionally called 'the average consumer'.

The next segment represents a large number of people: those who need some individual adjustment. For example, this could include

PEOPLE-CENTRED STRATEGY FOR SUSTAINABLE INNOVATION

Above: UN Sustainable Development Goals.

left-handed individuals, people with dyslexia, expectant mothers, travellers with heavy luggage, tourists in foreign countries, low vision or groups with reduced hearing. This area holds the most significant potential for companies to address.

The top two segments show people who need specialised design, assistive technology or personal assistance to complete simple daily activities such as bathing, eating, or moving. Since their needs differ greatly from the mainstream they are generally not considered to be markets in an Inclusive Design approach.

Consumers, especially the marginalised groups in the individual adjustment segment, represent a powerful tool for innovation, giving companies a way of exploring needs that current designs have not yet addressed. This represents an opportunity.

A HOLISTIC WAY OF THINKING

An Inclusive Design strategy does not need to be limited to the design process. It can be a foundation for companies to base their entire business philosophy on. An inclusive way of thinking can impact on employment policy, staff management, customer service, communications strategy and marketing, for example.

This implies that the design disciplines and other areas of expertise must cooperate in formulating a holistic approach that roots itself in company culture, policy and practice. Implementation at both a management level and throughout the organisation is equally important.

Practising Inclusive Design and conducting people-centred research require a minimum amount of investment when compared to technological research and product development. It is therefore a low-tech, cost-saving and uncomplicated method for innovation, with low barriers for implementation for any company, in both the short and long term.

EXPAND THE MARKET POTENTIAL
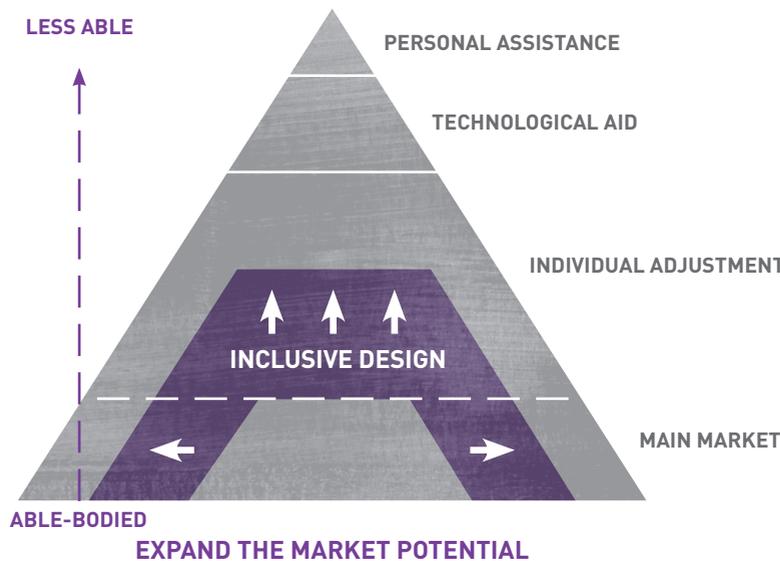
Ref. Knut Nordby 2003

CAN YOUR COMPANY AFFORD TO IGNORE THEM?

THE AFFLUENT OLDER CONSUMER
Although there are many groups who are excluded by mainstream design, one of the most important (and rewarding!) to design for are older people.

Older people make up the fastest-growing market segment and possess substantial purchasing power. In 2018, more than half of Norway's adult population are aged 55 or over. By 2050 the number of people over the age of 67 will have doubled.

It is a myth that seniors are low spenders. In reality, the "silver shopper" represents one-third of the population and holds 75% of total private assets.

Given their record-breaking purchasing power and their willingness to spend, seniors are the most powerful consumer group. They account for the most spending on health, well-being, travel and luxury goods in Norway, something that is reflected in other countries around the globe.

They are an opinionated, demanding and diverse consumer group, who are comfortable with consumerism but have yet to be fully included by mainstream design. They are generally not recognised as the real spenders by industry. They receive very little attention from marketing, and designers rarely accommodate their needs. In Scandinavia, women aged 55-65 spend the most on clothing, yet relatively few companies address their needs.

As we grow older, our sight, hearing, muscle strength, motor skills and cognitive powers will reduce as a natural part of the ageing process. Designers should therefore place an emphasis on functionality, user-friendliness and simplicity in the solutions they design, without compromising the need for aesthetics or desirability.

LIFESTAGES AND ECONOMY
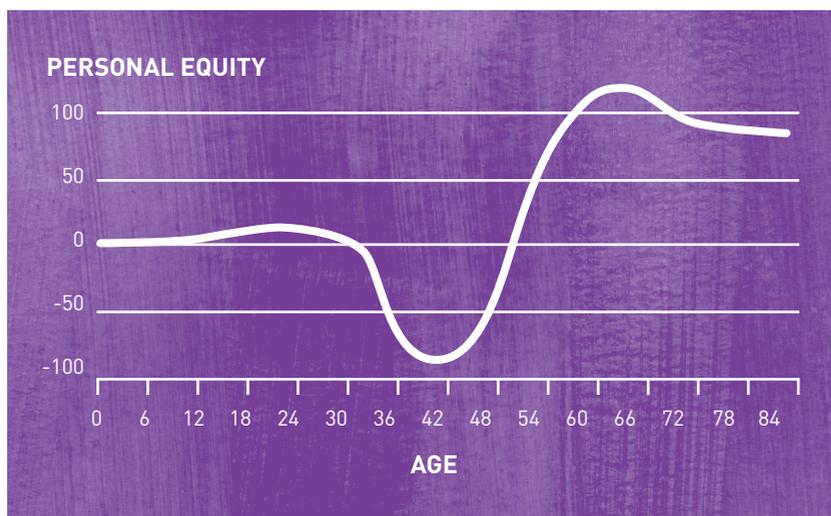
PERSONAL EQUITY

Left: Personal equity such as income and assets only start to exceed expenditure at age 45 as shown by the sharp upturn in the graph.

Japan is a super-ageing society. Population distribution by age and gender.

Age
100+
90-99
80-89
70-79
60-69
50-59
40-49
30-39
20-29
10-19
0-9

6 4.8 3.6 2.4 1.2 0 1.2 2.4 3.6 4.8 6

■ Male
■ Female
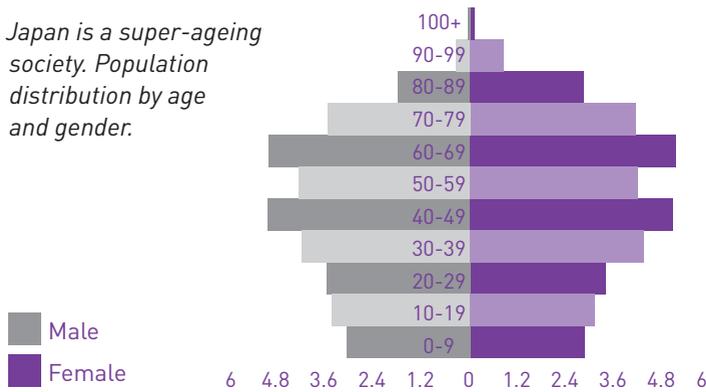
"A young man will never buy an old man's car and neither will an old man buy an old man's car"

Alessandro Coda, Co-ordinator, Fiat Autonomy Project

Above: UK retailer Marks & Spencer increased sales to over-50s by using Twiggy as a model. 'Trendy' was not defined as 'young'.

The average age of the new sports car buyer is 54, not 34

A new trend is emerging amongst older consumers, especially those aged between 60 and 70. They are remortgaging their homes in order to maintain or increase their standard of living. As a result, banks have successfully reacted to this market opportunity, creating new, tailor-made financial products and services. These assets are now being channelled into higher levels of consumption, meaning that market sectors other than banks could respond to this age group's demands in a similar way.

For people aged 75 and over, enabling them to live longer in their own homes by designing more inclusive and accessible domestic environments as well as services can save a significant amount of money for the government and improve the quality of life for the individual. Fewer will need care facilities, and thus will not draw on overburdened healthcare systems.

EXAMPLES FROM BUSINESS

Companies and organisations from around the world are using Inclusive Design to improve their offer to customers. Six case studies drawn from different industries are outlined below. They point to a different way of thinking, and have met with success.

PUBLISHING
Aftenposten Junior

Aftenposten Junior meets an increasing demand in creating news for children. It is a quality product on a par with media available to adults. This newspaper has become a distinct success, and is embraced by children and adults alike. It is the ninth largest newspaper in Norway, and continues to grow.

Research was carried out with a range of children to understand their needs and aspirations, and regular interviews were conducted during the planning and verification phases. Children react to both tactile as well as visual stimuli. They wanted thick paper to draw on and tear up. Offering print newspapers to a target group that mainly consumes digital media was an advantage. Many parents restrict the time that children spend on digital devices, so sitting with a print newspaper was considered positive.

Language was also seen as important, as articles needed to be presented without over-simplification. Graphic design tools are used to make editorial content enjoyable. The newspaper is also used by people learning the Norwegian language.

SERVICE
Kolonial.no

Kolonial.no is an online store that enables anyone to buy food. With an adapted voice feature, it signifies a small revolution for blind and visually impaired people who previously relied on other shoppers for orientation. Having a complete supermarket available online also benefits people who are ill, older people and busy families amongst many others.

This service, established by entrepreneurs , provides a positive experience that has improved the lives of many people. Inclusive Design has resulted in a solution that is useful for everyone and ensures that a customer-friendly approach is built into the system, rather than being created as an add-on.

By focusing on crafting a good service experience without accepting any compromises, Kolonial.no has developed a service that meets a commercial and social need. Kolonial.no has grown to become the leading online grocery shopping service in Norway.

HOME APPLIANCE
Panasonic washing machine

Japan has one of the most rapidly ageing populations and has an established focus on Inclusive Design, realising its commercial potential.

Leading Japanese companies formed the International Association for Universal Design in 2003 (Universal Design is the Japanese term for Inclusive Design). This organisation now has more than a hundred members, including household names and global brands such as Panasonic, Mitsubishi and Toyota. The tilted-drum washing machine by Panasonic is good example of how Inclusive Design thinking can create product differentiation in a highly competitive market. Panasonic developed their new, energy-efficient washing machine with an angled door placed in a more accessible position. People do not need to bend over to load, unload or see inside the machine.

The result was better for a wider range of customers, and has a unique selling point: easier handling of kilos of laundry. The angled door, illuminated and tilted drum and programmable controls make the machine easier to use.

SPORTS EQUIPMENT
Swix Nordic walking poles

Sticks have long been used to assist walking, but recently a new type of product, the trekking pole, has emerged. Whereas the walking stick is considered to be an aid for elderly people, the trekking pole is regarded as a sports product.

Nordic walking poles can improve fitness for all ages and fitness levels, appealing to anyone from cross-country athletes to those simply wanting to exercise. Nordic walking can provide a workout that is 40% more effective than a regular walk, as it activates additional muscle groups in the upper body. Older people can enjoy the benefits of better posture and balance whilst reducing shock to the knees, hips and back.

Trekking poles are a good example of inclusive, mainstream design, as the product appeals to a broad user group.

In 2018 there were more than 12 million Nordic walkers in Europe. Sales are steadily increasing, with annual sales figures reaching more than 100,000 poles with a global market share of 20% and sales offices in 24 countries.

> *"Mature and elderly drivers are becoming an increasingly large percentage of the motoring public. So, with the Third Age Suit, we believe we have an advantage in knowing what that large demographic group demands"*
>
> *Richard Perry-Jones, Vice President for Product Development, Ford*

AUTOMOTIVE
Ford Focus

The Focus is a small family car that meets Ford of Europe's aim to create a vehicle that can be sold across the globe. The Focus has been a runaway success since its European launch in 1998. It was the best-selling car in the world from 1999 to 2004, using Inclusive Design to beat established rivals who had previously dominated the market.

The designers and engineers of the Focus workshops to understand the effects of ageing. A 'Third Age Suit' – that simulates the reduction in functional abilities, vision, dexterity, range of motion and strength that all occur with age – was used by the team to ensure that the requirements of older customers were included. For example, difficulties in accessing the vehicle led to bigger door openings, and reduction in vision was addressed by using large, high-contrast dials.

Importantly, the Focus was never marketed as an older person's car, as the design improvements benefited everyone. The Focus has won over more than 60 awards,

including 13 Car of the Year awards. Ford has sold more than 16 million vehicles around the world since the Focus was introduced in 1998.

PRODUCT DESIGN
SAS coffee pot

Industrial designer Maria Benktzon and Ergonomidesign colleague Sven-Eric Juhlin developed a new, ergonomically improved coffee pot for SAS Airlines between 1984 and 1987. The old pot was made of stainless steel and weighed 2.5 kilograms when full. It was too heavy, and the cabin crew developed strain injuries in their shoulders and arms.

On the old pot, the handle was placed far away from the centre of gravity, which meant that the pot's weight had to be held by the strength in the arm and wrist. The goal was to optimise the distance between the wrist and the centre of gravity of the volume. The new pot also had to be drip-proof, fit into storage boxes, withstand major temperature changes and take very rough handling.

The SAS coffee pot reduces the distance between the centre of the handle and the centre of gravity. In this way the design addresses the needs of airline cabin crews by better balancing the weight, and has proven ergonomically beneficial for everyone with weaker hands. The coffee pot is still in use

on over 30 airlines, and over 500, 000 pots have been produced so far by Norplast in Norway. It has received many design awards and is in the permanent exhibition of the Museum of Modern Art.

CHECKLIST

Can I apply 'Inclusive Design' to my project?

Inclusive Design principles can always be applied when developing any product, environment or service. Below is a checklist to help you to decide why Inclusive Design should be applied.

Please note: the word 'product' is used in the questions below. This could be substituted for design, architecture, service, environment, etc.

MARKET
- ☐ Can you think of a person for whom your product would be challenging to use?
- ☐ Are people with a range of ages and abilities going to use your product?
- ☐ Do members of the public interact with your product?
- ☐ Could your product appeal to a wider market?
- ☐ Could your product be more relevant to its target group?
- ☐ Could your product be used beyond its target group?
- ☐ Do you think the needs of your target market are changing?

COMPETITORS
- ☐ Are you operating in a mature market?
- ☐ Do you wish to develop new competitive advantages?
- ☐ Could increased user-friendliness give you a competitive edge?
- ☐ Is your aim to innovate rather than imitate?
- ☐ Is customer satisfaction important to the success of your product?
- ☐ Is public perception important to your company?

PRODUCT
- ☐ Could your product be more intuitive?
- ☐ Are your customers dissatisfied with any aspect of your product?
- ☐ Do you think that having better information about your users would improve your product?
- ☐ Is the usability of your product important?
- ☐ Could your product be better presented to your customers?
- ☐ Are you looking for new product ideas?

RESOURCES
- ☐ Do you wish to base your design decisions on real-world evidence?
- ☐ Do you want to know what the key issues are facing your customers?
- ☐ Do you want to know how your product could be improved?
- ☐ Could understanding the limitations or successes of your product be useful in the future development?

If you answered yes to five or more of these questions then an Inclusive Design approach will add value to your process. On the following pages, you will find a description of practical approaches and methods to help you implement Inclusive Design.

HOW
DESIGN

This section looks at how you can bring an Inclusive Design approach into your existing design or development process. It outlines eight activities that can be incorporated to help you in achieving this. Significant reasons are presented for conducting research with people and the concept of the 'lead user' is described.

PEOPLE-CENTRED DESIGN

WHAT IT IS: Consulting a diverse range of people to get different perspectives into your design and development process. Talking to people throughout all stages from ideation to validation. Older and disabled people can form a key component of this, but other groups can also be consulted. It is important to have in-depth engagement, to research in context and see the issues from other people's point of view.

WHAT IT IS NOT: Designing for yourself, consulting only your friends or colleagues, talking to just the target market, holding a focus group at the office, designing with people in mind rather than actually speaking to them. Designing based on marketing data or statistics, or just talking to a random sample of people to validate your ideas at the end.

Conducting research with people can help you go beyond functional problem-solving. Users can inspire you, inform creative thinking and drive innovation. They should be seen as valued partners and contributors to your process and be treated with dignity and respect.

This approach can give you direct access to consumer attitude and help you to understand lifestyle and aspirational factors. It can bring statistical information to life and support existing marketing data that you may have already gathered. As a business tool, people-centred design can enable you to innovate from the customer's perspective and use design more effectivley.

You do not have to work with a large sample of people to get meaningful insights. Six to 12 carefully selected people can be enough.

Adults with infants often only have one hand available

Visually impaired individuals can test visual characteristics

Blind people can comment on tactile and auditory qualities
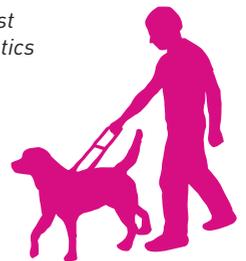
People with dementia can decide how intuitive and comprehensible a solution is. Older people can test a range of factors

People with hearing impairments can assess visual and auditory information

Right: Lead user in an extreme context for the sports industry

LEAD USERS

Lead users are people who make greater demands on a product, system, service or environment and therefore challenge it in ways beyond that of the average, mainstream user.

While it is important not to ignore mainstream users or your selected target market, working with lead users can help to explore the limits of existing designs and provide the inspiration to develop new thinking. They can give you different insights from those obtained from your mainstream users, and help

to lead design development in new and undiscovered directions.

Because they make greater demands on a design, they often have to work around the limitations, revealing valuable, tacit knowledge and providing detailed insight into what doesn't work. If a design can stand up to the demands of a lead user then this can translate into a better design for everyone.

In Inclusive Design, people may be considered lead users for any number of reasons. This will

depend on the nature of the design, what you are interested in exploring and the context of use. For example, if examining usability, a suitable lead user may have reduced physical ability such as poor eyesight, dexterity or hearing.

It is also important to consider other aspects that may make a person a lead user. This may have more to do with their lifestyle or cultural background, or the fact that they use the design to a high level or in an extreme context.

Children can test whether your design can be used by smaller bodies and whether it is intuitive
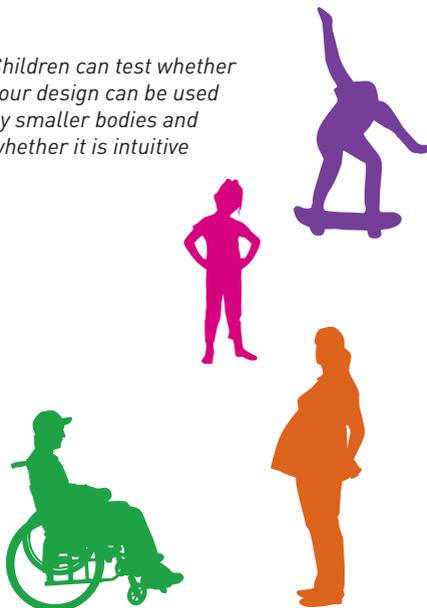
People with mobility problems can test physical accessibility

LEAD USER	TYPE OF INFORMATION THEY MAY PROVIDE
OLDER PEOPLE	intuitive, functional, aesthetics, strength, flexibility
DISABLED PEOPLE	visual, audible, tactile, strength, grip, accessible, functional
CHILDREN	intuitive, small bodies, strength, coordination, aesthetics
CULTURAL DIVERSITY	aesthetics, symbolism, value, function, context of use
MALE AND FEMALE	aesthetics, intuitive, strength, form, function

Above: This list is not exhaustive – think about who would be most relevant to your project

"People are experts in their own lives"

CHOOSING THE RIGHT LEAD USERS

Think differently, and pick people who will provoke new ideas or be challenging to design for.
For instance:

- If you are designing wayfinding, appropriate lead users might have poor vision, be a tourist or have mobility problems
- If you are designing a bathroom, lead users might include older people, children, hospital patients or even prisoners. All of these would have an interesting perspective on hygiene or bathing
- If you are designing an online shopping service, some lead users might be people who are addicted to shopping or those who hate it. Both these extreme points of view will give alternative perspectives
- If you are designing a city square, lead users could include skateboarders, travellers with luggage, parents with prams, workers on a lunch break, unemployed individuals or street artists

It is important to choose lead users who are relevant to the design and its intended purpose. For example, a small child may not be a suitable lead user for a razor, unless you are interested in child-safety features.

Within any lead user group, there can be wide variance in ability and individuals will therefore challenge the design in different ways. For example, in the visually impaired community only a small percentage of people are totally blind. This group might inform tactile solutions whilst the majority, who can see something, can talk about legibility as well.

Aim to choose lead users who are motivated and good at communicating their experiences. Children, people with cognitive impairment, dementia patients and autistic individuals may find it difficult to give feedback on a design. However, if it is important to consult them, it will be necessary to adapt the way in which you gather information.

Once parameters have been established for selecting lead users, it is best to aim for a variety within those parameters. For example, if older people are selected as lead users, make sure you have a mix of gender, social circumstance, culture and age within the group.

Lead users can be brought into the design process at any point from ideation through to validation. They can be especially relevant at the start of the project to give early feedback on direction and help to generate new ideas.

However, lead users can even be consulted when the project is undefined to help uncover radically different directions right at the start. Be creative and do not just use them to evaluate your ideas at the end of a project.

"Seeing one interesting thing from one user can be enough to get started"
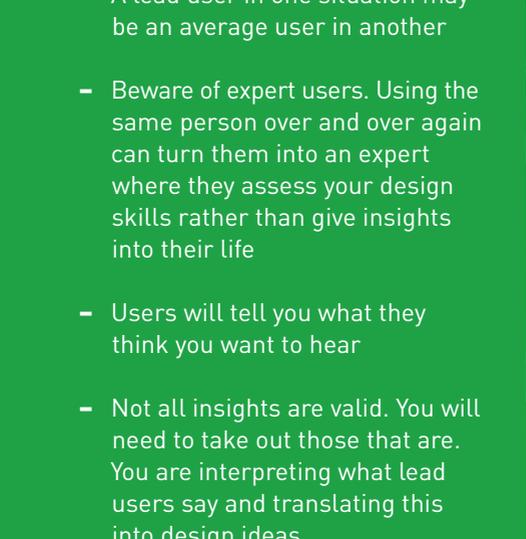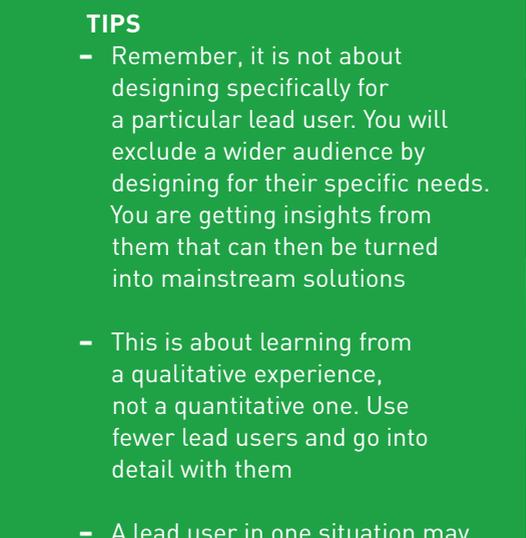
TIPS

- Remember, it is not about designing specifically for a particular lead user. You will exclude a wider audience by designing for their specific needs. You are getting insights from them that can then be turned into mainstream solutions

- This is about learning from a qualitative experience, not a quantitative one. Use fewer lead users and go into detail with them

- A lead user in one situation may be an average user in another

- Beware of expert users. Using the same person over and over again can turn them into an expert where they assess your design skills rather than give insights into their life

- Users will tell you what they think you want to hear

- Not all insights are valid. You will need to take out those that are. You are interpreting what lead users say and translating this into design ideas

- Do not choose users you are personally close to, as this can give biased results

COMPARING APPROACHES

Number-centred techniques are useful, but people-centred research can add value to them. It can give deeper insight into consumer behaviour and bring marketing data to life.

The table below compares people-centred methods of research with number-centred methods. Number-centred methods, in this context, represent statistically-driven approaches to gathering information or traditional market research where hundreds or thousands of people are asked the same set of questions and the results then collected together to generate percentages.

Number-centred techniques have value, but people-centred research can work alongside them to give insight into consumer behaviour. They also provide a qualitative evidence-base for any business interested in developing new ideas or innovative thinking. Market segmentation defines people according to how you want to see them, but people-centred techniques allow them to express themselves.

NUMBER-CENTRED RESEARCH	PEOPLE-CENTRED RESEARCH
Statistical results	Inspirational stories
Limited to a set of questions	Freedom to explore through dialogue
Reported life	Real life
Second-hand information	First-hand observation
Out of context	In context
Hear about issues	See issues
Market defined by segment	Person describes themselves
Actions or attitudes logged	Emotions and aspirations explored
Validate direction and limit focus	Open new possibilities
General trends	Individual thinking
Person is the subject of research	Person is the centre of research
Charts, numbers, percentages	Images, video, audio

10005 547
10
808

THE DESIGN PROCESS

Most companies have a design or development process
that they use to bring new ideas to market. Inclusive Design
can be integrated into these models, adding the value of
a people-centred approach without disrupting existing practice.

There are many different ways of modelling a typical design development or innovation process, and each company is likely to have developed their own version to suit their particular purpose or industry. However, each model will generally follow the same basic steps. This section introduces eight Inclusive Design elements and explains how they can be incorporated into the various stages of any process.

The design development model below is used by the Norwegian Design Council as a general example. It has a primary focus on the early phases in the process, named the Ideation Stage in the diagram. This stage is of key importance in innovation projects as many of the decisions made here will impact om the rest of the project. The activities grouped under the Ideation Stage can be iteratively

used until a concept is defined and selected for development. It is then passed into the Operative Stage, which is more linear and focuses on bringing the idea to market.

THE IDEATION STAGE

THE OPERATIVE STAGE

GENERATE IDEAS

CLARIFY IDEAS

DISCOVER USER NEEDS

DEFINE CONCEPTS

IDENTIFY OPPORTUNITIES

DEVELOPMENT

MARKET INTRODUCTION

GROWTH

DEVELOPMENT PROCESS

| STEP 1 Recognise problems | STEP 2 Research problems | STEP 3 Grow insight | STEP 4 Develop ideas | STEP 5 Test and apply |
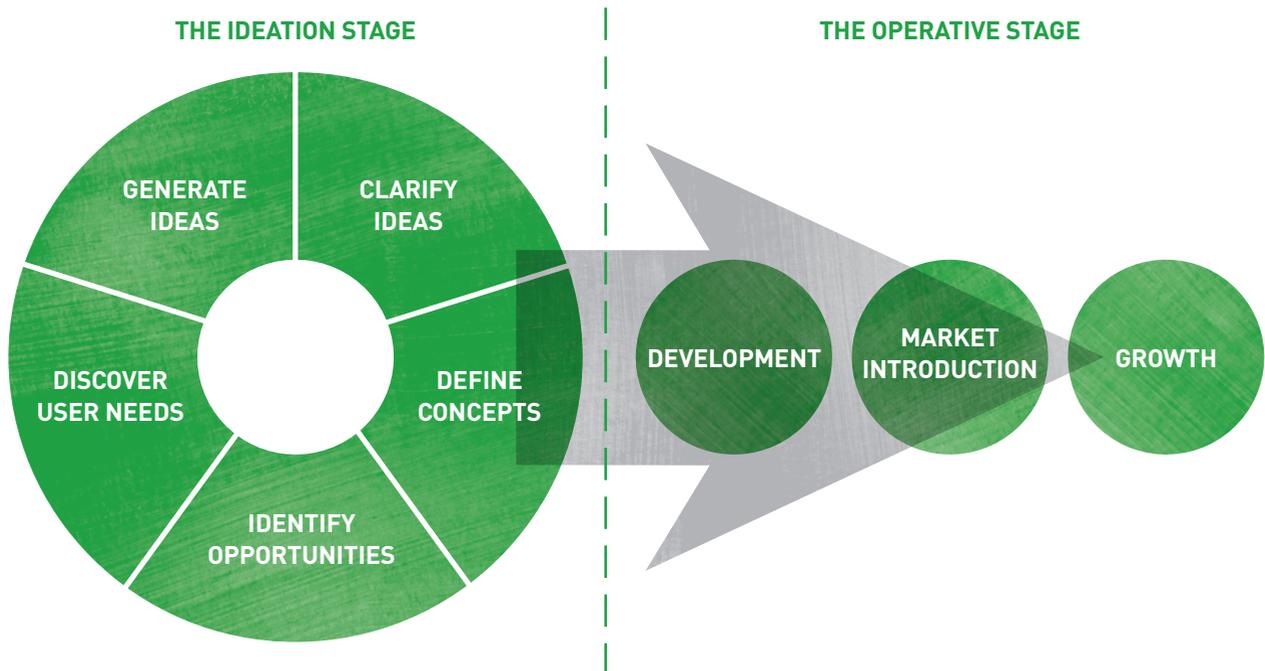
Two other examples of project development processes are shown above. They are used in a variety of different industries, but have been generalised to demonstrate typical practice. The process structures are similar, as they share common phases. You should be able to recognise these stages within your own process, though wording, number of stages and other details may differ.

For simplicity this book uses the the four-stage model shown below with the Explore, Focus, Develop and Deliver stages.

INCLUSIVE DESIGN ACTIVITIES

The eight Inclusive Design activities described on pages 44-53 give you an overview of practical methods and techniques for bringing Inclusive Design thinking into your development process. Each activity consists of tasks that help to bring the user into focus.

In the early stages, these activities include methods for setting up your research, obtaining insights from users and then using these insights as inspiration for ideas. In the later stages, as a project progresses through its development cycles, the activities help to maintain a people-centred perspective during decision-making and evaluation.

It is important that the tasks are adapted to suit your own needs and individual process. It may not be necessary to complete every activity, or even follow the order shown on pages 44-53. They can be used as appropriate. These activities should not be seen as stand-alone tasks but should eventually become an integral part of your own development process.

Above: A generic four-stage design process. This is used to explain the Inclusive Design activities on the following pages

CRITERIA TOOL

Criteria tools are often used throughout the development process to check whether ideas meet certain objectives or are of a good standard. They are a way of making decisions or ranking ideas.

WHAT

The criteria tool is a decision-making tool that keeps the perspective of the user in focus throughout the design process. Criteria are drawn up based on initial insights gathered from user research and are combined with the commercial objectives set for the project. These criteria then help to define the key requirements a successful design must fulfil and set a framework for measuring the success of a particular idea.

Ideas are scored and ranked on a quantitative scale for each criterion, allowing you to assess and prioritise those that best fulfil the needs of the user and the project. Used iteratively and throughout the design process, the criteria tool will help to compare ideas, check their performance and show areas for improvement.

HOW

1. Define the sequence of interactions between the user and the design. Remember to include the entire relationship, from start to finish. For a product this may begin from the decision to buy until the product is discarded. For a service, this may be from finding the service to termination or renewal.

2. Produce a set of criteria for each stage in this sequence that are important from the users' perspective. This should include both functional and emotional experience. The criteria can then be weighted in relation to each other depending on how critical each is to success. This weighting may take into account factors such as the effect on cost, or how broadly across the market the effect applies.

3. Create a visual scale that allows you to record and clearly show how well a solution scores compared with another.

4. Refine the criteria tool to become more specific and focused as the design and development progresses. During later stages, your criteria tool can be refined to focus on a particular concept or scenario.

SCORE

CRITERIA 1
CRITERIA 2
CRITERIA 3
CRITERIA 4
CRITERIA 5

0 1 2 3 4 5 6

Lead users:
- Older person
- Visually impaired
- Person with arthritis
- Child
- Person without capability loss

Left: Criteria tool in which a range of users have rated each criterion on a scale of 1 to 6. The low score on criterion 4 shows opportunity for improvement, as circled

ADDING INCLUSIVE DESIGN TO YOUR DESIGN PROCESS

Activity 1
Understand context

Activity 2
Design research

Activity 3
Discover needs

Activity 4
Map Insights

EXPLORE

FOCUS
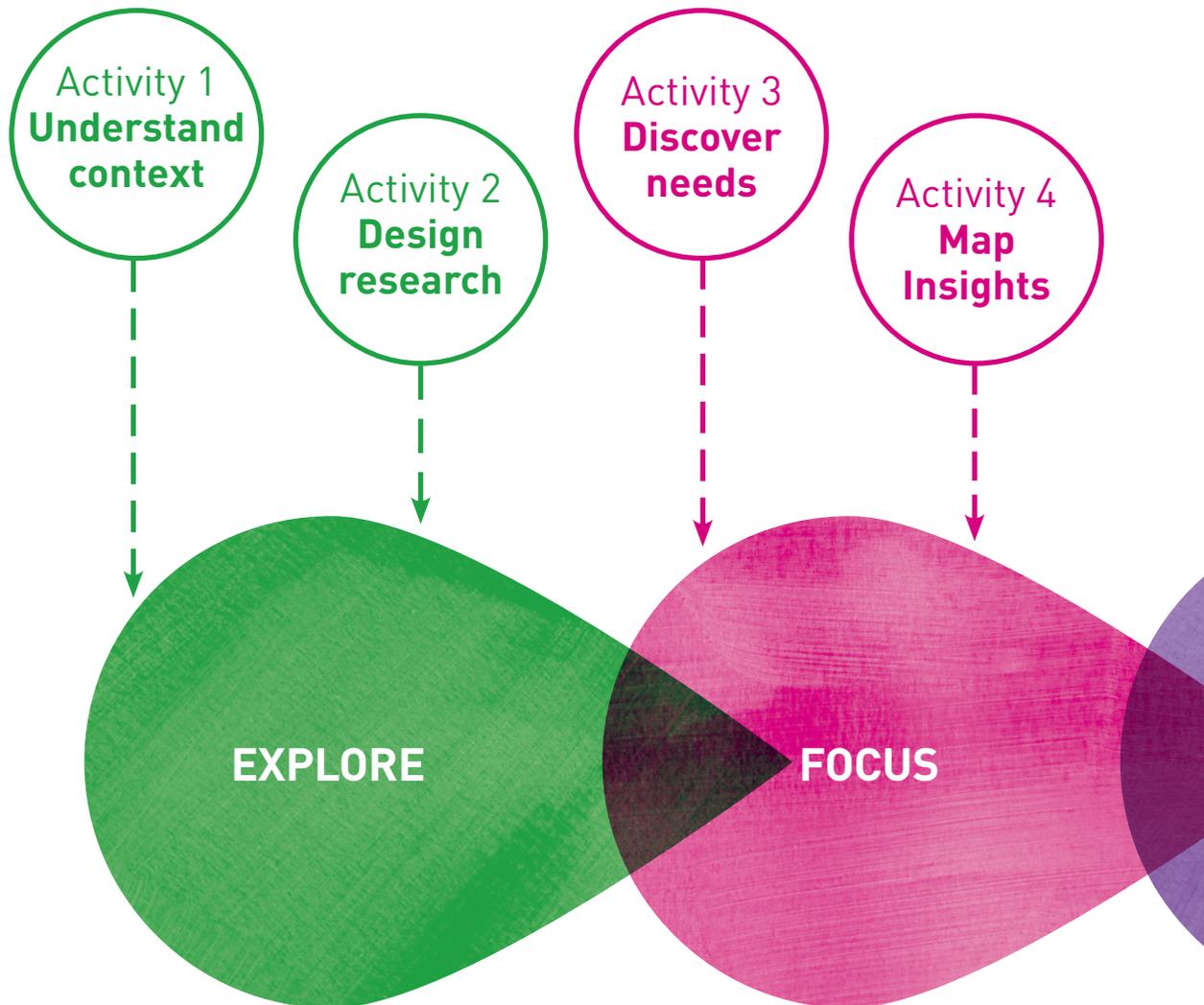
This diagram shows a typical development process. At each stage there are a number of Inclusive Design activities that can be added to create a more people-centred approach. Adapt them to suit your purpose. Each activity is described in detail on the following pages.

Activity 5
Translate briefs

Activity 6
Scenario building

Activity 7
User feedback

Activity 8
Resource building

DEVELOP

DELIVER
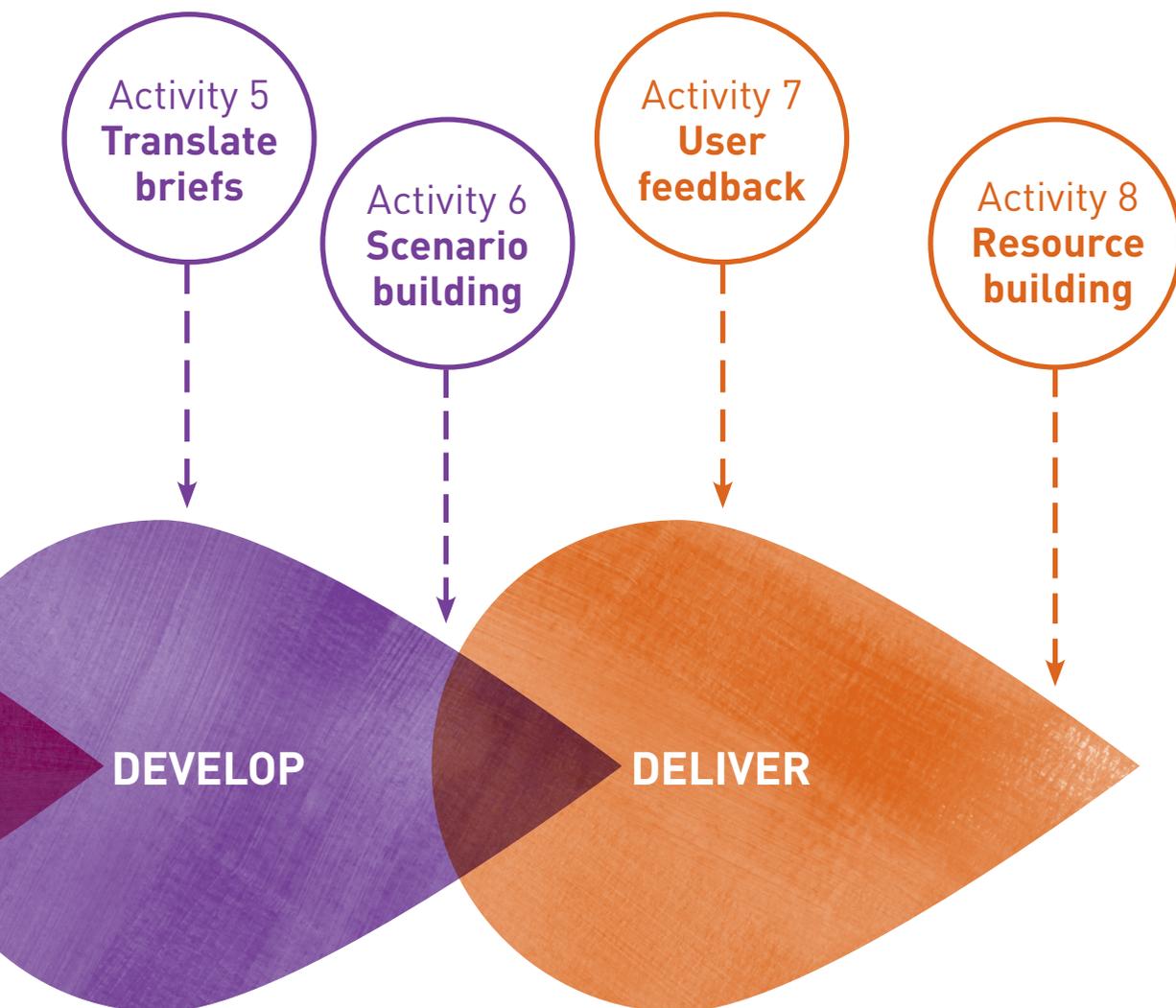
ACTIVITY 1
UNDERSTAND CONTEXT

This activity will give you a better understanding of the context surrounding the issue that you are looking at. It will give you a firm basis for moving forward, as well as people-inspired insights and direction.

Before starting any project it is important to understand the market in which you are operating and have an idea of the overall landscape from your users' perspective. This will help you to build a correct vision for your project, see how you can improve existing offers and ensure that your initial ideas have relevance to the real world. Spending time on this and getting it right will give you good grounding for the rest of the process.

METHODS

– **Literature search**: See what information already exists. You could look at trends, web research, books, academic publications and current media.

– **Market research**: Find out who is affected by your context. Examine marketing data, statistics, surveys and information gathered from large numbers of people.
– **Competitor audit**: Find out which other companies are operating in this field. Look at existing designs to identify gaps in the market and analyse current solutions. Looking at parallel industries can show you how other sectors have responded.
– **Initial user visits or observation**: See how people behave within the existing context. Explore their experiences and identify key areas of interest. You can do this through web forums, telephone interviews or natural observation. (See pages 82-83)

– **Go into the context**: Explore the issues first hand. Learn about the situation by experiencing it yourself. Use your own products or services and talk to other people who also interface with them such as the sales team, the distributors and end users.

END RESULT

By completing this activity you will define areas for research focus that have captured your attention. You can then set clear project goals and have some idea of how to approach your issue. You will also be able to assess whether you have correctly understood your context and adjust accordingly. You will be able to scope other opportunities that you might not have seen before.

ACTIVITY 2
DESIGN RESEARCH

Your research should aim to get a significant amount of insights from the users you decide to work with. Spend time planning this carefully, as badly designed research will produce limited results and not be cost-effective.

It is important to allow adequate time to design your research properly, as this will give you the best chance of success and ensure that common mistakes are avoided. Building on your understanding of the context, think about the type of information you will need, how you can access it and who you will get it from. Consider the availability of the users, your time-frame and budget, then plan accordingly.

METHODS

– **Ask the question**: Identify the primary research question. Audit your existing insights, rank them and select those with most potential. Turn your insights into a question. For example if your insight is: "76-year-old Berit gets her son to put up her new shelves", your question might be: "why don't older people like power tools?"

– **Find the focus**: Identify and map key issues. Understand the different aspects of your research question and explore all angles. You could use a mind map, lists, brainstorming and other creative methods. In the example above, you might consider issues such as: Are the tools too heavy? Is she worried about safety? Or do the shelves actually give her an opportunity to see her son?

– **Create the framework**: Develop criteria for finding users. This could be a simple x-y graph, chart or table. In the example, you could look at differences in age, gender and familiarity with power tools.

– **Pick your users**: Identify potential lead users (see pages 38-39) and their position on your framework. Aim for contrast and variety. In the example above, your framework could include looking at older adults who have never used power tools and those who are familiar with them.

END RESULT

This activity will give you a solid basis for conducting research with people and a way of taking this forward. Themes for exploration should be organised into a research framework and you will have developed criteria for selecting users. Your research methods will be defined and designed.

URBAN   **RURAL**

SINGLE   **COUPLE**

LOCAL FAMILY   **DISPERSED FAMILY**

ACTIVITY 3
DISCOVER NEEDS

This is the point at which you put your planning into action and go out to work with users. You are immersing yourself in other people's lives and aiming to understand their problems, needs, desires and aspirations.

There are many techniques that you can use in this activity to get closer to your users and meaningfully engage with them. These are covered in greater detail under the Research Methods section (pages 76-79). Although you are looking to capture insights, do not treat people like test subjects. Ensure that your users are seen as valued contributors and are respected. The insights you gather will be a platform for inspiration in the next activity.

METHODS

– **Scheduling**: Contact your users and arrange to meet. Make sure you are fully prepared, that the users have signed consent forms where necessary and your activities with them are fully explained.

– **Going and doing**: Conducting the user visits and research. Techniques might include questionnaires, web forums, observation (both natural and controlled), interviews, research kits and workshops (see pages 76-97).

– **Research focus**: Keep the primary question in mind but also allow yourself to look beyond it. For instance, gathering information on the context can reveal hidden information that is relevant to the research focus.

– **Tune method**: Do not be afraid to change your plan or review the primary question. If you are not finding out the information you need or if new exciting directions are opening up, modify your plan to suit. Build on each experience.

END RESULT

Completing this activity should produce large amounts of data containing rich insights and qualitative information from the people you have worked with. You need to capture and store this in an organised way for later access and analysis. Do not be overwhelmed at this point by the amount of user data that you might have gathered.

ACTIVITY 4
MAP INSIGHTS

Having gathered insights from people, you now need to map them. Review and analyse all the information to identify key themes and opportunities. Extracting the right insights will lead to new ideas or designs.

You need to make sense of the research data you have gathered. Not everything will be relevant. Sort those insights that are inconsequential from those that are important or inspiring. Refer back to the primary question to help filter results. Do not be afraid to discard things that are not of interest.

METHODS

– **Review data**: Get an overview on all data gathered. See what you have captured and analyse gaps. Conduct further research if those gaps need to be filled. Review photographs, videos and interviews to separate insightful information from background information.

– **Organise data:** Sort the data into groups. Create a method that will give you and your team easy access. Back-up and keep information that you might not need for this project. It might be useful in other projects.

– **Visualise data**: Search for patterns and themes. Lay out everything you have chosen so you can contrast and compare. Look for natural groupings, common themes and cross-references to help you organise. Be visual and qualitative in the way you visualise. Do not just use lists or spreadsheets. Use alternative mapping tools.

– **Rank data**: Prioritise needs and findings. Develop a list of criteria to rank insights that respond to the primary question (see page 43 for a criteria tool). You might find that your research opens up other opportunities so rephrase the primary question if necessary. Be strict in prioritising your results. Brainstorm with other people who are not connected to the project – fresh eyes can be very helpful.

END RESULT

At the end of this activity, you should have some new discoveries with an evidence base of human stories. These could be issues, problems or interesting solutions discovered during the user research. These can act as starting points for idea generation and design briefs. They can be quite broad at this stage, but will soon lead to specific design directions. At this point you will have an understanding of key themes and issues.

ACTIVITY 5
TRANSLATE BRIEFS

This activity takes the ranked ideas or themes from the last activity and translates them into design briefs to be addressed. Choose those directions with the most potential and define the challenges to overcome.

Create design briefs that take account of the evidence base that you have generated and reference the original project goal or mission. Build on ideas that have the most potential for your business. You can bring other colleagues into the brief-writing process for alternative perspectives. Make sure that you maintain the user voice in the briefs that you write, including direct quotes if necessary.

METHODS

– **Success criteria**: Build a list of criteria for the brief. These will be important in assessing the success of the outcomes and can be used to evaluate and select ideas throughout the design phase.

– **Write briefs**: Define the goals or challenges to overcome. Be very specific as to the topic of each brief. For example, do not write "my idea will improve people's lives". Write "my idea will aim to get schoolchildren to drink more water to improve their concentration". You should be able to summarise your brief in two or three sentences.

– **Choose briefs**: Select briefs for development. Use the list of criteria developed to choose those briefs with the most potential.

END RESULT

This activity will give you specific briefs to respond to that explore different creative directions. This is the start of the traditional development process, but it will now have a people-centred evidence base to give it a more solid foundation. At this stage, your briefs and design directions will be driven by your users, helping to ensure that you are answering the right question.

ACTIVITY 6
SCENARIO BUILDING

This activity complements the traditional idea-generation phase of the typical design process. Use the research you have gathered to build scenarios that will help you to see things from the point of view of your users.

Scenario building will help you to keep in mind the insights already gathered from your users and ensure that their needs and aspirations are driving the process. Generate ideas in response to those scenarios and virtually test ideas from a particular user's perspective. This will allow you to assess which ideas will work much earlier on in the process.

METHODS
– **User profiles**: Determine main drivers and character traits of each user. Think about what is important to each individual and summarise key aspects of their personality.
– **Personas**: Generate fictional characters based on your research and on real users. You should have a good idea how they might think and respond to situations they face.

– **Storyboarding**: Visualise scenarios to explore an idea. Draw out sequences of how and where the idea might potentially be used. It is important to give detail to the central characters and the context.
– **Role-play**: See from the user's point of view. Imagine that you are the user and act out scenarios reacting as you think they would. Use other team members to help or set in the real world context.
– **Revisit insight databank**: Keep the user study fresh in your mind. Remind and re-inspire yourself throughout the idea generation phase using the data gathered during the research.

END RESULT
Completing this activity should generate a range of concepts, ideas and scenarios that are driven by user need whilst considering other factors that are important in business. It will help you to answer the brief in new and interesting ways, animating solutions and testing them from a user perspective.
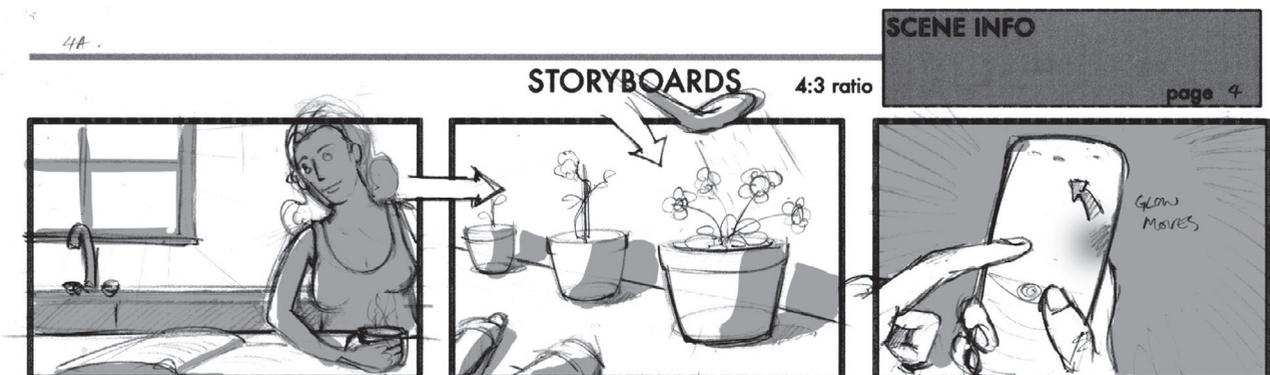
ACTIVITY 7
USER FEEDBACK

Evaluation with users should happen iteratively throughout the development process, but at this stage, as the design is nearing completion, users should be brought in to give specific feedback on the ideas produced.

Once concepts have been developed into realistic solutions and other constraints such as materials and manufacturing have been addressed, final validation should take place. Realistic prototypes or mock-ups should be tested with a range of users to verify design solutions, record initial market reaction and fine tune details (see pages 96-97). Leave time within the overall process to make final adjustments to your design as a result of user feedback.

METHODS

– **Test onsite**: Ask users to come to your office to test prototypes. They can do this individually or in focus groups. Capturing feedback will be easier, but you will not see the prototypes being used in a real context.

– **Test offsite**: People take away prototypes to test in a real context or over an extended period of time. This can give a more realistic picture, but can be more difficult to capture feedback.

– **Research methods**: Reuse the research methods you have applied earlier in the process (see pages 76-97) but re-apply with new focus. You are not using them to capture insights but to evaluate concepts.

– **Mass market**: Test outside your lead user group to assess wider market appeal. Bring in a variety of mainstream users.

END RESULT

This activity will allow you to verify your design solutions and test the details, usability and features. It makes sure that user need is informing the design right up to the point at which it is ready for production. This will help to deliver a more market-ready, considered outcome. You will also pick up on early failings and be able to design them out.

ACTIVITY 8
RESOURCE BUILDING

Collect and keep all the information and insights that you have gathered even those that were not used for this particular project. Material collected along the way may have relevance to other areas of your business.

As a result of your activities with users, you will have knowledge and experience that can be passed on to other projects and colleagues. This should be organised and stored in a way that can be easily accessed either physically or digitally. Your studies with lead users can act as a resource and reference for future projects and help to create a library of user data for your organisation. Information that might not have been applicable to one project could be vital for another, so make sure you save discarded data.

METHODS

– **Image library**: Collect and organise still and video images by theme or keyword in a manner that makes it easy for other people to search and access. Do not upload all your raw data. Edit and select the material that is most interesting and relevant.

– **Insight database**: Create a database of insights gathered throughout your research. This can be quotes from users, ideas you have had or problems that have been articulated.

– **Persona library**: Creating personas based on real users can help to generate more inclusive briefs and virtually test ideas in other projects. Make sure that the personas you create are believable and have depth to their character. Write in likes and dislikes, as well as physical functionality, for example.

– **Catalogue unexplored ideas**: Often user research will uncover other ideas that are new and exciting but not relevant to the brief you are addressing. Record these ideas for consideration at a future date. They might be a potential fit for another project.

END RESULT
At the end of this activity you will have a reference library of people-centred insights in the form of quotes, pictures and video. This information can be a valuable resource for your organisation in developing new projects as well as maintaining an Inclusive Design approach. The innovation that results from this process can also add value from your clients' perspective. However, most importantly, completing this activity means that you do not have to start from scratch the next time.

HOW
ARCHITECTURE

This section describes a generic architectural process based across four stages. It then outlines nine Inclusive Design activities that can be added to the process, benefiting architects, developers, contractors and the community. Articles making the case for people-centred and citizen-driven approaches are described.

INCLUSIVE ARCHITECTURE

This activity gives a better understanding of the context and purpose of the project, based on the vision by the client or developer.

The idea that Inclusive Design can influence and benefit architecture and urban design processes is not new, but has yet to become common practice. Innovative approaches in the sector tend to focus on environmental sustainability but equally important are the social and economic aspects.

Our built environment should be more inclusive, empathic and people-friendly benefiting society, business and citizens. But can Inclusive Design techniques and tools be applied in complex architectural processes with so many requirements and regulations? And can such methods help drive innovation within construction, one of the largest, most traditional business sector in most countries? Can this be achieved by applying unconventional people-centred approaches when end-users or citizens are rarely engaged in a substantial or immersive way?

This section presents a generic model for an architecture process that responds to the above questions, suggesting nine Inclusive Design activities that can be added. The aim is to support and motivate architects and urban planners to become more people-centred and inclusive in their creative work. Everyone from

architect to builder is encouraged to consider real people's needs and aspirations, and not just design for an imaginary average client.

This requires a shift from the standardised 'one size fits all' mindset. In return, this can distinguish a company from its competitors by establishing a people-centred position within this realm or niche – where individual needs and human behaviour can form the basis for profitable business concepts. How the built environment and our surroundings impact our health and wellbeing is on the agenda for governments concerned with public health and seeking policy reform around these issues. Evidence-based research indicates a strong link between health, wellbeing and socially inclusion and the built environment.

Public health is a complex issue where new challenges are emerging as a result of changing lifestyles, family structures, cultural, social and economic diversity and rapid changes in technology, infrastructure and employment. These transformations are having massive impact and must influence how we plan and develop our built environment in the future. Inclusion and participation, in this context, are key to addressing

these challenges. However, we can go further. To be sustainable in the broader sense of the word, a holistic approach is required. The UN's Sustainable Development Goals are widely-accepted guidelines that can help set direction.

The global challenges that we face makes the task even more complex. Growing disparities and inequality, scarcity of resources, a fast-growing population, climate change and an ocean full of plastic call for new approaches. Growing urbanisation increases the need for smarter, more compact cities – where technology and Big Data typically are the drivers. But how can smart cities also be people-friendly and inclusive for all citizens, and how can Big Data be combined with Deep Data to enable a better understanding of the problem? Organisations that can respond to these challenges applying people-centric approaches will be more competitive and profitable whilst pioneering social responsible business models in the ideal of establishing circular economy.

Since traditional and conventional approaches need to evolve to become more relevant and future-proof, the following pages present ideas on how to adapt and respond to a new reality, focusing on the social aspect of sustainability.

When public and private property clients become more demanding and engaged in the early stages of an architectural or planning process, they can impact and influence the output in a more direct way. This should not be seen as a challenge to the existing and traditional top-down way of doing things but represents new opportunities that support more democratic decision making. Stakeholders and other actors are not adversaries but could actually bring mutual benefit from a better-balanced cooperation from the very start.

Urban design and public governance including procurement differs from private commercial investments in many ways. This applies to how citizens and stakeholders are involved and consulted including the traditional public hearing, more recent versions of co-creation, and how ethnographic tools are used to gain user insights that can inform decisions throughout the urban planning process.

The possible conflicting interests between urban planners, local government, private builders and the citizens, or between architects, builders and projects managers may be reduced by applying an Inclusive Design framework that can help to establish common ground for more collaborative and sustainable development. The emerging fields of collaborative urbanism and citizen engagement against a background of social innovation can help citizens become more empowered as both user and co-producer in urban design, and have real influence on decisions concerning their own neighbourhood, community and city.

The approach and philosophy, the tools and methods presented in the architecture process are also applicable for urban design when adapted to context, complexity and scale. There are several interventions to enable citizen and stakeholder involvement but the activities and tools described in this section give a foundational level of information and act as a starting point to increase the role of individual and communities in the development, governance and use of their environment.

INCLUSIVE DESIGN APPROACH FOR DEVELOPERS

This short checklist outlines a list of Inclusive Design actions that can be specifically undertaken by developers to ensure that a people-centred innovation approach is part of the process. Developers have strong influence over a project and can set directions for other team members.

- Embed Inclusive Design in the business case to appeal to notions of social sustainability, improved innovation and reduction of cost

- Add Inclusive Design as part of the procurer's vision

- Define Inclusive Design objectives at the start of a project

- Involve key stakeholders to ensure an inclusive approach

- Address the legislative context, so the project meets and even exceeds standards

- Identify an Inclusive Design champion who can hold the project accountable

- Adopt an Inclusive Design strategy that can be applied throughout the project

- Give Inclusive Design an equal voice alongside the other project considerations

- Allocate a budget line for Inclusive Design activities and consultants

- Outline Inclusive Design considerations in the brief to attract the right designers and architects

- Employ a design team and architects who are familiar with Inclusive Design or open to applying it on the project

- Define specific Inclusive Design actions and milestones during the design process, construction and handover and hold the team accountable

- Ensure that information about Inclusive Design guidelines are adequately conveyed across the project to all team members and at all levels

- Create constant project management, follow-up and check-ins to ensure that Inclusive Design implementation takes place according to the strategy

- Identify conflict of interest areas early and create good communication pathways to avoid or resolve

These represent a few key considerations that can help developers benefit from Inclusive Design considerations.

PROJECT DEVELOPMENT

FINDING ID APPROACH IN YOUR BUSINESS

TEAM BUILDING

INCLUSIVE DESIGN

CITIZEN INVOLVEMENT AND PARTICIPATORY URBAN DESIGN

Inclusive Design as an approach and philosophy can also be applied to urban design, enabling and empowering a diverse range of citizens to be involved in urban planning at a more comprehensive and engaging level. This evolves the traditional (and not-so-inclusive) ways of citizen consultation to develop more people-friendly, liveable cities. Currently, most planning is controlled by an inter-disciplinary elite with little or no citizen involvement. Bringing citizens and communities into the process and enabling their perspectives is important. Exclusion can have consequences – in Germany, the term ʻ*Wutbürger*ʼ meaning ʻenraged citizenʼ has emerged, specifically from people being left out of the planning process. A more inclusive process of urban engagement needs to be evolved.

The European Charter on Collaborative Urbanism outlines four key principles:

1. Creating liveable cities
2. Connecting government to people
3. Using data for wiser cities
4. Engaging and involving a diversity of citizens in urban planning

The fourth principle which relates directly to Inclusive Design is described in more detail below, and methods for engaging citizens are contained in the following pages.

The United Nations estimates that over 70% of the world's population will be living in towns and cities by 2050

Above: Kids' Tracks is a digital registration tool used in urban planning that gives a clear indication of children's movements in their surrounding area: which places they like and don't like. Kids' Tracks also shows children how participation in planning processes works, and how they can be aware of and care for their rights at a young age.

ENGAGE AND INVOLVE A DIVERSITY OF CITIZENS IN URBAN PLANNING

Existing official procedures used to consult citizens in urban planning are not relevant to the diversity of citizens today. There is a lack of strategic frameworks that enable citizens to shape their cities and we need to change this so that people themselves can become drivers for cities, they live in.

1) INCLUDE THE MARGINALISED

Cities should commit to identifying and engaging their marginalised and excluded groups. Create strategies and spaces to allow a diversity of stakeholders to engage.

2) ENGAGE EARLY

Promoting active citizenship from an early age with children and young adults to raise awareness of what it means to shape one's environment and be a part of urban citizenship.

3) CHANGE POLITICAL FRAMEWORKS

Commit time and resources to increase understanding and support of participatory urbanism by politicians and policymakers. Policy timelines and frameworks should be updated accordingly.

4) CHAMPION A PEOPLE-CENTRED APPROACH

Promote an inclusive approach in training and higher education. Collaboration between urban planners and academia ensures knowledge transfer and helps build curricula in participatory urbanism.

5) FOSTER SYNERGY AND PROMOTE EXCELLENCE

Share good practice, exchanging insights and promoting synergies to champion excellence in urban planning. Cities and their main stakeholders can co-create new models of collaboration.

PARTICIPATION IN PRACTICE

So what are the most effective tools to engage a wide range of people, and allowing them to influence decision-making processes?

Engaging diverse people in the complex urban planning agenda is not easy, especially involving them as users and co-producers. This vision requires a form of collaborative urbanism with a more dynamic connection between data, research and prototyping, utilising the influence of 'open source' technological advances. Although some initiatives speak to the smart cities agenda, driven by technology and Big Data, others combine diverse approaches across sectors and stakeholders. Some of the tools for inclusive citizen engagement include the following ideas listed on the facing page:

Engaging communities in different social and cultural contexts is important.

- Urban Living Labs that use an interdisciplinary approach to test and prototype new ideas, concepts and initiatives through live experiments in communities

- Pop-up street booths for consulting the general public and gathering individual perspectives at a low threshold and analogue level

- Coffee-table conversations in public spaces on specific themes to gain general insights

- Door-to-door surveys to consult with those not normally interested in giving their opinions

- Virtual reality tools to present, engage with and discuss solutions in a more realistic setting to experience spaces and environments

- 24 Hour Inclusive Design challenges for new perspectives and insights involving a diverse range of citizens to inform and influence urban planning and decision-making

- Public spaces to create various ways of meeting and consulting citizens. These could include parks, playgrounds, city and community centres, actively using existing networks and associations

- Mapping and visualisation tools that can help people to express themselves in ways that go beyond textual communication for local community initiatives

ARCHITECTURAL PROCESS

This section adds nine Inclusive Design activities to a typical architectural process described in four stages, as below.
As models vary internationally, this provides a broad description for the different types of processes that are commonly used.

The aim is to outline a practical representation for understanding and applying Inclusive Design in a way that benefits anyone involved in an architectural project. There are many different models that have been developed to represent the architectural process, and a number of organisations have developed versions to suit their particular purpose or context. However, many generally follow the same basic steps. The four-stage description below is an attempt to simplify these complex processes without losing the overall structure or meaning.

This has been drawn from a number of international sources, including architectural associations, firms and academic models. The stages cover processes that are relevant for everyone involved in projects, including developers, architects, planners, clients, community groups and project managers. Roles and responsibilities differ according to size, scale and context, and will change from activity to activity. The process therefore is meant as a generic overview that suggests nine Inclusive Design activities to add to most architectural processes. These activities, outlined on the following pages, encourage all members of a project team, whether temporary or permanent, to adopt a practical approach to involving people throughout the different stages of a project. Activity 9 is about resource building, and should not be left till the end. Make a plan and allocate responsibilities to capture material, learning and findings throughout the project.

STAGE 1: CONCEPTUALISE

This stage typically focuses on two Inclusive Design activities, namely "frame context" and "involve people". A starting point will be to set a vision that defines the aspirations and focus for a project. Activities can include:

- Understanding the business case for the space or the building
- Interpreting the project vision and aligning with the client's vision
- Clarifying the legislative and social context around the project
- Working with the people who will be using your design to understand their functional needs and personal aspirations

A third activity, "translating insights", transitions into the next phase, moving into development.

| 0 strategic Definition | 1 Preparation and Brief | 2 Concept Design | 3 Developed Design | 4 Technical Design | 5 Construction | 6 Handover and Close Out | 6 In Use |
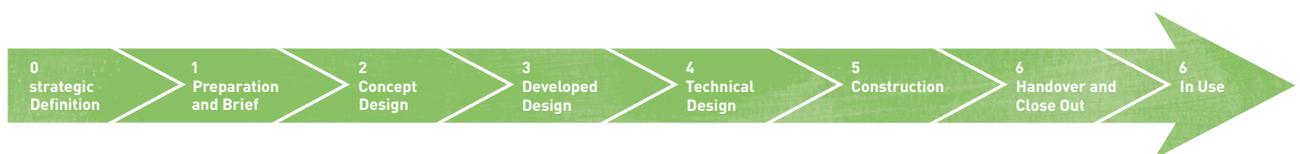
Simplified architectural process as defined by RIBA, the Royal Institute of British Architects

STAGE 2: CREATE

This is very developmental, with activities including "define plan" and "develop design". It is a process of evolution, balancing an architect's ideas and sensitivities with stakeholder need and participation. Typical activities include:

- Finalising the project brief and setting all parameters in place
- Developing design proposals that span a creative spectrum of application
- Consulting with a range of experts, stakeholders and advisers
- Assessing technical feasibility
- Agreeing final ideas from a shorttlist of creative propositions and proposals

STAGE 3: CONSTRUCT

This is the construction stage and implementation through site management. Communication is extremely important here, as there are both new and existing parties involved in the realisation of the project through to handover. Typical activities include:

- Preparation of handover package for construction team
- Construction underway and liaison meetings set up to maintain oversight from both architect and client perspective
- Technical oversight to ensure the vision of the project is maintained alongside delivery
- Verification with users in the case of deviation, alteration and progression.

STAGE 4: CONTINUE

This stage covers handover to the client, in-use services and resource building. It continues into a period of handover, settling in, minor adjustments and reorientation. This includes:

- Completing the project properly in a satisfactory way for the client
- Undertaking 'post-occupancy evaluation', ensuring that everything works
- Briefing and handover to occupants, facilities management and owner
- Minor adjustments begin
- Conducting Post Occupancy Evaluation, ideally over a period of time to allow for changes
- Building resources and data for future projects

CONCEPTUALISE **CREATE** **CONSTRUCT** **CONTINUE**
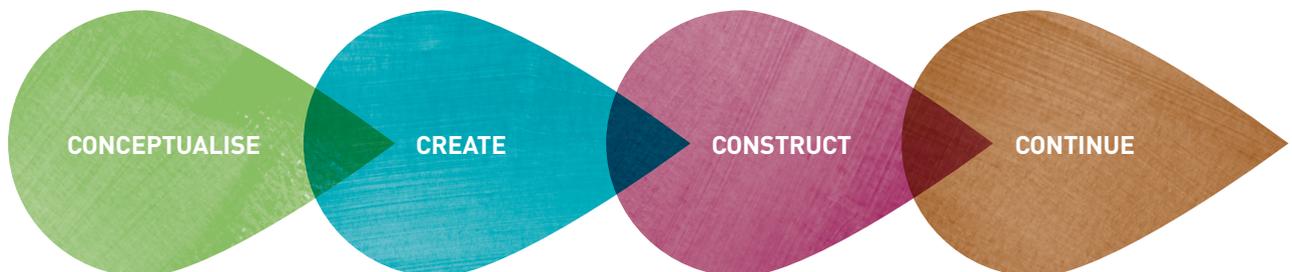
ADDING INCLUSIVE DESIGN TO YOUR ARCHITECTURAL PROCESS

Activity 1
Frame Context

Activity 3
Translate Insights

Activity 5
Develop Design

CONCEPTUALISE

CREATE

Activity 2
Involve People

Activity 4
Define Plan
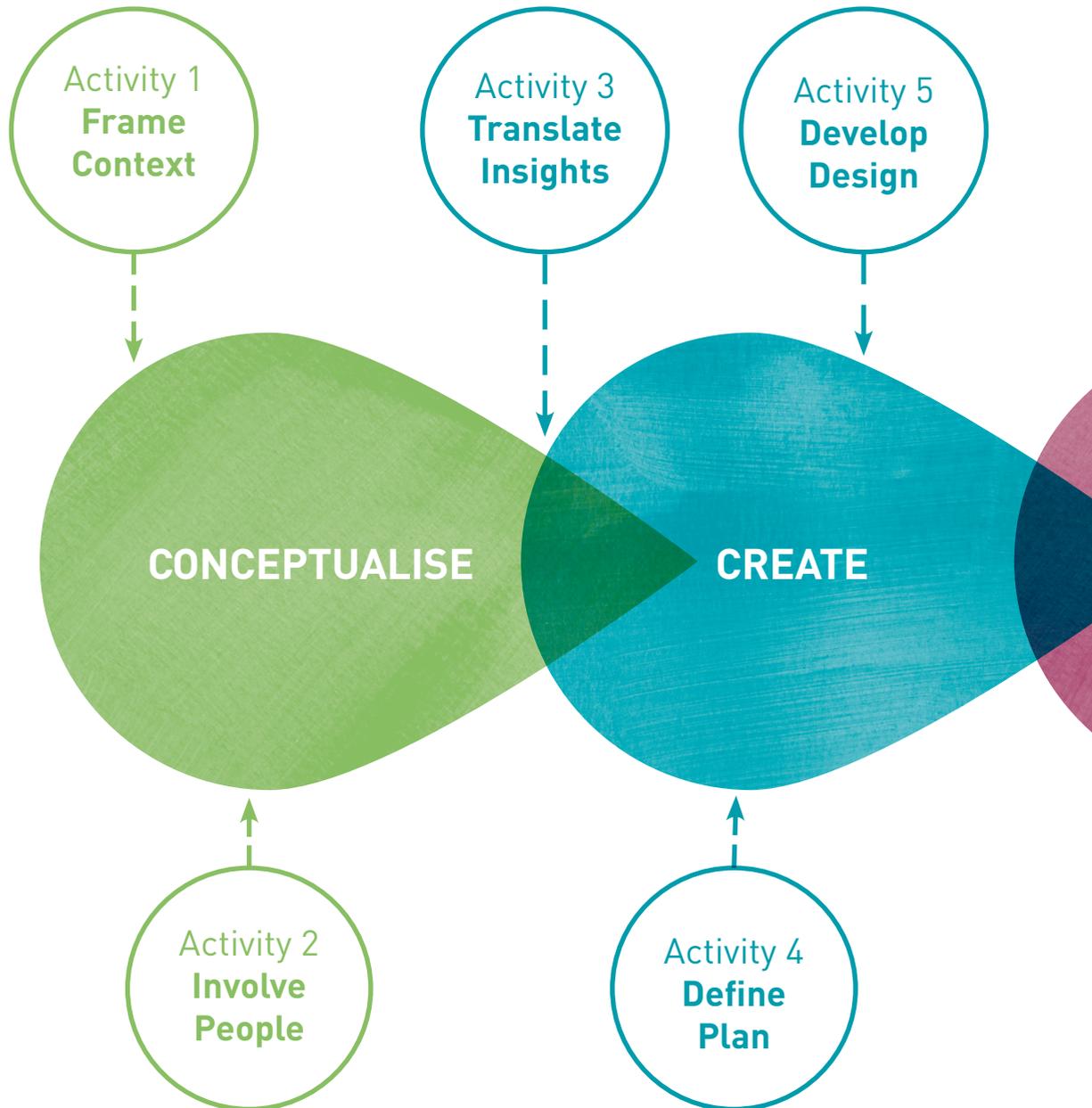
This diagram outlines a typical architectural process from briefing through construction to handover.
It is simplified into four main stages. A number of Inclusive Design activities can be added at different points to enhance the project. The activities are described in more detail on the following pages.

Activity 7
Building Management

Activity 9
Resource Building

CONSTRUCT

CONTINUE

Activity 6
Construction Stage

Activity 8
Post-Occupancy Evaluation
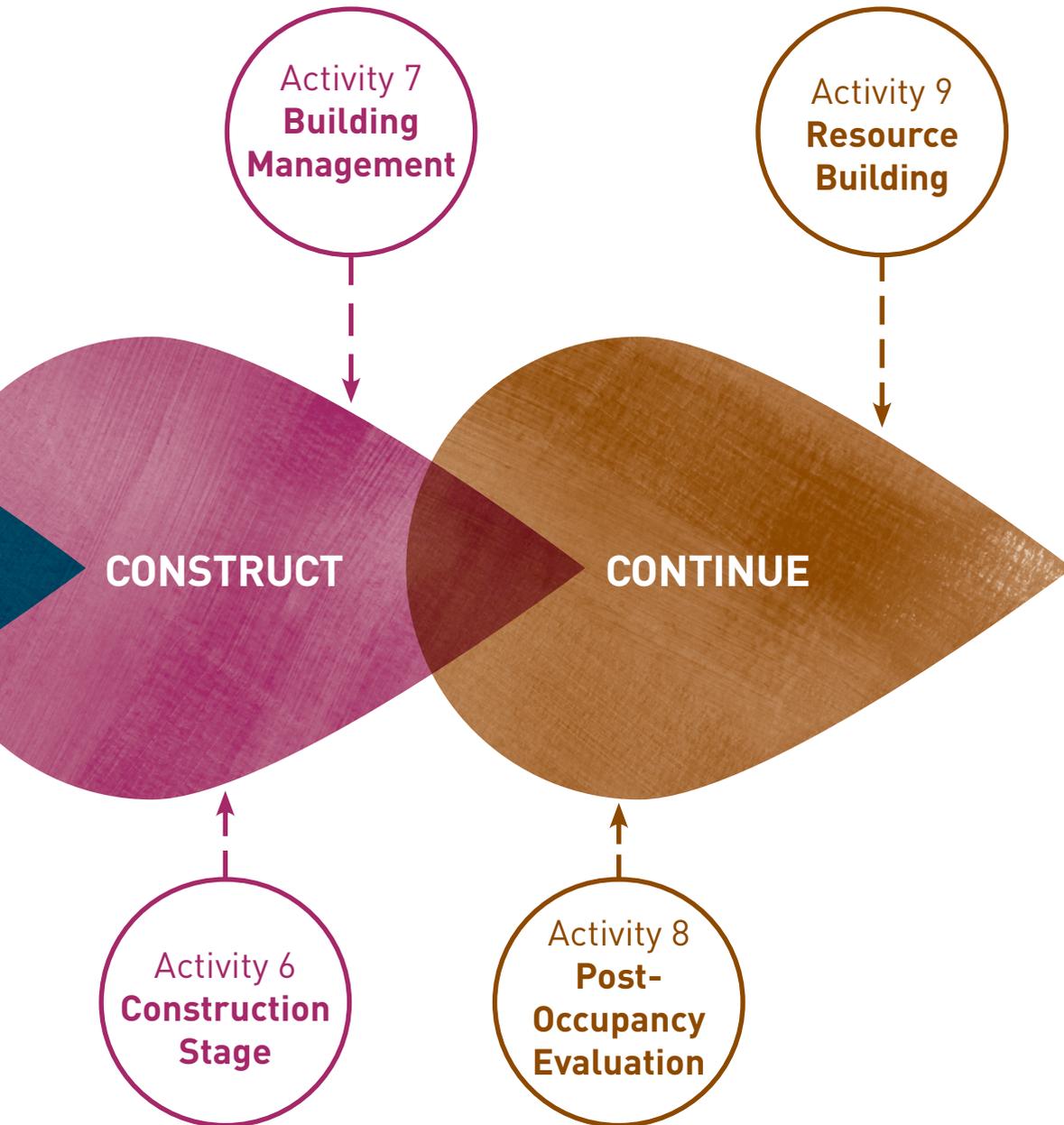
ACTIVITY 1
FRAME CONTEXT

This activity gives a better understanding of the context and purpose of the project, based on the vision by the client or developer.

At the start of any project, it is important to understand and clarify legislative requirements, as well as the social context, in order to ensure an Inclusive Design approach. This can be achieved through early-stage user consultation as well as focusing on inter-disciplinary collaboration. Ensure that relevant competencies are involved in the project, and methods for capturing and sharing knowledge are established (see Activity 9).

METHODS

– **Workshop:** Initial sessions to introduce the concept and methods of Inclusive Design to ensure that this is embedded from the start and introduced to all stakeholders – you may need different workshops for different groups, such as users versus project managers. A theoretical and practical understanding should be defined and tailor-made for the project.

Literature research: See what information already exists and look at guidelines and recommendations from legislation, other projects and practitioners. Look at emerging trends, desk research, books, academic publications and digital media to assess current and future context.

– **Similar projects:** Learn from the successes and failures of other projects that compare to yours. Map insights and draw inspiration from case studies.
– **Inspections:** Conduct on-site walk-throughs to see the project context at first hand. You can involve stakeholders, community representatives, the project team as well as people with diverse needs (e.g. lead users, see pages 38-39) to give diverse perspectives on initial challenges.
– **Experience at first hand:** Visit similar sites and projects to further explore context and issues. This type of immersive experience can inspire ideas and set direction.
– **Define collaboration:** As most projects are highly collaborative and involve many people at different stages, it is important to set up communication and collaboration strategies to build trust.
– **Champion Inclusive Design:** Ensure that Inclusive Design is visible through the creation of guidelines, checkpoints or even a named champion. Establishing a core team drawn from the different project partners will support this. Ensure an interdisciplinary approach and equal voice.

END RESULT

By completing this activity, you will deeply understand the business case, developer's aims and user requirements. You will identify goals, create common objectives and uncover economic interests and social incentives. The creation of an interdisciplinary core team in this initial phase will produce better solutions, fewer mistakes, higher quality and a focus on Inclusive Design, alongside other issues. This leads to positive cooperation and facilitates continuous follow-up throughout the process.
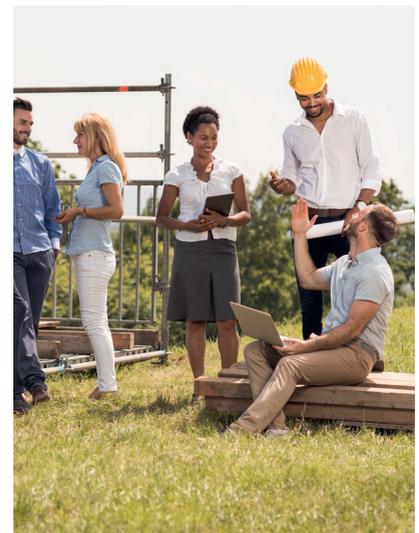
ACTIVITY 2
INVOLVE PEOPLE

Drawing on the goals and specifications, you can prioritise and challenge the initial project ideas to develop people-centred engagements.

Every project involves people or communities with different needs and aspirations. Mapping these and reaching consensus is a part of the creative briefing process. This will provide a framework for solutions Progress the client's vision, ambitions and expectations in response to the insights you uncover. It is good to check and even challenge the initial issues that the developer or client has presented. This activity defines various user groups and stakeholders for involvement. Scale the level of user engagement to fit the project.

METHODS

– **Highlight key participants:** Each phase requires a distinct set of people who play important yet varied roles within the project team. These include architects, consultants, designers, access advisors, contractors and project managers, amongst others. A particular challenge can be ensuring that all members of the design and construction teams understand the detailed Inclusive Design requirements and do not deviate from the vision. This can be achieved by strengthening communication, and producing a level of oversight throughout. Appointing a champion and creating clear guidelines will also help.

– **Identify lead users:** Select user groups and stakeholders, such as the people who will use the space, live next to it, maintain it or own it. Make sure that all groups are involved and that insights are gathered from a variety of people. Research should focus on supporters as well as actively involving those who are less visible or marginalised (see pages 38-39).

– **Methods, focus and framework:** Define methods for engaging with users and stakeholders using different tools, such as interviews, observations, provocations or virtual reality workshops (see pages 76-99). Designing the research is a creative and important activity. Use insights that you gather to identify and map key issues, looking beyond the obvious to uncover hidden needs and perspectives. Co-creation is at the heart of this activity, so be prepared to have your ideas challenged. However, this can spark more creative solutions that are relevant to the end-users.

– **Define expectations:** Look at what the client wants, as well as the user's expectations. Get perspectives from other professionals, such as an anthropologist or a service designer. This is not simply about bringing novelty value to the

project but about enabling innovation at a deeper level.

END RESULT
This activity will give you rich insights that provide a solid evidence base for creating an initial brief that is people-centred and useful for both the core team and the users of the solution. It can help to set common objectives to drive the operational plan. It will also provide an Inclusive Design landscape, and the methods you create can be refined for the next project. Insights can be captured and documented for future use. you will always get more insights than are applicable for a single project.

SUB-CONTRACTOR

SUB-CONTRACTOR

CONTRACTORS

ARCHITECTS

COMMUNITY

LEAD USERS

OTHER DESIGNERS

CORE TEAM

INCLUSIVE DESIGN ADVISORS

DEVELOPER

CLIENT
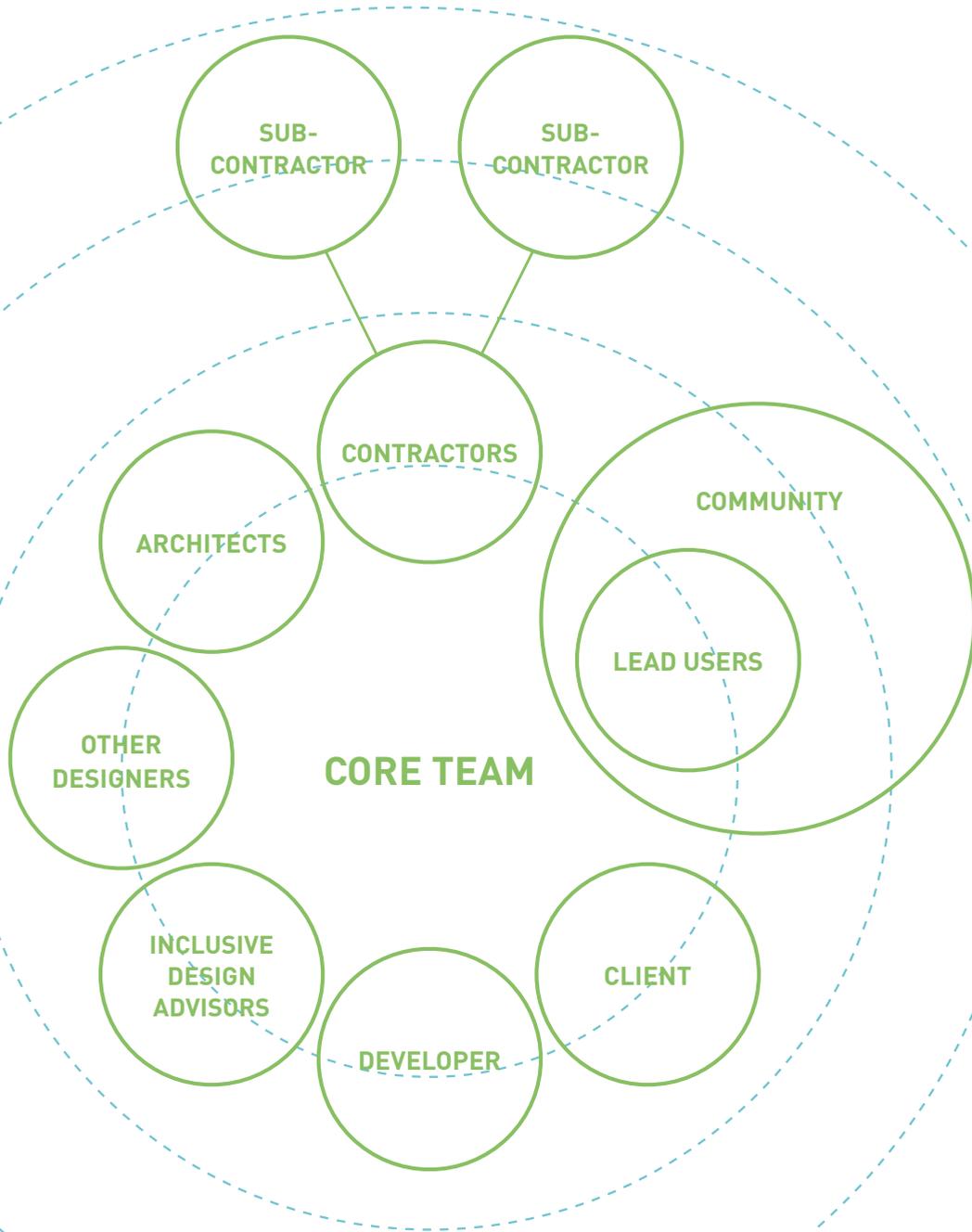
ACTIVITY 3
TRANSLATE INSIGHTS

Having involved people and worked with them to gain insights, this activity looks at interpreting, selecting and analysing relevant user information.

User insights can help you focus and improve the end results and solution. You now need to identify conflicting interests, possible barriers and main obstacles for achieving the vision and ambition of the project. Once these are established, they can become a source of innovation. Mapping and clustering insights is an important part of this activity. This is about making sense of research data. Refer back to the vision and objectives of the project when describing insights.

METHODS
- **Review data:** Assess the data that has been captured, and look for patterns as well as gaps in the research. Do not get lost in the details but make sure that the findings represent the broader picture. Look over the raw material, such as photographs, videos and transcripts, to review.
- **Cluster data:** Organise the data into groups and create a framework that allows the project team to access information readily. Separate and archive information that may be useful in the future, even if it is not directly relevant to the current project.

- **Represent data:** Visualising the data you have gathered is an important milestone and can support the research integrity of the project, providing an evidence-base for decisions. Good representation is equal to good communication. Be visual and qualitative in the way you present material. This can be done by using photos, video clips, quotes or themes.
- **Translate into directions:** Look at how the user feedback can generate new solutions and new directions at the briefing stage. Present the findings in an comprehensible way for architects, developers, contractors and sub-contractors. This forms a basis for further decision-making.

END RESULT
Completing this activity will ensure that user knowledge and insights are not only gathered but actively embedded within the project's objectives and approach. The data that you gather, select and present will be in a usable, translatable format with project directions now verified with users. You will have gathered insights through user involvement and created a working document of these that you can revisit throughout the process. You can also create an "insight bank" which digitally captures your user research (see Activity 9).

ACTIVITY 4
DEFINE PLAN

At this point, the project plan is being finalised, the procurement route is being defined, and you are preparing to develop the design proposal.

When developing the plan, it is important to exercise, implement and operate Inclusive Design principles, using the knowledge gathered from the previous activities. Although there are many different aspects that need to be included in the planning, and reflected in the procurement strategy, Inclusive Design is an important one, and complementary to many of the others. Doing this will give you a definitive, operational project plan that draws on the analysis and interpretation of the previous phase.

METHODS

– **Setting direction:** As part of the creative process, you can write more than one brief, and then further narrow down the selection. The brief should reference the original goals whilst accounting for changes that have been driven by the user research. Ensure that user perspectives are written into the brief, even on large, complex projects. Briefs can be short – a Hollywood movie is pitched using a "logline" of 50-100 words!
– **Consultancy agreements:** Use the brief to highlight the key participants and contributors in each phase, looking at how to interact, collaborate and communicate at each milestone in the project plan. This would

involve the architect, consultant, access advisor, project manager and end-user. It is good to ensure that each person or group that is involved complies with the Inclusive Design principles and guidelines that have been set. Write this into the consultancy agreements and contracts as a contractual requirement.
– **Milestone markers:** The brief will outline critical stages in the decision-making process and define the points of "no return". Inclusive Design gives a people-centred framework to enable the right decisions to be made at the right time. This will benefit most people and support the validity of these milestone stages. User involvement is becoming a self-evident (if not legal) part of consultation, and increasingly architectural schemes rely on this type of approval before beginning the next phase of work.
– **Common understanding:** Through Inclusive Design, the brief should ensure that everyone is "on the same page" and anchored to the same intentions and perspectives. An inclusive approach that is championed by the core team, will enable this. This can result in shared ownership of the work and joint acceptance of project goals and ambitions.

END RESULT
At this point, you will have adjusted the project plan and strategy to include the results of the user involvement phase, and created a final project brief that has Inclusive Design embedded within it. This ensures that your project will meet legislative requirements, not just at the conceptual phase but throughout build, delivery and use. You will typically future-proof your project and exceed expectations, especially if your contractor commitments to Inclusive Design go beyond the standard legal requirements. This is where you unlock the innovation potential.
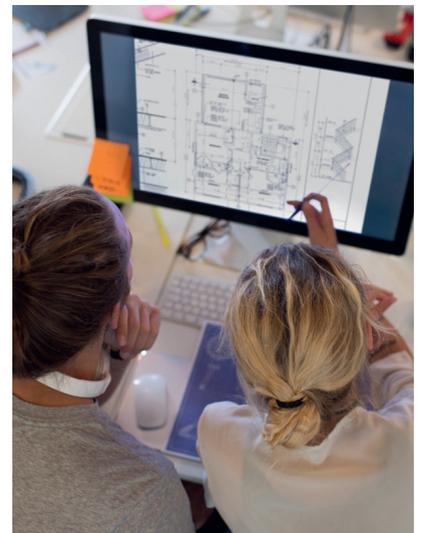
ACTIVITY 5
DEVELOP DESIGN

The developing design should be co-ordinated with technical aspects including structural and building services information.

This is the stage at which the design is being fully developed. At this point, activities focus on verification with users to pinpoint deviations, alterations and progressions from the original project plan to ensure that changes comply with the Inclusive Design guidelines. Make sure all team members in this phase share goals that reflect findings and feedback from users, especially new team members who are brought in alongside the core team.

METHODS

– **Multiple solutions:** It may be impossible to find one solution that fits everyone in an appropriate way. Create a combination of different options that can cover diverse needs and abilities. Inclusive Design is about providing choice.

– **On-site testing with people:** Use models, drawings and even full-scale prototypes to trial your designs. These could represent elements of your scheme such as an entranceway or part of a space, or could look at specific details such as choice of materials. Move beyond traditional communication, such two-dimensional images and scale models, to include mock-ups, virtual reality and immersive experiences to engage people.

– **Ongoing design reviews:** It is important that all drawings and specifications are reviewed on an ongoing basis throughout the design process to ensure that the Inclusive Design guidelines and brief have been followed. These updated design reviews should be recorded and circulated amongst the team members and other relevant stakeholders.

– **Engaging contractors in the process:** Inclusive Design issues are often overlooked during design and construction phases, so decide how to educate and involve your contractors and sub-contractors. This could involve some non-traditional solutions, such as embedding the working team within the community, or having user representatives join them as project contributors.

END RESULT

Testing the solution in detail and prototyping elements for assessment makes sure that user needs are considered as the construction begins and can help steer a project away from costly mistakes. This is also a way of ensuring a more innovative, people-friendly outcome. Capturing research and early feedback will provide you with an evidence base that can help reassure stakeholders about on-site decisions.

ACTIVITY 6
START CONSTRUCTION STAGE

Evaluation with users should happen iteratively throughout the construction phase to allow deviations to be proposed, discussed and verified.

The supervision of construction and production is also important to ensure that Inclusive Design principles are adhered to. Decide whether you bring in a separate Inclusive Design champion, or ensure that the existing team members represent these values throughout this stage. Inclusive Design values can be driven by anyone, including the architect, project manager, developer or even a separate consultant, but they have to be given the role and responsibility. Communication is key, and building trust is central to this. Make sure that new team members, contractors or sub-contractors who are brought in, follow the project's Inclusive Design guidelines.

METHODS

– **Detailed guidance:** Make sure that all the contractors have the project plan, updated drawings and specifications in order for them to understand and follow the Inclusive Design guidelines and brief.

– **Follow-up meetings:** Connect and check in with the contractors, sub-contractors and builders throughout this phase using different methods of communication that is appropriate to them. Regular compulsory meetings where tasks are stated and allocated can help to clarify and request commitment from everyone. Write Inclusive Design requirements into the contracts to ensure compliance and give all parties responsibility for their individual contributions.

– **Educate through workshops:** Ensure representatives from your previously defined user groups meet with contractors, suppliers and builders to help them understand Inclusive Design from a practical point of view and engage with diverse needs and abilities. Workshops are a good way of bringing people together and showing them why this is important.

– **Create access to insights:** Make sure that all partners, participants and stakeholders can access the guidelines and insights from the user research so that they make the right decisions moving forward on specification, construction and detailing. Create a live, active platform that is easy to access and understand. Look at new and emerging digital solutions and tools (see pages 98-99) and make this appropriate for use on mobile devices such as smartphones and tablets.

END RESULT

This activity will allow the stakeholders to ensure that all Inclusive Design requirements are met as the project moves from detail design through to construction. This ensures that new participants on the project have the understanding, ability and permission to stay true to the original principles of Inclusive Design as set out at the project start. Establishing an Inclusive Design champion or watchdog also adds another skillset to your team, and one which could help win you more business in the future.

ACTIVITY 7
SITE MANAGEMENT

At this stage, the construction reaches completion and it is now the managers of this complex phase who are responsible for implementing Inclusive Design.

During this stage, site management becomes important, as many types of contractors, installers and finishers will be on site, and in an effort to streamline efficiency and reduce costs, changes and deviations can occur. This should not compromise the Inclusive Design vision and guidelines, as a mistake here could jeopardise the whole Inclusive Design ethos of the project and negate the outcome. Intentions have to be translated into action. The managers must be able to make decisions and involve user groups when unforeseen situations occur. This will keep Inclusive Design at the forefront, and remind the teams on site of the economic, creative and inventive, as well as social benefits of the approach.

METHODS

– **Atmosphere:** Encourage open communication between the on-site teams and all the specialists involved. If the architect is no longer involved, then responsibility for championing these views needs to be reallocated to someone else. To help communication, avoid using complex jargon.

– **Conflicting interests:** This stage might feel like a war-zone, with conflicting interests. However, it is key to keep communicating and respecting all the different perspectives. Keep reminding the team of the intention and vision, so that all parties understand the Inclusive Design purpose and benefits. Even the newest members of the team can then be quickly aligned to the ambitions by the existing members.

– **Communication with suppliers:** Althoughthe core project team will have understood and implemented Inclusive Design values, temporary team members will be present, in the form of sub-contractors and suppliers. Strong lines of communication and oversight can help ensure that they also align and integrate.

– **Training personnel:** As important as training the users of the building, is the training of the managers, operators, owners and service personnel. Advising them of the user needs you have addressed, and the solutions you have created to support this, will help them create a longer-lasting, more inclusive building that works as intended. Simple things, such as the placement of bins, signage, cleaning and building maintenance, make a big difference to everyone's everyday life. Make sure the level of training is appropriate for different contexts, e.g. domestic versus public buildings.

END RESULTS

At the end of this activity, your project will be delivered with all team members in the different stages following a people-centred approach. Strong communication will have been established and you will have received feedback on the process – both on final solution and as a result of user involvement. You will understand what worked and what did not, and ensure that your project effectively moves into the next activity.

ACTIVITY 8
IN-USE SERVICES

The typical methods of Post-Occupancy Evaluation (POE) can be expanded to involve the existing lead users from the project, as well as introducing the end-users.

You will have built up a network of lead users throughout the project, and a method such as POE can assess the solutions from their point of view. Refer back to the early stage insights and assess how successful the delivery has been. Discuss variation, and why this has occurred. Consult new users, such as incoming occupants. Existing Inclusive Design guidelines will help steer this activity.

– **Post Occupancy Evaluation:**
This measures people's satisfaction with buildings, space and surroundings once they are in use. This is done by referring back to the initial vision, objectives and guidelines that were set and honestly assessing whether they have been successfully addressed. In addition to the existing users, think about other lead users who will give interesting feedback.

– **Training of occupants:**
Support people in embedding themselves in the space. Inclusive Design solutions should be easy to understand. However, in-depth explanation or training will introduce facilities in a more intuitive way. This could cover many aspects, from wayfinding, access, fire exits and adjacencies.

– **Codes of use:** Secure the right code of use for the building. In Norway, this is called the FDV documentation, a regulation that covers management, operation and maintenance. Rules will vary according to local context, but most cities and countries will have codes of use. Although not always directly applicable to Inclusive Design, there will be codes affecting aspects of the design that do.

– **Expert evaluation:**
Include Inclusive Design experts in the evaluation to enable a large amount of feedback in a short amount of time. Selection of these experts is critical and you should build up a group that you can call on throughout.

END RESULT
If users have been involved in the POE process, they will feel more involved in the building and feel a sense of ownership. This could result in higher POE results. By expanding the POE to include users and experts, you will get a better sense of how successful the project is and how it will be used. This can feed ideas into your next project, future-proofing your practice across evolving legislation. A successful, people-centred POE will improve your next project.
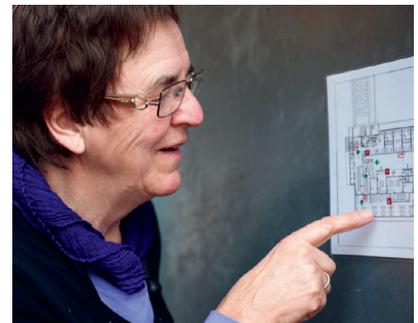
ACTIVITY 9
RESOURCE BUILDING

At the end of the project there are insights, methods and information that could be used to improve subsequent projects. It is valuable to capture and organise these.

You should create a data-bank of information that can benefit new projects. Even insights that you gathered that were not applicable on an existing project could be utilised on another scheme. You will typically have created and adapted methods, so capture the changes. Planning how you build resources from the early stages can save time and effort, adding skills to your practice and helping you communicate results in a more evidenced manner.

– **Plan documentation from the start:** To simplify the gathering and utilisation of user insights and methods, plan how you will do this from the beginning and how you will create a process of continual capture throughout. Decide whether this is the sole responsibility of an individual or whether you will make this part of team practice. Setting milestones and goals with checkpoints in place will ensure that this happens, even on a large, complex project.
– **Save and keep insights:** As well as benefiting new projects, you can also learn from mistakes. Cluster insights into themes to develop insight databases, image libraries and digital recordings. Providing easy access will help the current project team as well

as future ones. This is an investment that will pay off. Recognise the ethics behind the data you have gathered and adhere to the local legislation.
– **Decide on access:** Some aspects of your documentation will be for internal use and some will benefit from external access. The former can help build your business and competence and the latter is about showcasing results and skills. Both represent expertise that can distinguish you in the marketplace.
– **Look at the bigger picture:** Information from your insight bank can give everyone from developers to politicians a better understanding about how people actually want their cities to develop and their spaces to function.

END RESULT
People who have been involved may be more willing to participate in your next Inclusive Design activity. They will see how their contribution has impacted on the result and this can lead to citizen empowerment. Information gathered will give you a better understanding of what different people actually want from their buildings and neighbourhoods. A great result will raise the reputation of any stakeholder, such as the construction company, developer, builder or architectural practice, leading to new business.
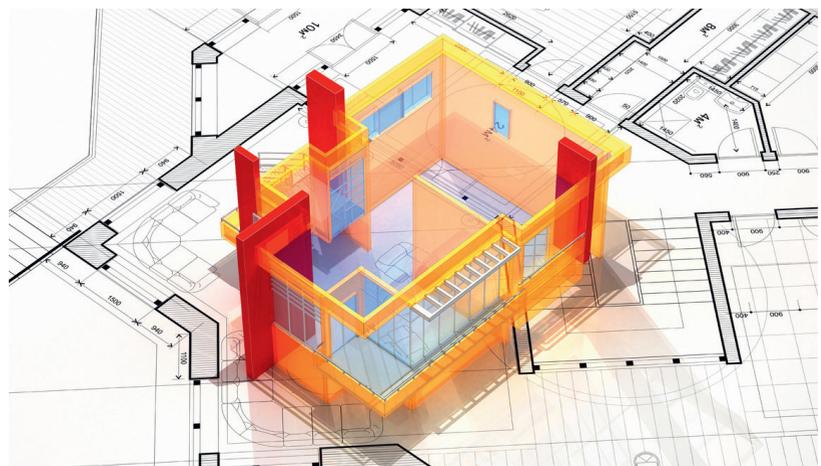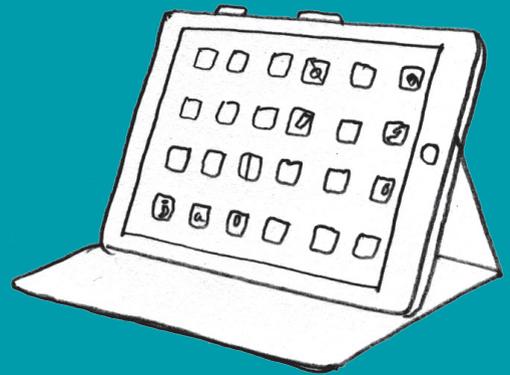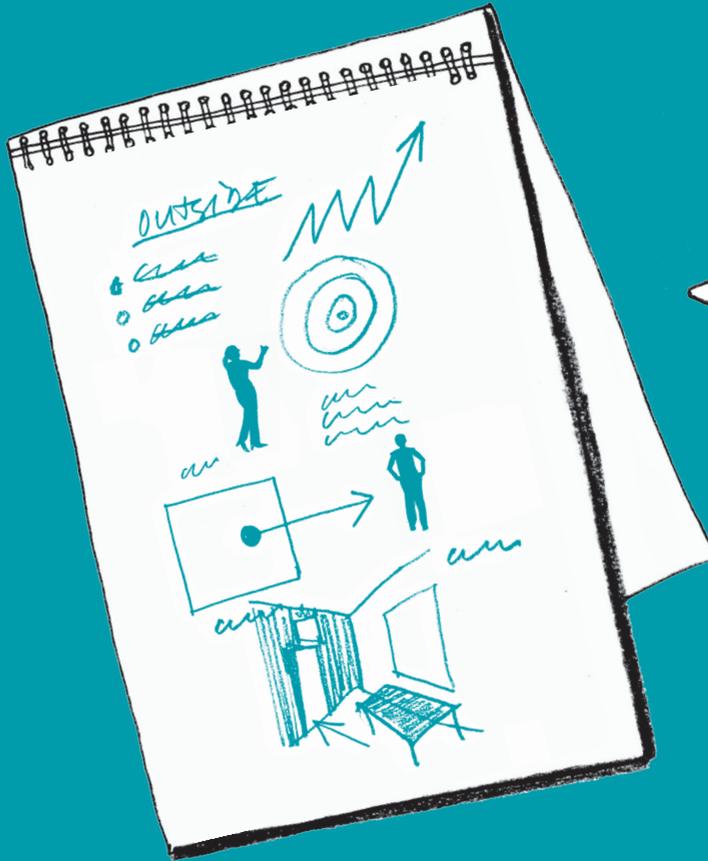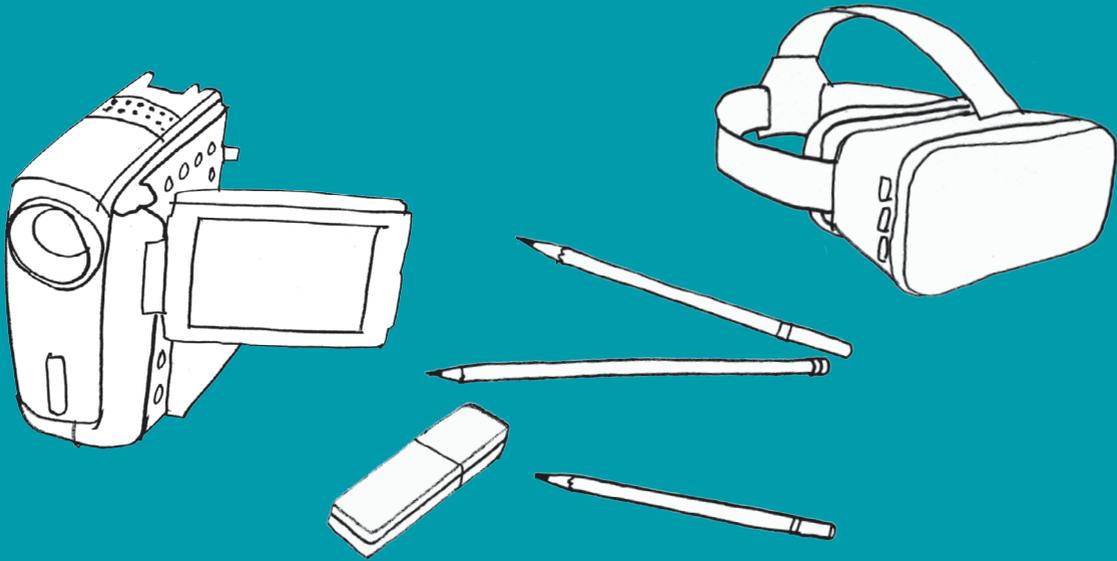
TOOLS

This section gives you practical advice on using a number of different tools for conducting research with people. There are low-medium and high-contact methods that reflect different levels of engagement and resources needed. Each tool is outlined, giving strengths, weaknesses and useful tips to help you in the field.

RESEARCH TOOLS

These tools and techniques enable you to conduct research with people. These can be used even if you have little or no experience. The nine research tools outlined here will help you to gather insights and feedback effectively. They are not just for designers and architects, but can be used by anyone.

INTRODUCTION

There are many different research techniques and methods and they all have varying strengths, weaknesses, levels of user involvement and resource requirements. The methods outlined here talk about how, when and why you might use them. However, not all methods will suit all purposes, or be applicable for all individuals or groups you will work with. For example, group interviews are not suitable for people with poor hearing and web surveys cannot be answered if the respondent does not have digital access.

The table below arranges the research methods into categories of low-medium and high-contact. This ranks them according to a number of factors:

1. The degree of interaction with the person or the group.
2. The depth to which insights can be explored.
3. Time and resources needed to arrange and prepare your research.

For example, natural observation, where you observe people's behaviour without talking to them, has little interaction, and as a result the depth to which any observed insight can be explored is also low. This is not to say that the insights gathered are any less important, but that this set of tools are suited to discovering insights rather than examining them deeply.

There are no fixed rules as to when tools should be used, but low-contact tools tend to be used at the beginning of the development process, medium-contact throughout and high-contact in the middle and at the end. Most of the tools can be used in combination with each other. For example, a visit to a user's home may combine a questionnaire with an interview, and controlled observation with a specific task. You should decide how and when to use the tools to suit the type and level of information you require.

TIPS ON CONDUCTING RESEARCH

- Set your research goals: think about the scope of the project, and what you are trying to find out. This can help to select the right tool.
- Adapt your techniques: use this guide as a framework and adapt each study according to the user and the focus of the project. This can range from taking into account a potential users disability or developing a new method to capture a particular type of information.
- Always get consent from people when recording them.
- Make people comfortable and inform them about the purpose and intention of the information you are collecting.
- Do not forget that you are asking people to help you. Thank them in return. See them as co-producers and collaborators rather than test subjects.
- See research as a creative activity, not just a mandatory part of the process

LOW CONTACT	MEDIUM CONTACT	HIGH CONTACT
Questionnaire	Interview	Controlled observation
Web forum	Research kit	Workshop
Natural observation	Design provocation	Evaluation

THE INVESTIGATIVE MIND
Adopt the correct frame of mind. You need to put aside your own thoughts and prejudices and be willing to see from another person's perspective. To help you here is a list of 10 guidelines to keep in mind when conducting a user study:

1. Ask the question 'why?' You may see what people are doing, but understanding why they are doing it will give you more understanding.

2. Look beyond surface actions. Think about what the person is trying to achieve, what their intention is and what their aspiration actually is.

3. Look for makeshift solutions to problems. These are often indicators of an unfulfilled need.

4. Explore habitual or accepted behaviour. Be aware of things that seem normal just because many people do it, but question the underlying reason.

5. Look for people misusing or reinterpreting the function of a design. Find out the reason behind it to understand what could be done better.

6. Pay attention to things that people have difficulty with and try to uncover the reasons. It is likely that that others will also face the same problem.

7. Do not focus just on the subject matter, but also consider the context, as this can influence also e.g. time of day, the location, ambient noises, etc.

8. Examine interactions such as the relationships between people, and between people and things.

9. Be aware of the whole process that people follow, both physically and mentally, and leading up to and beyond your particular event of interest.

LOW CONTACT
1. QUESTIONNAIRE

A list of questions sent to users to find out what they think or feel about particular issues. Can be printed or emailed.

WHEN

Usually used in the early stages to identify issues and areas for further research

ISSUES

- Choose the right type of question to get the type of information you want, i.e. structured, semi-structured or open questions

- The format needs to reflect the type of answer required for each question

- Decide on a delivery method, whether it will be completed online, sent by email or post, or whether the investigator will be present

STRENGTHS

- A relatively quick and cost, effective way to reach a large number of users

- Good for access to users who may live far away or for those who wish to remain anonymous

- The standardised format makes it suitable for comparison between different users

- Both quantitative and qualitative information can be gathered. You can ask for written responses or tick boxes

- A good way of getting a broad overview of a subject where no other information is available

WEAKNESSES

- Leading questions can bias responses

- It is hard to predict or control the response rate

- Explanations cannot be given to a user who does not understand a question unless the investigator is present

- Questionnaires can seem impersonal, making users less likely to engage

- No access to observable context or behaviour, and responses are limited to things of which a user is conscious

- The information gathered can be dry or uninspiring and not visually compelling

HOW

1. Find people willing to participate and include an introduction to the study along with your questionnaire to give them context.

2. Consider the needs of your users when writing the questionnaire. For example, those who are not computer literate or are visually impaired will have different requirements.

3. Aim for the questionnaire to take approximately 10-20 minutes to complete.

4. Trial the questionnaire with a colleague first, then edit it to improve the clarity and ease of use.

5. Focus on the topics that interest you. Do not try to cover everything, or the user will lose interest.

6. Make the questions simple and clear. Avoid negatives in the question, as these may influence the response.

7. Use tick boxes, scales, ranks and charts to reduce writing tasks.

8. Formatting is very important. Think about the sequence of questions, break them into sections and use pictures where appropriate. Indicate the type of response expected for each section.

9. Send the questionnaire to more people than you require, as the response rate is unpredictable. Quantitative surveys require a larger sample to achieve meaningful results.

10. Use an online questionnaire maker where appropriate, as these can manage and sort the data for you.

GOES WELL WITH

– Interviews: a questionnaire can serve as a topic guide for an interview or the basis for a follow-up interview allowing the users responses to be explored in greater detail

– Research kits: a questionnaire can be included as part of a research kit to gather background information

BEST SUITED TO

– Gaining a broad overview of a topic and asking preliminary questions to prepare for further investigation

– Gathering quantitative evidence to support further investigation

– Getting information on specific topics where no other information exists

LOW CONTACT
2. WEB FORUM

The investigator posts questions on a web forum for members to respond to or reads existing posts that people have already written.

WHEN

Used during the formative phases or to target specific user groups

ISSUES

- Decide whether you want people to respond privately to you or publicly to the rest of the forum

- Make sure your questions are appropriate for the forum and within the rules of conduct. Get permission for any activities you perform or any information that you use

- Decide whether you require anecdotal responses or a survey with "yes" or "no" answers

STRENGTHS

- A relatively quick and low-cost way of reaching many people within a community that may already be interested in your topic

- People are likely to engage and respond to your questions, as web forums are already there for discussion

- You can ask targeted questions and find a rich supply of information on a specific topic

WEAKNESSES

- No opportunity to observe behaviour or context at first hand

- Users are anonymous and responses cannot be verified

- Over-enthusiastic forum members may lead the discussion away from your topic

- Impossible to gauge the response rate, and it might take some time for people to get back to you

- Knowledge of user is limited to answers on a specific theme unless further information is sought privately

HOW

1. Search for forums online that deal with your subject of interest. Be sure to read existing threads on similar topics first. This can help to find out the information currently available and prevent you posting the same questions again.

2. Get permission from the forum administrator where necessary and adhere to forum rules.

3. Be honest about your presence. For example, do not pretend to be over 65 if you are not.

4. Forums are well suited to qualitative responses so try to ask questions such as "does anyone have a problem with…" or "what do you think about…"

5. If appropriate, post pictures relevant to the subject matter to help drive the discussion.

6. Only cover a few topics within the general forum. If people are interested in the discussion, start a new thread.

7. If people are willing, it can be useful to contact them privately and explore their answers in greater depth. People may also be more willing to provide photographs and better contextual information.

8. Record the discussions and responses along with any photographs.

BEST SUITED TO

– Finding out specific information at the early stages to understand the issues before going out into the field

– Gathering real-world insights and personal stories from people to build an evidence base for your approach

– Making use of established expertise and experience and talking to many individuals at the same time

LOW CONTACT
3. NATURAL OBSERVATION

Observing people in their natural setting with no interference from the investigator to see how users actually behave within a given context.

WHEN

Used during the exploratory phase or to gather key insights into general behaviour

ISSUES

- It is important to remain unnoticed. The investigator must take care not to be intrusive and make people uncomfortable

- Choose locations to observe, rather than specific people to follow. It is a criminal offence in some countries to follow people without their permission

- Observe group behaviour rather than focusing on any individual. Use in public spaces rather than private areas. Do not stalk, stare, use a telephoto lens or do anything else which might be illegal or disrespectful

STRENGTHS

- Gives honest and insightful information. The user is acting in a natural context and is not influenced in any way

- Can uncover behaviour of which you were not previously aware

- Can reveal surprising or unexpected events

- Can capture ordinary interactions between people, products, services and environments

- Good for seeing surrounding contextual information

- Will create visual data to act as inspiration

- Requires little preparation time and can be started at short notice

WEAKNESSES

- Cannot guarantee a specific event will occur

- Time-consuming to conduct. You might have to sit for several hours in a particular place

- Time-consuming to analyse and reveal insights. You may have to review images or video later to notice additional insights

- Users are not interviewed, so the investigator could misinterpret what they see

- Cannot capture user personality or history beyond the observed duration

- Confined to public spaces which will allow you to take photographs or video

- Difficult to observe vulnerable groups such as children

HOW

1. Choose a location that relates to your research topic and observe how people act within that space.

2. Be prepared to stay in one location for several hours. Between 1-2 hours is enough to provide some meaningful information or indicate whether the location is suitable.

3. Pay attention to the context, even information that may not seem important at the time. Try to record points of interest, time intervals, sketch layouts, floor plans, movements and dynamics.

4. Take a still camera or video camera where allowed. You can capture complex situations in great detail and examine them later.

5. Have your camera on and ready as important events may happen at a moment's notice.

6. If the observation is task-based, then participate. You will experience the context at first hand and blend in with other people.

BEST SUITED TO

– Forming an opinion quickly on a large topic such as looking at the problems people have whilst travelling through the city

– Gathering insight on general behaviour, actions, interactions, procedure and context rather than gaining specific information from individuals

MEDIUM CONTACT
1. INTERVIEW

Conversation between the investigator and the user or expert. Questions are asked by the investigator and responses given by the person being interviewed.

WHEN

Generally used during the initial phases of a project, but can be of value throughout the design process

ISSUES

- Decide on a formal or informal tone. For a formal interview, develop a list of structured questions. In an informal interview you allow the conversation to develop naturally

- If possible, choose a location that is relevant to the user or the project focus, such as their home or workplace, so that you can see them in context

- Interviewing several people at once can be useful to assess group dynamics but the group must be well-known to each other to get useful information. The conversation needs to be controlled to give equal opportunity to everyone

STRENGTHS

- Relatively quick

- Good access to the personality of the user

- The conversation can be directed by the investigator and refocused if necessary

- Good depth of information achievable

- Good access to people's aspirations and emotional reactions

- Users can show or respond to objects that are relevant to the interview

- Investigator can gauge body language

TELEPHONE-SPECIFIC ISSUES
An interview can also be conducted over the telephone, but there are some pros and cons to be aware of:

- You can access remote users or those wanting anonymity
- There is no way to observe reactions or read body language
- Some people may prefer to speak by phone while others may open up better in person

WEAKNESSES

- Can be time-consuming to arrange interviews

- Relies heavily on quality of the questions and personality of the interviewer

- Questions can be leading, and you may influence the response. Users will sometimes give you the answer they think you want to hear

- Limited value for comparative studies. You cannot give every user exactly the same interview

- Limited to insights and issues of which the user is conscious and able to verbalise. You only hear what they say rather than see what they do

- Recordings can be lengthy to analyse
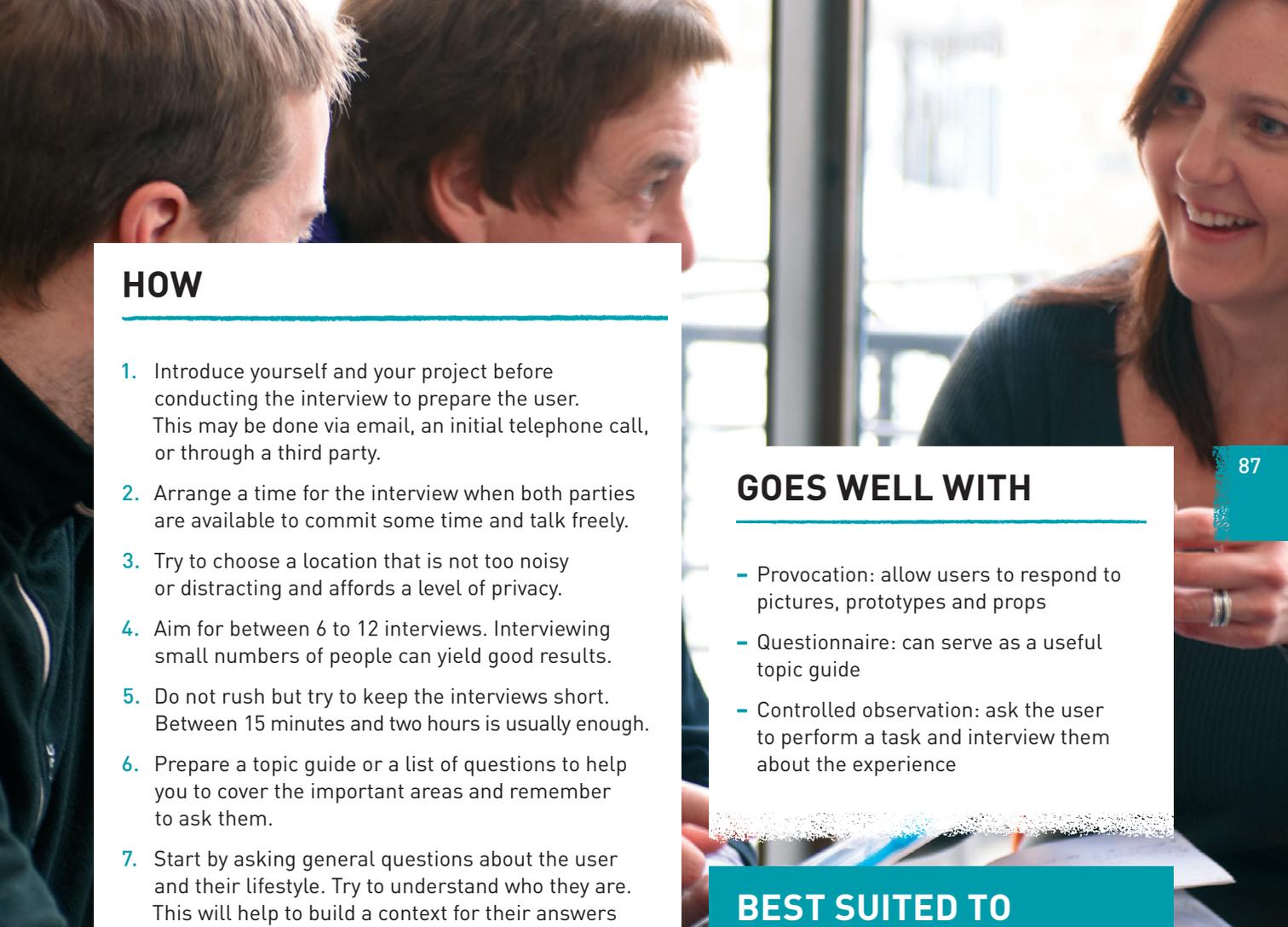
HOW

1. Introduce yourself and your project before conducting the interview to prepare the user. This may be done via email, an initial telephone call, or through a third party.

2. Arrange a time for the interview when both parties are available to commit some time and talk freely.

3. Try to choose a location that is not too noisy or distracting and affords a level of privacy.

4. Aim for between 6 to 12 interviews. Interviewing small numbers of people can yield good results.

5. Do not rush but try to keep the interviews short. Between 15 minutes and two hours is usually enough.

6. Prepare a topic guide or a list of questions to help you to cover the important areas and remember to ask them.

7. Start by asking general questions about the user and their lifestyle. Try to understand who they are. This will help to build a context for their answers and be useful when comparing responses from different people.

8. Do not be too rigid with your plan. Aim to lead the conversation to explore important topics but allow the user to answer freely.

9. Ask people to explain answers further if you want more detail.

10. Record the conversation where possible using audio or video, as it is difficult to interview and take notes at the same time. Always get permission. Never put the camera between you and the person being interviewed, as this creates a barrier.

11. Set aside some time immediately after each interview to make notes and general comments while they are fresh in your mind. This can save you hours of trying to remember the most interesting or important things later.

GOES WELL WITH

– Provocation: allow users to respond to pictures, prototypes and props

– Questionnaire: can serve as a useful topic guide

– Controlled observation: ask the user to perform a task and interview them about the experience

BEST SUITED TO

– Investigations into a specific topic area to gather details where no other information is available

– Gaining an in-depth understanding of individual people

– Getting technical information or opinions from experts

MEDIUM CONTACT
2. RESEARCH KIT

People are asked to complete research kits prepared by the investigator in order to capture information about their lives. Tasks and activities may include diaries, timelines, question cards, cameras, mapping and drawing.

WHEN

Used during the formative and exploratory phases. Can be used to generate design directions

ISSUES

- Decide whether users should complete it in their own time or while the investigator is present
- Depending on the individual, some people may easily engage while others may see it as a burden

STRENGTHS

- Can cover an extended period of time
- Can capture information when it is not possible for the investigator to be present, or in private areas such as bedrooms and bathrooms
- Good for capturing information about the lifestyle, personality and preferences of individual users
- Provides a good mixture of qualitative and quantitative insights
- Allows time for a person to reflect on an issue and give richer feedback
- Good for creating visual data for inspiration, and will give you material that can be used as an evidence base for decisions

WEAKNESSES

- Very reliant on the motivation and commitment of the user to complete the kit. Be prepared for a low response rate
- Badly designed or confusing kits will not be effective and produce limited results
- Insights can only be explored further when followed with an interview
- Time-consuming to design and create an effective kit
- Time consuming to analyse and reveal insights from the information gathered
- Potentially slow to gather information
- Not suited to busy users

HOW

1. Keep the research kit as easy and quick as possible to complete. A complex and lengthy kit risks being rejected by the user.

2. To encourage people to accept and complete the kit, make it appealing and attractive. It can be helpful to include a small gift to say thank-you.

3. Include an introduction and explanation of the project, and make sure that your instructions are clear and concise.

4. Think about the type of information that you would like to capture, and tailor the activities towards getting it.

5. Try to make the kit fun to complete. Keep writing tasks short and make it creative instead. Ask the user to fill in charts, draw or take pictures.

6. If you can, personally explain the kit to the user. Otherwise it can be helpful to include examples or suggestions to start them off.

7. Include an agreement form for them to sign and contact details where they can reach you should they have any questions.

8. Provide all necessary materials in the probe: i.e., pens, paper, stickers or disposable cameras. The user should not have to source or buy anything.

9. If the user is to complete the probe in their own time, give a firm deadline and include prepaid packaging with your address on it.

10. Due to the detailed amount of data to be gathered a small number of users is advised. Six to 12 will be optimal for most situations.

GOES WELL WITH

– Interview: interviewing the user beforehand will allow you to introduce subjects of interest and explain how to use the research kit. A follow-up interview after the kit has been completed will allow you to explore any insights further

BEST SUITED TO

– Capturing a broad picture of daily lives and context, especially if research over a period of time is required

– Providing insights into an individual s personality and aspirations

– Providing access to subtle or hidden issues that a person might not typically be able to articulate or demonstrate in an interview

MEDIUM CONTACT
3. DESIGN PROVOCATION

Showing props, visuals or sketch ideas to people to stimulate feedback and discussion. This is not about validating ideas but aims to provoke responses from your users.

WHEN

During the early and middle stages of the design process, to explore potential directions and create discussion around prospective ideas

ISSUES

- Decide whether you want the users to alter, influence or even create the provocation, or to simply give feedback on it
- Construct as either a group or individual activity

STRENGTHS

- Can help stimulate discussion and inform new directions
- Can present users with untested, future-thinking or even unfeasible ideas for feedback early on in the development process
- People are able to relate better to physical objects and visuals than abstract ideas
- Asking the user to respond to a sketch prototype can reveal the motivation behind their choices
- Early assessment of acceptability of design concepts
- Engages a person's imagination and their own empathic response

WEAKNESSES

- People find it difficult to see beyond details. You might want them to comment on the concept direction but they get hung up on the colour
- Users are not generally trained in design, so feedback must take account of this
- Ideas and discussion can be limited by the range of provocations shown
- Provocations may be too abstract for some users who need something more concrete to respond to

HOW

1. The investigator creates and brings a number of provocations to show to a user and ask for feedback.

2. Allow for as wide a range of provocations as possible in order to accommodate the subject being explored. Try not to be too conservative. This is an opportunity to push the boundaries.

3. Clearly explain the purpose of the provocation and what you hope to explore. For example, are you interested in the form, or function, or both?

4. Props can be used to help to discuss symbolic meaning, as well as to explore physical and tactile qualities. These are a selection of existing objects for the user to comment on.

5. Speculative designs can be explored by mixing or contrasting existing ideas. These are usually simple hybrid images or customisable sketches that allow people to create an ideal design for themselves.

6. Concept designs such as images, storyboards and sketch models can be shown to the user to help gauge responses and clarify needs.

7. Asking the user to explain their responses or decisions can help to understand motivations and potential design requirements.

8. Use the provocations as a starting point for discussion and feedback on designs and directions. Try not to get stuck on an assessment of the details.

GOES WELL WITH

– Interview: design provocations can be useful in an interview. They can add an extra layer of more specific feedback and help to focus discussion onto design issues

– Workshop: design provocations could be used as a creative activity or as a starting point for discussion within a workshop

BEST SUITED TO

– Focusing the design direction in the early stages of development

– Talking about ideas that users might not be able to understand or visualise without a physical piece to respond to

– Exploring a range of new ideas rather than finalising or validating

– Assessment and clarification of key features and requirements from a user perspective

HIGH CONTACT
1. CONTROLLED OBSERVATION

Observing people going about their normal activities with their consent. Presenting them with a task or design and observing how they complete or interact with it.

WHEN

Used during the exploratory phases and evaluative stages

ISSUES

– Choose the level of control. Are you observing the people performing everyday activities in their natural settings, or are you introducing them to a new environment and asking them to complete specific tasks?

– Decide on whether the observation space is controlled or no: for example indoors or outdoors, public or private

– Choose level of interaction between observer and user. Decide how much the investigator may be involved or whether the user will be left on their own

STRENGTHS

– Can understand user intentions and opinions by asking them questions during the observation

– Can recreate or simulate specific events of interest

– The user can be asked to repeat specific actions

– Good for understanding and capturing the natural context and external influences on the user

– Can uncover insights that the user is not aware of themselves and then probe them further

– A good way of seeing and documenting procedures or observing how people respond to different situations

WEAKNESSES

– People tend to behave differently when they know they are being observed. You might not see their natural behaviour

– People can become self-conscious and skew responses

– Difficult to recreate complex or group interactions

– The way that a task or scenario is presented by the investigator can influence the response

– Time-consuming to conduct observation and gather information

– Time-consuming to analyse all the information gathered

– Can be difficult to record the observation using a still camera or video camera in certain locations or situations

HOW

1. Plan your strategy for conducting the observation. Will you observe people going about their everyday business or will you recreate or simulate a particular event and set them tasks to complete?

2. When shadowing, only participate if it does not distract or unduly influence the user.

3. When simulating an event or activity, try to recreate natural conditions wherever possible. Choose your context and locations carefully.

4. Do not demonstrate when presenting tasks or scenarios for an individual to complete. They will then just do it in the way you have shown them.

5. Ask users to verbalise their thoughts during a task or process. This can help to understand their perceptions and decision-making.

6. When a user needs direction, try to assist without prompting them.

7. Take a camera, or preferably a video camera, as it allows you to capture complex situations easily. Recordings can then be examined in greater detail at a later stage.

8. When filming, try to set up the camera in a location where it is obvious and will soon be forgotten by the user.

GOES WELL WITH

– Interview: finding out about the user's will help to contextualise the observed responses and encourage the user to give explanations

BEST SUITED TO

– Experiencing the user's daily life and capturing the broader context

– Detailed understanding of a specific task, context, or action from a user perspective

– Giving feedback on existing designs and activities

HIGH CONTACT
2. WORKSHOP

A group of users led by a moderator participate in discussion and exercises to explore a subject or design idea in greater detail. People can be asked questions or directed to perform tasks.

WHEN

Used during the early phases to gain broader understanding of a topic and during evaluative stages to define problems or test ideas

ISSUES

- Engaging and controlling a group of people is challenging and requires a skilled moderator who is energetic, able to focus the discussion and has good knowledge of the topic being discussed

- Good time management is crucial when dealing with groups of people working together

- It can be difficult to capture and make sense of the information generated as workshops can be energetic events with many people talking at the same time

STRENGTHS

- Can explore multiple points of view within the same discussion

- Group participation can stimulate new ideas as people bounce ideas off each other

- Explores contrasting ideas and opinions

- Highlights differing user experience and expertise

- Feedback on design directions will come from different perspectives

- Can produce large amount of opinions and ideas in a short amount of time

WEAKNESSES

- Information can be less honest. People will be influenced by the group dynamics and will try to present themselves in a positive way

- There is a danger of leading questions. People may be influenced by the moderator and try to please them by confirming their suggestions

- People are limited to their own personal experiences. Do not expect them to come up with new design ideas but aim to capture their thoughts, feelings and feedback instead

- Strong individuals can dominate the group and influence the other participants

- It is easy to stray from the topic if the workshop not carefully and consistently controlled

- Workshops can be costly and time-consuming to organise. They need to be planned well in advance

HOW

1. Assemble a group of 6-10 people willing to participate in the workshop. Larger groups will be difficult to control while smaller ones will limit the scope. Choose a venue that is of an appropriate size and suitably private.

2. The investigator acts as the moderator facilitating the activities and encouraging discussion. It is essential to have helpers to set up and support activities.

3. Create a structured plan for the workshop and keep to it as much as possible. Timekeeping is critical when working with groups, and workshops can be very difficult to manage.

4. Plan for the workshop to last from two hours up to two days depending on the activities and availability of the participants.

5. Start with an ice-breaker that gets everyone involved. This will help to energise and engage participants and help them get to know each other.

6. Aim for a series of short tasks rather than one long one. Use early activities to build up to and prepare the participants.

7. When performing tasks, break the group into teams of 2-4 participants. This makes it easier to control and encourages different opinions to be heard.

8. Get the teams to take ownership of their ideas and get them to present to the other teams. Mild competitiveness between teams can sometimes be beneficial.

9. Stationery such as whiteboards and post-its should be provided. 'Post-it walls' allow everyone to have their say and enables ranking and grouping of ideas. People should not have to bring anything with them.

10. Breaks and refreshments should be provided, especially for longer workshops, but these need to be strictly controlled in order to maintain momentum.

11. Collect data periodically. Photograph and collect the material that has been generated throughout the workshop, at the end.

12. Set aside time immediately afterward to note down key points or ideas before you forget them.

GOES WELL WITH

– Design provocations: props and visual provocations can be useful to inspire the group or as starting points for discussions and activities

– Questionnaires: questionnaires given to the group before a workshop can help you to gather background information on the participants and prime them for the discussion

BEST SUITED TO

– Exploring broad topics from different perspectives and brainstorming new ideas

– Focusing attention on big issues that need detailed discussion

– Providing feedback and challenging existing ideas and designs

– Collecting opinions from a community rather than an individual

HIGH CONTACT
3. EVALUATION

Testing prototypes and design concepts with different user groups for detailed feedback and evaluation. This can be used to validate an idea, iteratively improve it and provide data on how well aspects of the design will perform.

WHEN

Use iteratively throughout the development process, but particularly as a design progresses towards the final idea

ISSUES

- Choose users carefully: Make sure you have a wide range of lead users within your target market

- Choose whether to test ideas with people that you have already conducted research with in order to make use of their familiarity with the project, or whether to use new people for a fresh perspective

- Do you test for a couple of hours or ask people to test for longer periods?

STRENGTHS

- Feedback from a user perspective on a full range of design characteristics including aesthetics, function, ergonomics, user-friendliness etc.

- Can test ideas at varying levels of completeness

- Brings fresh opinions to a design that you are by now very familiar with

- Can catch obvious design flaws early on, giving you time to address them

- Ideas tested in "real-world" scenarios. Lead users will test the idea in unexpected ways, adding a robustness to your approach

- Enables comparison of your potential solutions against existing ideas from competitors to benchmark your idea before it goes to market

WEAKNESSES

- Users can be influenced by the appearance and sophistication of the prototype. This may bias the feedback on other aspects of the design

- Feedback from users may influence the design in favour of their own specific needs

- Be careful when basing design decisions on the opinions of a small number of users. You must retain the role of editor. Not everything that every user says is correct

- Users may lack the experience or training to give useful feedback. Many may just say "It's OK" and not articulate any further

- Testing out of context will provide limited insight, while in-depth testing in context can be time-consuming to conduct

HOW

1. Start testing as early as possible before too many decisions have been made. This will save you spending a lot of time on solutions that do not work.

2. Plan what you want to test, and tailor this to suit the current stage of the design work. An early test may include an 10-minute assessment of simple functionality. Later tests may include in-depth testing over several weeks.

3. Increase the scope of your evaluation as the design progresses. Start by testing the first impressions, and build up to use over a longer period of time.

4. The number of users will vary depending on the scope and nature of the design. Aim to find 8-10 different users.

5. Test with one user at a time whenever possible to get more focused feedback.

6. Try to test alternative solutions. It is often easier to give comparative feedback than to assess a single design.

7. Try to test the idea in context and in a variety of circumstances.

8. Test one time too many rather than one time too few. Your users' knowledge and growing experience of the product is a valuable resource.

9. Document the testing through video and photographs. This is important for analysing and sharing the information with the rest of your team.

GOES WELL WITH

– Interview: ask users to give feedback on prototype features in relation to current products and experiences

– Controlled observation: when introducing a prototype or setting tasks to test functionality, use controlled observation and ask users to verbalise their reactions and thoughts

– Research kits: suitable for lengthier tests carried out in context such as an individual's home. A research kit could be developed to capture feedback whilst the prototype is being used

BEST SUITED TO

– Checking the design throughout the development process across the full range of characteristics from function and ergonomics to materials and finish

– Comparative testing of alternatives to focus on the best solution to take forward

– In-depth testing of an idea before going to market

ARCHITECTURE TOOLS

The following four tools can help architects to engage with people, understand user needs, create dialogue with clients and other stakeholders, and support decision-making throughout the process. Digital tools can result in increased benefits and fewer mistakes. Immersive experiences are also important both physically and digitally.

VIRTUAL REALITY

WHAT

Virtual Reality (VR) tools can be used in the early stages of your project to present a digital experience of the space and environment. They can also be useful in later stages when detailing and testing the design. VR is primarily a communication and dialogue tool to interact with end-users and clients. If people can test buildings before they are built, this can drive a co-design approach, get early feedback and result in innovation. The vast majority of technical drawing programmes are compatible with VR technology, which increases potential usage.

STRENGTHS

- Gives a realistic 3D presentation of ideas to inform decision making

- Provides the opportunity to test different solutions in an immersive way

- Presents an impression of space, light, colour and contrast, bringing 'difficult-to-read' drawings to life

- Uncovers needs, identify barriers and problems, reduce uncertainty and spot bottlenecks

- Allows suppliers and other stakeholders to be involved, increasing buy-in

- Reduces risk and potential mistakes as the building or space can be tested virtually

- Good for testing wayfinding

ISSUES

- VR experience that is too realistic can create expectations that cannot be fulfilled. This can result in a discrepancy between the perceived and final solution

- As VR provides many options, people can become confused about choices, leading to constant changes that can delay the project

- VR has no material physicality, so you cannot test surfaces, materials, textures, tactility or acoustics

- A number of dimensions of the spatial quality of experience are missing

- VR can be time-consuming to create properly, and some people may experience dizziness and nausea when using the equipment

BUILDING INFORMATION MODELLING (BIM)

WHAT

Building Information Modeling (BIM) is a digital model of a building. Different software or application can be used to create models in 3D. The models can be shared by the architects with developers, builders and others in the core team as described on page 67-68 in Activity 2 of the architecture process.

BIM is generally used in the create and construction phase of a project but can be of value throughout. BIM can be used on different platforms such as mobile, tablets or laptops. Most advanced 3D-drawing programmes used by architects to model can be exported as a BIM file. BIM enables team communication e.g. the architect can take their tablet to the site and show the construction team potential solutions in 3D.

STRENGTHS

- BIM is useful in bringing together different expert perspectives. This can contribute to a shared understanding of the project ideas and visions

- When a model is opened using BIM, and VR mode is then enabled, it can help to define needs, identify barriers and challenges, create walkthroughs

- A BIM file on a smartphone can enable a VR experience even when using a cardboard headset. This is very easy, inexpensive and informative

- Provides great flexibility, making it a useful tool in the studio, at user forums and at the construction site. It can enhance creativity

- Can be used as a decision-making or discussion tool for the professionals on the project, resulting in better understanding of issues and more innovative solutions

- Sub-contractors can merge different BIM models to see potential conflicts and convergences

ISSUES

- BIM does not give the same experience as on-site inspection, and some information can be missed

- Does not give a full experience of a space or an environment. An overview can be difficult to acquire

- Wayfinding might be difficult to experience in its entirety so would need to be physically tested to ensure suitability

- BIM is at scale, so one-to-one experiences need to be created to fully test the experience

- BIM does not give a physical experience so this needs to be factored in
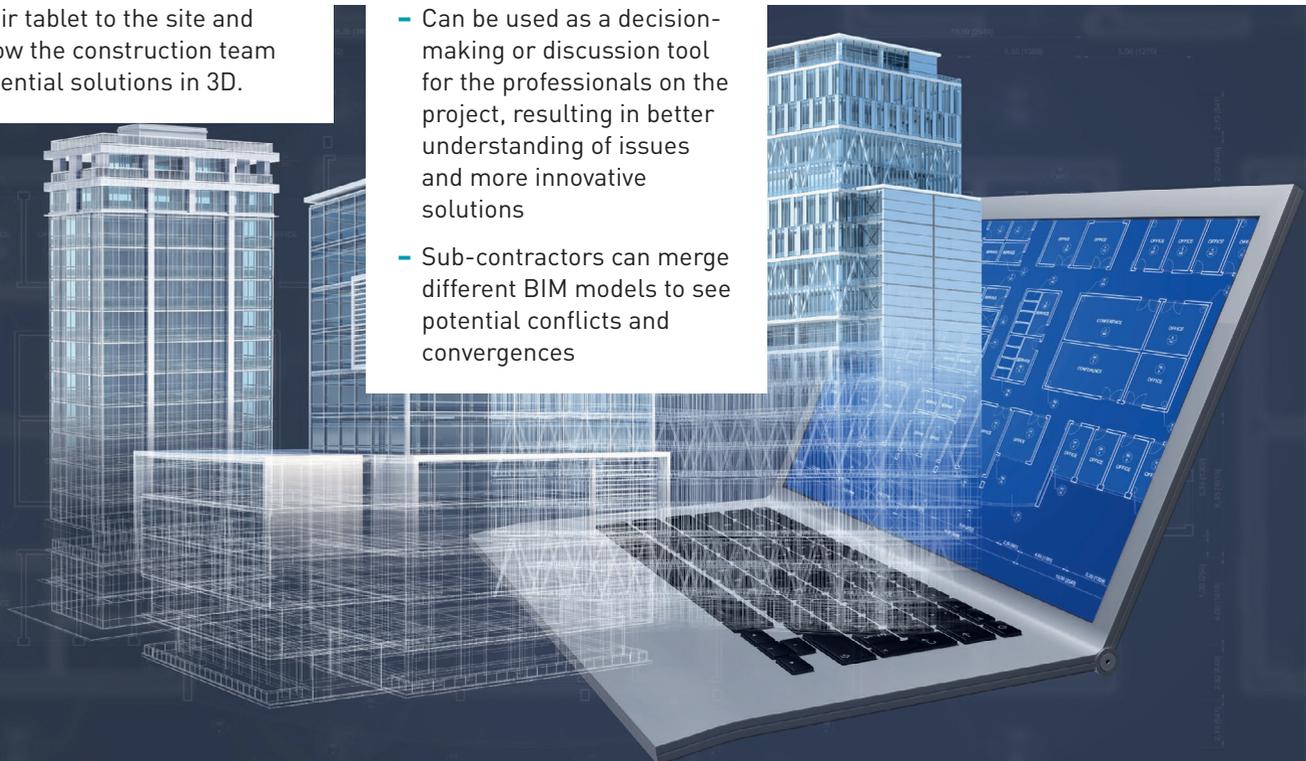
MODELS

The creation of physical models are a traditional part of the architectural process. These can present the entire building or space at a smaller scale, show rooms or individual spaces, or showcase individual elements such as materials, lighting, surfaces or interiors. This can become a tool for dialogue tool when combined with other methods. There is a much greater sense of physicality than in VR. Investigations on a one-to-one basis give an opportunity to test the solutions directly with people throughout the construction project. Models can be roughly mocked-up using cardboard, paper or plasticine at either full size or at scale, to enable user walk-throughs, discussions around adjacencies and even to test the effect of the proposed design on people with different abilities and functional needs.

STRENGTHS

- The exchange of impressions will be more immediate in model or prototype where people can experience materials, colours and light in a more physical way

- Surfaces, lighting, contrast and acoustics can be checked and tested

- The location of stairways, windows, toilets etc. can be functionally assessed and new discoveries can made that might not be possible using digital models

- The sense of dimension is much clearer, and slip surfaces, bases and equipment in the room can be investigated

- Wayfinding solutions can be put to the test

- Can be cost-effective and easy to mock-up smaller models

ISSUES

- Larger models may be necessary, but can be time-consuming and expensive to create

- Organising testing and recording feedback and findings can be resource-intensive

- Can only test elements of the building, not the whole space

- Models are typically representative rather than actual designs, therefore requiring participants to interpret the ideas, e.g. to see a paper wall as a wooden or concrete one. This could lead to some confusion

- Invitees may not know how to read a scale model, especially if they are not professional designers or architects

- Capturing feedback needs careful thought and consideration, as insights will be open to interpretation
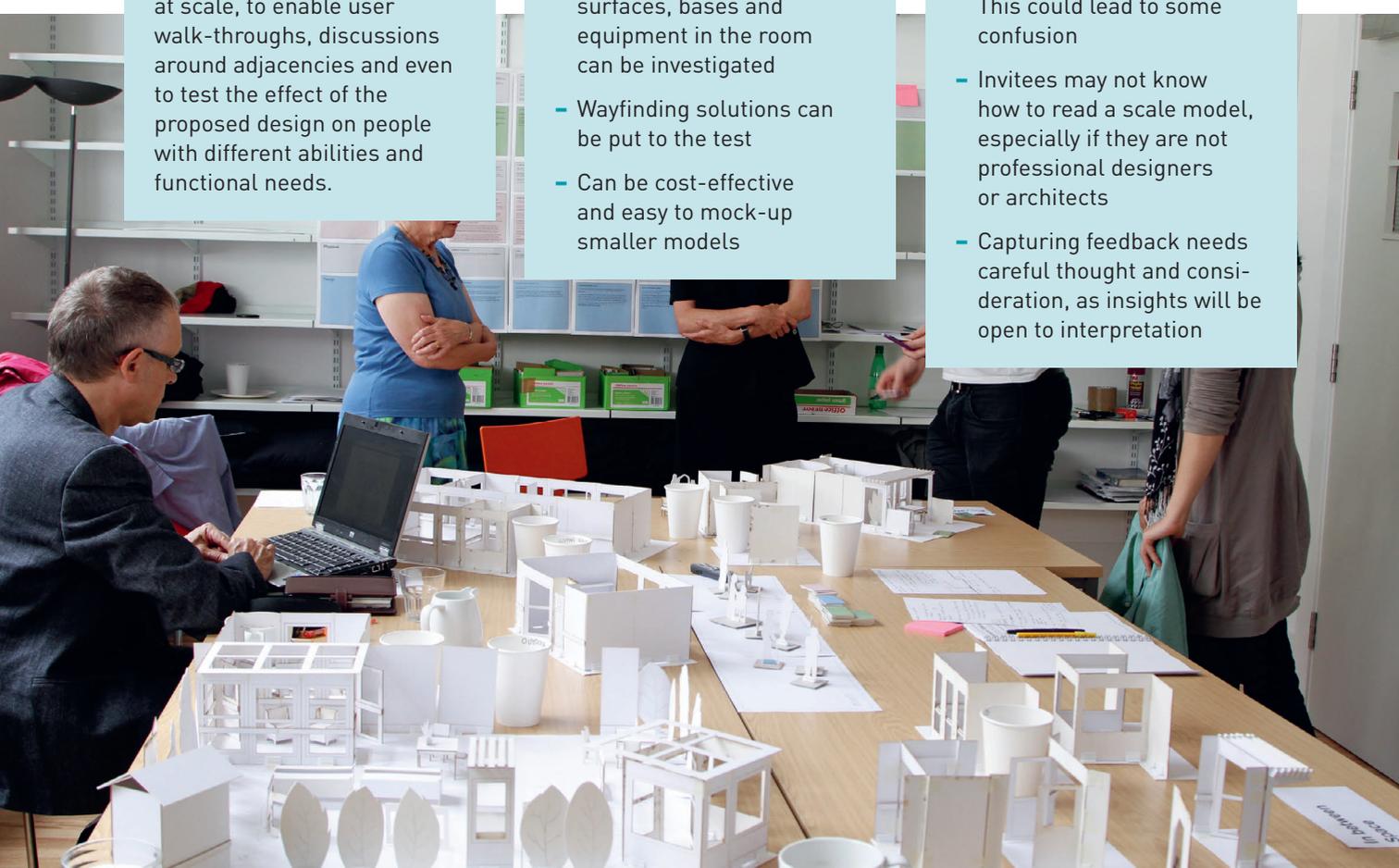
ON-SITE INSPECTION

Digital tools need to be balanced with on-site inspections throughout the process. This involves team members, stakeholders and users visiting an actual site and can be used for many different goals and purposes. At the start of the project, it can help to understand the site, the context and the neighbourhood, as well as bring the core team together, establishing mutual intent and providing an important 'kick-off' ritual. Other sites can also be visited for inspiration, learning and reference. During the later stages, this method can be used to check progress or to test ideas as they develop in context and at full scale. On-site Inspection or Walking Tours can also function as a method of evaluating buildings after they have been put into use as part of Post-Occupancy Evaluation (see Activity 8, page 74) and Resource Building (see Activity 9, page 75).

STRENGTHS

- An undervalued tool that creates a shared understanding of different problems and solutions, including an assessment of positive and negative attributes of a site

- Can be a strong dialogue tool as attendees undergo an experience where they can immediately share opinions, thoughts and feelings around materials, colours, light and space, to name a few

- Can enable the original project vision and ambitions to be followed through to construction

- When construction work commences, different visits can be made with people who have various abilities. One could focus on spatiality and accessibility, and another on the location of equipment. For example, lighting subcontractors could use this method to get direct feedback from the visually impaired people

- Some companies incentivise project managers to cut costs, and On-site Inspections can ensure that quality is maintained

ISSUES

- Can be difficult to arrange, and gathering the entire project group can require a feat of timing and coordination

- Site access can be a challenge because of gatekeepers, conflicting interests and a lack of understanding from the site owner

- Although different perspectives can be presented, strong facilitation is needed to prevent the visit digressing or turning into an argument

- Health and safety requirements need to be fulfilled and can be stringent for a construction site

- Unfinished buildings can be difficult to imagine in a more finished manner. Attendees can be asked to stretch their imagination too far

- If architects are not part of On-site Inspections in the later stages of a project, the quality and the Inclusive Design vision can be reduced
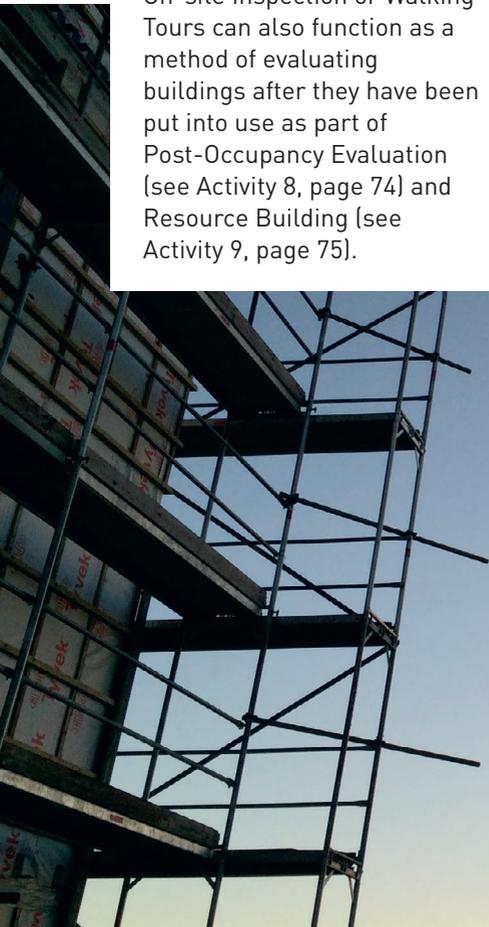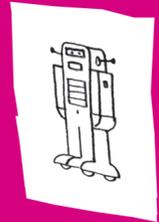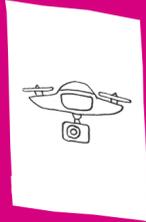
CASES

This section presents international and inspirational case studies that showcase Inclusive Design in action. Different examples are presented across the architecture and design disciplines. There are short cases highlighting methods or outcomes, and longer cases detailing the whole process, from research through design, to launch in the marketplace.

HOMEWARE

Tuva cutlery

PROBLEM

Cutlery is used every day but people hold their cutlery in different ways. Not all cutlery is suitable for people with varying hand sizes or grip strength. The aim was to design attractive, new cutlery that would be suitable for a wider range of people by making it easier to handle.

" I think curiosity about the user is important when you work as a designer"

APPROACH

- Lead users: children, older people with reduced grip ability and people with physical difficulties, as well as adult users without special needs.
- Initial methods: interviews with different lead users to build up background information, in addition to previously obtained user information on cutlery.
- Additional methods: controlled and natural observation in different contexts, looking at how people use a knife, spoon and fork. Study of the placement of the cutlery in the hand and how each individual uses their fingers.
- Evaluation: based on the insights from the interviews and observations, sketch models were prepared and tested with a selection of lead users. This was conducted as one-to-one interviews between the user and the designer, taking place in the users' homes and at the designer's house.

RESULT

The final concept was hollow-handled cutlery welded together from two parts, resulting in a fully balanced grip without compromising the weight or use of material. The cutlery can be gripped in a number of different ways, making it easier for people with reduced mobility and grip strength to use. By following a user-driven approach throughout the design process it was possible to create aesthetic cutlery that is suitable as a wedding gift but which could equally be used by everyone. During the first year that Tuva was launched, the manufacturer sold over 100,000 items, 100% more than the budgeted sales figure.

SERVICE

Blanke Ark Election System

PROBLEM

The current election equipment in Norway has been difficult for voters with common disabilities to access. Ballot boxes were unreachable for wheelchair users, and visually impaired people could not vote without asking for assistance in the booth – a violation of the rules of a closed election. This project looked at how the ballot and booth system could be redesigned to make government elections accessible and appealing for everyone.

APPROACH

– Lead users: visually impaired people, older people and people with reduced physical ability, as well as cleaners and election officers who could provide detailed insights into existing problems.
– Initial methods: phone conversations and face-to-face interviews with lead users provided insights and inspiration that helped to establish the design specification.

– Additional methods: presentation of mock-ups and sketches to lead users to adjust and select initial designs. These were built as full-scale prototypes for testing in situ. At this stage, a reference group consisting of lead users was established to follow the project to completion. They gave feedback on general concept directions as well as design details, taking ideas through several iterations. They gave the green light on the final product specification.
– Evaluation: questionnaires and focus groups were used to collect feedback, and a team of observers followed people on election day to assess the new designs.

RESULT

Blanke Ark can be accessed by voters with different abilities. The graphic profile of all elements is consistent. Black text and symbols are displayed on a white background and the deliberate use of orange attracts greater attention to selected elements. Orange guide tape provides a good contrast against most floors. Booths have two table heights to accommodate standing and sitting voters and are wide enough to accommodate a wheelchair. Labelling for the ballot papers have a suitable font size for low-vision users, and ballot papers are folded, removing the need for envelopes that are difficult to access. The curtain now has a high-contrast orange rod to make it easier to handle. The ballot box, where the ballot paper is posted, is placed at a height that wheelchair users can reach. The opening is high-contrast orange and shaped to aid those with unsteady hands or visual impairment.
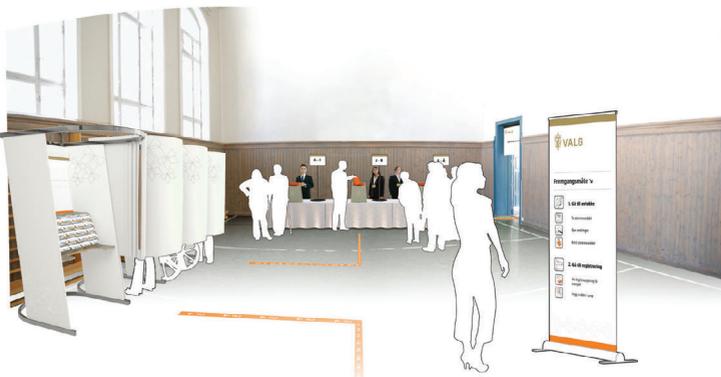
ED-TECH

Kahoot!

PROBLEM

Learning and education are a universal human need – to discover the world, to connect and grow. A major educational challenge is not just outdated curricula or classroom settings, but the learning experience itself.

How we learn is as important as what we learn, and the learning experience needs to become more relevant, meaningful and powerful for all learners, no matter their age, functional abilities, background or motivation. In particular, disengaged students need to be included and motivated. New learning paradigms are therefore needed.

"A class without Kahoot! is like a car without wheels"

student, New York

APPROACH

Kahoot! is a culmination of research, experiences and knowledge gathered by the co-founders over the years. It is based around a learner-centric approach, using behavioural and Inclusive Design methodologies to unlock the 'learner in us all'. It builds on people's motivation to learn, rather than generalising users by titles or roles or by stratifying achievements into grades.

Kahoot!'s culture was people-centred throughout. The founding team spoke to a diversity of potential users from around the world, and observed behaviour to gain insights. As the start-up grew, its product and community teams regularly visited schools, invited them into the office or engaged them at events.

As well as a Inclusive Design methods, Kahoot!' also drew on ideas from Lean Startup, Agile Thinking and Design Thinking.

RESULTS

The Kahoot! platform is a game-based education platform with over 100 million unique users every month, enabling playful learning. It creates a more inclusive learning experience than the traditional classroom, with learners encouraged to become leaders, setting tasks and sharing knowledge with peers.

Kahoot! is digitally inclusive. It simply needs an internet connection and a device with a web browser. Teachers can set games as homework challenges; encourage students to take charge of their own learning by creating their own games or play in real time with other schools in 180 countries around the world. The interface uses imagery, sound and visual cues, and a simple 'question and answer' format to include people with diverse learning needs.

This inclusive philosophy means Kahoot! is used by a wide range of audiences – including schools, university, corporate training, business and social events. In 2015, 3,000 Norwegian seniors played one of the biggest games of Kahoot! to learn about the internet.
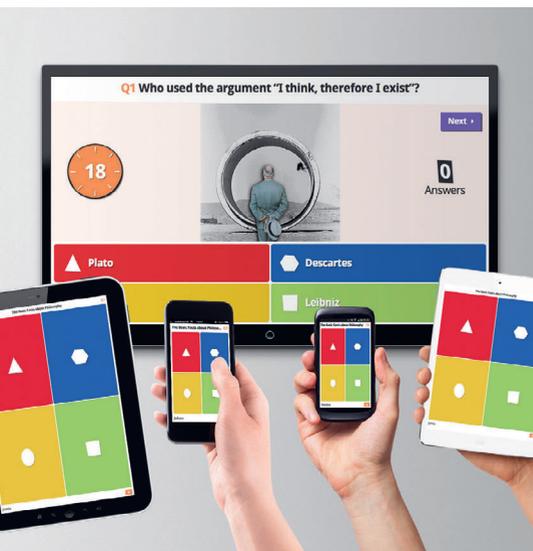
UX DESIGN

Yr.no weather forecasting

FACTS

Client: the Norwegian Meteorological Institute (MET) and the Norwegian Broadcasting Corporation (NRK)
Designers: MET and NRK

PROBLEM

The project began when the Norwegian Meteorological Institute (MET) opened up its data to allow free access. Yr.no was launched as a collaborative project between the institute and the Norwegian Broadcasting Corporation (NRK). Although weather apps are commonplace today, few interfaces or UX for detailed weather forecasts existed in 2009, so protocols and templates had to be created.

APPROACH

The designers realised that the solution needed to be based on a geographical framework, so they organised the database by place-names. An 'yr panel' was constructed, comprising volunteer lead users from around Norway. This led to the idea of an 'hour-by-hour' forecast.

The MET had existing meteograms showing weather forecasts, but tests showed that few people understood these graphs. The project group started to evolve the existing graphics and used hand-drawn sketches as 'design provocations' for direct research with users.

These were tested with random samples of people at train stations, on the street and in other locations. The advantage of using hand-drawn

sketches was that they are very quick to draw, took far less time to adjust than digital renderings, and were easily understood.

The final design needed to include a wide variety of people and not to digitally discriminate against anyone. Strong contrasts for people with reduced vision, large and clear fonts, clear page divisions and a navigable menu featured in the final design. As word of the new website spread, many emails poured in, with containing suggestions for changes. These helped to make multiple improvements to the site.

"It is definitely time-consuming to respond to all the feedback yourself, but you get a far better feeling for what is working and what is not, in this way"
said *Erik Bolstad, Managing Editor at NRK at the time*

Two years after being publicly launched, the first professional user test was conducted in a laboratory setting, where a large number of people were closely observed navigating through the website.
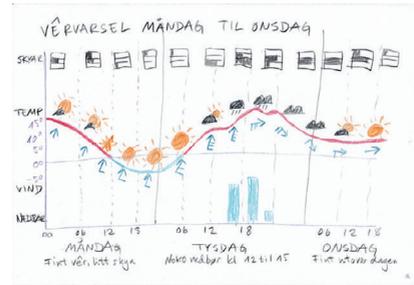
RESULT

Ideas were evolved according to feedback. All forecasts were tagged according to whether they were certain, uncertain or very uncertain, using red, green and yellow notification symbols. However, around 5% of Norwegian men are colour-blind, so this was resolved by introducing different graphic forms alongside the colour coding.

The team conducted frequent but simple user tests which were not just about measuring functionality, but also about assessing understanding.

People use yr.no to find out about the weather for a specific place, but the site is also a resource for schools, scientists and researchers who need an increased level of information. The site has been redesigned since launch, but the system registers how people use it to help to continuous improvement.

Yr.no are amongst the world leaders in the presentation and communication of weather forecasts, with up to 10 million unique users every week.

HOUSEHOLD PRODUCTS

OXO is a successful consumer products company whose entire range is based on the principles of Inclusive Design. Since 1990, OXO has grown its flagship Good Grips brand into a collection of over 500 products that have become international bestsellers. A key focus is kitchen utensils.

PRIMARY QUESTION

Inspiration for OXO came after its founder Sam Farber observed his wife's difficulty holding ordinary kitchen tools due to mild arthritis. Farber saw an opportunity to help not only people with reduced dexterity but also to create more comfortable kitchen tools for everyone to use.

"We wanted to appeal to the broadest possible market, not just a very specific market of arthritics and the infirm"

Sam Farber, Founder, OXO

PROBLEM
Why can't kitchen utensils be designed to be easy to use by people with arthritis?

RESPONSE
Extensive user research and innovative design create comfortable tools for all.

RESULT
Compounded annual growth rate of over 30%.

LEAD USERS

Lead users fell into two categories.
- Expert users. For example if the product is a chef's knife, these would include chefs who use these knives on a daily basis.
- Older people or people with limited dexterity from conditions such as arthritis.

As well as understanding the needs of these two lead user groups, research was also conducted with mainstream users. The aim was to develop solutions that were more comfortable and easier to use without sacrificing efficiency and performance.

METHODS

OXO applies an inclusive approach throughout the design development process and almost every product begins with user observation. The initial idea for the Angled Measuring Cup was proposed by a toy design firm named Bang Zoom. To take this concept through an inclusive development process, Smart Design, a design firm that worked closely with OXO from the beginning, was brought in. They studied existing products to scope the competition and interviewed different lead users to understand the human perspective. In particular, they held workshops and focus groups to explore the physical effects of ageing, and observed people with arthritis to identify possible barriers.

INSIGHTS

The users in the focus group were all asked what was wrong with existing measuring cups. People answered:

"When it's greasy, it becomes slippery"

"If I heat things up it is too hot to touch"

These revealed obvious problems but when users were asked to show how they measure liquids a less obvious issue was revealed. Most users would pour, bend down to look at the measurement, pour some out, bend down and look at it again. They had to repeat this process several times. No one in the focus group saw this as a problem. However, the designers focused on this as an opportunity to significantly improve the measuring cup design.

RESULTS

Research with people formed an integral part of the design process and was central in understanding the unarticulated needs of potential users. Further research into functionality and ergonomics was combined with these user insights to influence the choice of materials, manufacturing techniques, style, weight, look and feel of every product.

In the example of the measuring cup, OXO's innovation was to design a cup that could be read from above instead of the side, removing the need for constant bending over and adjusting. Red text on a white background gives a good colour contrast for most types of liquid.

OXO's Salad Spinner is its most popular product. The salad can be spun by pressing down on the large, black button, removing the need to grip and turn handles as on existing salad spinners. The design is simpler to use and can be operated by wet hands or arthritic hands and takes little strength.

The research carried out by Smart Design for the first set of OXO tools laid the basis for development of the entire Good Grips range, and OXO products are among the most widespread utilities of their kind on the international market. The company has effectively used Inclusive Design to develop mainstream commercial successes, that now benefit a wide spectrum of people.

" Our philosophy has not only resulted in user-friendly products for a wider user group; it has also proved to be a profitable business model. We have achieved annual growth of 30 per cent since 1991 and have won more than 100 international design awards"

Alex Lee, President, OXO

Above: The scale can be read from above without the need to bend over

PACKAGING

Jordan is an international brand working within oral care, painting and cleaning tools. Their focus on customers was not reflected in their packaging design. This project resulted in new insights, increased sales and an improved brand profile.

PRIMARY QUESTIONS

How can we make toothbrush packaging more user-friendly and easier to open for a wider range of people? Can an Inclusive Design approach improve communication, increase shelf presence and strengthen brand value?

LEAD USERS

The lead users had a range of abilities.

- People with arthritis provided feedback on handling and accessing the packaging.
- Low-vision users gave advice about shelf presence, information graphics and ease of opening through touch rather than sight.
- Children tested how intuitive designs were, as well as dexterity issues. Although not the primary consumer group, they gave key information on how easy the designs were to understand.
- Older people with multiple age-related impairments tested a variety of factors.

METHODS

- Controlled observation: Lead users were initially observed visiting supermarkets and shops. This aimed to explore the issues around shelf presence and information graphics on existing packaging.
- Interview: Lead users were interviewed as they tested existing toothbrush packaging and 70 other types of packaging. The process was recorded using video and still camera.
- Workshop: Testing was repeated with lead users, from initial concept to market-ready solutions. The process was recorded using video and still camera.

INSIGHTS

Many insights were successfully gathered, especially in the areas of ease of opening, prioritising information and brand visibility. Examples of quotes from the users:

"I like larger handles"

80-year-old man

"I usually try to open them in the store, if I don't think I can manage, I hang it neatly back in place"

43 year old with arthritis

Above: The previous toothbrush packaging

FACTS

Company: Jordan AS
Design and user research: Kode Design
Packaging Design: Hareide Designmill and E-types
Background: This case study was a pilot project for the Norwegian company Jordan in cooperation with the Innovation for All programme at the Norwegian Design Council

"Inclusive Design gives us a competitive edge and we have succeeded in distinguishing ourselves from our competitors"

*Bård Bringsrud-Svensen,
Product Development, Jordan AS*

DESIGN PROCESS

Step 1: A criteria tool (see page 43) was developed to make sure that critical factors were addressed throughout.

Step 2: Lead users rated openability and how easy it was to find the point of access. They all gave the old packaging a low rating.

Step 3: Initial research was conducted with lead users using Natural observation, Controlled observation and Interviews. Methods were combined and modified to improve interaction with the lead users.

Step 4: Design concepts were developed according to the experience of the lead users. These were filtered using the list of factors in the criteria tool.

Step 5: The new concepts were tested by the original lead users to ensure that their needs were addressed.

Step 6: An internal workshop was held at Jordan to select and refine solutions.

Step 7: Evaluation with lead users tested the final design before finalising.

CRITERIA TOOL: EASE OF OPENING
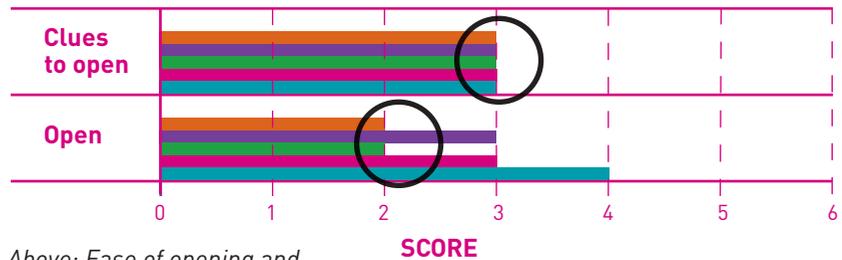
Above: Ease of opening and understanding how to open the packaging presented barriers for all users. The low score on both criteria indicate opportunities for improvement as circled

RESULTS

Information about the hardness placed next to the brush

'NEW' is highlighted

The toothbrush is easy to see and in contrast to the background (important in the purchase situation)

The JORDAN logo is easily recognisable and readable using large font size and good contrast

A visually clear opening mechanism with colour and arrow

'The cardboard is not glued to the plastic, making it easy to tear open.

FURNITURE

Norwegian furniture manufacturer Stokke is a worldwide distributor of children's equipment and furniture. TrippTrapp® is their award-winning, bestselling children's chair. The idea is an innovation of well-known designer Peter Opsvik and is currently sold in 50 countries.

PRIMARY QUESTION

The idea was born when Opsvik noticed a lack of practical seating solutions as his two-year-old son outgrew his high chair. He saw the need for a chair that could grow with a child and give them equal presence at an adult-sized table. As nothing existed on the market, he decided to design a solution himself.

LEAD USERS

Primary lead user: Opsvik initially observed his own son and studied his movements at the table to get an idea of the demands that a child would place on the furniture. Other lead users: children from the neighbourhood also acted as lead users, showing how the existing solutions did not work for them. Parents played a role, as they were key users of the furniture.

METHODS

This example demonstrates the importance of having the right lead user. In this case, Opsvik's son and the other children gave enough insights to inspire an innovative product. Simply observing a few people with a common problem was a powerful way of understanding product need and user aspiration. Natural observation of children was effectively used to see the difficulties with existing, traditional high chairs and define a starting point for design development. This is a suitable technique for conducting research with very young children who might not be able to articulate issues, so observation rather than consultation works best. Inclusive Design does not demand large groups of users. Seeing one interesting thing from one user can be enough to get started.

INSIGHTS

Opsvik gained critical insights from observing his users:
- Ergonomics: He saw how children quickly outgrew existing children's chairs and were left sitting on adult chairs with their arms and feet dangling in the air. This was very uncomfortable for them
- Function: High chairs or miniature adult chairs did not fit the hight of a typical adult table. Parents could not sit their children on these chairs and use the table at the same time
- Interaction: High chairs have their own table surface attached, which makes it impossible to get close to the family table

FACTS

Company: Stokke AS
Designer: Peter Opsvik
Background: Opsvik got the idea for Tripp Trapp as he watched his son grow out of his traditional children's chair

DESIGN PROCESS

To solve the problems that he observed, Opsvik designed a chair with both an adjustable seat and footrest. These could be placed at different heights in the frame to fit each user. His objective was that one chair should seat children and adults of different sizes .

Tripp Trapp® has a market share of 90% in Norway, and is sold in 50 countries

RESULTS

The design of the Tripp Trapp® chair allows it to be used throughout childhood. It is suitable for children of different ages, and positions them so that they can interact and be involved at the same table as everyone else. Tripp Trapp® reflects the designer's vision of creating products for life. The chair is made of wood, ensuring sustainability and longevity. Tripp Trapp® chair are typically passed down from generation to generation or are circulated on the second-hand market rather than thrown away. Since the chair was launched in 1972, more than seven million have been produced and it has become a significant export product that is distributed worldwide.

"If there's something around us that doesn't work, that annoys us, it can be a good starting point for design. Tripp Trapp® started as a solution to a personal challenge"

Peter Opsvik, designer

TRANSPORT

The subway in Fukuoka City in Japan demonstrates an exemplary approach to Inclusive Design. Over a ten-year period, 16 stations, facilities, signage, rail-yards, ventilation towers and subway car designs were developed and implemented. Research was conducted with a diverse range of travellers, all with different needs and demands.

PRIMARY QUESTION

The Nanakuma line that connects downtown Fukuoka with the Southwestern suburbs had limited budget when being built. This resulted in a narrow tunnel cross-section and smaller subway carriages. How could a complex city subway system be designed within this limited space but in a way that was easier and more enjoyable for a wide variety of people to use?

LEAD USERS

In order to ensure that the transport system would be more convenient for everyone to use, many different subway passengers were consulted in the development process. Those who found it difficult to travel using existing public transport were selected as lead users. These were divided into two main groups:

- People with limited mobility: pregnant women, parents with children, older people, wheelchair users, people with other physical impairments and travellers with heavy loads.
- People with limited ability to access information: foreign visitors who did not speak Japanese, people with visual or hearing impairments, people with cognitive impairments, older travellers and children.

METHODS

The lead users were brought in for the early stages of the design process during the first year and continually involved throughout the rest of the project. The designers saw their involvement as an essential part of the process and influential in making key decisions. Detailed research was conducted with them at every stage. Different research tools were used as follows:

- Questionnaires: these surveyed a large sample of people and give the designers an early understanding of user needs.
- Controlled observation with Interviews: lead users were asked to travel through subway systems. Difficulties were observed and logged and individuals were interviewed in situ. Video cameras (see below) were used to document this process.
- Evaluation: lead users were asked to give feedback as the designs developed.

"I think that the line is the most comfortable subway in the world for people with any kind of disabilities"

Toshimitsu Sadamura, GA-TAP Inc.

INSIGHTS

This research gave critical insights, showing potential areas for improvement. Some selected examples are given below:

Wheelchair users: were not able to cross over floor height changes. They needed more space to move and change direction. Could not reach buttons for lifts or ticket machines that were placed out of reach.

"Information is placed too high for me to read"

Older people: could not walk quickly or for long distances. Needed resting points. Could not read small text and did not like confusing information. Needed more time to orientate themselves.

"I need more time when walking"

Pregnant women: had difficulty moving and perceiving floor height changes or irregularities.

Foreign visitors: did not understand Japanese behaviour or patterns of movement in public spaces. Information in Japanese typically excluded this group.

DESIGN PROCESS

The design objectives were to create an environment with good mobility and fewer barriers, as well as information that could be easily understood by everyone. A large number of staff worked to solve the different problems on the stations, subways, cars and information systems. Guidelines were formulated for the team to ensure an Inclusive Design approach at all stages.

Considerations in the design process included:
- Design policy
- Concept formulation
- Architecture
- Sign design
- Basic design for a standard station and fleet yard
- Station operations equipment and car design
- Advertising and PR
- Implementation and construction management

RESULT

The design solutions concentrated on six areas. A few improvements are mentioned under each:

1. Universal movement lines

Station layouts allow passengers to move freely through the architecture using the shortest route possible. Entrances and exits always have an elevator or escalator and subway cars equipped for wheelchair users stop by the elevator. The height difference and gap between the platform and subway car are minimal. Getting on and off is safer than other systems.

2. Universal facilities

Ticket machines are mounted lower than usual to accommodate wheelchair users as well as standing passengers. They are angled upwards for easier access. The magnetic tip of the white cane carried by visually impaired users automatically calls the elevator and opens the doors via sensors. Accent colours have been added to stair edges to make them more visible.

3. Universal walkways

A number of design features make the narrow dimensions of the subway less noticeable and the stations brighter and more comfortable. Large atriums and transparent materials are used to bring natural light underground and provide a feeling of spaciousness.

4. Visual information

The colour green is used to identify the Nanakuma line from entrances at street level to ticket machines and bathroom walls.

5. Individual station information

Each station has its own colour, wall material and unique symbol making it easier for children and non-Japanese speakers to identify. The symbols use animals, plants or everyday objects that are instantly recognisable.

6. Universal signage

Children and wheelchair users have a lower eye level than standing travellers so signs are positioned at a height midway between the two. Audible signs direct visually impaired people, removing the reliance on difficult-to-recognise Braille.

Overall, this in-depth, people-centred approach helped the designers to innovate in a very cost-effective manner and invent creative solutions. The Nanakuma line has attracted worldwide attention and won several awards as an Inclusive Design exemplar. It is in daily use in Fukuoka, Japan.

PUBLIC SPACE

Queen Elizabeth Olympic Park

> **FACTS**
>
> The London Legacy Development Corporation (LLDC) is responsible for the development of the Queen Elizabeth Olympic Park following the 2012 Olympic and Paralympic Games

PROBLEM

There was a risk that the work undertaken to deliver "the most accessible Games ever" would not be built on during the post-Games development of the site. The London Legacy Development Corporation (LLDC) recognised that Inclusive Design of the park and venues underpinned the success of the Games and ensured that this ethos continued. In 2012, the space represented a major new urban location for London with iconic buildings such as the London Aquatics Centre designed by Zaha Hadid. But post-event, the project addresses another key question: how do we ensure that an Olympic Park and its buildings benefit the city and communities around them in an inclusive and equitable way?

APPROACH

LLDC's Inclusive Design approach included:

- Senior Inclusive Design Manager
  – the key, client-side lead on accessibility and Inclusive Design ensuring continuity and consistency
- Inclusive Design Standards
  – creation of standards that all the development must adhere to, as dictated by planning policy
- Built Environment Access Panel
  – an independent Built Environment Access Panel to review all the development work, made up of disabled and non-disabled people with knowledge of Inclusive Design in the built environment
- Innovation – remain at the forefront of inclusive urban design by promoting community participation, championing inclusion, and ensuring high quality design as well as environmental sustainability.

RESULTS

The outcome is an inclusive new city space in East London. LLDC produce a variety of projects and programmes ranging from concert events to the creation of five new lifetime neighbourhoods.

Inclusive Design is always key: for example, the London Aquatics Centre is designed for swimmers of all abilities, with a system for lowering wheelchair users into the pool, and the award-winning Timber Lodge and Tumbling Bay Playground which has some of the following Inclusive Design features: automatic doors; level access throughout; accessible changing facilities; multi-faith prayer room; good signage and layout and a playground designed for a broad range of ages and abilities. The operator employs over 50% disabled staff. True to the spirit
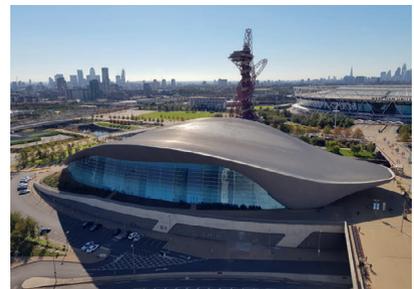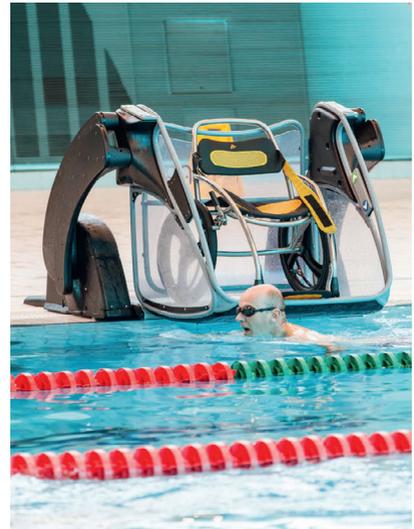
of inclusive innovation, the Global Disability Innovation Hub was also established on the park, bringing together academic excellence, innovative practice and co-creation to make a positive impact on the lives of disabled people around the world.

HOSPITAL

This pathfinding project used Inclusive Design principles to define co-design strategies and set new standards for a 21st-century healing space. It covered the redesign of the existing property, as well as the construction of new buildings and spaces.

CHALLENGE

In 1995, an international competition for a new hospital in central Trondheim in Norway was announced. The client, Helsebygg Midt-Norge, had the bold vision of a hospital design that was driven by the needs and perspectives of the patients. The resulting architecture received international acclaim for its novelty, innovation and inclusivity, whilst setting a benchmark for bringing nature, the city, employees and patients together in a holistic and harmonious way. As is the case with other types of public buildings, hospitals can come across as large and unfamiliar, with sterile décor and a complex layout of space across multiple floors. When setting a brief for these buildings, the key focus is usually on functionality and operations. However, this new hospital concentrated on the human experience. The aim was to develop a space that was accessible and attractive and to create processes to embed this at all levels and throughout all phases of the project. The challenge was to apply people-centred design to a complex, long term architecture project.

LEAD USERS

People are at their most vulnerable when ill, and in this state the environment and surroundings can have an exaggerated mental and physical effect. This directly influenced the planning of the buildings, the interior and the outdoor spaces. Fundamental to the project was the idea of creating a hospital space that emphasised the human scale as well as the architectural scale in its design. The vision was to make the hospital a pleasant and welcoming place for patients, relatives, employees, students, clinical staff and the locals.

Inclusive Design at St. Olavs, Hospital was applied not only to the architecture process, but also the decision-making framework. A set of priorities to enable this was laid down from the start and then embedded in the project at all levels. One example was the principle of seeing patient participation as important as staff participation, something that was unique to such a complex hospital project. Limiting engagement to hospital employees would restrict insights to work routines and operational functionality, and miss the innovation that results from understanding the human perspective of patients, their families and other visitors. Patients typically place more emphasis on emotional needs and are in a critical state that requires empathy and sensitivity. The involvement of a range of stakeholders brought

Liv Haugen, Medical Director St Olav's Hospital – talked about the importance of putting the ideas and visions of Inclusive Design into practice and formalising mechanisms on the project. The approach meant taking into consideration a range of human issues, including visual, hearing, mobility and cognitive impairments, as well as allergies and sensitivity to the indoor climate and materials. Patients can have reduced abilities and increased sensitivities, even if this is temporary. The application of Inclusive Design in this context is therefore more critical than for other buildings. The project began before the Norwegian legislation was put into effect (namely the anti-discrimination law and building requirements labelled TEK 10), so the project team wrote its own guidance, entitled Good for Everybody – Necessary for Some. This document contained recommendations from different user organisations and was incorporated in the project as a contractual document. Today there are a number of formal requirements and standards for Inclusive Design, but to achieve the exemplar solutions that can be seen today, the project team did much more than simply meeting minimum requirements.

together professional points of view with personal aspirations, resulting in more imaginative, game-changing ideas. Not every architect can be an expert on the functionality of a hospital, so they need to consult with those who have specialist knowledge. A user forum was established that consisted of patients as well as two sets of employees – those concerned with the daily administration and logistics of the building, and those engaged in clinical activities.

"Creating solutions for people experiencing difficulties and barriers automatically produces ideas that work better for everyone"

Work started with an informal forum initiated by a coalition of various user groups in the region, including the The Norwegian Federation of Organisations of Disabled People (FFO) and organisations representing people with conditions ranging from asthma or allergies to those with cancer. Patients and their relatives, as well as employees, contributed to the project guidelines. This then
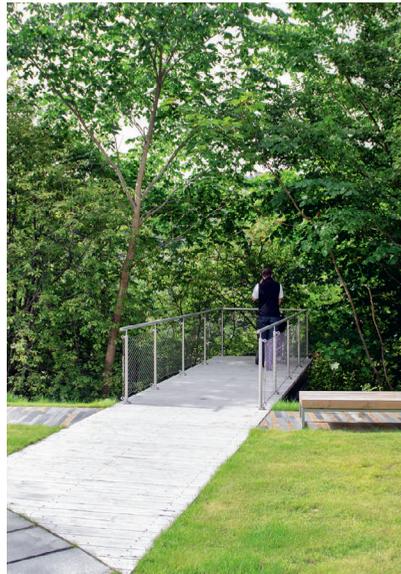
developed into a formal body, the Patient Organisations Community Forum (POFF) that had monthly meetings to address a variety of issues across the project, from inception through to delivery. Even the builders reported to this forum when deviations or mistakes occurred, and new solutions would then be found in consultation with them. POFF also appointed user representatives to the majority of the planning groups, with the exception of highly specialised spaces such as the operating theatres. There were always two users present when meetings took place with the planners, architects and the hospital professionals.

This user group did not exist to simply validate ideas. They were deeply embedded in the project with the power to alter solutions that did not work or were not according to plan. Many on-site visits were conducted alongside the project teams and the group also influenced decisions ranging from the Art Programme to furniture procurement. There was some exception for areas such as specialised medical equipment.

The experience gathered during the first stage of the project benefitted the next two stages, with Inclusive Design incorporated in the contractual documents.

"Inclusive Design means that 'the devil is in the details'. If you do not follow-up and watch carefully all the way, you end up with a building that was well planned but with important details that do not work"

INSIGHTS
The user surveys that were carried out with patient groups revealed three main desires: privacy, availability of staff, and accessibility. Patients were primarily concerned with their personal experience, particularly protecting their privacy at the hospital, as they had a general feeling of being invaded and boundaries were difficult to

maintain. Security and safety were important, with a desire to have appropriate hospital personnel within visible and easy reach. The general accessibility of the buildings and spaces were also critical. Access to nature and beauty was mentioned, coinciding with evidence-based research on the positive effect on healing, and the importance of providing a holistic and human experience.

Human as well as architectural issues were key to the process. Therapists and specialists were involved in creating solutions to increase awareness around patient privacy and maintaining personal boundaries, and these directly influenced the design of the space. Even detailed interactions were considered, such as helping the doctor maintain eye contact with the patient rather than staring into charts or digital devices.

This process of continuous user involvement through meetings, workshops and on-site visits revealed a large number of insights, increasing the innovation value of the project and ensuring that the people-centred vision of the project drove the creative process.

APPROACH AND PROCESS CONCEPTUALISATION
When the project started in 1995, comprehensive plans for every aspect of the design were drawn up alongside guidance for implementing Inclusive Design throughout. Importantly, there was political backing for the vision of a patient-oriented hospital, and this drove the project architects to take a people-centred stance from the start. Early-stage research lead to the three main strategies: firstly, applying evidence-based design; secondly, a non-hierarchical organisational structure allowing

decisions to be made by both patients and employees; and thirdly the definition of an area called environmental aesthetics looking at the relationship between health, people and the physical surroundings, and drawing on research areas such as architecture, psychology and neurophenomenology.

Based on these, the team developed principles, guidelines and decision-making criteria. These principles were followed by the various architects, designers and other partners who worked on the hospital and were also embedded in the contracts of the suppliers. The project enabled Inclusive Design by having it as a contractual requirement for everyone involved. In practice, this meant that patients, families, hospital staff and user organisations were mandated to work with the creative

and construction teams throughout. Other stakeholders included consultants, operations/logistics staff and administration.
In summary, the user groups could be divided into three main segments (forming three circles): be (patients) – do (medical staff) – operate (operations/logistics/administration). Conflicting interests could be addressed and solved by involving all parties.

"Establishing the concept of Inclusive Design at the initial stages has been crucial"

Ragnhild Aslaksen, Chief Architect

CREATE

Based on initial research with different stakeholders, a brief was defined along with the design guide, forming a basis for project decisions. The motto was "the patient in focus for all decisions". Following on from this, several manuals and handbooks were developed to ensure consistency and guidance from all the project parties involved.

For example, the landscape architects adopted a patient perspective and followed the

Inclusive Design guidelines to design surroundings that enable treatment and rehabilitation, and adapt to various needs and preferences. It was important to create variation at a human scale within the outdoor environment, including the park, back gardens and the streets between the buildings. The designers immersed themselves in the patient experience to gain deeper understanding of how the physical surroundings can best enable treatment and healing.

The plants were selected in consultation with the Norwegian Asthma and Allergy Association and a training path was created for wheelchair users in one of the parks to support rehabilitation. Giving people choice is an important element of Inclusive Design, as very different needs and abilities need to be accommodated in alternative ways. The landscape architects went beyond the accessible and functional to create witty and delightful spaces such as the "secret spot" by the river with an elevated bridge to create alternative access to the views.

CONSTRUCT

A challenge for the architects was to operationalise the vision and goals set by the client from a masterplan level right down to details, whilst
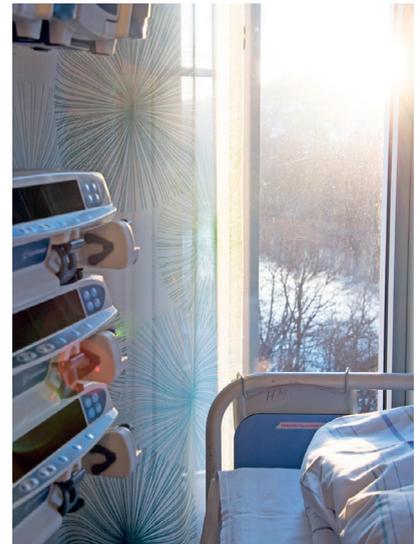
keeping the patient in focus.

"We incorporated the philosophy of a patient-focused hospital into the big picture and the masterplan, which guided us to a solution that put emphasis on human scale"

John Arne Bjerknes, Lead Architect

This meant avoiding a megalithic structure and facilitating easy and intuitive navigation instead. If these elements are designed successfully, there is a reduced need for signage or wayfinding. The medical area was organised into six organ-based blocks, each containing two to six floors, so that they had a much smaller scale and looked more approachable than institutional. The main square allows visitors to see the layout and easily orientate and reach the six blocks, regardless of their ability or age. The six blocks all have a welcoming façade at street level with a staffed and open reception

area backing onto a garden that is visible through full-length windows. The architecture aimed to create positive feelings and reduce stress, fear and anxiety.

As some old hospital buildings had to be torn down, the project developed in three stages: a sequence of tearing down, building a new, then moving in. The project was very complex, because of the technical and the functional requirements as well as the size and scale. With so many opinions to consider from the user meetings it was beneficial to have the same people involved throughout. Added to this was a range of technical information, components, design elements, functional requirements and medical equipment that had to be considered. The team had no choice but to keep the process simple.

Central to the Inclusive Design approach at St Olav's is the importance of human contact. There are people to welcome and orientate at reception, and to help in any way that is needed. The architecture supports good service,

continuing into the square and throughout each building. Because the buildings are designed at a smaller scale, visitors are not lost in a megastructure of endless glass. They find their way easily, and both elevators and stairs are within direct reach. The signage, personal service, orientation board and the back garden all provide focal points, and are accessible and intuitive solutions. The environments are easy to read, incorporate the architectural planning principles and are applied equally across all the six blocks. They look different, to help differentiate between each building, but they work the same way. Orientation is not just about signage. Floor-to-ceiling, distinctive and colourful wall art on the first floor is visible from the garden, providing iconic yet artistic wayfinding. Art is totally integrated as a functional element in the fabric of the building.

Accessibility is not just about entering the complex; it is also the ability to access the environment and the world around. It is about understanding that the real customer is the patient, not just the

hospital owner, health service, staff or builders. Patients lie in higher beds than at home to facilitate treatment, so giving sight-line access to amazing back gardens, lush green parks, natural green surroundings, and the sky above is incredibly important and forms a key part of accessibility. The wards have big windows, many of which are full-length, and benches built into the window sill enable this.

User groups were even involved in the detailing of the reception area and the desk, with organisations and individuals consulted in meetings at early stages to define design principles and criteria, and later during workshops to assess and input into sketch ideas and concept drawings. A series of on-site visits also showed a 1:1 prototype for further evaluation and co-creation. These are typical examples of how people were involved at different stages and levels.

The architect also had their own Inclusive Design champion in the final stage of the building project. The process was anchored by the senior management with this champion ensuring that important documents were communicated to all contractors and sub-contractors involved in engineering, construction and completion.

The client, Helsebygg, had their own Inclusive Design project advisors who functioned as watchdogs. On-site accessibility inspections with the user committee were conducted when installations were ready with all interior elements mounted.

"As soon as you are inside the building you see continuity, and contact with the outdoors. You know immediately where you are, and can orient yourself using daylight and the natural views"

Ragnhild Aslaksen, Chief Architect

SUCCESS CRITERIA

The project success can be summarised using the following six criteria. Together, they form a set of goals for almost any complex architectural scheme involving Inclusive Design. They are:

1. Start with a clear vision and a set of goals
2. Involve a diversity of users throughout the process
3. Develop guidelines and principles
4. Project management commitment
5. Interdisciplinary collaboration and close follow-up
6. Dedication and a high level of competence

Liv Haugen, summed up the lessons learnt as follows:
You need to start with a clear vision where Inclusive Design is written in from the start as a fundament. It must then be anchored throughout. This is part of the planning criteria, so develop a set of clear guidelines that are incorporated in the contractual documents. Users must be involved throughout and all project management must understand Inclusive Design and be on board. Ensure close follow-up on the building site to make sure that there are no deviations. The client also needs Inclusive Design competence within its own organisation and good advisors, who understand the client and the project, will ensure a smoother process. Someone watching what the project team are doing and following-up ensure oversight and a sense of rigour. This could be the users themselves. Finally, good collaboration, communication and teamwork across the disciplines, the client, builders and other interest groups, is essential for success.

"We are going to make the patient's healthcare – nothing about me without me"

Bent Høie, Minister of Health

SUMMARY

Making Inclusive Design a priority at all stages to the entire medical district becoming open to the neighbourhood and a destination in itself. It reframed the possibility of what a hospital could be for the city. The result is a high level of satisfaction for patients, relatives, students and employees and a hospital area that has become an attractive gathering place for citizens as well as students.

The project was innovative in integrating Inclusive Design into the landscape planning throughout the project. The landscape architects have been very thorough in gaining an understanding of the surroundings from the perspective of the patients themselves.

Each ward has been built as a hub, with eight single rooms located off an easily accessible open staff station. The sleeping areas are placed at higher levels in all the six building blocks to ensure uninterrupted views of the nature outside. The concept combines architectural and organisational considerations, and gives increased security for both patients and staff - the patients sleep better and employees have a better overview. The single patient room set a new standard for hospitals in Norway.

One important insight from both the user involvement and the evidence-based design research was: "don't intimidate, scare or stress the patients, but make an environment that feels normal and safe". This resulted in the use of natural design and materials such as wood, daylight channels and transparent surfaces to establish a warm and welcoming atmosphere. The Art Programme consists of 2350 pieces that focus on

optimising the patient and staff experience and environment. Guidelines for choosing art for a healing space were also developed. There have been countless unforeseen quantitative benefits, both in terms of cost savings and efficiency and qualitative ones such as increased security and better sleep. Research is still being conducted to document and disseminate these effects for knowledge sharing and to benefit other new hospital projects. Despite the additional benefits, the cost per bed is still the average for hospitals in Norway.

"We wanted to design a medical district in which streets and spaces create interplay in the hospital, opening it up to the neighbourhood. In addition, it has to be a green area, since the nature and its vegetation stimulate the body and the senses"

Lisbet Haug, Head of the Landscape Department, Asplan Viak

This complex project consisted of several sub-projects in different and well-planned construction phases, and covered several design and architecture disciplines, in addition to other professional fields, including:

1. Urban design and landscape architecture
2. Architecture (6 separate units/clinics) – based on health – enhancing architecture
3. People-centred design (interior design, graphic design, service design)
4. Wayfinding
5. Logistics and system-oriented design
6. User-centred art (programme)
7. Sensory design and neurophenomenology

The new hospital opened in 2010 and has received international acclaim and won several awards.

SERVICE

Scandic is one of the Nordic region's leading hotel chains with 151 hotels in ten countries. Their Hotels for All concept implements improvements in their rooms, restaurants and services that will increase accessibility for all guests.

PRIMARY QUESTION

There are over 50 million people in Europe with some form of disability, but staying at hotels can pose a challenge for many of them. The President and CEO of Scandic, Frank Fiskers, saw accessibility as an important factor in improving desirability and opening Scandic hotels to a wider market.

LEAD USERS

Hotel guests with disabilities and members of disability organisations were the lead users. User insights also came from 'expert users' such as Scandic's board of directors and members of the hotel staff by placing them in the situation of lead users with reduced ability.

METHODS

In 2003, the hotel chain engaged Magnus Berglund as its Disability Ambassador. His first course of action was to hire several wheelchairs for Scandic staff to use. Over a time period of three months they were all able to see life from the perspective of a wheelchair user. Although being in a wheelchair is just one of many disabilities, Berglund saw it as an excellent way to get people discussing the issues. This immersive method of research allowed key decision-makers and staff at every level to experience the difficulties firsthand.

Berglund and his team members worked with disabled guests and disability organisations to develop an accessibility standard for their hotels, resulting in a 93-point checklist. 77 points are compulsory for every Scandic hotel, but all criteria have to be met by new hotels currently being built. The list is now extended to 135 points and other hotels have adopted this approach.

An important part of accessibility is the quality of service and the attitude of the employees. Every member of the hotel staff is therefore given training to aid them in understanding what they can do to make guests of all abilities more comfortable. This can simply mean placing food in a buffet within sight and reach of everyone or understanding how a hearing loop works.

INSIGHTS

By putting Scandic staff members into a wheelchair, useful insights were discovered at first hand into the needs of people with disabilities.

"Does the mirror need to be so high up?"

"How do I reach the coffee cups at the breakfast buffet?"

Consultation with lead users provided other insights. One person talked about how her mother who has reduced hearing would be woken up by the fire alarm at a hotel. This was the inspiration behind the Scandic vibrating alarm clock that also turns on with the fire alarm.

"The best proof that we're doing the right thing came from a guest. She told me that when she is staying at Scandic, she is treated just like any other guest and not like a disabled guest"
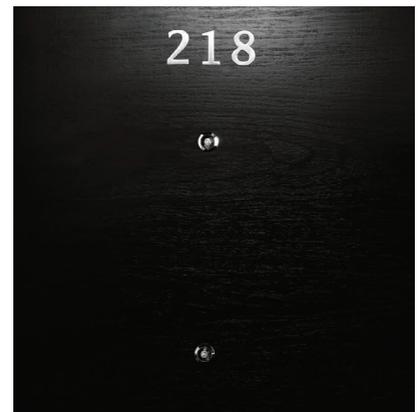
Magnus Berglund, Disability Ambassador, Scandic

"A major hotel chain should be accessible even if you've broken a leg, have impaired hearing, use a wheel-chair or for other reasons need a little extra consideration"

Frank Fiskers, President and CEO, Scandic

RESULTS

Scandic's design process is an ongoing, long-term plan for developing existing hotels, building new rooms and training staff members to have a better understanding of accessibility. Some key features on Scandic's checklist are listed below:

– Height-adjustable bed*
– Telephone on the bedside table along with the remote control
– A space of at least 80cm around the bed
– Vibrating alarm clock and fire alarm available on request
– Hooks placed at different heights so they can be reached from a wheelchair
– Mirror at a suitable height for wheelchair users as well as standing guests
– Handrail on the inside of doors at a height that can be closed from a wheelchair
– No or low thresholds at doorways
– Single-grip mixer tap or automatic tap*
– Washbasin placed at a minimum height of 78 cm*
  so a wheelchair will fit under it. The hook, soap and hand towels are also easy to reach
– Toilet paper holder on the armrest of the toilet

– Hearing loop available for meeting rooms
– The doors are at least 80 cm wide, so that guests can get through with a wheelchair, crutches or a walking frame*
– The stage is accessible for wheelchair users*

  *Only applies to some hotels.

All these features are not designed to look like "special needs" equipment or add-ons. Better accessibility is something that everyone, including able-bodied guests, can benefit from. Scandic hotels are becoming well placed to attract large numbers of disabled people looking for a better hotel experience.

BOAT

The sightseeing boat 'Vision of the Fjords' combines Inclusive Design and sustainability to set new standards for water transport. It was designed to sail into the UNESCO-protected Nærøyfjorden in Norway, a site of outstanding natural beauty.

PRIMARY QUESTIONS

Flåm is a world-renowned tourist destination on the West coast of Norway where ferries form part of the transport system. This area has stunning nature, so this project asked: how can we support more sustainable tourism and set a new benchmark for inclusive boat design? Three organisations from Sogn og Fjordane entered into a joint venture (Flåm AS) to create a new boat using Inclusive Design resulting in 'step-change' innovation. The shipyard Brødrene Aa had an award-winning reputation for inclusively designed passenger boats.

LEAD USERS

The Norwegian Association of Disabled People helped test solutions for people with reduced mobility. Non-Norwegian speakers tested information accessibility, and people with low vision were included from the Norwegian Association of the Blind and Partial Sighted. Research was conducted with a range of passengers 'in situ', mapping movements and barriers whilst travelling on the water. This became a starting point to create an equal experience for all passengers. The designer drew a spiral walkway which became an external ramp avoiding the need for lifts or stairs.

METHODS

Inclusive Design was embedded throughout the project to include tourists of all abilities. Inclusive Design insights from previous passenger boat research helped the project, showing the importance of curating findings from previous work. The Regional County of Møre og Romsdal had disability representatives as consultants, and in Sogn og Fjordane, local Inclusive Design champions were appointed.

INSIGHTS

Very few shipbuilders design boats with Inclusive Design in mind. However, Flåm AS understood the

growing need for inclusive tourism. Regulatory requirements, ramps, tactile signs, lighting, wayfinding, maintenance and materials were all considered. The boat design needed to reflect local context so crew design inspiration from waves, the Troll Ladder and nature trails.

FACTS

Client: The Fjords (Fjord1 and Flåm AS)
Shipyard: Brødrene Aa
Designer: Torstein Aa
Background: Three professional organisations from Sogn og Fjordane agreed to enter into a joint venture (Flåm AS) to build a new boat for sustainable tourism on the fjords and they worked closely together to solve this challenge behind this spectacular innovation

RESULTS

The boat is a radical and pioneering design that is fast-becoming a modern icon. The innovative gangway enables access for passengers with wheelchairs, strollers or reduced mobility alongside everyone else.
All doorways have ramps and handrails. The interior has panoramic windows so everyone can enjoy the view side-by-side. Any passenger can get from the main deck to the top deck with little effort. Passengers can orientate themselves around the interior with spacious furnishings and defined walking zones – the seats next to aisle use different colours and materials to emphasise pathways.

It is a hybrid, and 100 per cent emission-free and silent when running on batteries, allowing passengers to hear natural sounds around them. Advertising only appears on a downloadable app and hearing loops avoid noisy loudspeaker systems. Other Inclusive Design elements include handrails along the walls, tactile marking on the stairs, and understandable signage on bathroom doors.

Vision of the Fjords went further than regulation required, resulting in a large amount of positive press. It is pioneering and innovative in its construction, notably as the largest carbon fibre boat in the world. It represents a major shift in sustainable and inclusive boat design, contributing to both the shipping sector and international tourism by setting new standards. Although it costs more than a traditional ferry, the new boat will pay for itself with increased passenger traffic and the increased level of connection and enjoyment that it provides.

"We see in practice that making good solutions for those with mobility issues is great for all passengers no matter capability."

Tor Øyvin Aa, CEO

LANDSCAPE ARCHITECTURE

Hamaren Activity Park is a centrally located and easily accessible park. It surrounds a kindergarten, schools and a care home for older people. The park promotes physical activity within nature to improve health and well-being. It has become a social gathering point for the entire population.

PRIMARY QUESTION

With its large, natural landscapes, the municipality of Fyresdal asked: how can we create an activity park that can be used by everyone and address community needs of residents or visitors of all ages?

METHODS

The park received funding from government as well as from the private sector, with lottery and betting funds securing basic financing. The project go-ahead was secured by the regional county council, who remained vital to its implementation. The municipality invited the entire population of Hamaren to input their ideas, needs and perspectives at a meeting at the start of the project.

This resulted in a strong sense of engagement and community ownership from the outset. In turn, the project management team challenged themselves to meet most of the residents' wishes and even gave the them responsibility for the design of various elements such as information signs, lean-tos and the BMX park.

LEAD USERS

In terms of community involvement, the project was exemplary. For example, the contract was open to local craftsmen and companies based in the municipality's business park, ensuring a local sense of pride and a high-quality outcome. The kindergarten made information signage and younger people felt ownership of specific aspects of the park that they were involved in through schemes such as Ungt Entreprenørskap (Young Entrepreneurship).

INSIGHTS

The surrounding landscape was stunning, but was not accessible to many people, including the locals, who could not benefit from walks through the high mountains, deep fjords and hilly terrain. This is typical for the inhabitants of many small municipalities. Older people, families with small children, people with different abilities and non-locals who were not familiar with wild landscape found it challenging to visit the natural surroundings and benefit from the health-promoting activities and sensory experiences.

RESULTS

The project encountered significant resistance in its early phases with some believing that the outcome would not justify the investment. However, the criticisms receded as the park became a regional tourist attraction.

Some areas of the picturesque headland were inaccessible, but the gangway and bridge now provide stop-off points to access information and enjoy the vistas. The scheme is inclusive for wheelchairs, and this makes it easier for everyone. As well as creating a positive impact on public health, this park has also raised the level of social cohesion for the locals.

The high degree of community involvement brought a sense of shared ownership, so the space is kept tidy and quiet. Anti-social activities such as loitering, noisy parties and littering have been reduced.

The park has also had a positive "ripple effect" on the small, unique shops in the area, and as the entrance is next to the care home and kindergarten, older people and children access and use it without the need for supervision. The café has become a popular meeting place at the weekends attracting visitors from a far.

Inclusive Design ensures that everyone has equal access, and groups spanning four generations visit the park. This project shows that Inclusive Design is not just about the urban built environment, but can benefit natural spaces as well.
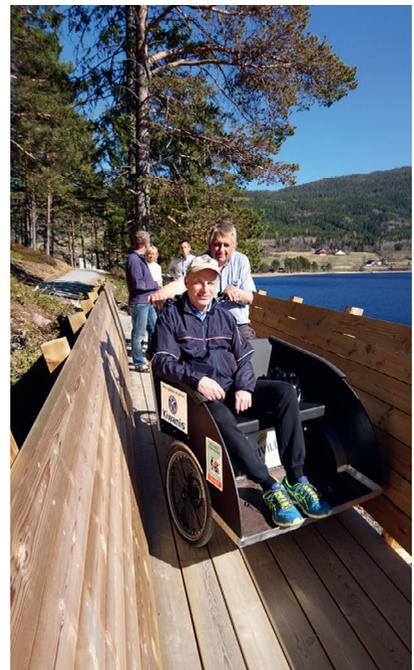
BANK

When the Central Bank of Ireland moved into new offices at North Wall Quay in Dublin, they wanted to ensure that the building fully met Inclusive Design standards and ambitions. The result was an award-winning building that set a new standard for public institutions nationally and internationally.

PRIMARY QUESTIONS

The Central Bank of Ireland asked: how can the everyday needs of a diverse range of employees and visitors be considered when planning a new headquarters? The aim was to create a state-of-the-art facility that showcased the value of Inclusive Design and accessibility.

LEAD USERS

Bank staff and management were involved to help them understand the importance of embedding Inclusive Design into the bank's buildings and services. Including staff with disabilities throughout the process meant that they could share their experiences and help reshape the bank.

A variety of other stakeholders were involved throughout the process, representing different services and disciplines.

The Central Bank rolled-out staff training in disability awareness alongside the building improvements and established a staff-led network called BankAbility, sponsored by senior management to promote disability awareness, and an accessibility policy rolled-out staff training alongside the building improvements. Lead users were not just part of the research but also had personal site inductions a week before moving.

METHODS

A number of methods were employed to ensure good practice:
- Relevant cases were examined and on-site visits conducted to see other Inclusive Design projects.
- An Inclusive Design consultant was hired to work across the project.
- A high-level site review gave over a hundred recommendations for the design team.
- On-going reviews took place throughout, covering everything from furniture to tea stations.
- Site inspections were a part of the construction process.
- Inclusive Design requirements were embedded into tender and procurement processes.
- Senior management committed to making changes
- Awareness through training, departmental workshops and staff meetings.
- Inclusive Design elements were included in induction manuals.

INSIGHTS

Several Inclusive Design workshops were held with different departments. Catering gave insights on improving restaurants and cafes. Meetings with Maintenance resulted in checklists to ensure that accessibility was well maintained, such as testing of induction loops. Security Services were consulted on offering a good balance between security and a welcoming, open-access philosophy was achieved.

The Human Resources Department and IT and Communications teams were also involved to support Central Bank staff. An awareness-raising video was prepared and

circulated to staff to help them engage with the project and identify accessibility requirements. All these insights were visibly fed into the process.

RESULTS

Many accessibility measures were implemented, including:

- Accessible parking and vehicle sit-down areas.
- Reception desks with split-level counters.
- Waiting areas to accommodate diverse users.
- Wayfinding and door design providing visual contrast, easy operation and generous width.
- Large lifts with good signage, clear controls, light floor finishes, contrasting handrails and half-height mirrors.
- Male and female toilets with enlarged cubicles, right-and left- handed doors, grab-rails and shelves.
- A Wellness Centre.
- Well-designed signage, lighting and audible aids
- Smart lift technology to allow for individual needs.

The result is an office environment that enhances well-being and differentiates itself with its staff and visitors through Inclusive Design. The ongoing commitment to continual improvement has secured positive feedback, national recognition and a number of awards for the Central Bank.

"The building at North Wall Quay has removed all of the barriers to accessibility and usability. I can now navigate my workplace fully independently."

Tony Murray, Senior Solution Architect with low vision

GLOSSARY

Accessibility: Physical or sensory ability to access buildings, use products and obtain information or services.

Adaptable Design: Design that can be easily adapted to create a barrier-free space, product or environment.

Artificial Intelligence (AI): A field of computer science dedicated to solving cognitive problems commonly associated with human intelligence, such as learning, problem-solving, and pattern recognition.

Assistive Design: A device that assists a person with disabilities in accomplishing daily tasks. These can include a wheelchair, bath hoist or extendable cutlery to help with eating.

Assistive Technology: Devices that aim to assist or rehabilitate people with severe impairments. Generally, not classed as Inclusive Design, as the devices might have little application for mainstream markets.

Augmented Reality (AR): Adds digital elements to a real-world live view that can be seen on screen

Autism: A spectrum of conditions that includes Aspergers. Autistic individuals have a behavioural condition affecting social communication, interaction and imagination. This can manifest in a variety of ways including repetitive behaviour, hypersensitivity to environmental stimuli or adherence to routine.

Barrier-free Design: Modifying buildings or environments so that they can be used by people with disabilities. Automatic doors and ramps are examples of this.

Big Data: Methods for researching of gathering data that are primarily based on statistics, large samples and percentages.

Co-Design: A process whereby end users actively participate in design activities alongside the designer, bringing their ideas into shaping the product, service or environment.

Deep Data: working with a few people to deeply understand their lives.

Dementia: Loss of memory primarily due to age that makes it difficult to remember things in daily routine. The effect is a serious loss of cognitive ability.

Design Exclusion: Term developed by the i~design research project as a way of understanding who might be excluded by a particular design.

Design For All: See page 9.

Design For Disability: Term used for design considerations focusing on specifically on aids and adaptors for the disabled people.

Design For Future Selves: Concept developed by DesignAge Programme to encourage young designers to see older people as their own 'future selves'.

Design Thinking: Defined by Tim Brown (IDEO in 2008 as a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity. Inclusive Design underpins and relates to Design Thinking.

Developer: In this book the term relates to a real-estate developer, an individual or an organisation who takes land and adds value in some way by building, developing or redesigning the space. Developers are often commissioners of architects.

Dexterity: Ability to perform tasks with skill and ease.

Dignity: Treating people with respect and promoting personal independence.

Disability: Disability can be seen as a result of mismatch between individuals and their social and physical environment. It is important to not define people by their condition. We are all on a spectrum of ability.

Dyslexia: Difficulty in comprehending, writing and reading words and text thought to be due to the result of a neurological defect or difference. It is not regarded as an intellectual disability.

Empathic Research: A form of research to understand

the explicit and tacit needs and perspectives of people. A core part of Inclusive Design and Design Thinking that is subjective and immersive rather than distant or objective.

Ergonomics: Scientific study that addresses the relation of human being to their environment and the application of anatomical, physiological, psychological, and engineering knowledge. It intends to maximize efficiency and productivity by reducing operator fatigue and discomfort. See also Human Factors.

Ethnography: A branch of social science that primarily conducts research with people. Design Ethnography is an emerging field specific to design.

Human-Centred Design: HCD or User Centred Design (UCD) is a term that can apply any design tailored to users that meet their needs and is completely intuitive to use. Sometimes used interchangeably with Inclusive Design.

Human Factors: Multidisciplinary scientific study sometimes known as ergonomics devoted to optimising human performance and reducing human error. Human Factors involves the study of factors and development of tools that facilitate the achievement of these goals. See also Ergonomics.

Inclusive Architecture: See page 9

Inclusive Design: See page 9.

IoT (The Internet of Things): A network consisting of any object with an on/off switch that is connected to the internet. Machines are connected to other machines and devices via sensors, sharing data and information with one another.

Mixed Reality (MR): A combination of AR and VR in which real-world and digital objects interact with each other

Mobility: Ability to moving freely across the city using public or private transport regardless of a person's age or ability. Can also impact an individual's participation in the economic, political and social life of the community.

Participatory Urbanism: Building on the ideals of Participatory Design, this idea looks to involve individuals and communities in the strategic planning and assessment of architectural schemes. The philosophy is rooted in peer-to-peer exchange.

People-Centred Design: A design process in which research with people is central. People are not treated like test subjects but as an integral and equal part of the research process. The term is based on Inclusive Design and sometimes used interchangeably.

Planning Process: A generic term used to cover the architectural process from defining a brief, obtaining planning permission, citizen consultation, through to delivery of the building or space. Seven Principles of Universal

Design: Developed by US architect Ron Mace, these principles have formed a benchmark in Universal Design thinking. In summary, they look at safety, comfort, convenience, ease of use, ergonomic fit, suitability, and user value.

Social Inclusion: A term that refers to the action being taken against social problems such as unemployment, poor education, ill health, low income, crime, poor housing or poor environment. Inclusive Design has been seen as a tool to promote social inclusion and equality by many governments.

Tactile Signs: Signs that have raised letters or markings to be read and interpreted by tracing with fingers over the surfaces. Braille is an example of a tactile language using dots that is

primarily aimed at visually impaired people.

Trans-generational Design: Design of residential environments and consumer products that are attractive and accommodating to people across the age spectrum. In short, trans-generational designs accommodate rather than discriminate and sympathise rather than stigmatise.

Universal Access: The ability to have equal opportunity and access to a service or product regardless of social class, ethnicity, background or ability. Also described as Access for All.

Universal Design: See page 9.

User-Centred Design: A term that is sometimes used interchangeably with people-centred design. It describes design processes in which end users influence the design outcome by being involved in all stages of development. It is very often regarded as 'user testing' and is brought in at the end of the product development cycle.

User Experience: The perceptions and responses of the person that result from the use or anticipated use of a product, system or service. This includes all their emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviours and accomplishments that occur before, during and after use.

User Research: Conducting research people to understand their experiences, in particular their needs and aspirations. A central part of Inclusive Design and people-centred design.

Virtual Reality (VR): Complete immersion of a person or people into an interactive virtual environment using equipment such as Google Cardboard or Occulus Rift

FURTHER READING AND REFERENCES

Norwegian sites:

The Agency for Public Management and eGovernment (Difi)
www.difi.no

Association for plan - and regulation
www.oslo.kommune.no/politikk-og-administrasjon/etater-og-foretak/plan-og-bygningsetaten/#gref

The Directorate of Health and Social affairs
www.helsedirektoratet.no

The Equality and Anti-Discrimination Ombudsman (LDO)
ldo.no

The Government Action Plan for Universal Design and increased accessibility ´Norway universally designed by 2025
www.regjeringen.no/globalassets/upload/bld/nedsatt-funksjonsevne/norway-universally-designed-by-2025-web.pdf

Governmental Special Education Support
www.statped.no

Guidelines on accessibility in public building
www.byggforalle.no

Kids' Tracks, Design and Architecture (DOGA)
www.barnetrakk.no/en

MediaLT
medialt.no

The Ministry of Children and Equality
www.bld.dep.no

The Ministry of Local Government and Modernisation
www.regjeringen.no/no/dep/kmd/id504

Mother of Sustainable Development
www.norway.no/en/missions/UN/norway-and-the-un/norways-rich-history-at-the-un/important-norwegians-in-un-history/gro

The National Council for Senior Citizens
www.seniorporten.no

Norwegian Association for Asthma and Allergies (NAAF)
www.naaf.no/en/sprak-samleside-en

The Norwegian Association of the Blind and Partially Sighted (NABP)
www.blindeforbundet.no

Norwegian Association of the Deaf (NDF)
www.deafnet.no
Norwegian Association for the Handicapped (NFU)
www.nfunorge.org

Norwegian Cooperation Forum of Disability Organizations (SAFO)
www.safo.no

Norwegian Federation of Organisations of Disabled People (FFO)
www.ffo.no/Organisasjonen/About-FFO

The Norwegian Directorate for Children, Youth and Family Affairs
www.bufdir.no/en/English_start_page

The Norwegian government's key advisor in construction and property affairs
www.statsbygg.no

The Norwegian State Housing Bank (NSHB)
www.husbanken.no

The Oslo Manifesto / Design and Architecture for the SDGs
oslomanifesto.org

Plan of Action for Universal design
www.regjeringen.no/en/dokumenter/regjeringens-handlingsplan-for-universell-utforming/id2473299

The SINTEF Group
www.sintef.no

Standards Norway
www.standard.no

Statistics Norway (SSB)
www.ssb.no

Vi fikk det til evalueringer av St. Olav-prosjektet
sjukehusbygg.no/wp-content/uploads/2015/04/Vi-fikk-det-til-evalueringer-av-St.-Olav-prosjektet.pdf

ÆRA Strategic Innovation Studio
era.as

International sites:

The Atlantic
www.theatlantic.com

Central Intelligence Agency, The World Factbook (CIA)
www.cia.gov/library/publications/the-world-factbook

CityLab
www.citylab.com

Design to Improve Life
designtoimprovelife.dk

European Blind Union (EBU)
www.euroblind.org

European Commission Eurostat
epp.eurostat.ec.europa.eu

Fast Company
www.fastcodesign.com

The Daily Good
www.good.is

Designing with People, the Helen Hamlyn Centre for Design at the Royal College of Art
www.designingwithpeople.org

Gartner Newsroom
www.gartner.com/en/newsroom

GlobalWebIndex
www.globalwebindex.com

Globetrender
www.globetrendermagazine.com

The Guardian
www.theguardian.com

The Lancet
www.thelancet.com/commissions/pollution-and-health

McKinsey & Company
www.mckinsey.com

Mightybytes
www.mightybytes.com

OECD Better Policies for Better Lives
www.oecd.org

Open IDEO
www.openideo.com

Organisation for Economic Co-operation and Development (OECD)
www.oecd.org/social/inequality.htm

Pew Research Center Journalism & Media
www.journalism.org

RCA The Helen Hamlyn Centre for Design Archive
www.rca.ac.uk/research-innovation/helen-hamlyn-centre/helen-hamlyn-centre-design-archive

Scandinavian Trend Institute (Pej)
www.pejgruppen.dk

Springwise
www.springwise.com

The Statistics Portal
www.statista.com

United Nations (UN)
www.un.org

Visual Complexity
www.visualcomplexity.com

We are Social
wearesocial.com

The World Bank
worldbank.org

World Health Organization (WHO)
www.who.int/en

World Institute for Development Economics Research
www.wider.unu.edu

Other links on Inclusive Design:

Center for Excellence in Universal Design
universaldesign.ie

Center of Inclusive Design and Environmental Access (IDeA), University at Buffalo
www.ap.buffalo.edu/idea

Center of Universal Design (CDI) of the Institute of Technology Sligo, Ireland
www.designinnovation.ie

Design Council The Double Diamond Process Model
www.designcouncil.org.uk/designprocess

Design for All Europe (EIDD)
dfaeurope.eu

Design for All Foundation
designforall.org

Design for All – Sweden
www.designforalla.se

Easy Living Home (elH)
www.easylivinghome.co.uk

European Cooperation in Science and Technology TU1214 People Friendly Cities in a Data Rich World
www.cost.eu/actions/TU1204/#tabs|Name:overview

Friendly and Inclusive Design Awards
uiafriendlyspaces.awardsplatform.com

iF International Forum Design GmbH
ifworlddesignguide.com/press-about/about-if/the-if-story

137

Inclusive Design Group, Cambridge Engineering Design Centre
www-edc.eng.cam.ac.uk/research/inclusivedesign
Inclusive Design Toolkit by BT and i~design
www.inclusivedesigntoolkit.com

Inclusive Design - UK Design Council
www.designcouncil.org.uk/inclusive-design/search/users

The Institute for Human Centered Design (IHCD)
humancentereddesign.org

International Association for Universal Design (IAUD)
www.iaud.net/global

People Friendly Cities in a Data Rich World
people-friendly-cities.eu

Resources for designers
www.designingwithpeople.org

Royal National Institute of Blind People (RNIB)
www.rnib.org.uk

Universal Accessibility by Architectural Service Department
www.archsd.gov.hk/archsd/html/ua/index.html

The World Design Organization
wdo.org

Reports:

Achieving full participation through Universal Design (2009). Soren Ginnerup.

EIAA Mediascope Europe Study (2008).

McKinsey & Company
Diversity Matters (2015), Vivian Hunt, Dennis Layton, Sara Prince

McKinsey Quarterly, The Business

Value of Design (2018). Sheppard, Sarrazin, Kouyoumjian, Dore.

Mightybyte, Web Sustainability (2018). Scandinavian trend institute, DK, Fra barnevogn til kørestol, – Livsfaser og forbrug. Part 1 and 2, (2007). Louise Byg Kongsholm.

Scandinavian trend institute, DK, Med det ene ben i graven og det andet i butikken, - de nye seniorer (2007).

United Nations, the Millennium Development Report, (2007).

World Bank Development Indicators (2017).

Literature:

(2017). Building for Everyone – A Universal Design Approach. Dublin: The Centre of Excellence in Universal Design, National Disability Authority universaldesign.ie/Built-Environment/Building-for-Everyone

Ahrensbach, T., Beunderman, J., Fung, A. and Johar, I. (2011). Compendium for the Civic Economy. London: Trancity Valiz

Bonnet, D. (1913). Inclusive Urban Design: A guide to creating accessible public spaces. London: BSI

Brenda, L. & Lunenfeld, P. (2003). De¬sign Research: Methods and Perspectives. Cambridge. MA:The MIT Press

Brown, T. (2008). Design Thinking. Boston. MA: Harvard Business Review

Clarke, A.J. (2010). Design Anthropology: Object Culture in the 21st Century (2011 edition). New York City, NY: Springer Publishing Company

Clarkson, P.J., Coleman, R., Keates, S. & Lebbon, C. (2003). Inclusive Design:

Design for the Whole Population, New York City, NY: Springer Publishing Company

Coleman, R. (1994). The Case for Inclusive Design – An Overview, Proceedings of the 12th Triennial Congress of the International Ergonomics Association Toronto, August 15-19, 1994. Mississauga, Ont: Human Factor Association of Canada

Curedale, R. (2015). Design Thinking Pocket Guide (2nd edition). Los Angeles, CA: Design Community College Inc.

Dorst, K. (2015). Frame Innovation: Create New Thinking by Design. Cambridge, MA: MIT Press

Froyen, H. (2012). Universal Design: A methodological approach. Boston, MA: Institute of Human Centred Design

FultonÐSuri, J. (2007). Design for people? Design with people? Design by people? Who is designing now? Proceedings of Include 2007: Designing with People conference, RCA, London, April 1-4, 2007. London: The Helen Hamlyn Centre for Design, Royal College of Art

Galán, J. H., Izarbe, F. Á., Hernández, C. F., Del Valle, T. G. et.al. (2014). Actuaciones accesibles en Arquitectura / Accessible activities in Architecture. Madrid: Fundacion ONCE

Gheerawo, R. (2016). Socially Inclusive Design: a People-centred Perspective. London: In, Sparke, P & Fisher, F (ed) The Routledge Companion to Design Studies, Routledge, Taylor & Francis

Gray, D. Brown, S. & Macanfuno, J. (2010). Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers. Sebastopol, CA: O'Reilly Media Inc.

Griffin, J. H. (1962). Black Like Me. New York City, NY: Signet Books

Keates, S. & Clarkson, P. J. (2003). Coun¬tering Design Exclusion: An introduction to inclusive design. London: Springer-Verlag

Kelley, T. & Littman, J. (2006). The Ten Faces of Innovation: Strategies for Heightening Creativity. London: Profile Books

Lee, K. F. (2018). AI Superpowers China, Silicon Valley, and the New World Order. New York City. NY: Houghton Mifflin Harcourt Publishing Company

Lidwell, W., Holden, K. & Butler, J. (2003). Universal Principles of Design. Beverly, MA: Rockport Publishers

Liedtka, J., Salzman, R. & Azer, D. (2017). Design Thinking for the Greater Good Innovation in the Social Sector. New York City, NY: Columbia University

Press:

Pickett, K. & Wilkinson, R. (2009). The Spirit Level. London: Allen Lane

Vavik, T. (2009). Inclusive Buildings, Products & Services: Challenges in Universal Design (2009 edition). Trondheim: Tapir Academic Press

Wolfgang, F.E. Preiser & Ostroff, E. (2001). Universal Design Handbook. New York City, NY: McGraw-Hill

Media content:

Video from cases can be found at YouTube if you search for:

Central Bank of Ireland - Accessibility in How We Work Video

Central Bank of Ireland - Accessibility in Our Environment Video

Inclusive Design at Queen Elizabeth Olympic Park Video

Innovating with People - Blanke Ark Voting System Case Video

Innovating with People - Hamaren Activity Park Case Video

Innovating with People – Kahoot! Ed-Tech Case Video

Innovating with People - Scandic Hotel Oslo Airport Case Video

Innovating with People - St. Olavs Hospital Case Video

Innovating with People - Tuva Cutlery Case Video

Innovating with People - Vision of The Fjords Case Video

Innovating with People - Yr.no Case Video

Photo courtesy and copyrights:

Special thanks to:

CONTRIBUTORS

DESIGN AND ARCHITECTURE NORWAY (DOGA)

D O A G Design and Architecture Norway

DOGA has a mission to explore the intersection of design and architecture and to promote the understanding, knowledge and use of the two disciplines from a commercial and social perspective. This book was produced and managed by DOGA as part of the Innovation for All Programme, lead by Onny Eikhaug from its inception. It is one of the measures in the Norwegian Government Action Plan for Universal Design coordinated by the Ministry of Children and Equality since 2005. It is the only programme in the Action Plan to promote Inclusive Design as an effective, people-centred strategy for innovation in private and public sector, across all design and architecture disciplines. DOGA has had a strategic partnership with RCA Helen Hamlyn Centre for Design since 2007, and has commissioned leading organisations, designers and architects within the field of Inclusive Design to contribute with the content of this book.

www.doga.no
www.inclusivedesign.no

Onny Eikhaug   Rama Gheerawo

Victoria Høisæther

RCA HELEN HAMLYN CENTRE FOR DESIGN

Royal College of Art
THE HELEN HAMLYN CENTRE FOR DESIGN

The Helen Hamlyn Centre for Design (HHCD) at the Royal College of Art (RCA) undertakes Inclusive Design to improve people's lives. It is the largest and longest-running centre for design research at the RCA with a 27-year history that includes the definition of 'Inclusive Design' as an idea in 1994. It has completed over 280 projects with business, academic, government and voluntary sector partners, and engages with communities including students, new graduates, and academics. It develops empathic research methods – and exchanges knowledge via education, events, publications and industrial collaboration. The Centre Director is Rama Gheerawo.

www.hhcd.rca.ac.uk

Editor-in-chief: **Onny Eikhaug**
Editor: **Rama Gheerawo**

Contributing writers:
Onny Eikhaug (DOGA),
Rama Gheerawo (HHCD),
Marianne Støren Berg, Cian Plumbe, Merih Kunur
Project Research Co-ordinator:
Victoria Høisæther (DOGA)

ARCHITECTURE EXPERT PANEL
Karine Denizou
Architect, Master Architecture, architecte DPLG
SINTEF Building and Infrastructure

Gunn Schmitthenner
Architect MNAL, partner
RAK Arkitektur AS

Masashi Kajita
Assistant Professor, Ph.D. Architect MAA
The Royal Danish Academy of Fine Arts, Schools of Architecture, Design and Conservation (KADK)

Fionnuala Rogerson FRIAI
Co-Director International Union of Architects (UIA) Architecture for All Work Programme
Director **Fionnuala Rogerson** Architects

Masashi Kajita   Karine Denizou

Gunn Schmitthenner   Fionnuala Rogerson