Universal design for health and wellbeing

Kristin Skeide Fuglerud

Norsk Regnesentral (Norwegian Computing Center)
University of south Eastern Norway

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Agenda

I. What is universal design (UD)?

II. Barriers in healthcare for people with disabilities

III. Universal design, health literacy, self-management technology

IV. Outlook – future research

I. What is universal design?

Universal design (UD) - definition

The design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

"Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.

From the UN Convention on the Rights of Persons with Disabilities (CRPD) (UN 2006)

Universal design vs. assistive device

- A web page that is accessible by everyone is universally designed
- A screen reader with braille for visually impaired is assistive technology

Important aspects of UD as a design method / approach

Characteristics of a method/approach:

- Goal / perspective
- Application area
- Guidelines
  - Principles for organization
  - Tools
  - Techniques

(Andersen et al.1990; Bratteteig et al. 2013)

Aligning methods to universal design

Characteristics of method:

- Perspective
- Application area
- Guidelines
  - Principles for organization
  - Tools
  - Techniques

Universal design

- Full participation and equality for everybody
- ICT solutions (products and services)
- Guidelines
  - Facilitate participation for diverse users
  - Principles and guidelines
  - Base on a human-centered design process
  - Adapt tools and techniques to diverse users

Differences in design approaches: goal and application area

Characteristics of method	User-centred design (UCD)	Universal design (UD)	Participatory design (PD)
Main goal / perspective	Best possible usability: effectiveness, efficiency and satisfaction	Solution that is usable for all, to the greatest extent possible	User participation in the design and decision processes
Application area	Product development	ICT solutions (products and services)	In-house development

(Kujala 2008; Grudin 1991)

Differences in design approaches: guidelines

Characteristics of method	User-centred design (UCD)	Universal design (UD)	Participatory design (PD)
- Degree of user involvement	Informative (for)	Consultative (with)	Participatory (by)
- Recruitment and representativity	Statistically stratified sample	Diversity in users, devices and context	Political delegation

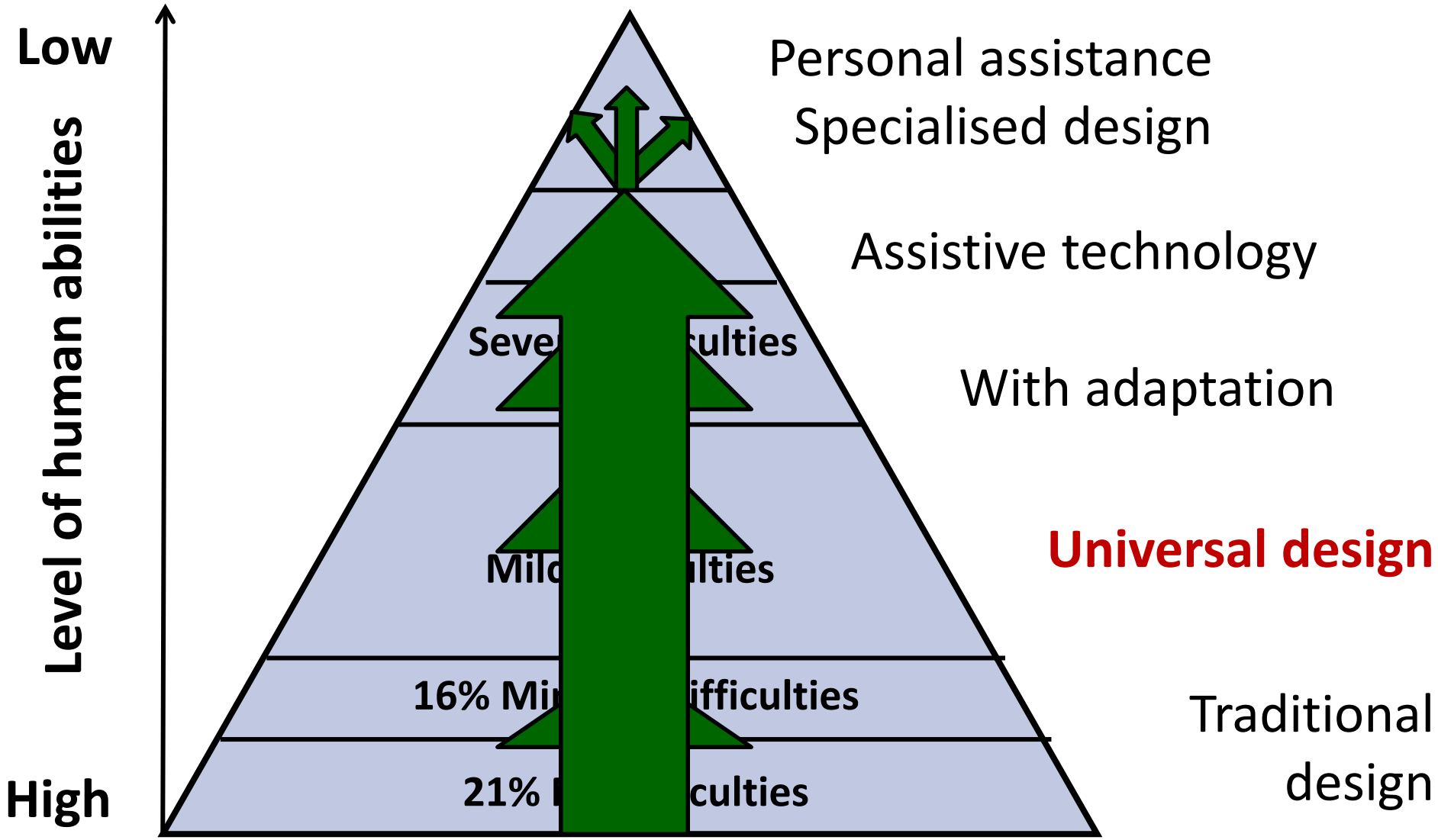
(Kujala 2008; Muller et al. 2001)

Methods that allow for diversity

- Many methods talk about representative users.
  - There are different interpretations of what constitutes representative users
  - In UD the main perspective is user diversity, deliberately targeting people with disabilities.

- Different types of user participants
  - A user that represents a group to safeguard the group's needs
  - Individual users that only represent themselves.

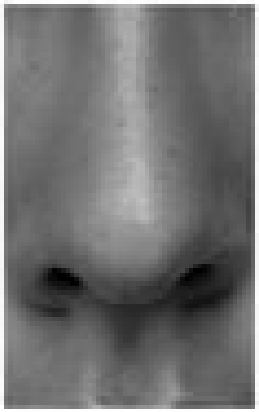
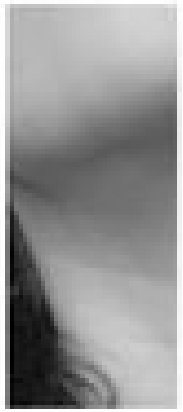
Usable for as many as possible: The population diversity pyramid



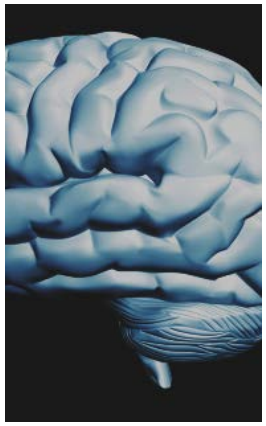
http://www.inclusivedesigntoolkit.com/whatis/whatis.html

Diversity in users




© clipart 2007



Main categories of (dis)abilities:

- Cognitive
- Physical
- Sensory

Permanent or temporary

Other perspectives: age, skills, languages, culture...

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Diversity in contexts and devices

Aligning methods to universal design

Characteristics of method

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- Guidelines
  - Principles for organization
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Universal design

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Guidelines: Facilitate participation for diverse users

- Access to users
- Ethics and privacy
- Incentives
- The design team's experience with various user groups
- Access to meetings
- Accessible tools techniques and materials?
- Needs for assistants or extra equipment?
- Duration
- Flexibility

Guidelines: The seven universal design principles

1. Equitable use
2. Flexibility in Use
3. Simple and Intuitive Use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for Approach and Use

Center for Universal Design, North Carolina State University, Raleigh, NC, 1997

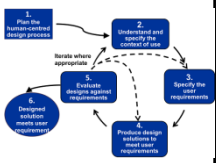
Guidelines: Accessibility is a precondition for universal design

- Web Content Accessibility Guidelines (WCAG, W3C)
  - Perceivable
  - Operable
  - Understandable
  - Robust
- Additional guidelines depending on application:
  - Accessible mobile applications
  - Accessible questionnaires
  - Usable security and privacy
  - etc.

Choosing tools for the UD-process

Examples of tools and techniques. Combine to cover various user groups and perspectives	design -phase 	for with by	organisation: equal participation for diverse users						
			vision	hearing	mobility	language	cognition	ict-exp.	age
Focus group	**2, 3**	**with**							
Interview	**2, 3, 5**	**with**							
Survey	**2, 3, 5**	**with**							
ICT-based forum, blog etc.	**2 - 5**	**with**							
Cultural probes/ diary	**2, 3**	**with**							
Field study	**2, 3, 5**	**with**							

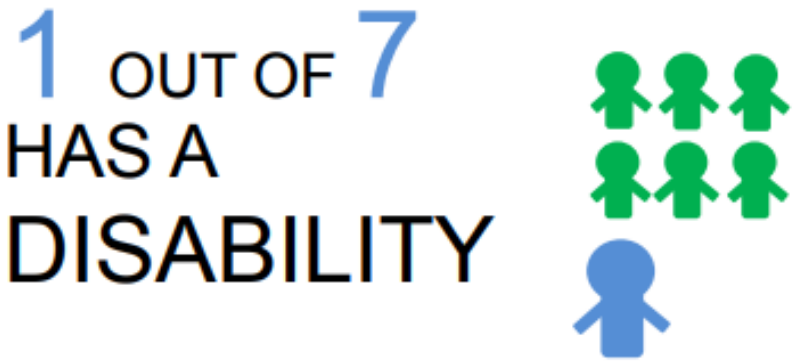
Choosing tools for the UD-process

Examples of tools and techniques. Combine to cover various user groups and perspectives	design -phase 	for with by	organisation: equal participation for diverse users						
			vision	hearing	move	language	cognition	ict-exp.	age
Long distance testing	**5**	**with**							
Log-fil analyse	**5**	**for**							
Technical testing/screening	**5**	**for**							
Expert evaluation	**5**	**for**							
Heuristic evaluation	**5**	**for**							
Cognitive walkthrough	**5**	**for**							

Barriers for people with disabilities

Demographics

- Disability: an impairment of function or structure that limits activity or involvement in life situations (WHO)



Source: WHO (2011) World Report on Disability

- Rates of disability are increasing due to population ageing and increases in chronic health conditions

People with disabilities

- are underrepresented in health research
- are less likely to be screened for high blood pressure, elevated cholesterol, or alcohol and tobacco usage
- have higher rates of obesity and are twice as likely to smoke
- are 5 times more likely to develop diabetes and 3 times more likely to have heart disease, stroke, and cancer
- have significantly lower usage of preventive services

Marrocco, A. and Krouse, H.J. 2017. Obstacles to preventive care for individuals with disability: Implications for nurse practitioners. *Journal of the American Association of Nurse Practitioners*. 29, 5 (2017), 282–293.

Barriers in healthcare for people with disabilities

- Physical access
- Transportation
- Communication and information
- Attitudes and competence among personnel
- Financial
- Preventive and coordinated care
- Barriers in work (as health professionals)

Accessibility and usability barriers of computer-based systems and e-health

- Accessibility
  - navigation,
  - poor contrast,
  - small text, buttons,
- Usability
  - cumbersome,
  - frustrating,
  - complex,
  - challenging
  - time consuming

Universal design, health literacy and self-management technology

Patient engagement and health literacy

- Patients are expected to take and active role in their relationship with health care providers.
- This requires health literacy
  - The active use of (written) information to achieve personal goals and to develop personal knowledge and skills (Panagioti et al. 2018)
- Necessary for
  - acquiring a relevant vocabulary
  - determining what information is relevant
  - understanding health information and to ask questions

(Panagioti et al. 2018; Geboers et al. 2016)

Empowerment and self-management

Empowerment: enabling patients to keep control of their own situation, and to support or educate them in learning to deal with their problem or treatment (Bastemeijer 2017):

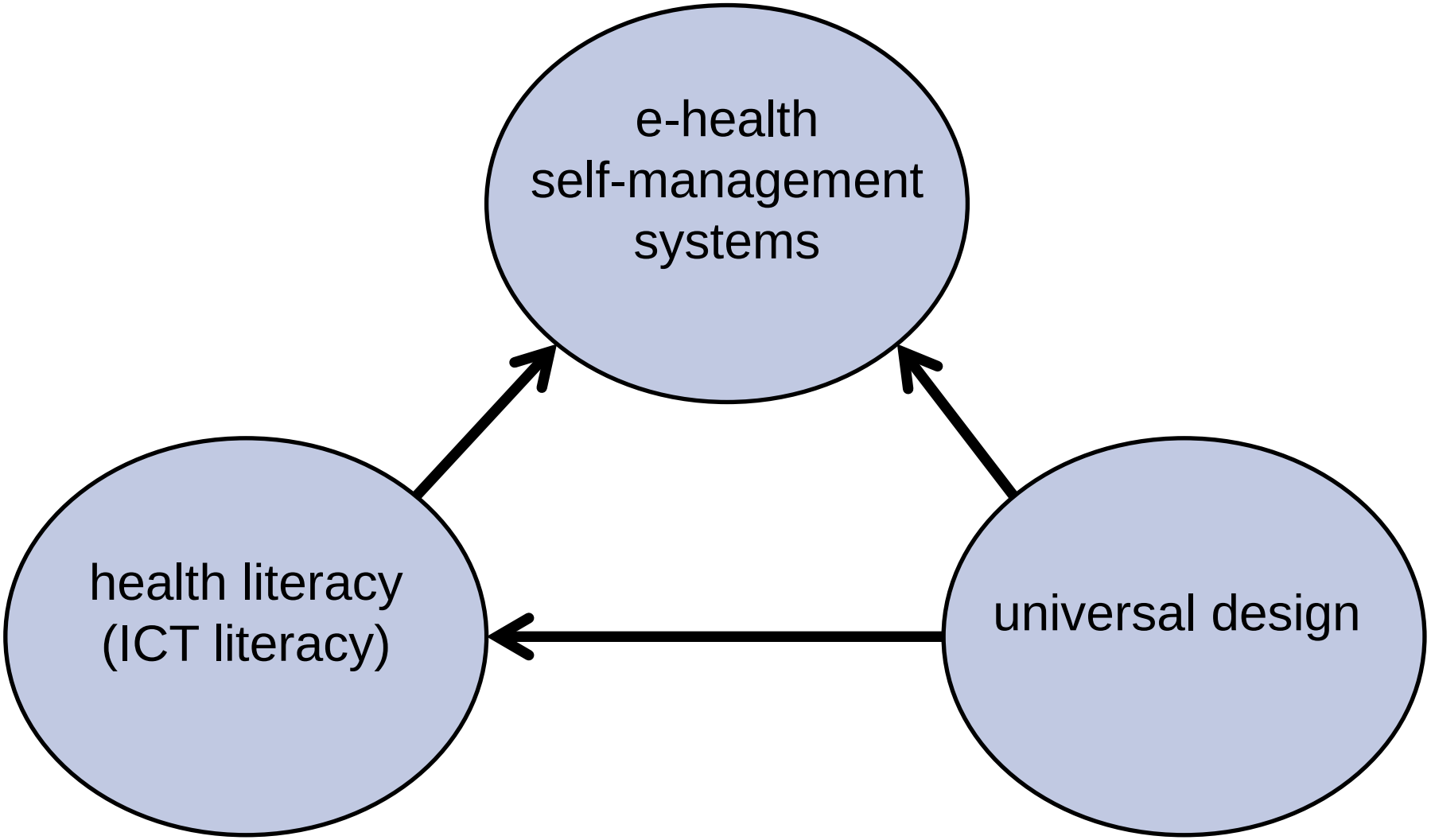
Important properties for **empowerment** (Bastemeijer 2017)**:**

- feeling respect and being listened to,
- having a sense of control,
- being informed,
- discuss the treatment with professionals,
- partnership in daily life and care

Important properties for **self-management** (Bardus 2016)

- goal setting
- self-monitoring
- feedback
- health literacy (Geboers, et al. 2016)

Literacy and universal design is important for self-management

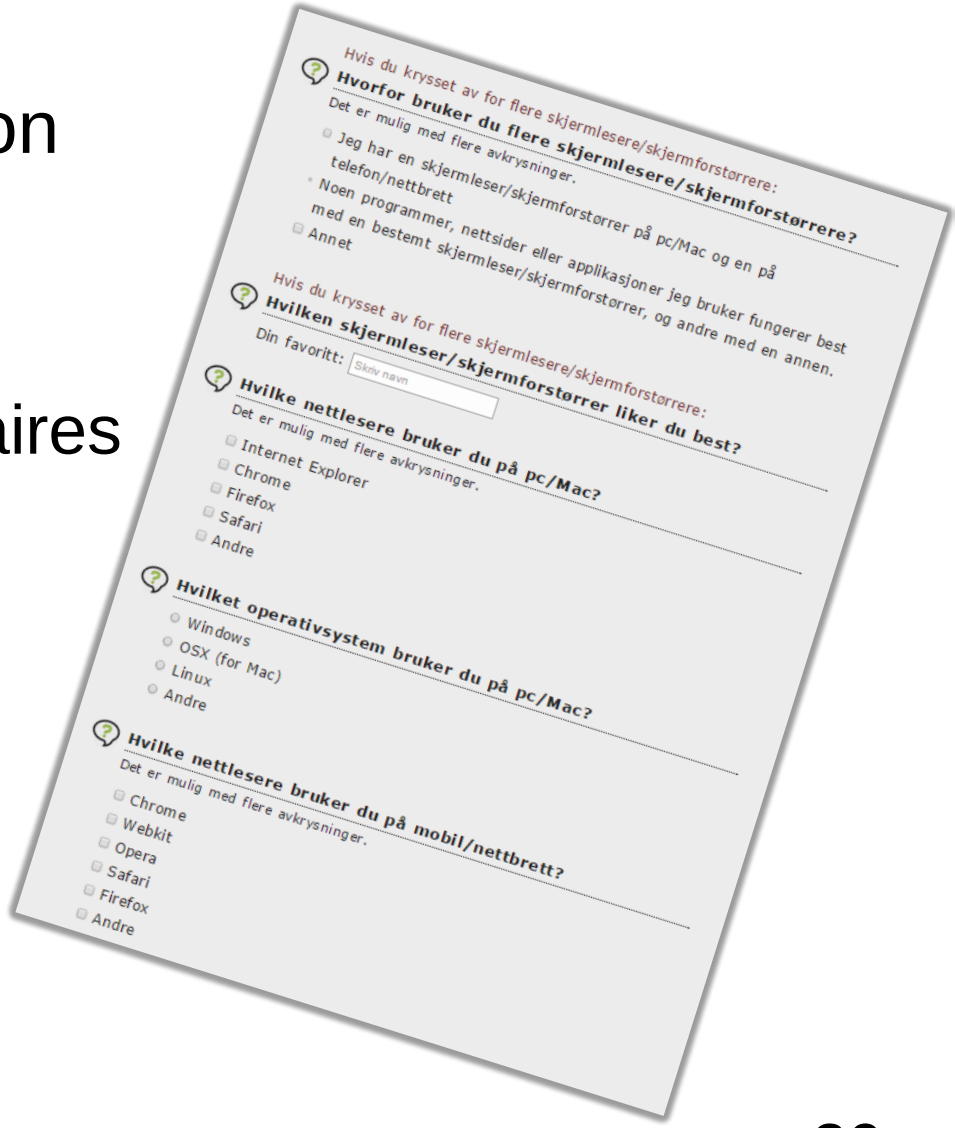


Examples

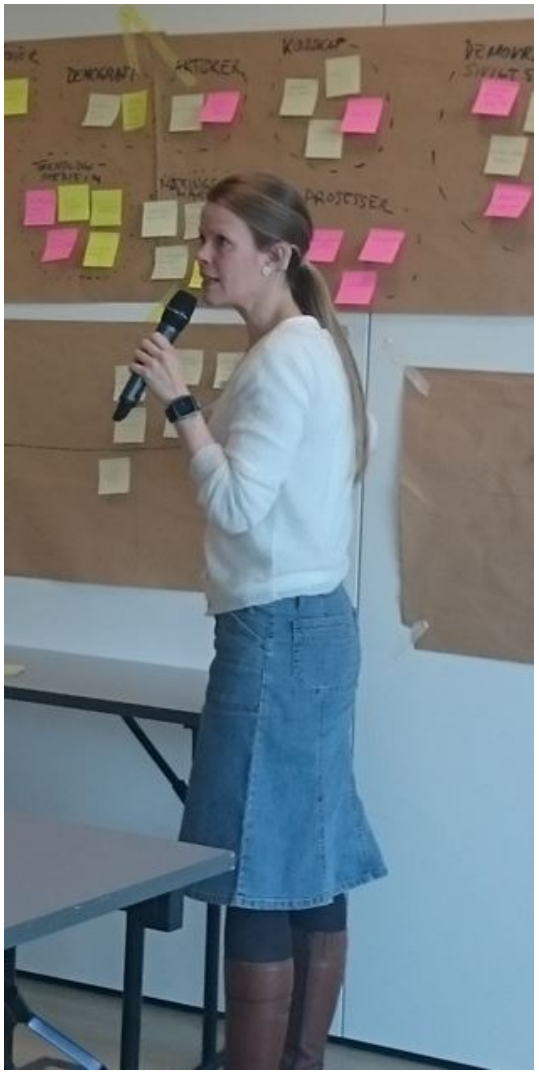
1. Including people with disabilities in research and design
2. Appetitus: app for inspiring older people to eat healthily
3. EziSmart: assistive technology to help people with visual impairments or poor dexterity to use a smartphone.

Including people with disabilities in research and design

- Accessible data collection
  - Paper-based
  - Telephone interviews
  - Web-based questionnaires
- Accessible workshops
  - Recruitment
  - Physical access
  - Communication, tools and techniques



Accommodating diversity



Accommodate diversity

Appetitus

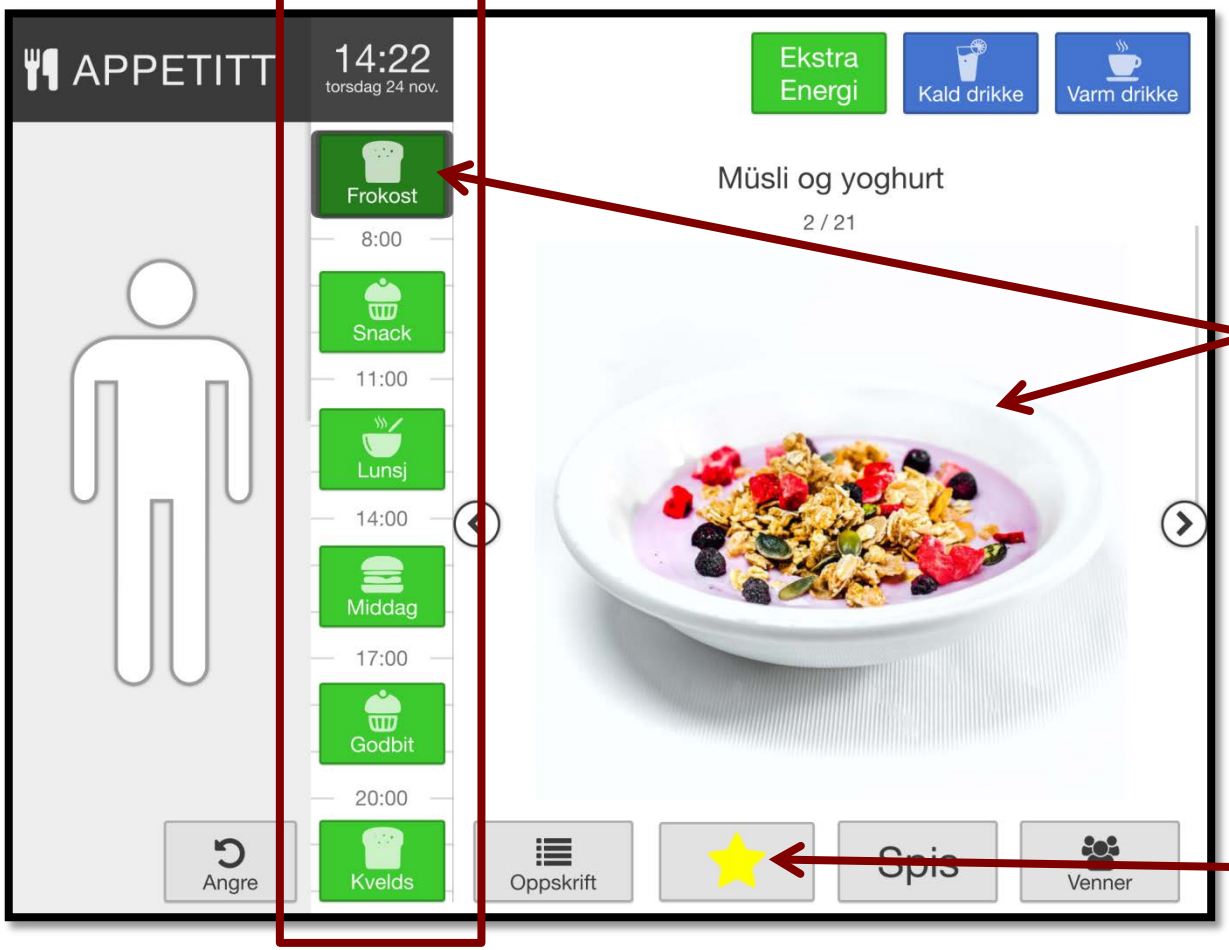
App for inspiring older people to eat healthily (Fuglerud et al. 2018)

- inspiration through appetizing pictures
- Registration of food intake
- Visualization of energy
- Wishes - shopping list
- Settings - Personalization

Photo: Kristin Fuglerud

APPETITUS

Structuring of meals

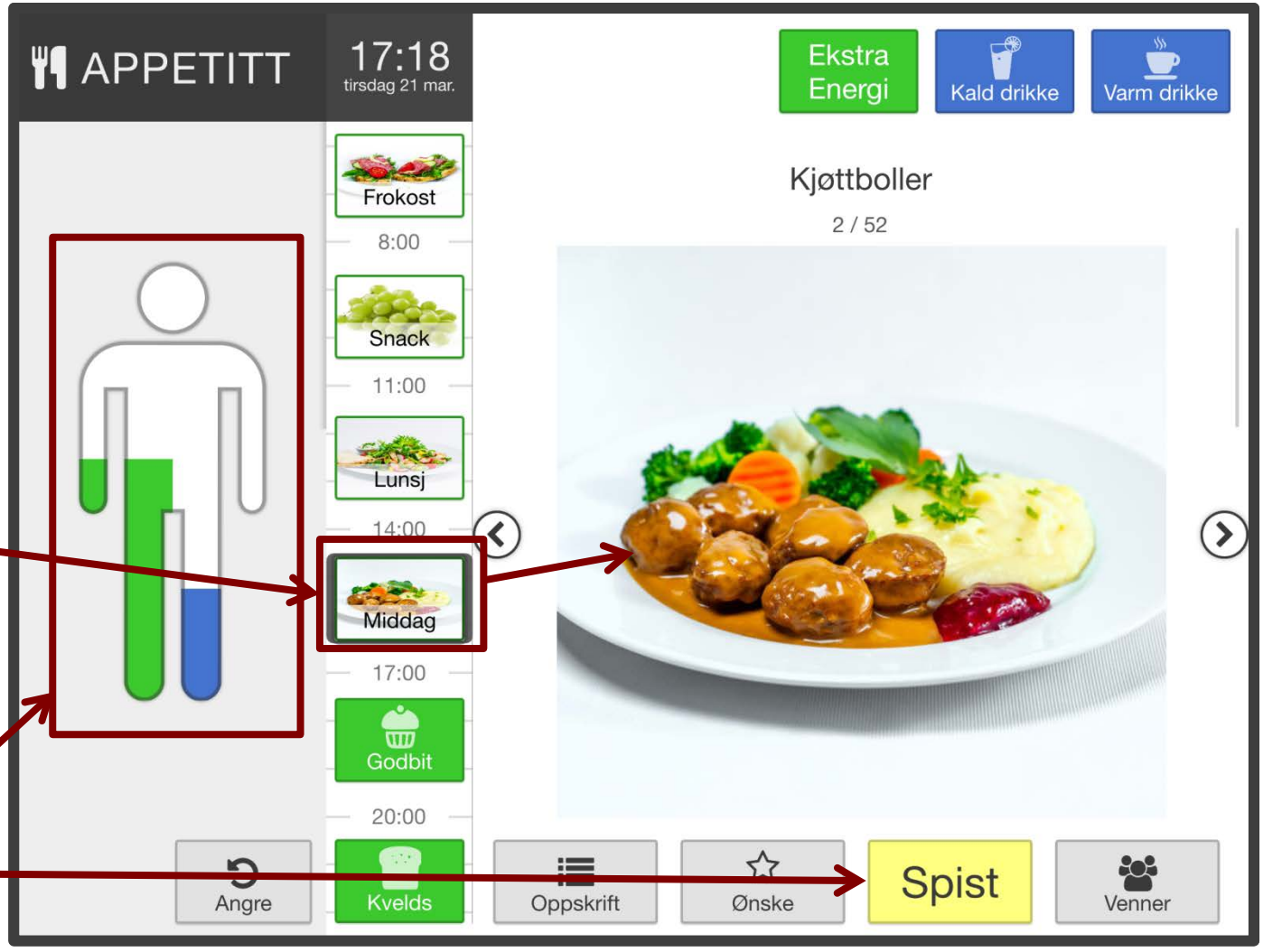


Suggested meals

Selection of wishes, linked to shopping list

Choose
food and drink

Register
food and drink



EziSmart – assistive device to help people with visual impairments and/or poor dexterity to use a smartphone.

50% of visually impaired people in Norway feel lonely, 20% very lonely (NBF 2018)

(Fuglerud et al. 2018)

Apps & Case

Future research

- improve techniques and tools to include people with disabilities in health research and in design
- improve information and communication
- increase health literacy
- coordination of health services
- Success criteria's for self-management in e-health

Thank you for your attention!

Comments?

Questions?

Please contact

Kristin Skeide Fuglerud

www.nr.no

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