4th International Meeting on Health Systems Design Research: Keeping the momentum

TU Delft · University of Cambridge · DTU · the Design Society – a worldwide community

Delft, December 1st, 2020

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Event overall context and goal

At our first meeting in Cambridge (UK) in 2018, we began to lay the foundations of a community of researchers and practitioners with a common interest in Health Systems Design. We met again in 2019 at DTU - Technical University of Denmark and in Cambridge. In 2020, we launched a Special Interest Group (SIG) on Health Systems Design as a part of the Design Society during the DESIGN 2020 conference.

In this meeting on the 1st of December 2020, our aim was to continue putting our talks so far into action, by working on a project that belongs to us as a community – an edited reference book on Health Systems Design Research and Practice.
We focused on two objectives:

- Introducing the current structure of the book (sections and chapters), presenting the timeline for delivery, and inviting feedback in section-specific breakout sessions; and
- Sharing specific projects from research groups represented in our community.

This year, the Delft University of Technology hosted the event. Due to the ongoing covid pandemic, however, we connected online (via Zoom).

Event program

10:00–10:15 Introduction

10:15–11:00 Keynote 1: Innovation @ Leiden University Medical Center & the National eHealth Living Lab

11:00–11:15 Break

11:15–11:30 Book session 1: introduction

11:30–12:15 Book session 1: Breakout

12:15–12:30 Book session 1: Wrap-up

12:30–13:00 Break

13:00–13:30 Shared break

13:30–14:15 Keynote speech: Innovation at Philips Design

14:15–14:30 Break

14:30–15:15 Book session 2: Breakout

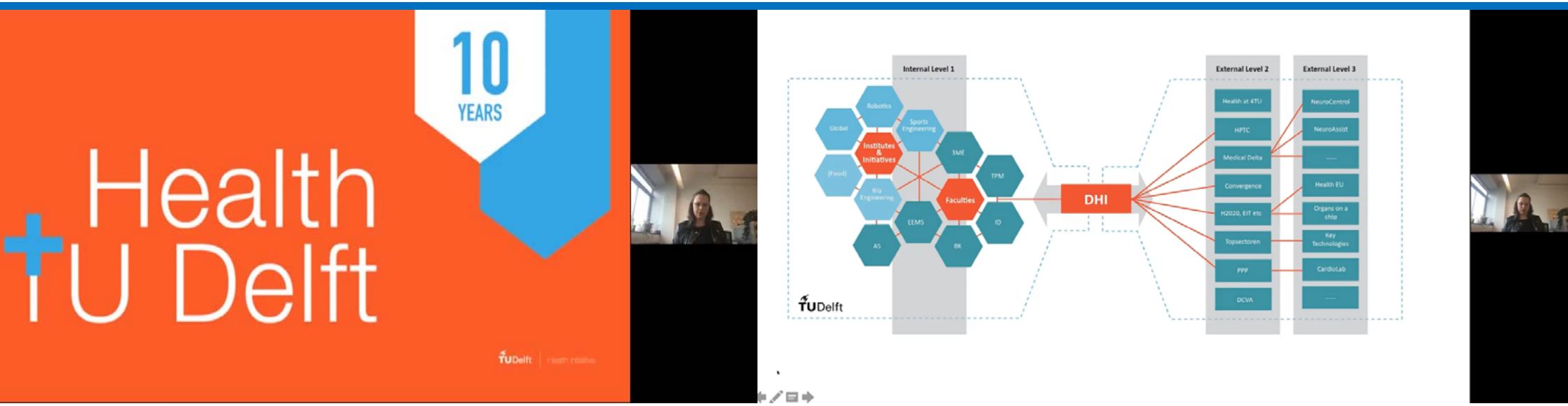
15:15–15:30 Book session 2: Wrap-up

15:30–15:40 Break

15:40–16:45 Presentations (project updates)

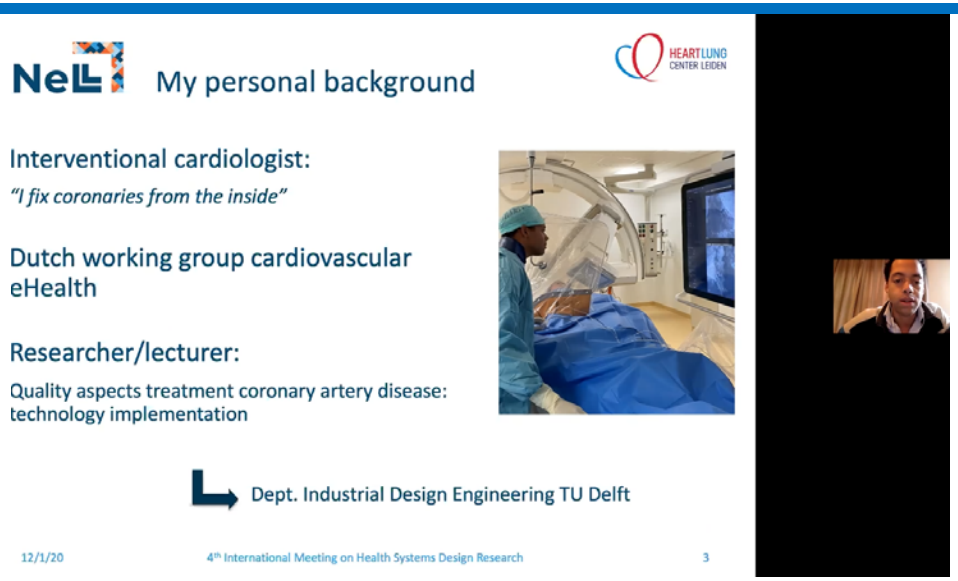
16:45–17:00 Wrap-up

Introduction



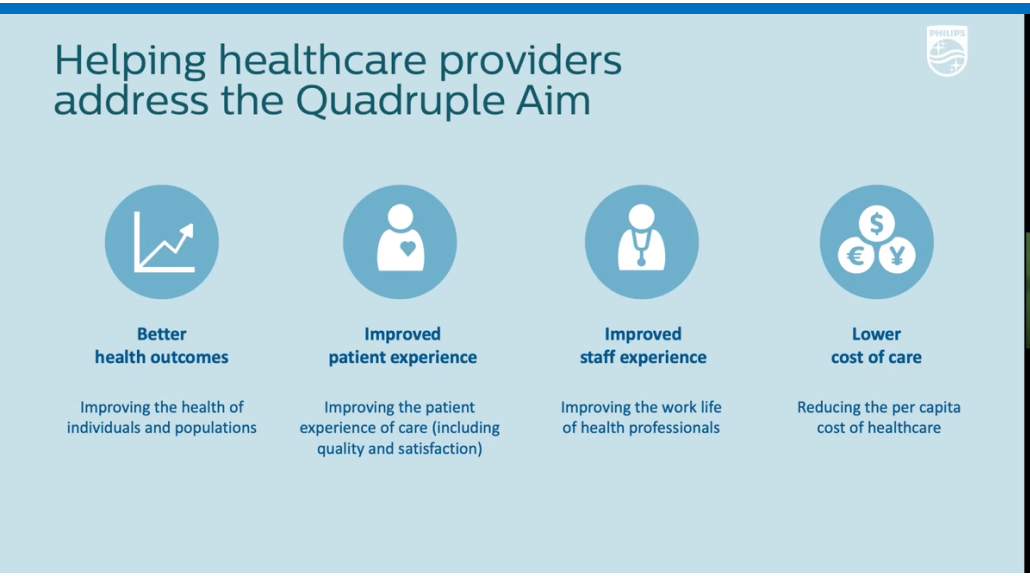
Maaike Kleinsmann (TU Delft) kicked off the event and introduced the health design research ecosystem connected to the university.

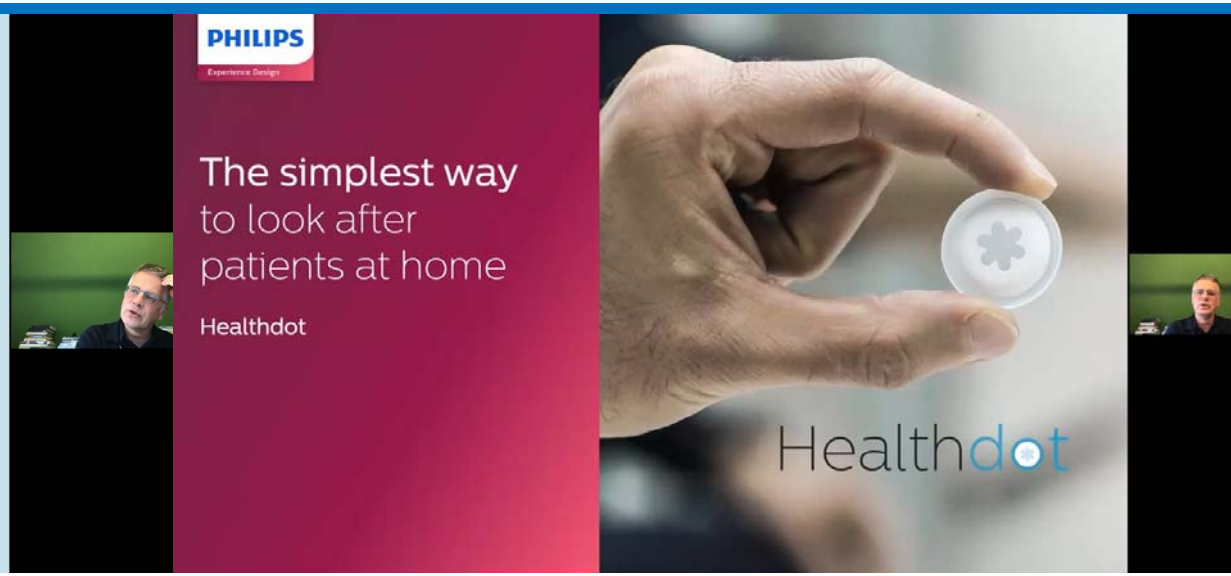
Innovation @ Leiden University Medical Center & the National eHealth Living Lab



Roderick Scherptong (Leiden University Medical Center) **and Annemiek Silven** (National eHealth Living Lab) presented their hospital-based work on eHealth development.

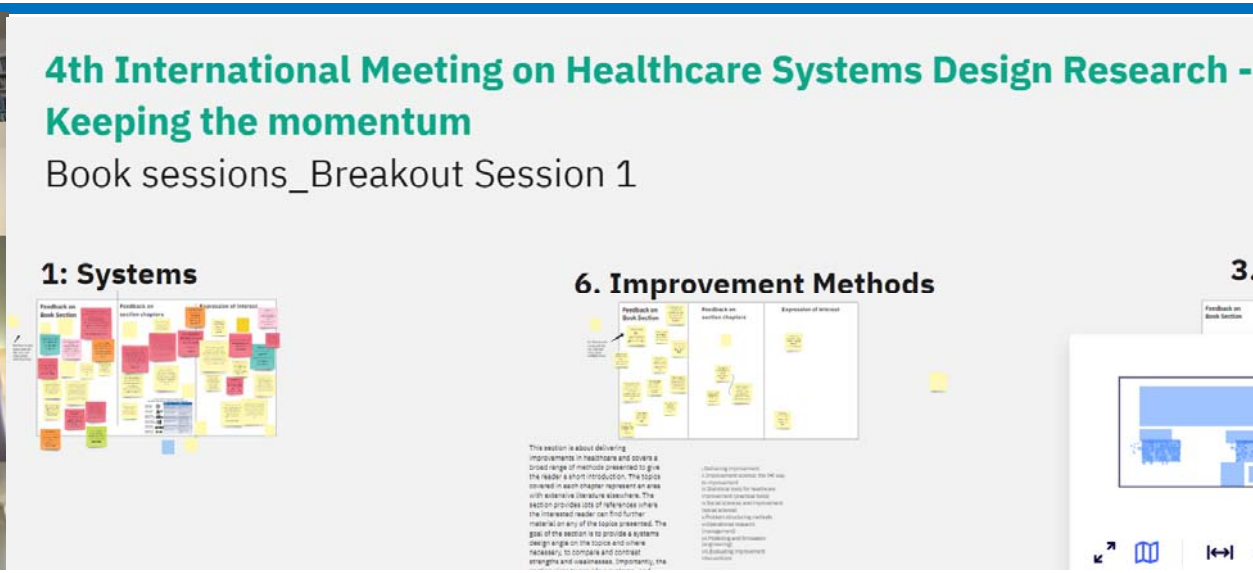
Innovation at Philips Design





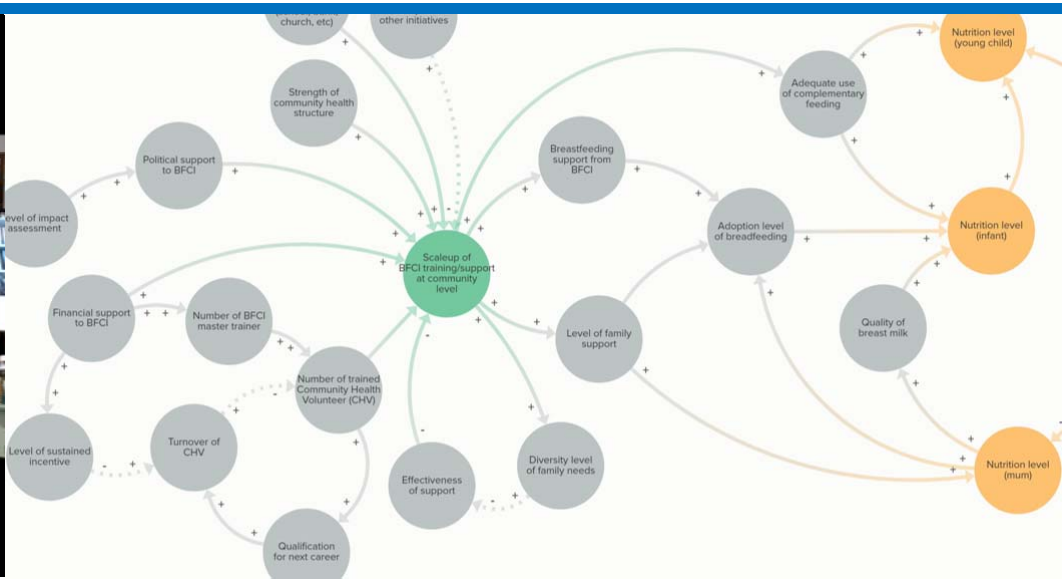
Jeroen Raijmakers (Philips Design) introduced approaches to healthcare-related design and showcased recent innovations.

Book sessions



All participants collaboratively worked on the Book project by discussing structure and potential contributors.

Project updates



Research teams provided updates on their most recent work

Project updates: abstracts

Guillaume Thomann

Development of a tool for driving evaluation by physical therapists for children with neuromuscular diseases.

The MFM is a validated functional evaluation scale for the diagnosis and clinical monitoring of patients with neuromuscular disease. It anticipates the adaptation needs of patients, provides a common language for all professionals and assesses the effects of different therapeutic treatments. To improve the performance of measurements, the reproducibility of evaluations and patient participation, it is proposed to develop a tool, based on accessible technologies, for assisting therapists. Thus, this thesis is developed along four research axes: (1) the choice of a 3D motion sensor to replace the Microsoft KinectTM sensor, (2) the development of software on a Tablet for the assessment of fine motor skills, (3) the proposal of a playful environment to motivate the young patients during the evaluations and (4) proposals to integrate the tool into the current practices of the therapists. This working context strongly suggests the use of a user-centered design approach (UCD), in which therapists and patients are asked to express their needs at each stage of the design process. As results, replacing the Kinect, the VicoVr sensor showed better performance in the context of MFM than the Intel® RealSenseTM sensor. The automatic fine motor rating TabMe2 software developed obtained very good results for 3 items considered from the MFM. 7 fun animations for the MFM were developed according to an approach resulting from the development of Serious Games. Finally, an integration of all the tools developed has been proposed through a custom interface already familiar to physiotherapists, to facilitate their adherence

Project updates: abstracts

Alexander Komashie, James Ward, Ambika Chadha, Sonya Sireau, Kanwalraj Moar, P. John Clarkson

Engineering Better FFP3 Facemasks for Covid-19 and Beyond.

Personal Protective Equipment (PPE) for frontline workers in healthcare has always played a major role in the outbreak of infectious diseases. However, recent experiences with the Covid-19 pandemic have provided valuable insights into the shortcomings of FFP3 facemasks as part of the full range of PPE required to effectively protect frontline staff especially in high risk situations. As current emphasis shifts to the restoration of NHS services and sustainability, there are challenging implications for not only the supply of FFP3 facemasks but also ensuring that they are fit-for-purpose. The goal of the project is to ensure the provision of the highest level of respiratory protection, for the right procedure, at the right time and in a safe way. This requires FFP3 masks that ensure that clinical staff feel psychologically safe, are able to perform the procedure that provides the best results for patients and remain confident in their clinical capabilities. It also requires that the systems and procedures for mask acquisition, distribution, usage and disposal are carefully designed. To address these challenges, we employed a systems approach as described in the Engineering Better Care report by the Royal Academy of Engineering and its clinical partners. This provided a comprehensive framework for understanding the problem and formulating a plan for developing effective solutions. This involves the generation of evidence derived from FFP3 user experiences, comprehensive characterisation of risk of Covid-19 transmission in clinical scenarios and solving a range of specific problems that together inform the development of the next-generation FFP3 masks. In this presentation, I will briefly report on a University, NHS and Industry collaboration that was inspired by clinicians passionate about improving mask fit for frontline healthcare workers. I will focus on the systems aspects, highlighting the role of systems mapping and present key results from an international survey we conducted as a way of better understanding the nature of the problems with FFP3 facemasks.

Project updates: abstracts

Nicholas Ciccone, Carolina Duarte, Maximilian Wittmann, Josef Oehmen, Anja Maier

COVID health research at DTU Engineering Systems Design.

The Engineering Systems Design research section from DTU – Technical University of Denmark is currently conducting four COVID related research projects, encapsulating various systems thinking elements and healthcare intervention levels. From high-level systems projects involving the visualisation of R&D outputs, such as publications and patents as part of the Horizon 2020 EURITO project, to system resilience, to more bottom up work focusing on designing interventions for behavioural change processes in care homes to prevent the spread of infections, and the use of visual attention theory embedded in design artefacts to improve COVID prevention behaviours.

Sebastiaan Meijer

Establishing an integrated policy for mental health and well-being for the Region Stockholm.

I would like to present our work on establishing an integrated policy for mental health and well-being for the Region Stockholm. We work on engineering systems methods for the governance system to enable cross-sectorial steering for health promotion.

Project updates: abstracts

Mohammad Hassannezhad

A Cybernetic view of Participatory Systems Design.

This presentation will focus on the ‘Cybernetic view of Participatory Systems Design’ and outline a systematic methodology for whole-systems modelling and analysis of health policy systems. The proposed method, refers to 5Ex – standing for Expose, Explore, Exploit, Explain, and Expand, offers a fully digital co-produced environment which enables active participation of stakeholders from start to end (and not confined to workshops) with the goal to develop more confident systems models and reconcile it to other policy areas. An extensive application of the proposed method in a Combined Authority in the UK illustrates its capability in understanding system boundaries and change flows for multi-interest poor-data complex systems where there is conflicting or dispersed knowledge about system structure; in particular, identifying the ‘hidden influentials’ between socio-economic determinants of health influenced by Covid-19. The fully digitised systems map also proves to facilitate feedback mechanism by giving stakeholders the chance to re-think about and improve their recognition of the system, thus leading to better-informed decision-making.

Project updates: abstracts

Jos Kraal, Valeria Pannunzio, Maaike Kleinsmann

Tradeoffs between holism and reductionism; reflections on health and design research at Industrial Design Engineering.

This presentation focuses on the differences between clinical research and design research through the differences in backgrounds and perspectives of Jos and Valeria. These differences are articulated at the levels of methods, objectives and challenges. Furthermore, a tentative approach to reconcile the different points of view is proposed through the example of the Peri-operative Box project.

Project updates: abstracts

Gyuchan Thomas Jun, Antuela Tako, Patrick Waterson, Paula Griffiths

Applying multiple systems thinking approaches to support the scale-up of the Baby Friendly Community Initiative in Kenya.

This presentation introduces an on-going health systems research project co-led by Loughborough University and the African Population and the Health Research Center, funded by the NIHR Global Health Policy and Systems Research Development programme. The project team is multi-disciplinary with expertise in public health, nutrition, social science, health system design, operation research, human factors and health economics. The long-term goal of the research team is to scale up Baby Friendly Community Initiative in Kenya, a public health programme adapted from the WHO/UNICEF. The BFCI is an infant health promotion initiative, which aims to support health, growth & development of infants within primary care health systems. The aim of the current project is to understand facilitators and barriers for the implementation of the Kenyan BFCI and to develop a whole-systems-based strategy for the BFCI uptake in Kenya and into other African health systems. We use a combination of systems analysis methods such as Soft System Methodology (SSM), causal loop diagrams (CLD) and System-Theoretic Accident Modeling and Process (STAMP) to establish a viable action plan. This presentation will report on the early findings from a virtual stakeholder workshop and 93 stakeholder interviews which were carried out during the Covid-19 outbreak.

Next steps

Preliminary arrangements for HSDR 5 – tentative (depending on covid-19)
Date: November/December 2021
Location: – Delft University of Technology (TU Delft), The Netherlands

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